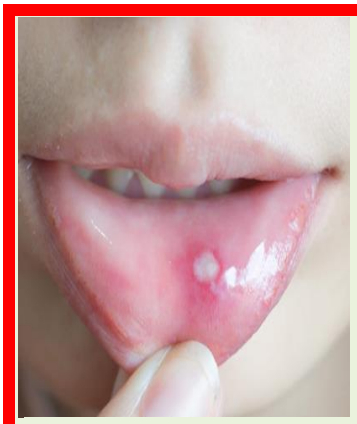


Community Pharmacy
A Guide to the Management of Minor Ailments




الدكتـــــور

ضيـــاء جبـــار كـــــاظم

كلية الصيدلـــة ـ جامعة بغـــداد

الطبعـــة الأولـــى

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A Guide
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بسم الله الرحمن الرحيم

(إِذَا مَاتَ ابْنُ آدَمَ انْقَطَعَ عَمَلُهُ إِلا مِنْ ثَلاثٍ :مِنْ صَدَقَةٍ جَارِيَةٍ ، أَوْ عِلْمٍ يُنْتَفَعُ بِهِ ، أَوْ وَلَدٍ صَالِحٍ يَدْعُو لَهُ)

حديث نبوي شريف

إهداء.....

إلى زملائي الصيادلة ..وصيادلة المستقبل (الطلبة الاعزاء) ..أهدي عملي المتواضع هذا...

ضياء

2018

تمهيد

يشكل العمل في صيدليات المجتمع (الصيدليات الخاصة)..مجالا مهما من مجالات ممارسة مهنة الصيدلة.. وواجهتها أمام المجتمع. ويشكل التعامل مع الحالات (البسيطة) هو الاخر جانبا مهما من ممارسة الصيدلة في هذا المجال.

ان هذا يحتم على الصيدلاني الالمام بالطريقة الصحيحة للتعامل مع هكذا حالات وتمييز ما كان بسيطا منها يمكن معالجته بأدوية تصرف دونما وصفة عن تلك الحالات التي تستوجب الاحالة الى الطبيب المختص. ولاكتساب هذه المهارة.. يتوجب على الصيدلاني قراءة المصادر المعتمدة في هذه المجال فضلا عن الممارسة والتدريب العمليين.

ان المصادر المتوفرة حاليا وان كانت متفقة-تقريبا- في تحديد وتسمية الحالات (البسيطة) التي يمكن للصيدلاني التعامل معها ومعالجتها دون الحاجة لرجوع المريض للطبيب.. الا انها تختلف اختلافا كبيرا في طريقة عرضها وتناولها لمختلف المواضيع. وكل له ما يميزه.

ان اقتصار الصيدلاني على قراءة مصدر واحد.. قد يحرمه من معلومات عملية مهمة يذكرها مصدر اخر.. كما ان قراءة المصادر جميعها والالمام بها ..هو الاخر.. امر صعب قد لا يتأتى لكثير من الصيادلة ..فضلا عن الطلبة.

ان هذا الكتاب.. هو محاولة بسيطة لعرض هذه المواضيع بطريقة مختصرة-نوعا ما- واختيار المعلومات الاكثر اهمية وذات الطابع العملي من مصادر عدة (كتبا ومجلات) وتجميعها في كتاب واحد.

في الختام ..اذكّر بقول القاضي الفاضل فيما كتبه إلى نائبه في وزارة الكتابة ":إنّي رأيتُ أنَّه لا يكتُبُ إنسانٌ كتابًا في يومِه؛ إلاَّ قالَ في غَدِهِ: لو غُيِّرَ هذا لكان أحسنَ، ولو زِيدَ كذا لكان يُستَحسَنُ، ولو قُدِّمَ هذا لكان أفضلَ، ولو تُرِكَ هذا لكان أجملَ. وهذا مِنْ أعظَمِ العِبَرِ، وهو دليلٌ علَى استيلاءِ النَّقصِ علَى جُملةِ البَشَرِ "...

ضياء

2018

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Introduction

Community Pharmacy Practice and Responding to Symptoms

Background

Community pharmacists are the **most accessible healthcare professional,** where no appointment is needed to council a pharmacist and the patient can receive a free advice anywhere without long waiting times at clinics or at other health facilities. Medications include Over-The-Counter medications (OTC) as well as prescription only medications (POM). Nonprescription (or OTC) products are a group of pharmaceuticals considered to be **sufficiently safe for use without the intervention of a physician**.

Differences between prescription and over-the-counter medications.	
POM medications	**OTC medications**
Require a **written order or prescription** from a physician, dentist, or nurse practitioner.	Can be bought **without a prescription.**
Are prescribed for the treatment of a **minor or major** medical problem.	Are intended for relief of **minor ailments.**
Are usually **more powerful** and have more side effects than OTC medications.	Are considered **safe** if warnings and directions are followed.

The switch of prescription-only–medicine (POM) to OTC status.

The availability of drugs over the counter **varies from country to country**. Generally drugs will be accorded OTC status if they fulfill various criteria:
1-The **condition** for which they are used can be reliably **self-diagnosed.**
2-Where there is **no evidence of irreversible or serious adverse reactions.**
3-Where **their use does not require medical supervision or monitoring by a doctor.**

Responding to symptoms in Community pharmacy

Responding to symptoms is a major activity for the community pharmacist. Many customers visit the community pharmacies each day with various symptoms for which they are seeking advice. This requires a **greater focus from the pharmacists on illness management, rather than on product selling**. Pharmacists will consider 1 of 3 recommendations during each encounter involving symptom presentation:
(1) Provide assurance that **drug therapy is unnecessary.**
(2) Suggest **treatment with non-drug measures, OTCs, or both.**
(3) **Refer the patient to appropriate medical personnel.**

As a general rule, the following **indicate a higher risk of a serious condition** and should make the pharmacist **consider referring the patient to the doctor**:

1-**Long duration of symptoms.**

2-**Recurring or worsening problems.**
3-**Severe symptoms.**
4-**Failed medication** (one or more appropriate medicines used already, without improvement).
5-**Suspected adverse drug reactions** (to prescription or OTC medicine).
6-**Danger symptoms** (Blood in the sputum, vomit, urine or faeces would be examples of such symptoms, as would unexplained weight loss).

Getting information from the patient:

The following **steps** highlight the key considerations you should think about when someone asks for your advice (as a pharmacist) about a particular symptom or condition they have**.**

1-Picking up on non-verbal cues:

Assessment of the patient begins the moment the patient enters the pharmacy and this 'first impression' can be very helpful in giving you clues to **their state of health.** For example, does the patient **look well** or **poorly**? For people who appear in discomfort or look visibly poorly, this might influence your decision to treat or refer.

2-Questioning:

Arriving at a diagnosis is a complex process. In medicine it is based on three kinds of information: patient history; physical examination; and the results of investigations. Currently, physical examination and using diagnostic tests are rarely used in community pharmacy practice. **Pharmacists rely almost exclusively on questioning patients** when deciding whether to offer treatment or perhaps refer the patient for further evaluation.

Acronyms

Acronyms have been developed to help pharmacists remember which questions should be asked. **WHAM** is the best known and simplest acronym to remember and has been advocated by many as a useful tool in gaining information from patients.

W–Who is the patient and **What** are the symptoms?

H–How long have the symptoms been present?

A–Action taken? (Any action taken by the patient should be established, including the use of any medication to treat the symptoms).

M– Medication being taken? There are four obvious reasons for this:

- A medicine may be causing the symptoms.
- A medicine may indicate a disease state the patients have.
- The patient may already be taking a medicine the pharmacist is about to recommend and which is not providing relief.
- Medications that are recommended may **interact** with existing treatment

3-Outcomes from the consultation:

The final step in prescribing for minor ailments is telling the patient what course of action you feel is most appropriate. This could be **referral** to another healthcare professional, giving **advice** or supplying a **product**.

A-Treatment and advice:

For many therapeutic groups there is a wide variety of products available, often in various combinations. The pharmacist should take into account the efficacy, potential side-effects, interactions, cautions and contraindications. When selecting a product, **the patient's needs** should be borne in mind. Factors such as prior use, formulation and dosage regimens should be considered. For example, antacids are available in both tablets and liquid form. Liquids tend to have a quicker onset of action than tablets but can be inconvenient for a patient to carry around with them or take to work. **Non-drug treatment s**hould also be offered where appropriate. For example, advice on increasing dietary fiber and fluids is an essential part of the management of conditions such as constipation and hemorrhoids.

B-Timescales:

One of the key things is telling the patient what **action to take if the symptoms do not improve.** Here, a defined treatment timescale should be used **(this is the length of time for which the problem might be treated before the patient sees the doctor).** The timescales given to each condition can vary.

Children and the elderly

These two patient groups have the highest usage of medicines per person compared with anyone else. Care is needed in assessing the severity of their symptoms as both groups can suffer from complications. For example, the risk of dehydration is greater in children with fever or the elderly with diarrhoea. Children should be offered sugar-free formulations to minimize dental decay and elderly people often have difficulty in swallowing solid dose formulations. It is also likely that the majority of elderly patients will be taking other medications for chronic disease and the possibility of OTC-POM interactions should be considered.

Pregnancy

The potential for OTC medicines to cause teratogenetic effects is real. The safest option is to avoid taking medication during pregnancy, **especially in the first trimester.**

Many OTC medicines are not licensed for use in pregnancy and breastfeeding because the **manufacturer has no safety data or it is a restriction on their availability**

Interactions of OTC medicines with other drugs:

Medicines that are available for sale to the public are relatively safe. However, there are some important drug-drug interactions to be aware of when recom mending OTC medicines.

Evidence-based medicine (EBM) and over-the-counter (OTC) drugs

Evidence-based medicine (EBM) emphasizes the use of evidence from well designed and conducted research in healthcare decision-making. **With regard to efficacy, pharmacists should be aware that** many OTC medicines have little or no evidence base**.** Therefore, products with proven efficacy should constitute first-line treatment. **Community pharmacists should stop selling over-the-counter (OTC) medicines that have little evidence of efficacy if they want to ensure the best treatment for patients.**

Chapter one: Gastrointestinal Tract Conditions

1-Constipation

Background

1-**Constipation**: is a condition characterized by the passage of **hard**, **dry** stools **less frequently** than the **person's normal pattern** [1].

2-The normal range may vary from three movements in 1 day to three in 1 week [1]. If it was stabilized at three daily for a patient, a reduction to one bowel movement daily might produce hard stools that lead to constipation. On the other hand, if a person's normal frequency is three weekly, two weekly might harden feces so that lead to constipation) [2].

3-**Women** are two to three times more likely to suffer from constipation than men and about 40% of women in late pregnancy experience constipation [3].

Etiology

1-Causes of constipation and their relative incidence are shown in (table 1-1) [3].

Table1-1: Causes of constipation and their relative incidence in community pharmacy [3]

Incidence	Cause
Most likely	Eating habits/lifestyle
Likely	Medication
Unlikely	Irritable bowel syndrome, pregnancy, depression, functional disorders (children)
Very unlikely	Colorectal cancer, hypothyroidism

2- Many drugs can induce constipation; some examples are listed in table1- 2 [1].

3-**Lifestyle factors**: like low-fiber diet, inadequate fluid intake, and chronic immobility can contribute to constipation [4].

4-**Examples of disease-induced constipation**: are diabetes mellitus, Hypothyroidism, **Irritable bowel syndrome** (IBS), bowel cancer, and painful anal conditions (such as anal fissures, and hemorrhoids) in which the patient tries to avoid defecation to avoid pain [5].

Table1 -2: Examples of drugs that may cause constipation [1]
Analgesics and opiates (Dihydrocodeine, codeine), **Antacids** (Aluminium salts), **Anticholinergics** (Hyoscine), **Anticonvulsants** (Phenytoin) **Antidepressants** (Tricyclics, selective serotonin reuptake inhibitors) **Antihistamines** (Chlorpheniramine, promethazine) **Antihypertensives** (Clonidine, methyldopa), **Anti-Parkinson** agents (Levodopa), **Beta-blockers** (Propranolol), **Diuretics** (Bendroflumethiazide) **Iron**, **Laxative abuse , Antipsychotics** (Chlorpromazine)

5-Constipation is a common problem in **elderly,** and **pregnancy** (due to hormonal changes, reduced mobility, bowel compression by the uterus, and iron therapy commonly taken by pregnant) [1, 3].

Complications [6]

If untreated, constipation can lead to:

1-**Faecal impaction** (when a large mass of faeces cannot be passed) and **obstruction** (with potential to progress to bowel **perforation**)

2-**Rectal bleeding** 3-**Anal fissures** 4-H**emorrhoids**

Patient assessment with constipation

A-Details of bowel habit:

1-Many people believe that a daily bowel movement is necessary for good health and laxatives are often taken and abused as a result. *In fact, the normal range may vary from three movements in 1 day to three in 1 week*. Therefore an important health education role for the pharmacist is in reassuring patients that their frequency of bowel movement is normal. ***Patients who are constipated will usually complain of hard stools which are difficult to pass and less frequent than usual*** [1].

2-The determination of any change in bowel habit is essential. A sudden change which has lasted for 2 weeks or longer [1] (**with no identifiable cause** [3]) should be referred for further investigations [1]. [Constipation continuing over several weeks to months is considered to be chronic [5]. If a patient suffers from longstanding constipation and has been previously seen by the physician then treatment could be given. However, cases of more than 14 days with no identifiable cause or previous investigation by the physician should be referred] [3].

B-Associated symptoms:

1-Intestinal obstruction:

Constipation is often associated with abdominal discomfort, bloating and nausea. In some cases constipation can be so severe as to **obstruct the bowel**. This obstruction or blockage usually becomes evident by causing ***colicky abdominal pain, abdominal distension and vomiting.***

When symptoms suggestive of obstruction are present, *urgent referral* is necessary as hospital admission is the usual course of action [1].

2-Blood in the stool:

The presence of blood in the stool can be associated with constipation. In such situations blood may arise from piles (**hemorrhoids**) or a small crack in the skin on the edge of the anus (**anal fissure**).

The bright red blood may be present on the surface of the stool (not mixed in with the stool). If piles are present, there is often discomfort on defecation. The piles may drop down (prolapse) and protrude through the anus. A fissure tends to cause less bleeding but much more severe pain on defecation [1].

The presence of blood in the stool [1], or dark tarry stool [5] required referral for further investigations. (Medical referral is advisable as there are other more serious causes of bloody stools, especially where the blood is mixed in with the stool) [1].

3-Constipation with associated **weight gain**, **deepening of the voice**, **feeling of tiredness** and **coarse hair** (*may indicate* **hypothyroidism**) and required referral [4].
4-Constipation with associated **weight loss** (may indicate **carcinoma**) and required referral [4].

C-Diet and lifestyle [1, 6]:

Insufficient intake of dietary fibers (like fruit, vegetables,…..), inadequate fluid intake , eating different foods or at different times may cause constipation.
Also changes in lifestyle, for example: job changes, loss of work, retirement or travel may cause constipation.

D-Medication:

1-One or more laxatives may have already been taken in an attempt to treat the symptoms. Failure of such medication required referral [1].

2-Many drugs can induce constipation; some examples are listed in (table 1-2) [1].

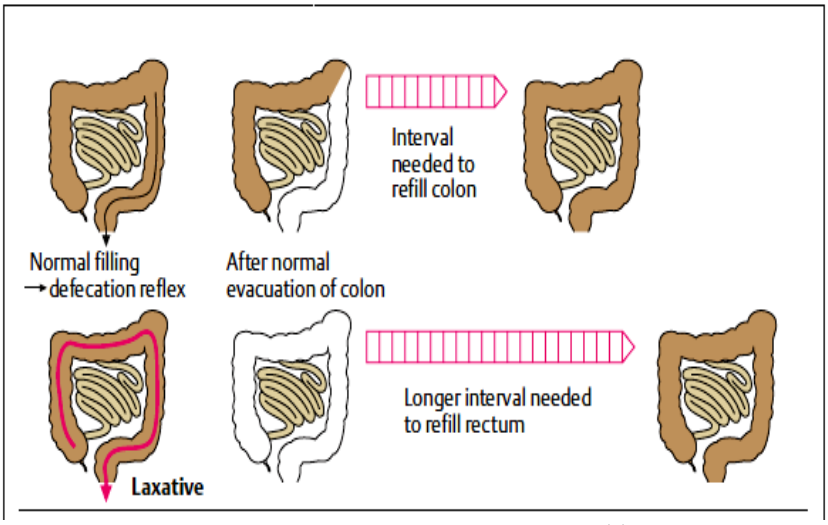

Figure1-1: laxative abuse [7].

3-**laxtive abuse**:
Continuous use, especially of stimulant laxatives, can result in a vicious circle where the contents of the gut are expelled, causing a subsequent cessation of bowel actions for 1 or 2 days. This then leads to the false conclusion that constipation has recurred and more laxatives are taken and so on [1]. (**See the figure1-1**) [7].
Chronic overuse of stimulant laxatives can result in loss of muscular activity in the bowel wall (an ***atonic colon***) and thus further constipation. Any patient who is ingesting large amounts of laxative agents should be referred to the doctor [1].

Note: well-designed recent clinical trials do not support an increased risk of colonic muscle or nerve damage with the use of these laxatives [5]. (many experts now believe that the risk of long-term use of stimulant laxatives use have been overestimated and they are safe for daily use) [8].

Treatment timescale [1]

A-If the pharmacist gives non-pharmacologic advice only, then the treatment timescale is 2 weeks.

B-If the pharmacist gives laxative drug, then the treatment timescale is 1week only.

Management

A-Non-pharmacologic advices:

1-Eat a diet high in fiber, including wholegrains, fruits and vegetables [4].
2-Drink plenty of fluids, the equivalent of at least 8–10 glasses of water a day[4]. However, it should be noted that fluid increase is contraindicated in some people (e.g. in heart or renal failure) [6].
3-**Develop and maintain a routine exercise program.** Walking can be helpful if the cardiovascular system is healthy [5] .
4-Patients should also be encouraged to **respond immediately to any urge to defecate**. Failure to do so can result in a build-up of faeces that continue to have water absorbed from them, making them more difficult to pass [6].

When to refer [1, 3, 8]
-Change in bowel habit of 2 weeks or longer -Presence of abdominal pain, vomiting, bloating -Blood in stools -Pain on defecation, causing patient to suppress defecation reflex -Prescribed medication suspected of causing symptoms -Failure of OTC medication -Symptoms suggestive of anemia such as tiredness or lethargy. -Unexplained weight loss

B-Laxatives:

1-Laxatives can be classified into groups depending on their mode of action [9] (table1-3).

Table1-3: types of laxatives

Type of laxative	Example(s)	Approximate onset of action
1-Stimulant laxative	Senna, Bisacodyl, Sodium picosulfate, and Glycerin (supp.)	Oral:6-12hours [1] Rectal: within 1 hour [1]
2-Bulk-forming laxative	Methylcellulose, Bran , Sterculia and Ispaghula (Metamucil®)	12 -24 hours, but onset may be delayed as long as 72 hours [5]
3-Lubricant (faecal softeners)	Liquid paraffin	6-8 hours [5]
4-Osmotic laxative	Lactulose	1-2 days [1]

2-The drug selection should be based on: Patients characteristics (age, pregnancy…), patient preference, how quickly an effect is needed, side effects, and cost [6] (table1-4).
Where constipation is not induced by necessary drug therapy or chronic illness, the laxative should be used for a short time until dietary and lifestyle changes become effective [6].

Table1-4:Product selection guidelines	
Patient	**Preferred laxative**
Pregnant women	Bulk-forming laxative. Lactulose may be used [1, 9, 10]
Breast-feeding mother	Bulk-forming laxative, Lactulose [3]
Children	Glycerin(supp.) [1], Lactulose [9]
Advanced age(elderly)	Bulk-forming laxative, Also Lactulose and Glycerin (supp.) are safe [5].

A-Stimulant laxatives:

1-Stimulant laxatives are thought to act mainly by stimulating the intestinal mucosa to secrete water and electrolytes [4].
2-The main **adverse effects of stimulant laxatives** are griping and intestinal cramps. Prolonged use may result in loss of colonic smooth muscle tone (see laxative abuse) [9].
Stimulant laxatives should therefore be used for only short periods of a few days at most, to reestablish bowel habit [4].
3-Bisacodyl tablet is **enteric-coated**; therefore, it should be swallowed whole and should not be taken within one hour of antacid or milk as this will lead to dissolution of the coating and release of the drug into the stomach and cause gastric irritation [9].
4-Senna is excreted via the kidney and may **color the urine** a yellowish-brown to red color depending on its PH [4].
5-Senna is secreted in breast milk, and large dosages may cause increased gastric motility and diarrhea in breastfed infants. Breastfeeding mothers should, therefore, avoid this laxative [4]. (However BNF-74 states that specialist sources indicate suitable for use in breast-feeding in infants over 1 month [10] and other reference states that its use in breastfeeding is OK but other safer laxatives are preferred [3]).

6-**Usual Doses:**
Bisacodyl 5 mg tab. Adult dose: usually 1-2 tablets (usually take at night to produce the effect next morning).
While the dose of supp. Is one supp. (usually in the morning) [9, 10].
Senna tab. Adult dose: usually 2 tablets (usually take at night to produce the effect next morning) [3, 9].
Glycerin suppositories: The patient should expect to have bowel movement quickly (within one hour). Varying sizes are made: the 1 gm suppositories are designed for infants, 2 gm for children and the 4 gm for adults [3].

B-Bulk-forming laxative:

1-Bulk laxatives are those that most closely ***resemble the normal physiological*** mechanisms involved in bowel evacuation. Bulk laxatives work by swelling in the gut and increasing faecal mass so that peristalsis is stimulated [1].
2-The laxative effect can ***take several days to develop*** [1].

3-Bulk laxatives **should not be taken immediately before going to bed**, because there may be a risk of oesophageal blockage if the patient lies down directly after taking them [9].
4-When recommending the use of a bulk laxative, the pharmacist should advise that ***an increase in fluid intake would be necessary*** [1].
5-***Adverse effects*** and disadvantages are relatively minor. They include:
–Risk of oesophageal and intestinal ***obstruction*** if preparations are not taken with sufficient water.
– Abdominal ***distension*** and ***flatulence***.
– They may not be suitable for patients who must restrict their fluid intake severely [4].

C-Liquid paraffin:

Liquid paraffin is considered to have a limited usefulness as an occasional laxative in situations where straining at stool must be avoided (for example, following an operation or a myocardial infarction), but it ***has several drawbacks*** that make it unsuitable for regular use [4] (it should never be recommended because other, safer and more effective medications are available) [3]:
-It can ***seep*** from the anus and cause irritation.
-It may ***interfere with the absorption of fat soluble vitamins***.
-It is slightly absorbed into the intestinal wall, where it may set up foreign-body ***granulomatous reactions***.
-It may enter the lung through aspiration and cause ***lipoid pneumonia*** [4].

D-Lactulose:

It can be taken by all age group, have no drug interactions and can be safely used in pregnancy [3]. However, there are some factors that may deter patients from using Lactulose: It may take 72 hours of regular dosing to produce an effect. **It is intensely sweet in taste** which makes it more palatable for children, to whom it can be given safely [9].
Adult laxative dose [10]: 15 ml twice daily.
Serious adverse effects with lactulose are rare. Relatively minor side-effects occur in about 20% of patients taking full doses and include flatulence, cramp and abdominal discomfort, particularly at the start of treatment [4].

Note: Lactulose syrup should be used with caution in diabetic patients because it contains lactose and galactose [11].

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2-Diarrhea

1-Diarrhea is an increased frequency of bowel evacuation with the passage of abnormally soft or watery stools [(1)]. Although the normal frequency of bowel movements varies with each individual, more than three bowel movements per day are considered abnormal [(2)].

2-Diarrhea may be **acute** (less than 14 days duration), **persistent** (14 days to 4 weeks duration), or **chronic** in nature (more than 4 weeks). Chronic and persistent diarrheal illnesses are often secondary to other chronic medical conditions (or treatments) and need medical care [(2)].

Causes

1-Acute diarrhea (infective diarrhea, gastroenteritis):

The most common causes of acute diarrhea are bacterial and viral infection and food toxins [(3)].

Viral: Rotavirus responsible for causing severe diarrhea in infants and children and the most common cause of gastroenteritis among children worldwide [(3)]. Rotavirus tends to be a seasonal infection, with peaks of gastroenteritis occurring between November and February. It is spread by the fecal-oral route [(2)]. Associated symptoms are those of a cold and perhaps a cough. The infection starts abruptly and vomiting often precedes diarrhea [(1)]. Whilst in the majority the infection is usually not too severe and is self-limiting, it should be remembered that rotavirus infection can cause death. This is most likely in those infants already malnourished and living in poor social circumstances who have not been breastfed [(1)].

Note: vaccine is available to protect against rotavirus [(3)].

Bacterial: These are *the food-borne infections* (previously known as food poisoning). There are several different types of bacteria that can cause such infections: *Salmonella*, *Shigella*, pathogenic *Escherichia coli*,…….. . The typical symptoms include severe diarrhea and/or vomiting, with or without abdominal pain [(1)].

Antibiotics are generally unnecessary as most food-borne infections resolve spontaneously. The most important treatment is adequate fluid replacement. Antibiotics are used (by prescription only) for *Shigella* infections and the more severe *Salmonella*. *Ciprofloxacin* (by prescription) may be used in such circumstances [(1)].

Protozoan: Examples include *Entamoeba histolytica* (amoebic dysentery) and *Giardia lamblia* (giardiasis). Diagnosis is made by sending stool samples to the laboratory [(1)].

2-Chronic diarrhea:

There are several causes and chronic diarrhea requires medical investigation. Causes include: **Irritable-bowel syndrome** (IBS), inflammatory bowel disease (**Crohn's disease**, **ulcerative colitis**), malabsorption syndromes (such as **celiac disease**)…… [(4)].

Patient assessment with diarrhea

A-Age

Infants (<1 years) and elderly patients are especially at risk of becoming **dehydrated** [1].

In newborn, water comprise up to 75% of total body weight. After 8-10 bowel movements within 24 hours period, a 2-month-old infant could lose enough fluid to cause circulatory collapse ***and renal failure*** [2].

B-Duration

Diarrhea of >1 day duration in children <1 year required referral [4].

(but in babies under 3 months: refer immediately)[4].

Diarrhea of >2 days duration in children <3 years and elderly patients required referral [4].

Diarrhea of >3 days duration in older children and adults required referral [4].

Diarrhea of more than 24 hours in people with **diabetes** required referral [4].

C-Severity

Severe diarrhea (**passing 6 or more unformed stool in 24 hours**) required referral [2].

When to refer [1]
Diarrhea of greater than:- 1 day's duration in children younger than 1 year. 2 days' duration in children under 3 years and elderly patients. 3 days' duration in older children and adults. -Association with severe vomiting and fever. -Recent travel abroad. -Suspected drug-induced reaction to prescribed medicine. -History of change in bowel habit. -Presence of blood or mucus in the stools. -Pregnancy.

D-Periodicity

A history of recurrent diarrhea of no known cause should be referred for further investigations [5].

E-Associated symptoms

The presence of ***blood*** or ***mucus*** in the stools is an indication for referral for further investigations [1].

Diarrhea with severe ***vomiting*** or with ***high fever*** required referral for further investigations [1].

Diarrhea with ***severe abdominal pain*** required referral for further investigations [5].

F-Recent travel abroad

Diarrhea in patient who has ***recently travelled*** abroad requires referral since it may be infective in origin (**Traveler's diarrhea**) [1].

G-Signs of dehydration [3]

Patient with signs or symptoms of debilitating dehydration required referral (table1-5).

Table1-5: Symptoms of dehydrations in children and adults [3]	
children	**adults**
Dry mouth, tongue and skin Fewer or no tears when crying Decreased urination (less than 4 wet diapers in 24 hours) Sunken eye, cheeks or abdomen Sunken fontanel Decreased skin turgor Irritability or listlessness	Increased thirst Decreased urination Feeling weak or lightheaded Dry mouth/ tongue

H-Medication [1]

Medicines already tried: The pharmacist should establish the identity of any medication that has already been taken to treat the symptoms in order to assess its appropriateness**.**

Other medicines being taken:

Details of any other medication being taken (both OTC and prescribed) are also needed, as the diarrhea may be ***drug induced*** (Table 1-6).

Table1-6: Some drugs that may cause diarrhea [1].
Antacids: *Magnesium salts* **Antibiotics** **Antihypertensives**: *methyldopa*; beta-blockers (rare) **Digoxin** (toxic levels) **Diuretics** (*furosemide*) **Iron** *preparations* **Laxatives** **Misoprostol** **Non-steroidal anti-inflammatory drugs** **Selective serotonin reuptake inhibitors**

Treatment timescale

One day in children, otherwise 2 days [1].

Management

A-Advices for patients suffering from diarrhea [4]

1-Drink **plenty of clear fluids**, such as water.

2-**Avoid drinks high in sugar** as these can prolong diarrhea.

3-**Avoid milk** and milky drinks, as a temporary lactose intolerance occurs due to damage done by infecting organisms to the cells lining the intestine, making diarrhoea worse.

4-**Babies should continue to be fed as normal**, whether by breast or bottle.

B-Oral rehydration therapy

1-The risk of dehydration from diarrhea is greatest in babies, and **rehydration therapy** is considered to be the standard treatment for acute diarrhea in babies and young children [1].

2-Oral rehydration sachets may be used **with antidiarrheals** in older children and adults [1].

3-Rehydration may still be **initiated even if referral** to the doctor is advised [1].

A premixed solutions [2] or Sachets of powder for reconstitution are available; these contain sodium as chloride and bicarbonate, glucose and potassium. The absorption of sodium is facilitated in the presence of glucose [1].

4-Table1-7 provides the volumes required per watery stool [1].

Table1-7:Amount of rehydration solution to be offered to patients. [1].	
Age	**Quantity of solution (per watery stool)**
Under 1 year	50 mL (quarter of a glass)
1–5 years	100 mL (half a glass)
6–12 years	200 mL (one glass)
Adult	400 mL (two glasses

5-**Reconstitution of ORS**: Only water should be used to make the solution and that boiled and cooled water should be used for children < 1 year [1].

6-**Stability of ORS after reconstitution**: To avoid risk of possible exposure to further infection, the solution should be discarded not later than 1 hour after reconstitution, or it may be kept for up to 24 hours if stored in a refrigerator [9].

7- If the child is **vomiting**, give 1 teaspoon of ORS every few minutes [2].

C-Antimotility Drugs:

1-Loperamide, **and Co-phenotrope** (Diphenoxylate+Atropine) [Atropine is included at a subtherapeutic dose **to discourage abuse** (unpleasant antimuscarinic effects will be experienced if higher than recommended doses are taken)] [4].

2-Loperamide is considered an OTC drug only for patient of > 12 years old [1].

Adult dose: Initially 2 tablets (4 mg) followed by 1 tablet (2 mg) after each loose stool (max. 8 tablets / day) [6].

3-Co-phenotrope is considered an OTC drug only for patient of > 16 years old [1, 6].

B-Adult doses: 4 tablets initially followed by 2 tablets every 6 hours [6] .

D-Adsorbents: Like Pectokaolin® (pectin +kaolin)

Adsorbents such as kaolin **are not recommended for acute diarrheas** [6].

Extra-Notes:

A-Probiotics (dietary supplement): Probiotics are **dietary** supplements containing bacteria (including several *Lactobacillus* species) that may promote health by enhancing the normal microflora of the GI tract while resisting colonization by potential pathogens [7]. Probiotics have been shown to decrease the duration of infectious and antibiotic-induced diarrhea (AAD) in adults and children (however; the use of probiotics to treat and prevent AAD is controversial) [8].

B-Use of zinc in children with diarrhea: Several large studies performed in **developing countries** have shown that daily zinc supplementation in young children with acute diarrhea reduces both the **duration** and **severity** of diarrhea [2, 3]. The **WHO/UNICEF** recommends that children with acute diarrhea also receive zinc (10 mg of elemental zinc/day for infants younger than 6 months; 20 mg of elemental zinc/day for older infants and children) for 10 to 14 days [2, 3].

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3-Hemorrhoids:

Hemorrhoids (also known as piles): are abnormally dilated, swollen, bulging of hemorrhoidal vessels and the overlying skin in the anorectal region [1].

Prevalence and epidemiology

Hemorrhoids can occurs at any age but are rare in children and adults under the age of 20. Prevalence appears to be increased with increasing age and is most common in patients between the ages of 45-65 years. In addition, there is a high incidence of hemorrhoids in pregnant women [2].

Etiology:

The cause of hemorrhoid is probably multifactorial with **anatomical** (degeneration of elastic tissue), **physiological** (increased anal canal pressure), and **mechanical** (straining at defecation) processes implicated [2].

In addition hemorrhoid is often exacerbated by inadequate dietary fiber or fluid intake [3]. **Pregnancy** is believed to **precipitate** hemorrhoids in **susceptible women** [4].

Types of hemorrhoids:

1-Superior to the anal sphincter there is an area known as the dentate line. Hemorrhoids above the dentate line are classified as **internal**, while hemorrhoids below the dentate line are classified as **external** [2] (figure1-2). The term **mixed hemorrhoids** is used when internal and external hemorrhoids coexist [4].

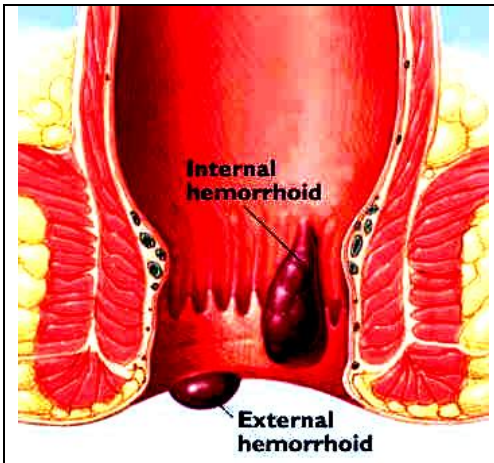

Figure1-2: types of **hemorrhoids**

2-**Internal** hemorrhoids should **not cause pain** unless complications develop, since this area has **no nerve fibers** [4].

3-Furthermore ***internal*** haemorrhoids are graded according to severity: **grade I**, do not prolapse out of the anal canal; **grade II**, prolapse on defecation but reduce spontaneously; **grade III**, require manual reduction; and **grade IV**, cannot be reduced [2].

Patient Assessment (Specific questions to ask)

A-Duration:

Patient with symptoms that have been constantly present for **more than 3 weeks** required referral for further investigations [2].

B-Severity:

Medication is unlikely to help patient who has to **manually reduce hemorrhoids** or of **3rd or 4th degree** and required referral [2] (fourth degree hemorrhoids are at risk of **thrombosis** and **gangrene** [4].

C-Pain:

Pain is not always present [3]. Pain associated with hemorrhoids tend to occurs on defecation and at other time for example when sitting. It is usually described as a dull ache. **Sharp** or **stabbing pain** at the **time of defecation** can suggest an **anal fissure** [2] and required referral [3].

D-Itching:

The most troublesome symptom for many patients is itching and irritation of the perianal area rather than pain [3].

E-Bleeding:

1-**Bright blood** does not normally have a sinister significance, but patients experiencing this for the **first time** should be referred [5].
2-**Blood mixed** in the stools, giving them a tarry red or black appearance. This indicates bleeding within the gastrointestinal system and must be investigated [5].
3-**Large volumes of blood** not associated with defecation; this may indicate carcinoma and must be investigated [5] (patient with hemorrhoids does not usually bleed at time other than defecation) [4].

F-Constipation:

Constipation is a common causatory or exacerbatory factor in hemorrhoids. In addition if piles are painful, patient try to avoid defecation which makes the constipation worse [3].

When to refer [2, 3]
-Duration of longer than 3 weeks -Presence of blood in the stools -Change in bowel habit (persisting alteration from normal bowel habit) -Suspected drug-induced constipation -Associated abdominal pain/vomiting -Fever -Severe pain associated with defecation

G-Bowel habit:

A persisting change in bowel habit (persisting alteration from normal habit) required referral (may be due to tumor) [3].

H-Associated symptoms:

Symptoms of hemorrhoids are usually local (pain, itching…). Other symptoms such as abdominal pain, **vomiting**, loss of appetite, **tenesmus** (desire to defecate when there is no stool), **seepage** (involuntary passage of fecal material) required referral [2, 3].

I-Medication

To know [3]:
1- Products already used to treat hemorrhoids.
1- Drug-induced constipation which exacerbate the condition.

Treatment timescale:

Patient should see the Dr. If the symptoms have not **improved after 1 week** [3].

Management

A-Non-drug measures :

1-**Increase** the amount of **fiber and fluid** in the diet [(1)].

2-**Avoid lifting heavy objects** [(1)].

3-**Avoid delaying the urge** to defecate [(1)].

4-Avoid **prolonged sitting** in the toilet to reduce straining and pressure on the hemorrhoids vessels [(1)].

5-**Wash the perianal area with warm water** after each bowel movement. In addition many patients find that warm bath soothes their discomfort [(3)].

B-pharmacological therapy:

1-The OTC products for hemorrhoids include the followings (alone or commonly in combined products) (table1-8) [(1-3)]:

Table 1-8: ingredients included in products for hemorrhoids [(1-3)]

Type	Example(s)	Purpose(and mechanism)
Anesthetics	Lidocaine, benzocaine	Reduce pain and itching
Astringents	Bismuth, zinc, Peru balsam	Precipitate the surface protein producing coat over hemorrhoids to reduce itching, irritation, ….
Anti-inflammatory	Hydrocortisone (the only OTC)	Reduce inflammation and swelling to relief Pain and itching.
Protectants	Zinc oxide, AL-hydroxide, calamine, shark liver oil	Form a barrier on skin to prevent irritation , itching, and loss of moisture
Antiseptics	resorcinol	antiseptic
Counter-irritants	menthol	Give tingling sensation to overcome pain and itching.
Vasoconstrictor	Phenylphrine, ephedrine…	Reduce swelling to relief pain and itching.

2-Laxatives: The short-term use (1-2 days) of a stimulant laxative to relieve constipation while dietary fiber and fluid are being increased.
For patients who cannot adapt their diet, bulk-forming laxative may be used long term [(3)].

How to use OTC products

1-Ointments and creams can be used for internal and external hemorrhoids while **suppositories are used for internal hemorrhoids**. However both are used twice daily (morning and evening) and after each bowel movement [(3)].

2-Many people prefer **suppositories**, but these products are often **not effective** because they **tend to slip into the rectum and melt, thus bypass the anal canal where the medication is needed**. In general Ointments and creams are preferred over **suppositories** [(4)].

3-When used intrarectally, the ointment may be inserted using an applicator or finger but the **applicator is preferred** because it can reach an area where the

finger cannot reach. The applicator should be **lubricated** by the ointment before insertion [(1)].

4-Products that contain hydrocortisone are restricted to those aged above 18 years and for no longer than of 7 days of continuous treatment [(3)].

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4-Heartburn

Background

1-Gastro-esophageal reflux disease (GERD), also known as reflux esophagitis, and commonly called heartburn [1]. Symptoms of heartburn are caused when there **is reflux of gastric contents**, particularly acid, into the esophagus, which irritate the mucosal surface [2].

2-Unlike the stomach lining, the esophageal mucosa has no protection against gastric acid and readily irritated by acid) [1, 2].

Patient assessment with GERD

A-Signs and symptoms

Heartburn is a common symptom of GERD [3] which is described as:
A burning sensation or pain experienced in the upper part of the stomach [2] (i.e. the lower chest [3]) in the Medline (epigastrium) [2].
The burning feeling tends to move upwards behind the breastbone . The pain may be felt only in the lower area or may be felt right up to the throat causing an acid taste in the mouth [2].
(Figure1-3)[4].

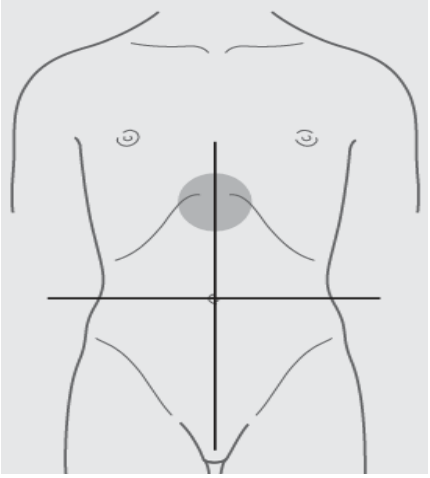

Figure 1-3: The position of pain in GERD[4]

B-Precipitating or aggravating factors.

Diagnosis of GERD can be helped greatly by asking about the Precipitating factors. These are [2]:

A-Bending **or lying down**.
B-**Overweight**.
C-After **large meal.**
D-**Pregnancy**(mechanical and hormonal influence).
E-It can be aggravated or even caused by **belching.**

C-Severity and location of pain:

Patient who have **severe pain** should be referred [3] as well as pain that radiate to the back and arm (possible heart attack) [2].

D-Difficulty in swallowing and regurgitation:

The sensation that food sticks as it is swallowed or it does not seem to pass directly into the stomach (**dysphagia**) is an indication for immediate referral.(It may be due to obstruction of the esophagus for e.g. by tumor). **Regurgitation** can be associated with difficulty in swallowing. It occurs when recently eaten food sticks in the esophagus and is regurgitated without passing into the stomach. This is due to a mechanical blockage in the esophagus and required referral [2].

E-Age:

Heartburn is not normally experienced in childhood; therefore, **children** with symptoms of heartburn should be referred for further investigations [2].

F-Medication: to know:

1-What had been tried to treat the condition (**failed medication** required referral) [2].

2-The use of **some drugs may cause GERD** and may also lead to an increase in existing GERD symptoms and signs. The mechanisms by which drugs cause reflux include a reduction in lower esophageal sphincter pressure (LESP) and delayed gastric emptying; drugs may also directly cause GERD by causing damage or inflammation in the esophageal mucosa (**Figure1-4**) [5].

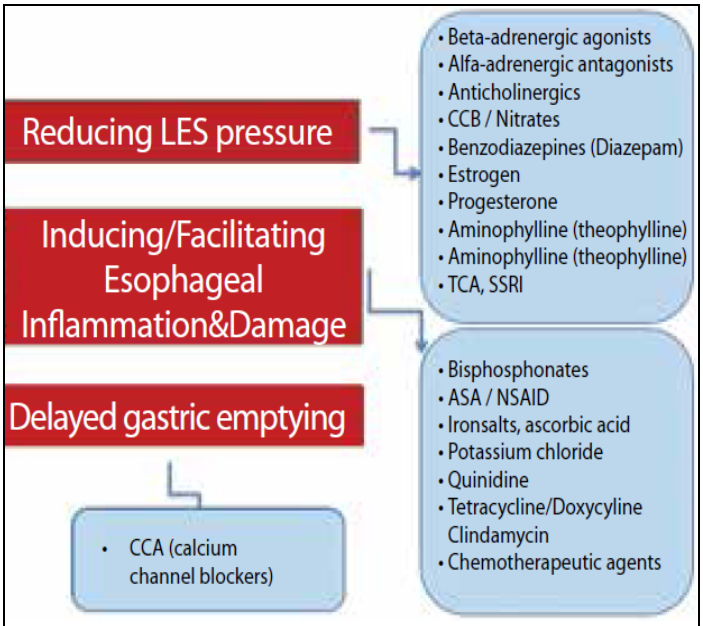

Figure 1-4. Drugs and GERD [5].

When to refer [2]
-Failure to respond to antacids
-Pain radiating to arms
-Difficulty in swallowing
-Regurgitation
-Long duration
-Increasing severity
-Children

Treatment timescale

If symptoms have not responded to treatment **after 1 week** the patient should see a doctor [2].

Management:

Non-pharmacological advices:

1-Eat **small and frequent meals** (to avoid distending the stomach) [2].

2-The **evening meal is best taken several hours before going to bed** [2] (Avoid lying down within 3 hours of a meal [3]).

3-Use **extra pillow** to elevate the head of the bed [2]. [using GERD pillow since the use of traditional pillows may worsen symptoms because they cause the individual to bend at the waist, which contributes to an increase in intragastric pressure] [3]. (Using extra pillows is not as effective as raising the head of the bed. The reason for this is that using extra pillows raises only the upper part of the body, with bending at the waist, which can result in increased pressure on the stomach contents [2].

4-**Wear loose fitting clothing** [3]. (Tight, constricting clothing, especially waistbands and belts, can be an aggravating factor and should be avoided) [2].

5-**Avoid smoking** and foods that exacerbate symptoms of GERD. If alcohol or caffeine consumption is a contributing factor individuals should be advised to limit or discontinue use [3]. (Smoking, alcohol, caffeine and chocolate have a direct

effect by making the esophageal sphincter less competent by reducing its pressure and therefore contribute to symptoms) [2].
6-**Weight reduction s**hould be advised [2].

Pharmacological Therapy:

A-Antacids (AL salts, Mg salts, Ca-carbonate, Na-bicarbonate, …):

Practical points:

1-Best time for taking Antacids :

Antacids are best taken about 1 h after a meal because the rate of gastric emptying has then slowed and the antacid will therefore remain in the stomach for longer. Taken at this time antacids may act for up to 3 h compared with only 30 min–1 h if taken before meals. [2]. Although antacids may be taken on when-needed basis [3].

2-Dosage form [4]:

Liquids and powders generally provide faster relief and have greater neutralizing capacity than tablets, as they are mixed very quickly with the stomach contents and their small particle size provides a large contact surface area for neutralizing activity [6].
Advantages of tablets over liquids include ease of portability and administration [6].
It might be appropriate for the patient to have both; the liquid could be taken before and after working hours, while the tablets could be taken during the day for convenience [2].
Tablets should not be swallowed whole; they should be chewed to initiate disintegration or sucked to provide a relatively slow but sustained delivery of antacid to the stomach [6].

3-Interactions:

A-Antacids can affect the **absorption of a number of drugs** (via chelation and adsorption) [4] . This interactions can usually be avoided when potentially interacting drugs are separated by at least 2 hours [3].

B- Antacids also interact with enteric-coated tablets, capsules and granules. These products are formulated to resist gastric acid and dissolve in the more alkaline medium of the duodenum, releasing the drug there. Enteric coatings may be disrupted prematurely in the presence of antacids, causing unwanted release of the drug in the stomach [6].

4-Side effects of antacids

A-AL-containing antacids tend to be **constipating.**
Mg-containing antacids tend to cause osmotic **diarrhea** and are useful in patients who are slightly constipated. Thus **combination** products of AL and Mg salts cause minimum bowel disturbances [2].
B-Antacids containing sod. Bicarbonate should be avoided in patients if sodium intake should be restricted (e.g. in patient with heart failure, hypertension,…..) [2] and during pregnancy [7] .

C-Calcium carbonate: It acts quickly, has a prolonged action and is a potent neutralizer of acid. It can cause **acid rebound** and, if taken over long periods at high doses, can cause **hypercalcaemia** and so should **not be recommended for long-term use** [2].

B-Alginates (Gaviscon ®):

Alginate-containing antacids form **a sponge –like matrix** that float on the top of the stomach contents [4]. Alginate-containing antacids can form a 'raft' that floats on the surface of the stomach contents to reduce reflux and protect the oesophageal mucosa [8]. Some alginate-based products contain sodium bicarbonate. If a preparation low in sodium is required, the pharmacist can recommend one containing potassium bicarbonate instead. Alginate products with low sodium content are useful for the treatment of heartburn in patients on a restricted sodium diet [2].

Practical points:

1-They are best given **after each main meal and before bedtime**. Although it may be taken on when-needed basis [4].
2-They can be given in pregnancy and breastfeeding [4].

C-Histamine 2 receptor antagonists (H2RA):

1-They can be used for the short-term treatment of dyspepsia, hyperacidity and heartburn in **adults and children over 16 years** [2].

2-Duration for OTC H2RA: Treatment with **OTC H2RA** is limited to a maximum of 2 weeks [6]. The treatment limit is intended to ensure that patients do not continuously self-medicate for long periods [2].

3-When to take H2RA (regarding OTC use for GERD only):
Patient can take 1 tablet when symptoms occur and if the symptoms persists, another tablet may be repeated after more than 1hour [4], but when food is known to precipitate symptoms, H2RA should be taken an hour before food[2]. (Table1-9) [8].

> **Note**: **Tolerance** to the gastric antisecretory effect may develop when H2RAs are **taken daily** (versus as needed) and may be responsible for diminished efficacy. Therefore, it is **preferable to take an H2RA on an as needed basis** rather than regularly every day [3].

4-Side effects of H2RA: Headache, dizziness, diarrhea and skin rashes have been reported as adverse effects but they are not common [2].

5-The OTC H2 antagonists are not licensed for sale to pregnant or breastfeeding women [6].

Table1-9: OTC H2RAs [8]				
	H2RA	**OTC dosage form**	**Max. single dose**	**Max. daily dose**
1	**Cimetidine**	200 mg tablet	200 mg	800 mg
2	**Famotidine**	10 mg tablet	10 mg	20 mg
3	**Nizatidine**	75 mg tablet	75 mg	150 mg
4	**Ranitidine**	75mg tablet	75 mg	300 mg

D-Proton pump inhibitors (PPIs):

1-PPIs are amongst the most effective medicines for the relief of heartburn [2]. PPIs available OTC are:

United kingdom	**Omeprazole** (10 mg tablet), and Pantoprazole (20 mg tablet) [8].
USA	**Omeprazole (**20 mg capsule**), Lansoprazole** (15 mg capsule) and **esomeprazole** (20 mg capsule**)** [3].

2- OTC PPIs can be used for the relief of **heartburn symptoms associated with reflux in adults** [2] **over 18 years** [8]. PPIs should not be taken (**as an OTC**) during **pregnancy** or whilst **breastfeeding** [2].

3-Onset of symptomatic relief following an oral dose may occur in 2-3 hours, but complete relief may take 1-4 days [3]. During this period a patient with ongoing symptoms may need to take a concomitant **antacid** [2].

4-Treatment with OTC PPIs is limited to a maximum **of 4 weeks** [8] (2 weeks in USA).This course of therapy must not be repeated more often than every 4 months [3].

5-OTC Doses of PPIs (table1-10):

Table1-10: OTC Doses of PPIs			
USA	**1**	**Esomeprazole** (20 mg capsule)	Single dose each day before breakfast for 14 days [3].
	2	**Lansoprazole** (15 mg capsule)	Single dose each day before breakfast for 14 days [3].
	3	**Omeprazole** (20 mg capsule)	Single dose each day before breakfast for 14 days [3].
UK	**1**	**Omeprazole** (10 mg tablet)	The initial dose is two 10 mg tablets (i.e. 20 mg) once daily, swallowed whole before a meal, with plenty of liquid, until symptoms subside. Thereafter, a dose of 10 mg once daily can be taken, increasing to 20 mg if symptoms return. If no relief is obtained within 2 weeks, or if continuous treatment for more than 4 weeks is required to relieve symptoms, the patient should be referred to their doctor [6].
	2	**Pantoprazole** (20 mg tablet)	Single dose each day before breakfast [8].

Note: Immediate release omeprazole (Zegerid®) is formulated with [omeprazole 20 mg and sodium bicarbonate 1100 mg]. The sodium bicarbonate in Zegerid® raises intragastric pH, permitting **rapid absorption of omeprazole from the duodenum** [3].

6-Drug-interaction of PPIs:

PPIs-Clopidogrel drug interaction: the proton pump inhibitors esomeprazole, and omeprazole are predicted to decrease the efficacy of clopidogrel (Avoid)[8].

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5-Indigestion

Indigestion (dyspepsia) is commonly presented in community pharmacies and is often self-diagnosed by patients, who use the term to include anything from pain in the chest and upper abdomen to lower abdominal symptoms. Many patients use the terms indigestion and heartburn interchangeably [(1)].

However, Heartburn should not be confused with dyspepsia. The discomfort of dyspepsia is variably described as a **pain**, **distension**, or feeling of **fullness**, but is **generally not burning in nature** [(2)]. (figure 1-5)

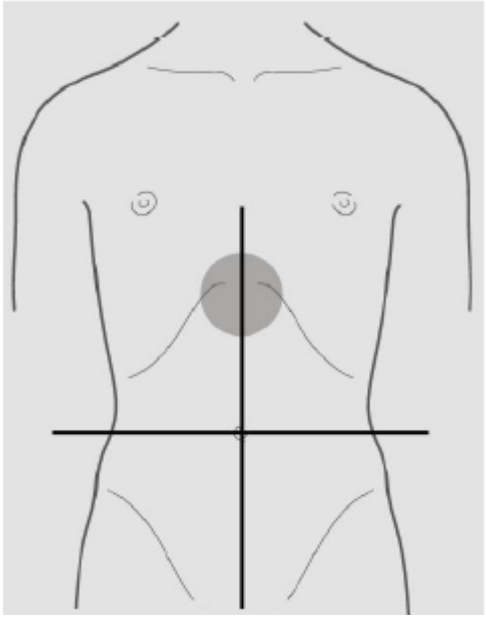

Figure1-5: The position of pain in dyspepsia [(4)].

Patient assessment with indigestion

A-Age

Indigestion **is rare in children**, who should be **referred** to the doctor. Be cautious when dealing with **first-time indigestion** in patients **aged 45 years or over** and **refer** for a diagnosis [(1)].

B-Symptoms

The symptoms of typical indigestion include poorly localized **upper abdominal discomfort**, which may be brought on by particular foods, excess food, or medication (e.g. aspirin) [(1)].

C-Duration/previous history

Indigestion that is **persistent** or **recurrent** should be **referred** to the doctor. Any patient with a previous history of the symptom which has **not responded to treatment**, or which has **worsened**, should be **referred** [(1)].

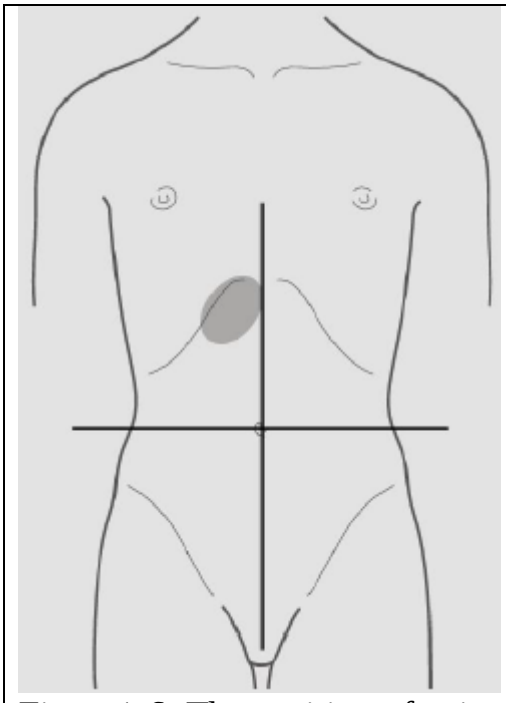

Figure1-6: The position of pain in ulcers [(4)].

D-Diet and Smoking habit

Fatty foods and alcohol can cause indigestion, aggravate ulcers and precipitate biliary colic. **Smoking** predisposes to, and may cause, indigestion and ulcers. The pharmacist is in a good position to offer advice on smoking cessation, perhaps with a recommendation to use nicotine replacement therapy [(1)].

E-Details of pain/associated symptoms

A few medical conditions that may present as indigestion described below:

1-Ulcer

Ulcers may occur in the stomach (gastric ulcer) or in the first part of the small intestine (duodenal ulcer).

Typically the pain of a **duodenal ulcer** is localized to the upper abdomen, slightly to the right of the midline. It is often possible **to point to the site of pain with a single finger** [1]. (figure 1-6). The pain is most likely to occur when the **stomach is empty, especially at night.** It is relieved **by food** and antacids.

The pain of a **gastric ulcer** is in the same area but **less well localized**. It is often **aggravated by food and may be associated with nausea and vomiting.** Appetite is usually reduced and the symptoms **are persistent and severe** [1].

2-Gallstones

Single or multiple stones can become temporarily stuck in the opening to the bile duct as the gall bladder contracts. This causes **severe pain (biliary colic)** in the upper abdomen below **the right rib margin**. Sometimes this pain can be confused with that of a duodenal ulcer. Biliary colic may be precipitated by a **fatty meal** [1]. (figure 1-7)

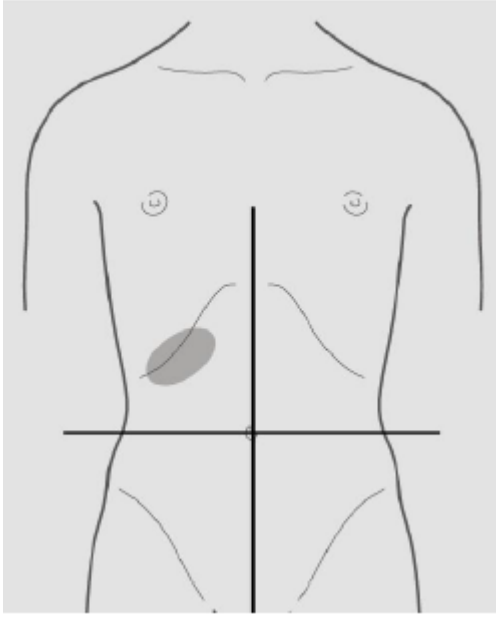

Figure 1-7 The position of pain in gallstone [4].

3-Gastro-Esophageal reflux

The symptoms are typically described as **heartburn** arising in the upper abdomen passing upwards behind the breastbone. It is often precipitated by a large meal or by bending and lying down [1].

4-Irritable bowel syndrome

Irritable bowel syndrome (IBS) is a common condition in which symptoms are caused by colon spasm. There is usually an alteration in bowel habit, often with alternating constipation and diarrhea. The diarrhea is typically worse first thing in the morning [1].

5-Myocardial ischemia

The pain is likely to be **precipitated by exercise** or exertion [1] and it **radiates** to jaw, neck, shoulder, arm [3]. Not all cases of angina have classical presentation. Patients can complain of dyspepsia-like symptoms and feel generally unwell (*Atypical angina*). These symptoms might be brought on by a heavy meal. In such cases antacids will fail to relieve symptoms and referral is needed [4].

6-Appendicitis

Starts **centrally** and radiates to **right iliac fossa** after some time [3] (figure 1-8).

7-More serious disorders

Persisting upper abdominal pain, especially when associated with **anorexia** and unexplained **weight loss**, may herald an underlying **cancer** of the stomach or pancreas. Ulcers sometimes start bleeding, which may present with blood in the vomit (**hematemesis**) or in the stool (**melaena**). In the latter the stool becomes tarry and black. **Urgent referral** is necessary. [1]

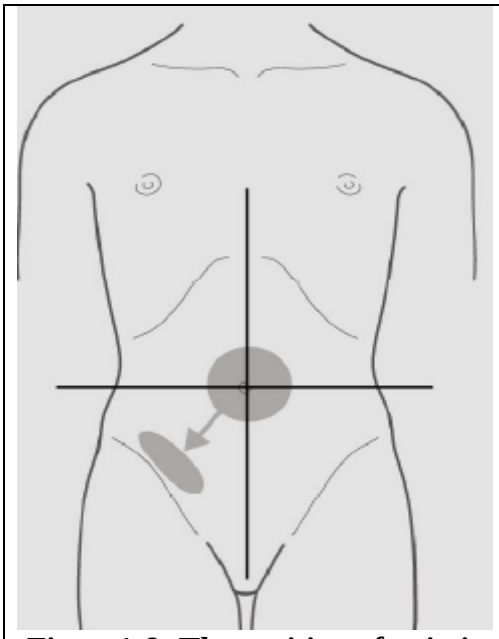

Figure1-8: The position of pain in appendicitis [4]

F-Medication

A-Medicines already tried: Anyone who has tried one or more appropriate treatments without improvement or whose initial improvement in symptoms is not maintained should see the Doctor [1].

B-Other medicines being taken:

Gastrointestinal (GI) side-effects can be caused by many drugs. NSAIDs have been implicated in the causation of ulcers and bleeding ulcers. Sometimes these drugs cause indigestion. **Elderly** patients are particularly prone to such problems and pharmacists should bear this in mind. **Severe or prolonged indigestion in any patient taking an NSAID is an indication for referral** [1].

Summary of Symptoms and circumstances for referral [1, 3]:

1-Age over 45 years if symptoms **develop for first time**.
2-Symptoms are persistent or recurrent.
3-Pain is severe. 4-Blood in vomit or stool. 5-Pain worsens on effort.
6-Persistent vomiting. 7-Treatment has failed. 8-Adverse drug reaction is suspected.
9-Associated weight loss. 10-Children.
11- Indigestion between meals or at night.
12-Pain radiating from central or epigastric areas.

Treatment timescale

If symptoms have not improved **within 5 days**, the patient should see the doctor [1].

Management

Smoking, alcohol and fatty meals can all aggravate symptoms, so the pharmacist can advise appropriately [1].

A-Antacids: as in GERD
B-Famotidine and ranitidine: as in GERD.

C-Dimeticone (dimethicone): Dimeticone is sometimes added to antacid formulations for its defoaming properties. Theoretically, it reduces surface tension and allows easier **elimination of gas** from the gut by passing flatus or belching. **Evidence of benefit is uncertain** [(1)].

D-Domperidone
Domperidone 10 mg previously was used as an OTC for the treatment of **postprandial stomach symptoms** of excessive fullness, nausea, epigastric bloating and belching, occasionally accompanied by epigastric discomfort and heartburn. It increases the rate of gastric emptying, and also increases the strength of contraction of the esophageal sphincter [(1)].
Unfortunately in 2014 domperidone was reclassified back to prescription-only status over fears over its potential cardiac side effects [(4)].

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2-John W. Devlin. Exploring the Role of the Pharmacist in OTC PPI Use for Frequent Heartburn. US Pharm .April 30, 2010.
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6-Intestinal Gas

Introduction

1-Intestinal gas symptoms and conditions that predispose patients to intestinal gas are common, and they may cause considerable discomfort and lifestyle impairment [(1)].

2-The most frequent symptoms are **eructation** (belching of swallowed air), **bloating** (sensation of **tension in the abdominal area** after eating or as a subjective sensation that the **abdomen is larger than normal**), and **flatulence** (excessive passage of air from the stomach or intestines through the anus) [(1)].

3-Flatulence is a common and logical consequence of intestinal gas [(2)]. Passing gas is **normal** and occurs either consciously or unconsciously even while sleeping [(1)]. The average person passes gases 10-25 times daily (more than 25 times/day may be considered excessive) [(3)].

Pathophysiology of Intestinal Gas

The pathophysiology of intestinal gas is poorly understood [(1)]. Various sources of excess gas have been identified, including **air swallowing**, **diet**, **lactose intolerance**, irritable bowel syndrome (IBS) [(2)], and certain medications [(1)].

A-Diet:

1-**Diet is a major cause of bloating and gas**. If certain food residues (mostly carbohydrates) reach the large intestine (since may be incompletely absorbed in the small intestine), normal bacteria utilize them as food sources, producing carbon dioxide, hydrogen, and sometimes methane as by-products [(1, 2)]. (Table1-11)[(4)].

2-**Dietary sugars** (e.g., **lactose** in dairy products ; **fructose** in fruits, vegetables, candies, and soft drinks; **sucrose** from “table sugar”; and **glucose** from the breakdown of starches) may be **incompletely absorbed** in the healthy human small intestine. These sugars are the principal substrates for hydrogen gas (H2) production in the colon [(1)].

Table1-11. Gas Producing Foods [(4)]
1-**Beans**, eggs, and fried and fatty foods 2–**Beverages**: Carbonated drinks, fruit drinks 3–**Diary**: Milk and foods made with milk (e.g., cheese) 4–**Fruits**: Apricots, bananas, melons, peaches, pears, prunes, raw apples 5–**Grains**: Wheat and wheat bran 6-**Vegetables**: Broccoli, cabbage, cauliflower, cucumbers, green peppers, onions, peas, radishes, raw potatoes.

B-Aerophagia (air swallowing)

1-We **automatically swallow** up to 2 quarts (1 quart= 1/4 gallon= **4 cups**) of **air** each day, usually while **eating and drinking**. A lot of air is also swallowed when we chew gum or drink with a straw. More than 1 cup of air is swallowed when we drink a full glass of water [4].

2-Eating **fast**, **gulping** food, **drinking** beverages **too rapidly**, **eating too much**, **smoking**, **chewing gum**, **sucking** on **hard candies** or feeling **stressed** increases the **amount of air we swallow**. We burp about 50% of this air, and the rest passes through the intestines and is released from the rectum [1, 4].

C-Lactose Intolerance

1-In addition, up to **30% of adults** have problems digesting a type of sugar called **lactose** found in milk and other dairy products [4].

2-In patients with **lactase deficiency**, the lactase enzyme is not available in sufficient quantities to break down lactose in dairy products before it reaches the colon [1]. It may be congenital (mutation in the gene) or acquired (more common and may be due gastroenteritis , celiac disease,…) [3]. Bacteria in the colon feed on undigested lactose, producing gas [4].

3-Individuals with lactase deficiency **experience GI symptoms** (e.g., gas pains, bloating, nausea, and diarrhea) upon exposure to **dairy** and other products containing milk or milk derived carbohydrates (e.g., caramel) [1].

D-Irritable Bowel Syndrome (IBS) and other conditions:

Conditions such as **IBS** may predispose patients to intestinal gas symptoms. Intestinal gas symptoms also may result from other less common medical conditions (e.g., celiac disease). Patients with **celiac disease have an intolerance to gluten** (a protein contained in wheat, barley, and oats). Intestinal gas symptoms may result from the inflammatory response that occurs in the GI tract after exposure to gluten [1].

E-Drugs [1].

A variety of drugs may cause intestinal gas symptoms. These drugs can be categorized broadly by the mechanisms that cause symptoms:

1-Drugs that affect **intestinal flora** (lactulose and antibiotics).

2-Drugs that affect **metabolism of glucose and other dietary substances** (alpha-glucosidase inhibitors, including acarbose and miglitol; and the biguanides, including metformin); and **GI lipase inhibitors** (orlistat).

3-Drugs that affect GI motility (narcotics, anticholinergics, and calcium channel blockers).

4-Drugs that are high in **fiber** (psyllium) or nonabsorbable polymers (**cholestyramine**).

5-Drugs that **contain or release gas** (**effervescent solutions**) also may cause intestinal gas symptoms

Clinical Presentation of Intestinal Gas

1-Patients with symptoms of intestinal gas complain most commonly of excessive **belching**, **abdominal discomfort or cramping**, **bloating**, and **flatulence** [1].

2-Other less common symptoms include nausea; **audible bowel sounds** and dyspepsia or indigestion [1].

3-Patients with alarm symptoms (weight loss, blood in vomit or stool, moderate-severe abdominal pain, vomiting, fever or chills) [3].

Treatment

Nonpharmacologic Therapy

1-Avoid **rush through a meal**. Eat and drink slowly in a calm environment [1].
2-**Chew** food thoroughly [1].
3-Avoid **washing down solids with a beverage** [1].
4-Avoid **gulping** and **sipping** liquids, drinking out of **small mouthed bottles or straws**, or drinking **from water fountains** [1].
5-Avoid **chewing gum** and **sucking hard candy**, especially those that contain artificial sweeteners (e.g., **sorbitol** or **mannitol**) [1].
6-**Do not overload the stomach at** any one meal [1]. Eating smaller more frequent meals throughout the day may help decreasing the symptoms [3].
7-Avoid **gas-producing foods**, **carbonated** beverages (e.g., sodas), **caffeinated** beverages (e.g., coffee, energy drinks) and **smoking** [1].
8-Avoid or minimize the use of **drugs that may cause intestinal gas symptoms** [1].
9-Patients with lactose intolerance either should avoid milk and dairy products or should use lactase replacement products [4].

Pharmacologic Therapy

1-**Simethicone** and **activated charcoal** may relieve symptoms after intestinal gas has formed [1].
2-**Alphagalactosidase** and **lactase enzymes** are taken with foods to prevent gas from forming [1].
3-Lactase replacement products may be beneficial for the treatment of intestinal gas and diarrhea associated with **lactose intolerance** [1].
4-The usual **adult and pediatric dosages** of these drugs are provided in (table1-13).

Simethicone

1-Simethicone (a mixture of inert silicon polymers) is used as a defoaming agent to relieve gas (it aid to make gas bubbles eliminated more easily by belching or passing gas through the rectum) [1].

2-Because simethicone is **not absorbed** from the GI tract, it **has no known systemic side effects**; its safety has been well documented [1].
3-Simethicone is contraindicated in patients with a known hypersensitivity to simethicone products or suspected intestinal perforation and obstruction [1].

Activated Charcoal

1-Activated charcoal also is promoted for relief of intestinal gas; However, it is **neither approved nor shown to be effective for this indication** [1]. (**Should not be recommended**) [3].
2-Activated charcoal also has **poor palatability** [1].
3-External devices containing activated charcoal also are available to reduce the odor of flatus in patients with ostomies [1].

Alpha-Galactosidase

1-This enzyme hydrolyzes oligosaccharides into their component parts before they can be metabolized by colonic bacteria [1].

2-Because high fiber foods contain large amounts of oligosaccharides, alpha-galactosidase is recommended as a **prophylactic treatment of intestinal gas symptoms produced by high fiber diets or foods that contain oligosaccharides** (table1-12) [1].

Table1-12: Oligosaccharide Containing Foods That Alpha-Galactosidase might affect [1].

Vegetables	Grains	Beans
Beets, Broccoli, Cabbage, Corn, Cucumbers, Leeks, Lettuce, Onions, Parsley, Peppers	Barley, Pasta, Wholegrain breads, Wheat bran, Rice bran	Broad beans, Chickpeas, Mung beans, Peanuts and peanut butter, Seed flour (sesame, sunflower), Soy products (including lentils, soy milk)

4-Because the enzyme produces galactose, this product should not be used by patients with **galactosemia** (an inherited metabolic disorder in which galactose accumulates in the blood because of the deficiency of an enzyme that catalyzes galactose's conversion to glucose) [1].

5-Similarly, patients with **diabetes** should be cautioned about the use of the enzyme, which may produce 26 grams of carbohydrates per 100 grams of food [1].
6-Enzyme products should **not be put on hot foods** as heat inactivates the enzyme. Patient should place liquid enzyme **on the first spoonful of food** [3].

Lactase Replacement Products

1-Lactase replacement products are used in patients with lactose intolerance. Lactase enzymes break down lactose, a disaccharide, into the monosaccharides glucose and galactose, which are absorbed [1].

2-Lactase replacement products should be used in patients with lactose intolerance to **aid in the digestion of dairy products** [(1)].
3-There are **no adverse effects** listed for lactase replacement products [(1)].

Probiotics

Although data about the benefits of probiotics remain heterogeneous; however, many **studies showed significant improvement** with certain probiotic formulations [(3)].

Bismuth subsalicylate (adsorbent):

It capable of binding a considerable amount of sulfide gas. Therefore, it may be effective in short-term relief of gases. However, to avoid salicylate toxicity, do not recommend it for long-term use (> 3-4 weeks) or high doses (>150 mg/ kg) [(3)].
Adult dose: 524 mg qid (maximum 8 doses/day) [(3)].

Table1-13: Dosage Guideline for Intestinal Gas Products [(1)].

Agent	Adults	Children ≥ 12 Years	Children 2 to < 12 Years	Children < 2 Years
Simethicone	40-360 mg after meals and at bedtime, as needed	40-360 mg after meals and at bedtime, as needed	40 after 4 times daily	20 mg 4 times daily, as needed
Activated charcoal	520 mg (2 capsules) orally after meals, as needed; may repeat hourly	Specific guidelines not available		
Alpha-galactosidase	300-450 units per serving of food	Not recommended		
Lactase enzyme	3000-9000 units at first bite of food or drink containing lactose	Specific guidelines not available		
Probiotics	Specific guidelines not available	Specific guidelines not available		

References:

1-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
2-W. Steven Pray. Strategies for the Relief of Bloating and Gas. US Pharm. 2009; 34(12):16-22.
3-Canadian American pharmacists association (CPhA). CTMA: Compendium of Therapeutics for Minor Ailments. 2014.
4-Guido R. Zanni. coping with Intestinal Gas. Pharmacy times. August 18, 2010.

7-Irritable Bowel Syndrome (IBS)

1-Irritable Bowel Syndrome is defined as: a functional bowel disorder in which **abdominal pain** is associated with **abdominal distention** and a **change in bowel habit (**diarrhea and constipation may occur; sometimes they alternate) [1, 2].

2-The two main classifications of IBS are IBS with constipation predominant (**IBS-C**) and IBS with diarrhea predominant (**IBS-D**). Some patients may also have IBS with alternating diarrhea and constipation (**IBS-A**) [3].

Adult prevalence rates in Western countries are reported to be between 10% and 20%, with approximately twice as many women than men affected [2].

3-The cause is unknown [1]. Some possible causes include genetic mutations, abnormal GI motility, enhanced gut pain sensation (visceral hypersensitivity), or psychological changes. Most likely a **combination of these factors leads to IBS** [3].

Patient assessment with IBS

A-Age:

Because of the difficulties in the diagnosis of abdominal pain in children [1], it is best to refer children ***less than 16 years*** [2].

IBS often develop in **young adult life** [1]. If an older (**above 45**[2]) person presenting with for **the first time** with no previous history of bowel problems, referral should be made [1].

B-Symptoms:

IBS has three Key symptoms: **abdominal pain**, **abdominal distention/bloating** and **disturbance** of **bowel habit** [1].

1-Abdominal pain: The pain can occur anywhere in the abdomen. It is often central or left sided and can be severe [1] (pain normally located in the **left lower quadrant**) (figure1-9) [2].

The site of pain can vary from person to person and even for an individual [1].

Sometimes the pain comes on after eating and can be relieved by defecation [1] or the passage of wind [2].

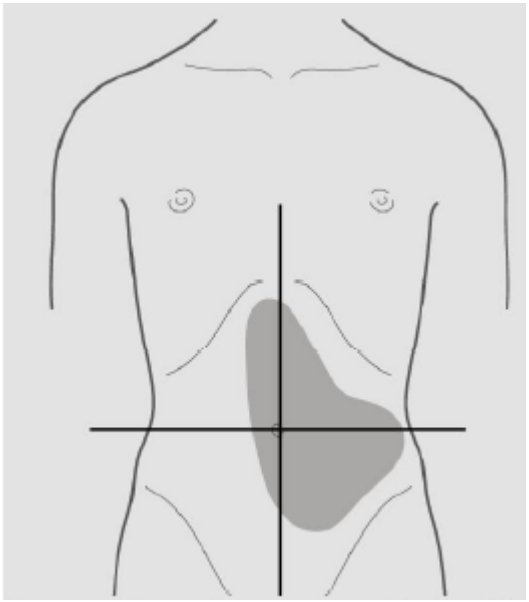

Figure1-9: The position of pain associated with irritable bowel syndrome [2].

2-Bloating: A sensation of **bloating** is commonly reported. Sometimes it is so severe that clothes have to be loosened [1].

3-Bowel habit: Diarrhea and constipation may occur; sometimes they alternate. A **morning rush** is common, where the patient feels an urgent desire to defecate several times after getting up in the morning and following breakfast, after which the bowel may settle .There, may be a feeling of incomplete emptying after a bowel movement. The motion is often described

as loose and **semiformed** rather than watery. Sometimes it is like pellets or rabbit dropping, or pencil shaped. There may be a mucus but **never blood** [1].

4-Other symptoms: Some patients may also complain of nausea, and other unrelated symptoms such as: backache, feeling tiered, urinary urgency, and the need to pass urine during the night.
Patient with ***unexplained weight loss***, or with ***signs of bowel obstruction*** (like vomiting) required referral for further investigation [1].

C-Periodicity:
IBS tend to be episodic. The patient might have a history of being well for a number of weeks or months in between bouts of symptoms [2].

When to refer [1, 2]
-Children
-Older person with no previous history of IBS
-Pregnant women
-Blood in stools
-Unexplained weight loss
-Caution in patients aged over 45 years with changed bowel habit
-Signs of bowel obstruction
-Unresponsive to appropriate treatment
-Fever .

D-Previous history:
To know whether the patient has consulted the Dr. about the symptoms and if so, what they were told. Any history of **previous bowel surgery** would suggest a need for referral [1].

E-Aggravating factors:
Stress appears to play an important role and can precipitate and exacerbate symptoms. Also some types of food may aggravate IBS [1].

F-Pregnant women: required referral for further investigation [1].

G-Medication [1]**:**
To know:
1-What had been tried to treat the condition and whether it produced an improvement. (Unresponsive to appropriate treatment required referral).
2-Other medicines (IBS is associated with depression and anxiety in many patients).

Treatment timescale
Symptoms should start to improve within a **week** [1].

Management
A-Diet:
Patient with IBS should follow the recommendation for a healthy diet (**low fat**, low **sugar**, **high fiber**). In addition patient should avoid any food **they know to exacerbate their symptoms** [1]. Various foods such as beans, and fatty meals, and gas-producing foods such as legumes, may aggravate symptoms in some patients.

This has led many patients to exclude these suspected aggravating foods from their diet although the effectiveness of such practices remains controversial [3].

B-Antispasmodics:

Antispasmodics (table1-14**)** [2] **are the main stay of OTC treatment of IBS**. They work by a direct effect on the smooth muscle of the gut, causing relaxation and thus reducing abdominal pain. The patient should see an improvement within a few days of starting treatment [1].

1-Mebeverine: It is given in a dose of 135 mg (1 tablet) three times a day, **preferably 20 minutes before meals** [1].

2-Alverine citrate: Alverine citrate is given in a dose of 60–120 mg (one or two capsules) up to three times a day [1].

3-Pippermint oil capsules: Capsules containing 0.2 mL of the oil are taken in a dose of one or two capsules three times a day, 15–30 min before meals [1].

4-Hyoscine butyl bromide: The recommended dose for adult is one tablet(10 mg) three times a day , although this can be increased to two tablets four a day if necessary [2].

Table 1-14: Practical prescribing: Summary of IBS medicines [2]

Name of medicine	**Likely side effects**	**Drug interactions of note**	**Patients in which care is exercised**
Hyoscine	Constipation and dry mouth	Tricyclic antidepressants, neuroleptics, antihistamines and disopyramide	Glaucoma, myasthenia gravis and prostate enlargement
Mebeverine	None	None	None
Peppermint oil	Heartburn	None	None
Alverine	Rash	None	None

C-Laxatives and antidiarrheals:

1-In addition, Bulk-forming and stimulant laxatives can be used to treat constipation predominant (IBS-C) [2]. Insoluble fiber (e.g. bran) may exacerbate symptoms and its use should be discouraged [4].

2-Use of OTC antidiarrheals such as **loperamide** is appropriate only on an occasional, short-term basis [1].

D-Compound preparations:

Bulking agents are also available in combination with antispasmodics [1].

e.g. **Fybogel® Mebeverine:** effervescent Granules (in sachets), contain ispaghula husk (Bulk-forming laxatives) and mebeverine hydrochloride [4].

Dose: 1 sachet in water, morning and evening 30 minutes before food; an additional sachet may also be taken before the midday meal if necessary [(4)].

E-Probiotics:

Probiotics such as ***lactobacillus*** and ***Bifidobacterium*** have also been promoted for IBS. The studies showed that probiotics appear to be effective however the size of the effect need to be established [(2)].

References:

1-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
2-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
3-Tracey JC, Carmela AW, Tomasz Z J. Irritable Bowel Syndrome Treatment Options. *US Pharm*. 2012;37(12):45-48.
4-BNF-74

9-Mouth Ulcer

Mouth ulcers are extremely common condition and they are recurrent problem in some people [1].The cause is unknown [2]. They are classified as:
A-**Minor aphthus ulcer(MAU)**(about 80% of mouth ulcer) are self –limiting condition and can be managed by OTC products [1].
B-Major aphthus ulcer(about 10% of mouth ulcer [3]) required referral[2].
C-Herpiteform ulcers(about 10% of mouth ulcer[2]) required referral[2].
In addition mouth ulcer may be a symptom of a serious disease which must be distinguished by the pharmacist [1].

Although it is most likely the patient will be suffering from MAU (Table1-15), it is essential that these are differentiated from other causes and referred for further evaluation[4].

Table1-15:Causes of ulcers and their relative incidence in community pharmacy [4]

Incidence	Cause
Most likely	Minor aphthous ulcers (MAUs)
Likely	Major aphthous ulcers, trauma
Unlikely	Herpetiform ulcers, herpes simplex, oral thrush, medicine-induced
Very unlikely	Oral carcinoma, erythema multiforme (Stevens–Johnson syndrome), Behçet's syndrome, hand, foot and mouth disease

Patient Assessment with Mouth Ulcer:

A-Age:

MAUs are more common in women and occur most often between the ages of 10 and 40 years [1]. MAU in young children (under 10 years) is not common. Therefore mouth ulcer in children under 10 years old required referral [4].

B-Appearance:

The lesion appears as a white or yellowish center with an inflamed red edge [1].

C-Duration:

MAU normally resolved in 7-14 days. Ulcers that fail to heal within this time required referral [4].

D-Size, site and number of lesions:

Table 1-16 summarizes the features of the three main types of aphthous ulcers.

Table1-16: The three main types of aphthous ulcers.			
	Minor aphthus	**Major aphthus**	**Herpiteform ulcers**
Number of lesions	1-5 [3]	1-10 [3]	10-100 (in crops) [3]
Size of ulcer	<1 cm [4]	>1 cm [1]	Pinhead-sized [1]
Common sites	Tongue margin and inside the lips and cheeks [1]	Any intraoral area but prefers lips, soft palate and throat [3]	Any intraoral area especially [3] (**floor of mouth**, gums) [1].
Pain	Usually not very painful [1]	Prolonged and painful ulceration [1]	May be very painful [1]

E-Associated pain:

Pain is the key presenting symptom and can make eating and drinking difficult, although pain subsides after 3 or 4 days [4].

Any patient associated with painless ulcer in the oral cavity must be referred (can indicate sinister pathology like carcinoma especially if the patient is above 50 years old) [4].

Note: The key point to raise suspicion would be a lesion that had lasted for several weeks or longer. Oral cancer is more common in smokers than non-smokers [1].

F-Previous history:

MAU often **recur** (generally after 1-4 months) with the **same characteristic and features** of size, number, appearance and duration before healing. The appearance of these ulcers may follow trauma to the inside of the mouth or tongue, such as biting the inside of the cheek while chewing food.

Stress and emotional factors at work or home may precipitate a recurrence or a delay in healing but do not seem to be causative [1].

G-Associated symptoms:

Mouth ulcer may associated with a number of diseases [like: inflammatory bowel diseases (ulcerative colitis, crohn's disease), behcet's syndrome] [1].Therefore patient reporting any of the following symptoms should be referred:

1-Persistent or recurrent diarrhea (Mouth ulcers may be associated with inflammatory bowel disorders or with coeliac disease. Therefore, if persistent or recurrent diarrhea is present, referral is essential) [1].

2-Weight loss (The severe pain associated with major aphthous or herpetiform ulcers may mean that the patient finds it difficult to eat and, as a consequence weight loss may occur. Weight loss would therefore be an indication for referral) [1].

3-Involvement of other mucus membranes [genital region(vagina, vulva…..), the Eyes…].
Occasionally, as in Behçet's disease, there is involvement of sites other than the mouth [1].

4-Signs of systemic illness e.g. fever [2]. (Rarely, ulcers may be associated with disorders of the blood including low white cell count or leukemia) [1].

When to refer
-Children under age 10 [4]
-Duration longer than 14 days [4]
-Associated weight loss [1]
-Involvement of other mucous membranes [1]
-Rash [1]
-Suspected adverse drug reaction [1]
-Diarrhea [1]
-Painless ulcer [4]
-Ulcers greater than 1 cm in diameter and ulcers in crops [4]

H-Medication :

Mouth ulcer may be produced as a side effect of drug therapy (e.g. cytotoxic drugs, radiotherapy, sulfasalazine, …) and required referral [1].

Treatment timescale:

If there is no improvement after **1 week**, the patient should see the doctor [1].

Management:

Treatment is symptomatic to relief discomfort, inflammation and pain. Commonly used preparations in Iraq include paste and mouthwashes.
Paste preparation is applied to ulcer with finger provided the ulcer is readily accessible. Mouthwashes are useful when there are several lesions or the ulcers are difficult to reach [Other dosage forms: tablets and Pellets: can be kept in contact with ulcer by the tongue and are useful especially when just one or two ulcers are present] [1].

1-Topical corticosteroid:

A-Triamcinolone acetonide in orabase (oral paste) (Kenalog in orabase®)
Apply to the ulcer with a finger, at bedtime and two or three times a day for a maximum of 5 days [2] . (After food, as food is likely to rub the paste off) [5].

B-Hydrocortisone (2.5 mg) oral pellet:
Each pellet contains 2.5 mg hydrocortisone. The dose for adults and children over 12 is one pellet to be dissolved in close proximity to the ulcers four times a day for up to 5 days. It does not interact with any medicines, can be taken by all patient groups, has no side effects and appears to be safe in pregnancy [4].
Pellets should be kept in contact with ulcer and allows to dissolve slowly [6].
(The pharmacist should explain that the pellets should not be sucked, but dissolved in contact with the ulcer) [1].

2-Antiseptic (e.g. chlorhexidine gluconate 0. 2 % mouthwash):

Which may be used to **prevent secondary bacterial infection** that increase discomfort and may delay healing. It has a bitter taste . Regular use can stain teeth brown – an effect that is not usually permanent. Advising the patient to brush the

teeth before using the mouthwash can reduce staining. The mouth should then be well rinsed with water as chlorhexidine can be inactivated by some toothpaste ingredients[1].
The mouthwash should be used twice a day, rinsing 10 mL in the mouth for 1 min and continued for 48 h after symptoms have gone [1].
It is considered safe to use during pregnancy and breastfeeding [7].

3-Topical anesthetics (e.g. benzocaine, lidocaine) gel;

All local anesthetics have a short duration of action; frequent dosing is therefore required to maintain the anesthetic effect. They are thus best used on a when needed basis, although the upper limit on the number of applications allowed does vary, depending on the concentration of anesthetic included in each product [4].

Both lidocaine and benzocaine have been reported to produce sensitization but cross-sensitivity seems to be rare. Thus, if a patient has experienced a reaction to one agent in the past, the alternative could be tried [1].

4-Other products

(like **choline salicylate** oral gel, **Benzydamine** oral rinse and spray,……) are also available. They are used to relief the pain and discomfort associated with mouth ulcer . for details of doses and uses -----see the BNF [6].

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Chapter two: Respiratory Tract Conditions

1-Colds and Flu

1-Common cold: is a self-limiting viral infection of the upper respiratory tract [1]. More than 200 different virus types can produce symptoms of the common cold, including rhinoviruses (accounting for 30-50% of all cases), coronaviruses, parainfluenza virus, ……...[2].

2-**Transmission** is primarily by the virus **coming into contact with the hands, which then touch the nose** (direct contact transmission). Droplets shed from the nose coat surfaces such as door handles and telephones. Cold viruses can remain viable on these surfaces **for several hours** and when an uninfected person touches the contaminated surface transmission occurs [2].

3-Transmission by coughing and sneezing infected mucus particles does occur, although it is a **secondary mechanism**. This is why good hygiene (washing hands frequently and using disposable tissues) remains the cornerstone of reducing the spread of a cold [2].

4-**Children contract colds more frequently than adults** with on average five to six colds per year compared to two to four colds in adults, although in children this can be as high as 12 colds per year. Children aged between 4 and 8 years are most likely to contract a cold and it can appear to a child's parents that **one cold follows another** with no respite [2].

Patient Assessment with cold

A-Age:

Very young patients and **very old patients** required referral. Also the age affect the choice of treatment [3].

B-Duration: In general:

1- **Abrupt** (rapid) onset of symptoms may indicates **flu**.
Gradual onset of symptoms may indicates common **cold**.

2- The symptoms of the common cold usually last **for 7–14 days**. Some symptoms, such as a cough, may persist after the worst of the cold is over [3].

C-Symptoms: Symptoms of common cold are:

1-Sore throat:

The throat is often feels dry and sore during a colds and it is usually 1st sign of common cold [3].

2-Runny / congested (or blocked) nose:

Most patients will experience a runny nose (rhinorrhoea). This is initially a clear watery fluid, which is then followed by the production of thicker and more tenacious mucus [3].

3-Sneezing/ coughing [3].

4-Aches and pains:

Headache may occurs but a **persistent or worsening frontal headache** (pain above or below the eyes) may be due to **sinusitis** and required referral for further investigations. (Note: headache of sinusitis **increase by lying down or bending forwards**) [3].

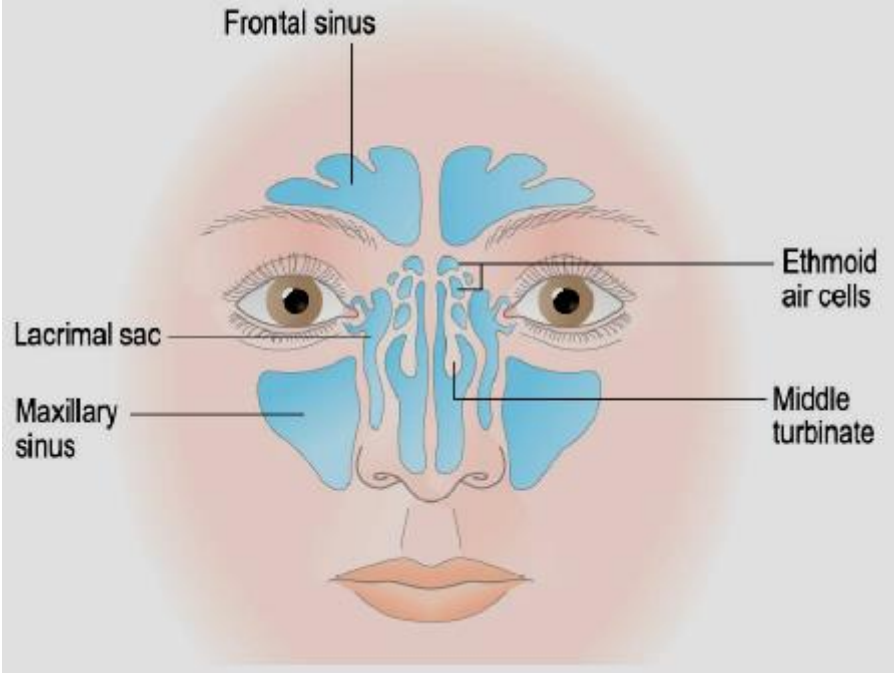

Figure 2-1: location of sinuses [2].

5-Low grade fever:

Those suffering from a **cold** often complain of **feeling hot,** but in general a high temperature will not be present. The presence of **fever** may be an indication that the patient has **flu** rather than a cold [3].

Peak incidence of flu is in the winter months; the common cold occurs any time throughout the year [2].

Differentiating between colds and flu is needed. Flu is generally considered to be likely if :

1-**Temp. is 38c^0 or higher** .(37.5 **c^0** in elderly).

2-**At least one of the respiratory symptoms** (cough, sore throat, nasal congestion, or rhinorrhoea) is present.

3-**At least one of constitutional symptoms** (headache, malaise, myalgia, sweat, chills, and prostration) is present [3].

Influenza is therefore normally debilitating and a person with flu is much more likely to **send another person into a pharmacy for medication** [2].

Flu generally settle with no need for referral, however , flu can be complicated by secondary lung infection (pneumonia); therefore any patient with flu and **warning sign and symptoms of complication** (**severe or productive cough**, **persisting high fever**, **delirium**, **pleuritic chest pain**) required referral for further investigations [3]. (However reference 2 recommends referring any patient with symptoms indicative of flu) [2].

Note: **A vaccine is available for flu** (influenza), which is **reformulated each year**. While no vaccine is available for cold [4].

6-Earache:

Earache is a common complication of colds, especially in children.
Sometimes the situation worsens when the middle ear fills up with **fluid** (Under normal circumstances, the middle ear is **an air-containing compartment**). This is an ideal site for a **secondary infection** to settle. When this does occur, the ear becomes acutely painful and is called **acute otitis media (AOM).**
AOM is a common infection in young children. The evidence for antibiotic use is conflicting . In about 80% of children, AOM will **resolve spontaneously in about 3 days without antibiotics** [3].

In summary, **a painful ear can *initially* be managed by the pharmacist**. There is evidence that both paracetamol and ibuprofen are effective treatments for AOM. However, if **pain were to persist or be associated with an unwell child** (e.g. high fever, very restless or listless, vomiting), then referral to the Dr would be advisable [3].

D-Previous history:

Patient with a history of asthma (**asthmatic attack can be triggered by respiratory viral infection**) or chronic lung disease e.g. **chronic bronchitis** (which can be complicated by secondary chest infection) required referral for further investigations [3].
(**chronic bronchitis**: defined as a chronic cough and/or mucus production for at least 3 months in at least two consecutive years) [2]**.**

E-Present medication :

If one or more *appropriate* remedies have been tried *without success* (failed medication), then referral for further investigations is required [3].
Also patients taking chronic ***immunosuppressive drug*** therapy (e.g. corticosteroid or ciclosporin) Required referral [1].

When to refer [3]
-Earache not settling with analgesic -In the very young -In the very old -In those with heart or lung disease, for example, COPD, kidney disease, diabetes, compromised immune system -With persisting fever and productive cough -With delirium -With pleuritic-type chest pain -Asthma

Treatment timescale:

Once the pharmacist has recommended treatment, patient should be advised to see the Dr. in **10-14 days** if cold has not improved [3].

Management:

1-**Antibacterials are not effective or appropriate as both infections are viral**. Patients with suspected secondary bacterial infection should be referred to a doctor [4].
2-The same non-prescription medicines are used to treat the symptoms of both the common cold and influenza [4].
To reduce the likelihood of catching or passing on infection [4]:

– If possible, **stay away from people with colds or influenza.**
– **Avoid crowded places** where the risk of infection is greater.
– **Do not touch nose or eyes** after being in physical contact with somebody who has a cold or influenza.
– **Wash hands thoroughly**, especially after blowing the nose.
– **Throw away paper tissues** after use to prevent the spread of infection.
– Keep **rooms well aired**.

A-Non pharmacological measures:

Non -drug therapy include:

1-Saline nasal sprays or drops moisten irritated mucosal membranes and loosen encrusted mucus [1]. Nasal saline drops or sprays are a useful option to consider in nasal congestion in babies and young children [3].

2-Regarding influenza [4]:

-Rest, preferably by staying in bed.
-Try to get **plenty of sleep**.
-Drink as much as possible, as large amounts of fluid are lost during a fever.

B-Pharmacological therapy:

1-Decongestants (sympathomimetics):

Decongestants constrict the dilated blood vessels of the nose [4].

A-Systemic (oral) decongestants: like Pseudoephedrine, phenylphrine and ephedrine [3, 4].

C/I: Systemic (oral) decongestants cause stimulation of the heart, increase the BP and may cause hyperglycemia. Therefore they should avoid in : [Diabetes mellitus (D.M), ischemic heart disease (angina, M.I), hypertension, and hyperthyroidism). (The hearts of the hyperthyroid patients are more vulnerable to irregularity, so stimulation of the heart is particularly undesirable)] [3].

B-Topical (drop/spray) Nasal Decongestants (sympathomimetics):

1-**Classification and Doses** [1]:

Intranasal OTC decongestants include the short acting decongestants naphazoline, phenylephrine, and tetrahydrozoline, and the long-acting decongestants xylometazoline (8-10 hours) and oxymetazoline (12 hours) [1].

2-Topical nasal decongestants (sympathomimetics) can be recommended for those **patients in whom systemic (oral) decongestants are less suitable** [3]. (i.e. D.M, Ischemic heart disease (angina, M.I), hypertension, and hyperthyroidism).

3-Dosage of some topical nasal decongestants are listed in (table 2-1).

Table 2-1: dosage of some topical nasal decongestants		
Drug		**Dose**
Naphazoline	0.05%: ≥12 years	1-2 drops/sprays in each nostril not more often than every 6 hours [1]
	0.025%: 6-<12 years	1-2 drops/sprays in each nostril not more often than every 6 hours [1]
Oxymetazoline (Nazordine®):	0.05%: ≥12 years	2-3 drops/sprays in each nostril not more often than every 10-12 hours (max: 2 doses/24 hours) [1]
	0.025%: 6-<12 years	2-3 drops/sprays in each nostril not more often than every 10-12 hours (max: 2 doses/24 hours) [1]
Xylometazoline (Otrivine®)	0.1%: ≥12 years	2–3 drops 2–3 times a day as required for maximum duration of 7 days [5]
	0.05%: 6-<12 years	1–2 drops 1–2 times a day as required for maximum duration of 5 days [5]

4-Nasal Spray or Drop:
-**Nasal sprays are preferable for adults and children aged over 6 years** because spray has a faster onset of action and cover a large surface area.
-**Nasal drops are preferable for children aged below 6 years** because their nostrils are not sufficiently wide to allow effective use of sprays . (But the drops cover a limited surface area and easily swallowed which increase the possibility of systemic effects) [3].

5-Duration of treatment with topical nasal decongestants
If topical; (drops or sprays) decongestants are to be recommend, the pharmacist should **advice the patients not to use the product for longer than 7 days** [3] (3-5 days in some references [1]) because: **Rebound congestion** (Rhinitis medicamentosa) (with congestion returning often worse than before) [6] can occur with topically applied [3] (especially short acting [1, 6]) but not with oral sympathomimetics [3].
(Many treatment options have been proposed for rhinitis medicamentosa including **slow reduction** in the use of decongestant, a **switch to inhaled corticosteroids** or an **abrupt discontinuation**. Abrupt cessation is effective but it is difficult because the patients will be congested for several days or weeks) [7].

2-Antihistamines:

Antihistamine can reduce some of symptoms of a cold: runny nose (rhinorrhoea) and sneezing but are not so effective in reducing nasal congestion [3]. There is no evidence that any antihistamine is preferable to another in the treatment of rhinorrhoea although **individual response to specific drugs varies widely** [6].

Antihistamine can be classified into:

A-Sedating Antihistamine:

Examples of OTC sedating antihistamine are: chlorphenamine (chlorpheniramine), dexchlorpheniramine , clemastine, triprolidine and diphenhydramine.

Side effects: The major side effect of the older antihistamines is their potential to cause drowsiness. Their anticholinergic activity may result in a dry mouth, blurred vision, constipation and urinary retention. These effects will be increased if the patient is already taking another drug with anticholinergic effects (e.g. tricyclic antidepressants, neuroleptics) [3].

Accordingly they are not recommended [3] (or used with caution [5]) for patients with: Glaucoma, or prostate hypertrophy and in elderly patients.

B-Non-Sedating Antihistamine:

Examples of OTC non-sedating antihistamine are: loratadine, acrivastine and cetirizine [3, 4].

Adult dose of Loratadine: 10 mg once daily.

Note: although the drowsiness is rare, but the warning that these drugs may affect driving and skilled tasks is still present [5].

Important : Because of their antimuscarinic actions the *sedating antihistamines* should be used with care in conditions such as angle-closure glaucoma, and prostatic hyperplasia; **antimuscarinic adverse effects are not a significant problem with the non-sedating antihistamines** [8].

3-Combination products: sympathomimetics (for congestion) + Antihistamine (for rhinorrhoea and sneezing):

The antihistamine is usually combined with sympathomimetics because :

A-The suppression of rhinorrhea can provokes congestion so the sympathomimetics will offset this effect.

B-Sympathomimetics may also help to counteract sedation caused by the antihistamines (because the sympathomimetics cause CNS stimulation) [6].

4-Analgesics, antipyretics:

_ Paracetamol, aspirin and ibuprofen can be used to reduce fever, if present, and ease headache and muscle pains in influenza and general discomfort with colds.

_ Aspirin is restricted in its use by its pronounced side-effect profile, and may not be **given to children under 16 years because of its association with Reye's syndrome**, a rare but occasionally fatal encephalopathy in children [4].

5-Inhalants:

Preparations containing **volatile substances for inhalation**, either directly or via **steam**, produce a sensation of clearing the nasal passages and are used for the relief of cold symptoms. They have few, if any, contraindications [4].

6-Vitamin C in common cold:

Vitamin C **does not prevent colds** and **even high-dose** vitamin C (over 1 g/day) produce **minimum benefits** [3] .

In case of vitamin **C effervescent tablets**, large quantities of **sodium bicarbonate** are required in this formulation, which could disturb the electrolyte balance of patients with **cardiovascular diseases** , especially those whose sodium intake is restricted [6].

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2-Cough

Cough is a reflex action to remove secretions or foreign material from the airways [1]. The **majority** of coughs presenting in the pharmacy will be caused by a **viral** upper respiratory tract infections (URTIs) [2].

Types of cough

1-Productive (wet, chesty) cough: A productive cough expels secretions from the lower respiratory tract that if retained, could impair ventilation and the lungs' ability to resist infections [3].

2-Nonproductive (dry) cough: in which no sputum is produced [2] and has no physiologic purpose [3]. These cough are usually caused by viral infections and are usually self-limiting [2].

3-Chesty-Nonproductive: Many patients say that they are not producing sputum and they say that they can "feel it on their chest ",[4] where there is congestion on the chest but no mucus is produced, and this should be treated as a productive rather than non-productive cough [4, 5].

Patient assessment of cough

A-Duration

Most coughs are self-limiting and will be better within a few days with or without treatment. In general cough of longer than 2 weeks duration should be referred to the Dr. for further investigations [2].

B-Nature of cough

Whether the cough is dry or wet. If it is wet then we ask about the color of the sputum. Non-colored (clear or whitish) sputum is known as mucoid [2]. Mucoid (clear and white) is normally of little consequence and suggests that no infection is present. Yellow, green or brown sputum normally indicates infection [4] and require referral [2].

C-Associated Symptoms:

1-Chronic cough with haemoptysis associated with chronic fever, weight loss and night sweats are classical symptoms of tuberculosis (TB) [2, 4]. Patient with suspected TB required referral.
2-A recurrent night-time cough especially in children with or without wheezing may indicates asthma and should be referred. Especially if there is a family history of eczema, asthma, hay fever … [2].

Note: Night cough in children is fairly common in association with a cold but in the absence of cold symptoms could indicate asthma [1].[Symptom of cold include: sore throat, Runny / congested (or blocked) nose…].

3-Cough with clear **frothy sputum**, breathlessness (especially in bed during the night) may indicate heart failure and required referral for further investigations. (Note: other symptom of heart failure may be **swollen ankles**). (if there is a history of heart disease especially with a persisting cough, then referral is advisable [1].

4-Upper airways cough syndrome (UACS) (previously referred to as postnasal drip; also referred to as rhinosinusitis):
It is a common cause of coughing [1].(**UACS** is characterized by a nasal discharge that flows behind the nose and into the throat . Patient present with swallowing mucus or frequent clearing of the throat more than usual [4]). Allergies are one cause of UACS. If UACS is present, it is better to direct treatment at the cause of the UACS (e.g. antihistamines or decongestants) rather than just treat the cough) [4].

5-Chest pain, shortness of breath (SOB), wheezing, whooping
These symptoms required referral for further investigations [1].

6-Croup:
Croup usually occurs in infants. The cough has a harsh barking quality It develops 1 day or so after the onset of cold-like symptoms. It is often associated with difficulty in breathing and an inspiratory stridor (noise in throat on breathing in). Referral is necessary [2].

7-Coughing during the recumbent (supine, lying down), with heartburn may indicate **Gastro esophageal reflux disease (GERD)** which may be improved by with acid lowering drugs [2, 3].(see chapter one).

8-Smoking: Patient who smokes is more prone to chronic recurrent cough. Over time this might be develops into chronic bronchitis or emphysema [4].
A change in the nature of a smoker's cough (e.g. more productive or frequent, or a different sound) may suggest malignancy. So, a smoker's cough that has changed in nature required referral [5].

When to refer [2]
-Cough lasting 2 weeks or more and not improving
-Sputum (yellow, green, rusty or bloodstained)
-Chest pain
-Shortness of breath
-Wheezing
-Whooping cough or croup
-Recurrent nocturnal cough
-Suspected adverse drug reaction
-Failed medication

D-Medication:

1-If one or more **appropriate** remedies have been tried **without success** (failed medication); then referral for further investigations [1].

2-Drug-induced cough: e.g.:
Angiotensin-converting enzyme (ACE) inhibitors (e.g. Lisinopril, Enalapril …) cause dry cough in approximately 20% of treated patients [3](especially women), Patients may develop the cough within days of starting treatment or after a period of a few weeks or even months[refer and suggest the alternative: Angiotensin –II receptor antagonists (valsartan, losartan…)] [1].

Treatment timescale

Depending on the length of time the patient has had the cough and once the pharmacist has recommended an appropriate treatment, patients should see their doctor 2 weeks after the cough started if it has not improved [2].

Management

Non-drug measures:

1-Demulcents:

Nonmedicated lozenges may reduce cough by decreasing throat irritation [3]. Demulcents may contain ingredients such as honey and lemon, or glycerol. They are thought to coat the pharyngeal mucosa, soothing inflammation and reducing irritation, and can be used to **treat both productive and non-productive coughs** [5].

They are usually harmless and cheap and have a useful placebo effect. They can be used for any type of cough [6]. (They considered to be safe in children and pregnant women) [2] but should not be given to children under three years of age because of the risk of choking [5]. If recommended they should be given 3-4 times daily [4].

*General advice to patient with cough and cold is **to increase fluid intake** [2].

Non-prescription medications:

Note: In short-term acute conditions, the **amount of sugar in cough medicines is relatively unimportant**. Nevertheless, many diabetic patients may prefer a sugar-free product, as will many other customers who wish to reduce sugar intake for themselves and their children, and many such products are now available [2].

A-Antitussive (cough suppressants): Codeine, **Pholcodeine** and **dextromethorphan** are used for dry cough. Although all three may be effective, dextromethorphan and pholcodeine have a lower risk of constipation and dependence developing. In addition, both pholcodeine and codeine can cause drowsiness whereas dextromethorphan is non-sedating in most people [5].

1-Codiene:

The FDA recommended that the use of codeine-containing cough medicines should be contraindicated in children younger than 18 years [7].

Side effects: even at OTC doses codeine can cause constipation and at high doses, respiratory depression [2], therefore it is best avoided in patients with impaired respiratory function e.g. **asthma** [3].
However, in practice this is very rarely observed and does not preclude the use of cough suppressant in asthmatic patients) [4].

Notes:
1-Codeine is well known as a drug of **abuse** and sales must be refused because of knowledge or likelihood of abuse) [2].

2-Dextromethorphan:
Generally it is considered non-sedating and has fewer side effects and thought to have a low potential for abuse [1]. Dose [3, 8]:
Adults: 10-20 mg every 4 hours or 30 mg every 6-8 hours (maximum 120 mg/ day). children aged 6–12 years: 5-10 mg every 4 hours or 15 mg every 6-8 hours (maximum 60 mg/day).

3-Diphenhydramine:
Which is one of the sedating antihistamines. The ***antitussive*** doses are [3]:
Adults: 25 mg every 4 hours (maximum 150 mg/day). children aged 6–12 years: 5- 12.5 mg every 4 hours (maximum 75 mg/day).

4-Pholcodeine
The adult dose is 5 to 10 mg 3-4 times a day. Most marketed products now state avoidance in children but British National Formulary (BNF-74) still states that it can be given to children aged 6 years and over (dose 6-11 year: 2–5 mg 3–4 times a day) [4, 9].

B-Expectorants and Mucolytics: which are used for wet cough.

1-Glyceryl guaiacolate (also called **Guaifenesin**): Which is the only FDA approved OTC expectorant [3]. Doses [3]:
Adults: 200-400 mg every 4 hours (maximum 2.4 g/day). children aged 6–12 years: 100-200 mg every 4 hours (maximum 1.2 g/day).

2-Bromhexine :
Bromhexine is a mucolytic used in the treatment of respiratory disorders associated with productive cough. It is usually given orally in a dose of 8-16 mg three times daily [10].

C-Additional Constituents:
1-Theophylline: which is one of the bronchodilators, and it is available in some OTC products but it is best **avoided** because patients requiring medication to help with shortness of breath (SOB) or wheeze are best referred [4] (In view of the problems associated with theophylline, and the availability of a wide range of

alternative treatments, it would seem best not to recommend any theophylline-containing OTC product)[5].

2-Sympathomimetics (e.g. pseudoephedrine and phenylphrine): these are commonly included in cough and cold remedies for their bronchodilator and decongestant actions [2].
They may be useful if the patient has blocked nose as well as cough, but they can increase the BP ,stimulate the heart, and alter the diabetic control [2] ; therefore they are not recommended for patients with :
Coronary artery diseases (Angina, MI, ….), hypertension, diabetes mellitus, and hyperthyroidism (raised level of thyroid hormone increase adrenoceptors sensitivity and hence putt patients at more risk of cardiac effects if sympathomimetics are used) [5].

3-Sedating Antihistamine: like diphenhydramine, and chlorphenamine,…., which may be added to antitussives (combination with expectorant is illogical) and they are effective especially if the dry cough is disturbing sleep [2].
Side effects: include sedation and drowsiness and anticholinergic side effects (i.e. dry mouth, urinary retention, constipation, …..)[4].
They are not recommended for patients with glaucoma or prostate hypertrophy [1, 4].
Note: Non-sedating antihistamines are less effective for cough [2].

Restriction on the use of cough and cold medicines in children

1-Children under 6 years should not be given OTC cough and cold medicines containing the listed ingredients in (table 2-2) [9].
2-Children should not be given more than 1 cough or cold preparation at a time because different brands may contain the same active ingredient [9].
3-OTC cough and cold medicines can be considered for children aged 6–12 years after basic principles of best care have been tried, but treatment should be restricted to five days or less [9].

The reasons behind the restriction on the use of cough and cold medicines in children are [11]:
1-Children under the age of 6 years generally **have more colds compared to older children** and therefore, are likely to be exposed more frequently to these medications.
2-There is **no robust evidence that cold and cough medicines containing the above ingredients work (placebo effect).**
3-They may produce **side effects** in young children and may **cause poisoning** if a child accidentally swallows more than the recommended dose.
4-Younger children are **less likely to be able to communicate a potential side-effect** from a cough and cold medicine and to ask their parents/caregivers for help in the same way a child over the age of 6 can.

Table 2-2: Over the counter cough and cold medicines for children [9]
1-Children under 6 years should not be given OTC cough and cold medicines containing the following ingredients: -Brompheniramine, chlorphenamine, diphenhydramine, doxylamine, promethazine, or triprolidine (antihistamines); -Dextromethorphan or pholcodine (cough suppressants); -Guaifenesin (expectorants); -Phenylephrine, pseudoephedrine, ephedrine, oxymetazoline, or xylometazoline (decongestants).

Best practice for treating cough and cold [11]

Current advice on **treating colds and coughs in children** includes:

1-**Giving fluids**.

2-Ttreating fever and pain with **paracetamol or ibuprofen**.

3-The use of **saline drops** to loosen dried nasal secretions or help a stuffy nose in young children and babies.

4-Simple cough mixtures containing a **demulcent**, for example **glycerin**, and syrup can have a soothing effect by coating the throat and relieving the irritation which causes the cough.

5-A child over the age of one may also be helped by **a warm drink of lemon and honey**.

If a cough as a result of a viral infection does not go after 2 weeks a doctor should be consulted.

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3-Seasonal Allergic Rhinitis

Rhinitis is simply inflammation of the nasal lining. It is characterized by **rhinorrhoea**, nasal **congestion**, **sneezing**, and **itching** [1].

Seasonal allergic rhinitis (SAR) and/or **conjunctivitis**, more commonly known as **hay fever**, are **allergic reactions** in the nasal mucosa and the conjunctiva of the eye associated with the **presence of pollens in the atmosphere**.
Hay fever occurs at certain times of year. The most common causes are:

- **Tree** pollens in **spring**.
- **Grass** pollen in **summer** [2].

Patient Assessment with Allergic Rhinitis:

A-Symptoms:

1-The patient usually have all ***four*** classical symptoms of nasal **itch, sneeze, rhinorrhoea, and nasal congestion** , however, the patient might also suffer from ocular irritation , giving rise to **allergic conjunctivitis** [1].

2-The nasal discharge is often thin, watery, and clear, but it may be change to colored and purulent one which may indicate secondary infection**. However the treatment is not altered and antibiotic are usually not needed** [3].

3-Symptoms of allergic rhinitis may be **confused with that of common cold;** the two conditions may be distinguished by the following points (table 2-3) [2]:

Table 2-3: Differential diagnosis of allergic rhinitis and the common cold [2]

Allergic rhinitis	Common cold
Ocular symptoms present	Usually **no ocular** symptoms
Symptoms continue for as long as the patient is exposed to the allergens , **often for several weeks**	Symptoms last for about **4-to several days**
Symptoms occur at **the same time each year**.	Can occur at any time of the year but more usually in the **winter months**
Only affect **isolated individuals**.	**Highly contagious** (affects other family members and may be common within the community.

B-Associated symptoms:

1-Earache and facial pain: As with cold and flu, allergic rhinitis can be complicated by secondary bacterial infections in middle ear (**otitis media**) or the sinuses (**sinusitis**), therefore patients with painful ear or painful sinuses required referral [3].

2-When associated symptoms such **as wheezing, tightness of the chest, shortness of breath** (SOB)are present, immediate referral is advised. These symptoms may herald the onset of an asthmatic attack [3].

3-Eye symptoms:
The eyes may be **itchy** and also **watery (allergic conjunctivitis)**, occasionally, this may be complicated by a secondary bacterial infection in which the discharge change from clear watery to **sticky colored (purulent)** [3].

C-Seasonal variation:

Repetitive and predictable seasonal symptoms characterize **SAR** [4].

D-Triggers:

Classically symptoms of hay fever **are more severe in the morning and evening** this is because pollen rises during the day after being released in the morning and then settled at night. Hay fever symptoms worsen also on **windy days**. While symptoms **may be reduced after rain** [3] and when the patient stay indoors [1].

E-Family history:

If a first degree relative suffers from **atopy** then hay fever is the most likely cause of rhinitis [1].
(Atopy: A form of hypersensitivity characterized by a familial tendency**)** [1].

F-Medication:

When to refer [1, 3]
-Wheezing and shortness of breath
-Tightness of chest
-Painful ear
-Painful sinuses
-Failed medication
-Medicine-induced rhinitis

1-If one or more **appropriate** remedies have been tried **without success** (failed medication), referral is required [3].
2-Medication of other condition:
-To avoid drug-drug interactions between the recommended OTC and this drugs [3].
- A number of oral medications are implicated in causing rhinitis including alpha adrenoceptor antagonists (e.g. terazosin)(used for benign prostate hyperplasia) [1].

Treatment timescale:

If no improvement is noted after **5 days** of therapy, the patient should be referred [3].

Management:

A-Nonpharmacological advices for SAR [2]:

1-Stay **indoors** and keep all **windows closed**.
2-**Avoid going out**, particularly in the early **evening and mid-morning**.
3-Wear close-fitting **sunglasses** when outside, and a **mask** if symptoms are really severe.
4-In the car, **keep windows closed**, especially on motorways. Keep the air conditioning system on, if there is one.

B-Pharmacological therapy:

Pharmacists now possess a wide range of options to treat SAR. Medications used can be divided into two categories [1]:
Topical: corticosteroids, antihistamines, mast cell stabilizers, and decongestants.
Systemic: Antihistamine and decongestants.

1-Topical therapy:

A-Steroid nasal sprays: Beclometasone, fluticasone, and triamcinolone:

1-A steroid nasal spray is the **treatment of choice** for moderate to severe nasal symptoms [3] and superior to oral antihistamine [5].
2-They can be used in patients aged over 18 years **for up to 3 months** [3].
3-Ideally treatment should be start **at least 2 weeks before symptoms are expected** [2].
4-Regular use is essential for full benefit [3] and **it should be continued throughout the hay fever season** and repeated each year [2]. If symptoms are already present, the patient needs to know that **it take several days** before full effect is reached [3].
5- **Side effects:** are (nosebleed, dryness and irritation of nose and throat) [3] but these are mild and transient [5].
Note: Patient sometimes **alarmed by the term (steroid),** therefore the pharmacist needs to take account of these concerns [3].
6-They should not be recommended for anyone with **glaucoma** [1, 3]. Manufacturers recommend that they are not used during pregnancy and breastfeeding due to insufficient evidence to establish safety. However, exposure data do suggest that they are safe [2]. (They are considered to be safe for use during pregnancy) [7].
7-Corticosteroid nasal sprays are suspensions and the bottle should be shaken before use [1].
8-Recommended adult doses of nasal steroids are listed in (table 2-4) [7].

Table 2-4: Recommended adult doses of nasal steroids [7]

Drug	Dose
Beclometasone spray (50 mcg/ one spray)	100 mcg (2 sprays) twice daily, dose to be administered into each nostril, reduced to 50 mcg twice daily, dose to be administered into each nostril, dose to be reduced when symptoms controlled; maximum 400 mcg per day.
Fluticasone spray (50 mcg/ one spray)	100 mcg once daily, to be administered into each nostril preferably in the morning, increased if necessary to 100 mcg twice daily; reduced to 50 mcg once daily, dose to be administered into each nostril, dose to be reduced when control achieved.
Triamcinolone spray (55 mcg/ one spray)	110 mcg once daily, dose to be sprayed into each nostril, reduced to 55 mcg once daily, dose to be sprayed into each nostril, reduce dose when control achieved

B-Mast cell stabilizers (Sodium cromoglicate):

1-This is available OTC as nasal drop or spray (4%) and as eye drop [3]. Like Corticosteroids (CS) , sodium cromoglicate is a prophylactic agent, but their place in nasal symptoms of allergic rhinitis is **limited because it is less effective than steroids and it need more frequent administration** (4-6 times a day) [1].

2-It is preferably **started 1 week before the hay fever season** is likely to begin and then used continuously [3] .

3-There are no significant side effects although nasal irritation may occur. [3] It has no drug interactions and can be given to all patient groups. Clinical experience has shown cromoglicate to be safe in pregnancy, and expert opinion considers sodium cromoglicate to be safe in breastfeeding [1].

C-Topical Decongestants: see common cold.

D-Topical antihistamine:

Azelastine is a nasal spray used in allergic rhinitis. Topical antihistamines are considered **less effective than topical corticosteroids** but probably more effective than cromoglicate. The BNF suggests that treatment should **begin 2–3 weeks before the start of the hay fever** season. The dose: apply twice daily; increased if necessary to 4 times a day, maximum duration of treatment is 6 weeks [7].

E-Topical ocular preparations:

1-Most eye symptoms will be controlled by oral antihistamines, however if symptoms are persistent or particularly troublesome, topical ocular preparations are effective [5]:

2-**Ocular preparations** include sodium cromoglicate and decongestants-antihistamine (Naphazoline-Antazoline) (see chapter 8 eye disorders).

2-Systemic (oral) therapy:

A-Systemic (oral) decongestants: like pseudoephedrine, phenylphrine and ephedrine which constrict the dilated blood vessels of the nose [3]. (see common cold)

B-Antihistamines:

1-Many pharmacists would consider these drugs to be the first-line treatment for mild to moderate and intermittent symptoms of allergic rhinitis. They are effective in reducing sneezing and rhinorrhoea, less so in reducing nasal congestion [3] . (see common cold).

Note 1 (important): The maximum effect of antihistamines is achieved if they are block histamine release before it occurs. **For maximum effectiveness, therefore, antihistamines should be taken when symptoms are expected rather than after they have started [5].**

2-**Breakthrough symptoms with one-a-day antihistamines:** Patients who suffer breakthrough symptoms using a once daily preparation (loratadine, cetirizine) may

benefit from changing to acrivastine, as three-times-a-day dosing may confer better symptom control [(1)].

C-Combination products: sympathomimetics + Antihistamine (see common cold).

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1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
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4-Yvette C. Terrie. Seasonal Allergic Rhinitis. Pharmacy times. APRIL 01, 2008.
5-Nathan A. Non-prescription medicines. 4th edition. London: Pharmaceutical Press. 2010.
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7-BNF-74.

4-Sore Throat

1-Most sore throat which present in the pharmacy will be caused by viral infection (90%). with only one in ten (10%) being due to bacterial infection so the treatment with **antibiotics is unnecessary in most cases** [1].
Clinically, differentiation between viral and bacterial sore throat is extremely difficult [2]. Causes of sore throat and their relative incidence are shown in (table 2-5) [2].

2-Patients will present with a sore throat as an **isolated symptom** or as part of a **cluster of symptoms** that include rhinorrhoea, cough, malaise, fever, headache and hoarseness (laryngitis) [2].

Table 2-5: Causes of sore throat and their relative incidence in community pharmacy [2]

Incidence	Cause
Most likely	Viral infection
Likely	Streptococcal infection
Unlikely	Glandular fever, trauma
Very unlikely	Carcinoma, medicines

Patient assessment with sore throat:

A-Age:

Although viral causes are the most common cause, streptococcal infections are more prevalent in people under the age of 30, particularly those of school age (5–10 years) and young adults (15–25 years old) [2].

B-Duration:

Most sore throats are self-limiting and will be better within 7-10 days [1].
Therefore, sore **throat lasting more than 2 weeks** should be referred [2].

C- Severity:

If the sore throat is described **as extremely painful**, especially in the absence of cold, cough or catarrhal symptoms, **then referral** should be recommended if there is no improvement within 24-48 hours [1].

D-Previous history:

Recurrent bouts of infection (**tonsillitis**) would mean that referral is best [1].

E-Associated symptoms:

A cold, catarrh and cough may be associated with a sore throat. There may also be a fever and general aches and pains (these are in keeping with a minor self-limiting viral infection) [1].

Symptoms that may need referral:

1-Dysphagia: Most patients with sore throat will find it less easily to swallow (not required referral) but this has to be differentiated from **actual difficulty in swallowing** (dysphagia) that required referral. True difficulty in swallowing

(dysphagia) (i.e. not just caused by pain but mechanical blockage) should be referred [2].

2-Hoarseness: when hoarseness persist **for longer than 3 weeks**, referral is necessary [1].

3-Apperance of throat:
Unfortunately the appearance of throat can be the same in both viral and bacterial sore throat (which may be normal appearance or the presence of white spots, exudates or pus on tonsils) [1].
However, **marked tonsillar exudates accompanied with high temperature and swollen glands** required referral (possible bacterial cause and may require antibiotics) (table 2-6) [2].

Table 2.6: Features of viral and bacterial sore throat [2].

	Age	**Tonsillar/ pharyngeal exudate**	**Duration**	**Cervical glands**	**Cough present**	**Other symptoms**
Viral infection	Any age	Possible, but Generally limited	3–7 days	Normal	Common	Low-grade fever, headache
Bacterial infection	School children	Often present and can be substantial	3–7 days	Swollen	Rare	High-grade fever, possible rash

F-Present medications:

1-A rare complication of certain medication is **agranulocytosis** (suppression of WBC production in the bone marrow) [1] which can manifest as fever, **sore throat**, and ulceration. The patient will probably present with signs of infection, including fever and chills. Examples of drugs that cause this adverse event are: [**Captopril, carbimazole**, cytotoxics, pencillamine, sulfasalazine, neuroleptics e.g. clozapine] [2].

When to refer
-Duration of more than 2 weeks [2]. -Marked tonsillar exudate, accompanied with a high temperature and swollen glands[2]. -Adverse drug reaction [2]. -People taking medicines that can interfere with the immune response (e.g., immunosuppressants, disease-modifying antirheumatics) [2]. - Dysphagia [2]. -Associated skin rash [2]. - Hoarseness of more than 3 weeks' duration [1]. - Recurrent bouts of infection [1]. - Failed medication [1].

2-Steroid inhalers can cause hoarseness. Generally, they tend to do this at high doses. It is worthwhile checking the patient's inhaler technique. If you suspect this is the problem, discuss with the doctor [1].

Treatment timescale:

Patients should a doctor in if the sore throat has not improved **in 1 week** [1].

Management:

The majorities of sore throats **are viral and are self-limiting.** Medication therefore aims to **relieve symptoms and discomfort while the infection runs its course** [2].

A-Oral analgesics:

Simple systemic analgesics such as paracetamol, aspirin, and ibuprofen are effective in **reducing the pain associated with sore throat** [2].

The patient can be advised to take the analgesics **regularly** (**not on an 'as needed' basis**) to sustain the pain relief [1, 2].

Note: Flurbiprofen is a non-steroidal anti-inflammatory drug (NSAID) that is available as a lozenge formulation for the relief of sore throat [3]**.** It is used for adults and children aged 12 years and over [2].
The dosage is one lozenge sucked or dissolved in the mouth every 3–6 h as required, to a maximum of five lozenges. Flurbiprofen lozenges can be used for up to 3 days at a time [1].

B-Locally acting preparations (lozenges and pastilles):

1-The action of sucking anything produces saliva, which lubricates and sooth the inflamed tissues. All lozenges (**regardless of ingredients**) produce this action and much (if not all) of their effectiveness is due to this [3].

2-Gargles or lozenges?
Gargles have very short contact time with inflamed mucosa and therefore any effect will be short lived. A lozenge or a pastille is preferable, as contact time will be longer [2].

3-Non medicated demulcents pastilles such as that containing lemon, honey, glycerin… may be as effective as anything for soothing the sore throat (as in the above note).They can be taken as **often as required** to stop the throat feeling dry, thereby relieving discomfort. Some products contain volatile oil such **as menthol** , and eucalyptus oil which produce a sensation of **clearing the blocked nose** which may accompany the sore throat [3].

4-Most products do contain a sugar base, but the amount of sugar is too small to substantially affect blood glucose control and therefore can be recommended to diabetic patients [2]. Several sugar-free throat lozenges are available [3].

5-local anesthetic**s (e.g. benzocaine) are included in a number of marketed products** (**throat lozenges) and used** for patient who finds the swallowing uncomfortable. The Local anesthetics can **cause sensitization** in some individuals with prolong use, so usage should be limited to **5 days**.
Local anaesthetics should not be used at all by children or elderly people [(3)].

References:

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Chapter three: Childhood Conditions

1-Colic

There is no universally agreed definition of colic. A widely used definition of colic known as the **'rule of threes'**. An infant could be considered to have colic if he or she cries for more than **3 hours a day** for more than **3 days a week** for more than **3 weeks** [1].
However, few parents are willing to wait 3 weeks to see if the infant meets the criteria for colic. As a result in the clinical setting colic is usually defined as repeated episodes of excessive and inconsolable crying in an infant that otherwise appears to be healthy [1].

The cause of colic is poorly understood but seems to be multifactorial [1]. Colic generally starts in the early weeks and may last up to the age of 3–4 months [2].

Patient Assessment with Colic:

A-Duration of colic:

Rule of three (but see the above note)

B-Clinical features of colic:

1-Mothers usually describe crying that occurs in the late afternoon and evening [2] [Attacks appear to be more common in the early evening giving rise to the name '6:00 pm colic'][1] , where the baby cannot be comforted, becomes red in the face and may draw the knees up [2].

2-Passing wind and difficulty in passing stools may also occur [2].

C-History of crying:

1-Colic and acute infections of the **ear** or **urinary tract** can present with almost identical symptoms. However, in acute infection the child should have no previous history of excessive crying and **have signs of systemic infection such as fever** [1].

2-Infants may excessively cry for reasons other than a medical cause, for example, hunger, thirst, being too hot or cold. These should be considered before diagnosing colic [1].

D-Intolerance to cow milk :

Colicky pain in infants is sometimes due to intolerance to cows' milk protein. This is far less common than generally believed but should be considered if the **infant is failing to thrive** [1].

E-Feeding technique:

Underfeeding the baby can result in excessive sucking resulting in air being swallowed leading to colic –like symptoms. Additionally the teat size of the bottle

should be checked. When the bottle is turned upside down the milk should drop slowly from the bottle [1].

Management:

1-Parents should be reassured that the child's symptoms will **subside over time** [1].

2-**Simeticone** is reported to have antifoaming properties, reducing surface tension and allowing easier elimination of gas from the gut by passing flatus or belching. It is widely used yet has very **limited evidence of efficacy** [1].

3-Simeticone is pharmacologically inert; it has no side effects, drug interactions or precautions in its use and can therefore be safely prescribed to all infants. The dose **is given after each feed** [1].

References

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2-Fever

Background:

1-Fever is simply **a rise in body temperature above normal**. Normal body temperature is 37 ºC, plus or minus 1ºC, although **rectal** temperature is **about 0.5 higher** and **underarm** the temperature is about **0.5 lower than oral temperature** [(1)].

2-Fever is often classified as being either **mild** (**low-grade**) (up to 39°C) or **high** (above 39°C) [(1)].

3-Rectal temperature has long been considered the gold standard measurement; However, its utility has been challenged. **Many patients prefer other methods** of temperature measurement because of comfort and ease of use [(2)].

4-Fever is a common symptom of many conditions, and in children **viral**, and to a lesser extent **bacterial**, causes are **most commonly implicated.** It has been reported that fever is probably the commonest reason for a child to be taken to a doctor [(1)].

Measurement of body temperature

1-Oral, rectal and axillary temperature may be taken with an **electronic thermometer** with a digital probe [(3)].

2-Standard mercury in glass thermometers are **no longer recommended** due to **potential toxicity if they break** and **problems with proper use** [(3)].

3-Recomenndations for temperature measuring techniques are shown in (table 3-1) [(3)].

Table 3-1: temperature measuring techniques [(3)].

Age	Recommended technique	
	First choice	Second choice
Birth -2 years	Rectum	Axillary
2-5 years	Rectum	Axillary
Older than 5 years	Mouth	Axillary

A-**Rectal** is the most **accurate**, **less acceptable by toddlers**, **contraindicated** in **premature infants**, **recent** anorectal **surgery** or **severe hemorrhoids** [(3)].

B-**Oral**: **younger children** may **bite** the **thermometer** or have **difficulty keeping it** in **the closed mouth** (this may also be a problem for **mentally impaired** or elderly with **dementia** since they have difficulty understanding the instructions) [(3)]. **Avoid oral route** when nasal breathing is difficult (e.g. due to viral upper respiratory tract infection). **Beverage** (hot or cold) and **smoking** should be **avoided for at least 10 minutes** before taking an oral temperature [(3)].

C-**Axillary**: have many **disadvantages** they take a **longer time** to measure and **affected by a number of factors** including hypotension [(3)].

Patient assessment with Fever

A-Age:

Children **under 3 months** should be referred automatically because diagnosis can be very difficult and serious complication can arise [1].
(They have an immature CNS thermoregulatory system, so less able to mount a febrile response. Therefore, when they do become febrile**, it may indicate a major illness**) [3].

B-How poorly is the child:

1-The parent will know how poorly the child is relative to normal behavior. A child might have a high temperature but be relatively normal whereas a child with a mild temperature may be quite poorly [1].
Obviously ill child or child who fails to respond to stimuli required referral [1].

2-Fever rises **above 40°C** in a child of any age, required referral [4].

C-Duration:

Children < 2 years with fever that persists > 24 hours required referral [2].
Children > 2 years with fever that persists > 3days required referral [2].

D-Associated symptoms:

1-**Viral upper respiratory** tract infections are usually accompanied by one or more symptoms including cough, cold or sore throat [1].
2-If the patient has suffered any **febrile seizur**e (or has a **history of febrile seizures**), then referral is advised [2].
3-If **no other symptoms are present,** fever suggest a bacterial infection, often a urinary tract infection, referral is required [1].
(Other symptoms can be present and include irritability, poor feeding, or vomiting) [1].

When to refer [2]
-Any feverish child under 3 months old.
-Fever accompanied with no other symptoms.
-Fever of 5 days or longer.
-Febrile convulsion/seizures
-Stiff neck.
-Obviously ill child or child who fails to respond to stimuli.
-Signs of dehydration.

4-Child who is **vomiting**, **very sleepy**, **hard** to **wake up**, **irritable**, or develops **spots** or **rash**, **neck stiffness**, **joint swelling**, **diarrhea**, **increased respiration rates** or **signs** of **dehydration** required referral [1, 2].
5-Children with **impaired immune function** (e.g. cancer) required referral [2].

Treatment timescale:

Patient should seek medical attention if fever persists **after 3 days** of drug treatment [2].

A-Non-pharmacological advice:

1-Nonpharmacologic interventions, regardless of the temperature, include wearing **lightweight clothing**, **removing blankets**, **maintaining a comfortable room**

temperature of approximately (20°C), and **drinking sufficient fluid** to replenish insensible losses. Because a fever will cause a child to lose fluids more rapidly, sufficient fluid intake is recommended [(2)].

2-**Body sponging with tepid water** may facilitate heat dissipation, given that only a small temperature gradient between the body and the sponging medium is necessary to achieve an effective antipyretic response. However, sponging is not **routinely recommended for those with a temperature less than** (40°C); Sponging is usually **uncomfortable** and often induces **shivering**, which **could further raise the temperature** [(2)]. Sponging does not **reset hypothalamic set point.** If used, administer **antipyretics 30 minutes before sponging** to reduce the hypothalamic set point [(3)].

Pharmacological therapy

1-Both **ibuprofen** and **acetaminophen** are effective in reducing fever, with both showing reductions of approximately 1-2 degrees within 30 minutes to 1 hour [(2)].

2-Avoid alternating antipyretics (**ibuprofen** with **acetaminophen**) because of the increased risk for potential **dosing errors** and adverse effects, especially in children [(3, 4)].

2-Acetaminophen typically reaches a maximum temperature reduction at 2 hours at the usual recommended dosing of **10-15 mg/kg every 4-6 hours**, with a maximum **of 5 doses per day** [(2)].

3-Acetaminophen is also available as a **rectal suppository**. Although a suppository may be an advantage for caregivers who have problems giving their children oral medications, or for children who are vomiting or are having a febrile seizure, the **suppository's absorption is erratic**, and studies on its antipyretic activity are conflicting [(2)].
4-Ibuprofen can be given to children **over 3 months old** in UK[(1)](6 months in USA) [(2)]. Ibuprofen is the most common NSAID used as an antipyretic; it typically reaches a maximum temperature reduction at 2 hours at the recommended dosing of **5-10 Mg/kg per dose every 6-8 hours**, with a maximum **of 4 doses per day** [(2)].

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3-Head lice (Pediculosis)

Background:

1-Head lice infestation (or infection) is most commonly found in children, especially around the age of 4-11 years old [1] with girls showing higher incidence than boys (this may be because girls often huddle together when playing) [2]. While the older children and adults are less prone to infestation [1].

2-Infection is spread by direct head-to-head contact, and possibly by transfer through contact with infected hairbrushes, hats, pillows, etc., although lice cannot survive for long away from the scalp [3] (fleeting contact will be insufficient for lice to be transferred between heads) [4] because head lice cannot fly, jump or swim. Moreover, they cannot survive away from the host for more than 12 hours and are unlikely to be passed from person to person through shared combs, brushes, towels, clothing or bedding [2].

3-The main risk factors for infestation with head lice (pediculosis) are being of primary school age or having a young child in the family. **Having unwashed hair or long hair is not a risk factor and neither is low social class** [2].

4-Head lice infestation rarely causes physical problems and head lice **are not known to be vectors for infectious diseases** [2].The adult louse lives for approximately 1 month during which the female louse lays several eggs at the base of hair shaft each night [4].

Patient Assessment with Head Lice

A-Have live lice been seen?

1-The presence of live lice is diagnostic [4].Treatment should be reserved for infected heads. Many parents are worry that their children may catch lice and wish the pharmacist to give their **prophylactic** treatment. Insecticides should never be used prophylactically, since this may **accelerate resistance** [1]. However a **lice repellent** is now available [5].

2-Pharmacists can advise patients on how best to check the infection [4]. Wet combing of the hair is a more reliable detection method than scalp inspection. Parents can easily check for infection by combing the child's hair over a piece of white paper, using a fine-toothed comb. The hair should be damp or wet to make the combing process easier and less painful. If live lice are present, some will be combed out of the hair and onto the paper [1].

3-The hair at the **nape of the neck and behind the ear** should be thoroughly checked. These spots are preferred by the lice because they are warm and relatively sheltered [1].

B-Presence of empty egg shells (nits):

The presence of nits is not necessary evidence of current infection (**common misconception**) unless live lice are also present [1, 4].Nits are not removed by insecticides [4]. (Because they are firmly glued to the hair) [1]. So **the presence of nits does not mean treatment failure** [4].
A fine toothed comb can be used to remove the nits after treatment [1].

C-Presence of itching:

Contrary to the popular belief, **itching is not experienced by everyone with head lice** (i.e. absence of itching does not mean that infection does not occur). [Itching is an allergic response to saliva of the lice which injected into the scalp during feeding; therefore, sensitization does not occurs immediately but may take weeks to develop (thousands of bites from the lice are required)]. But in case of re-infection, itching may be quickly begins [1].

D-Previous medications:

While it is possible that treatment failure may occur, this is unlikely if a recommended insecticide has been used correctly [1].

Management:

Preventative Measures [6]:

1-Avoid direct contact with infected patients.
2-Do not share articles such as combs, brushes, hats and towels
3-Use hot water to wash hairbrushes and combs of patient for 10 minutes.
4-Use hot water to wash clothes, bedding, and towels of patient.

Note: Shaving the head is not an effective treatment because lice can cling to as little as 1 mm of hair **[2].**

Treatment:

There are three treatment options :
A-Insecticides: permethrin, lindane (gama benzene hexachloride), and malathion.
B-Dimeticone and **isopropyl myristate (physical insecticides)**
C-Wet-combing.
Recent trials report cure rates of 70-80 %, 70 %, and 50-60 %, for insecticides, dimeticone and wet-combing respectively [2].

Note: Itching can persist after infestation has been cleared. For troublesome itching a sedating antihistamine may be recommended [2].

Practical points

1-It is generally recommended to **treat all family members at the same time** to prevent reinfection from other family member. Another approach is to treat only those with confirmed infection and to check the hair of other family member on regular basis (but it required a high level of motivation) [1].

2-Some eggs may survive after the first application; therefore a **second application 7 days later is now recommended** to kill any lice that emerged from eggs [1, 2, 4]. (The incubation period for head lice is 7-10 days [1]).

3-Parents are often are **embarrassed that their child has head lice** ,but pharmacist should reassure them that this is not a sign of poor hygiene [1] (Head lice are not only associated with dirty hair) [4].

4-Children should not be kept off school [4].

5-**Alcoholic and Aqueous lotions** [1]:
If available, aqueous lotion is preferred for small children and for asthmatics. Alcoholic lotions can cause some problems:

A-Alcohol can cause stinging when applied to broken skin (e.g. eczema).
B-Evaporation of alcohol may irritate the lung and can precipitate an asthmatic's attack (the risk is rare but the caution is still advised). In addition when an alcoholic lotion is used the hair should be kept away from naked flame.

6-**Application of solution:** The most effective method of application is to sequentially part sections of the hair and then apply a few drops of the treatment, spreading it along the parting into the surrounding scalp and along the hair. Approximately 50–55 mL of lotion should be sufficient for one application, although people with very thick or long hair may need more [1].

7-**Wet-Combing method:**
Wet combing, or bug busting, can break the life cycle of head lice (physically remove the lice and nymphs) [2].
Effectiveness of this method is very dependent on repeated use [1] (every 4 days) [4] over a peroid of 2 weeks [1]. The procedure is described in (table 3-2) [1].

Table 3-2: Wet-Combing method [1]
1-Wash the hair as normal. 2-Apply conditioner liberally. (This causes the lice to lose their grip on the hair.) 3-Comb the hair through with a normal comb first. 4-With a fine-toothed nit comb, comb from the roots along the complete length of the hair and after each stroke check the comb for lice and wipe it clean. Work over the whole head for at least 30 min. 5-Rinse the hair as normal. 6-Repeat every 3 days for at least 2 weeks.

8-All products, except isopropyl myristate, can be used on children older than 6 months [4].

9-**Pregnant women:**
Pregnant women with head lice should be advised to use dimeticone or to wet-comb [2].

10-Usage guideline presented in (table 3-3).

Table 3-3 Usage guideline of drugs for head lice		
	Drug	**Method of use**
1	**Permethrin** 1% cream rinse	The 1% cream rinse is applied in sufficient quantities to cover or saturate washed hair and scalp. It is left on the hair for 10 minutes before rinsing; the hair is then combed with a lice comb [6].
2	**Malathion** (0.5% liquid) [7]	Rub preparation into dry hair and scalp, allow to dry naturally, remove by washing after 12 hours [7] (or overnight) [1].
3	**Isopropyl myristate** lotion and spry (only recommended for adults and children over the age of 2 years) [4]	The lotion and spry are applied to dry hair ensuring that they are evenly distributed over dry hair . Rinsed after 10 minutes [4, 8].
4	**Lindane** (gama benzene hexachloride) 1% Shampoo [8].	Rub into the affected area, leave in place for 4 minutes then wash [8].
5	**Dimeticone** 4% Lotion & Spray	The lotion is applied to dry hair ensuring that it is spread evenly from the hair root to the tips. The spray should be applied approximately 10 cm from the hair making sure it is evenly distributed over dry hair. Both need to be left on for a minimum of 8 hours (overnight is preferable) before being washed out with shampoo [4].

Note : After washing the product, the hair should be combed with a fine-toothed comb while it is still wet, to remove dead and dying lice from the scalp and empty egg cases attached to the hair shafts [3].

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4-Napkin rash (also called diaper dermatitis, nappy rash)

Napkin rash refer to the erythematous rash that appear on the buttock area during infancy. Contributing factors includes:
1-Contact of urine and faeces with the skin.
2-Wetness of the skin due to infrequent nappy changes and inadequate skin care [1].

Patient Assessment with Napkin Rash.

A-location:

Napkin rash affect the diaper region (buttock, lower abdomen, and the inner thighs) [2]; therefore, involvement of rash away from nappy area required referral [3].

B-Severity [1] :

1-In general , if the skin is unbroken and there are no signs of bacterial infection, treatment may be considered.
2-If signs of bacterial infection is present (weeping, yellow crusting, oozing blood or pus), then referral is required.
3-Secondary fungal infection is common [characterized by the presence of satellite papules (small red lesions near the perimeter of the affected area)], then pharmacist can recommend one of the OTC azole antifungal (see antifungal later).

C-Duration:

Napkin rash of **longer than 2 weeks** duration may be referred [1].

D-Previous history:

To identify the identity and effectiveness of any products used for the current or previous episodes [1].

Treatment timescale:

A baby with nappy rash that does not respond to skin care and OTC treatment within 1 week should be seen by the doctor [1].

Management:

A-Skin care:

1-Nappies should be **changed as frequently** as possible [1].
2-Nappies should be **left off wherever possible** so that air is able to circulate around the skin and helping in drying the skin [1].
3-At each nappy changes the **skin should be cleansed thoroughly with warm water** and then dried carefully. The use of talc powder may be helpful , but the clumping of the powder can lead sometimes to further irritation. Talc powder should be applied to dry skin and dusted lightly over the nappy area [1].

Note: powder is poured into the hands then gently rubbed onto the skin but keep away from the face of the child to prevent inhalation of the powder which may lead to breathing problems[2].

B-Skin protectants (barrier preparation, emollient):

1-Examples: Zinc oxide, castor oil, talc powder, white petrolatum, calamine, cetrimide (celavex® cream: which has antibacterial property also),…….

2-They absorb moisture or prevent moisture from coming in contact with the skin (act as a barrier between the skin and outside). Also they serve as a lubricant in area of the skin in which skin-to-skin friction could aggravate diaper rash [(2)].

3-They are applied **at each nappy changes,** after cleansing the skin [(1)].

C-Antifungal:

1-Secondary infection with candida is common in napkin dermatitis and the azole antifungals would be effective [(1)].

2-Miconazole or clotrimazole applied twice daily could be recommended by the pharmacist with advice to consult the doctor if the rash has not improved within 5 days.
If an antifungal cream is advised, treatment should be continued for 4 or 5 days after the symptoms have apparently cleared [(1)].

2-An emollient cream or ointment can still be applied over the antifungal product [(1)].

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5-Oral thrush

Thrush (Candidosis) is a fungal infection caused by ***Candida albicans*** which occurs commonly in the mouth (**oral thrush**) [1]. It is common in new born babies because they can pick up the organism during passage through an infected birth canal [2].

It may also occur in the **nappy area** in the babies and in the **vagina** [1].

Patient Assessment with Oral Thrush:

A-Age:

Oral thrush is most common in babies. In older children and adults it is rarer and it may be **a sign of immunosuppressant** and **referral** to the Dr. is advisable [1].

B-Affected area:

Oral thrush can occur anywhere in oral cavity (**mainly on the surface of the tongue** and insides of the cheeks) [1].

C-Appearance:

Oral thrush occurs as a **creamy white soft elevated patches which resemble milk curds** (but oral thrush differ from milk curds in that it is **not so easily** removed and when it is scraped , a sore **and reddened area will be seen which may sometimes bleed**) [1].

D-Previous history:

Patients who experience **recurrent infections should be referred** for further investigations [1].

E-Medications:

1- Broad–spectrum antibiotics can predispose to oral thrush [1].

2-Immunosuppressive agents: like cytotoxic and steroids (oral or inhaled) can predispose to oral thrush (Rinsing the mouth with water after the use of inhaled steroid may be helpful) [1].

Treatment timescale

If symptoms are not cleared within **1 week,** then patient should see a doctor [1].

Management

Miconazole Oral Gel:

1-The only specially formulated product currently available for sale OTC to treat oral thrush is miconazole gel [1].

2-Preparations containing nystatin are also effective but are restricted to prescription-only status [1].

Dose for infants and children under 2 years is:

A-Neonate: 1 mL 2–4 times a day treatment should be continued for at least 7 days after lesions have healed or symptoms have cleared, to be smeared around the inside of the mouth after feeds [3].

B-Child 1 month–1 year: 1.25 mL 4 times a day treatment should be continued for at least 7 days after lesions have healed or symptoms have cleared, to be smeared around the inside of the mouth after feeds [3].

Practical points

1-Patients should be advised **to hold the gel in the mouth for as long as possible** [1].
2-For young babies, the gel can be **applied directly to lesion using a cotton bud or the handle of a teaspoon** [1].
3-Treatment may be enhanced by **cleaning the white plug off with a cotton bud prior to the application of the gel** [1].
4-The pharmacist **should check whether nappy rash is also presents** [in the napkin area, candidal infection present as red papules on the outer edge of the area of napkin rash (satellite papules), another feature is that the skin in the skin folds is nearly always affected] [1].
In this case an antifungal cream containing miconazole or clotrimazole can be used for the nappy area (see napkin rash) [1].
5-Where the mother is breast feeding; a small amount of miconazole gel applied to the nipple will eradicated any fungus present [1].

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3-BNF for children. September 2017-2018.

6-Threadworms (Pinworms)

Infection with threadworm (***Entrobius vermicularis*)** is common in young children [(1)]. Eggs are transmitted to the human most primarily by the faecal-oral route (e.g. eggs lodging under fingernails) which are ingested by finger sucking after anal contact [(2)]. Eggs can survive for up to a week outside the human host [(3)].

Patient assessment with pinworms

A-Clincal feature

1-**Perianal itching** is the classic presentation and any child with **night-time** perianal itching is almost certain to have threadworm [(2)](females worms emerge from the anus at night to lay their eggs on the surrounding skin. The eggs are secreted together with a sticky irritant fluid onto the perianal skin) [(1)].

2-The intense itching caused by the sticky secretion [(4)]. Itching can lead to sleep disturbances resulting in irritability and tiredness the next day [(1)].

3-In girls, migration to the vagina can cause intense irritation, which may be confused with thrush [(3)].

4-Diagnosis can be confirmed by observing threadworm on the stool [(2)] (white- or cream-colored thread-like objects, about 10 mm in length and less than 0.5 mm in width. The worms can survive outside the body for a short time and hence may be seen to be moving) [(1)].

5-Itching without sighting the threadworm may be due to other causes such as allergic dermatitis caused for e.g. by soaps [(1)].

6-Complicating factors such as secondary bacterial infection of the perianal skin can occur due to persistent scratching. The parent should be asked if the perianal skin is broken or weeping [(2)].

B-Other family members

The pharmacist should enquire whether any other member of the family is experiencing the same symptoms. However, the absence of perianal itching and threadworms in the faeces does not mean that the person is not infected (during the early stages, these symptoms may not occur) [(1)].

C-Recent travel abroad

If any infection other than threadworm is suspected, patients should be referred to their doctor for further investigation. If the person has recently travelled abroad, this information should be passed on to the doctor so that other types of worm can be considered [(1)].

When to refer
-Infection other than the threadworm suspected [(1)]. -Recent travel abroad [(1)]. -Medication failure [(1)]. -Pregnancy and breastfeeding [(5)]. -Children under 2 years [(5)]. -Secondary infection of perianal skin due to scratching [(2)].

D-Medication:

The pharmacist should about the identity of any recent treatment tried **and how the treatment was used.** Any treatment failure (correct use without benefit) required referral [(1)].

Management:

A-Mebendazole :(OTC in UK) (Vermox®: tablet and suspension).

1-Dose: for adult and children above 2 years is: **100 mg as single dose** [(4)].

A repeated dose 14 days [(2)] (2-3 weeks)[(1)] later is often recommended to ensure worms maturing from ova at the time of the first dose are also eradicated [(2)].

2-Mebendazole is not licensed for use in children under 2 years of age, in pregnant or breastfeeding women when sold without prescription [(4)].

B-Pyrantel pamoate : OTC in the USA and Canada (liquid, caplet, or chewable tablet):

1-Dose: for adult and children above 2 years is: 11mg/kg (max.1 g) as single dose. The dose can be repeated in 2 weeks if symptoms do not resolve because reinfection can occur [(5)] (in USA, the repeat dose should be administered only after consultation with a doctor [(5)] while in Canada, treatment of **symptomatic household** members should be repeated to decrease the likelihood of reinfection [(6)]).

2-Pyrantel pamoate may be taken at any time of the day without regard to meals, and it may be taken or mixed with milk or fruit juice. A special diet or fasting before or after administration is not necessary [(5)].

Practical points:

1-Parents are often **anxious and ashamed** that their child has a threadworm, thinking that lack of hygiene is responsible. The pharmacist can **reassure them that it is a common condition** and any child can become infected and it does not indicate a lack of attention [(1)].

2-**All family members** should be treated at the same time this is because they may be in the early stages of infection and thus asymptomatic [(1)].

3-Transmission and re-infection by threadworm can be prevented by the following practice measures:

A-**Cutting fingernails short.** Hands should be washed after going to toilet and before preparing or eating food [(1)].

B-**Affected members having a bath or shower** each morning during the treatment period to wash away the eggs which were laid during the previous night [(1)].

C-**Change and wash your underwear each day** [(5)] (for 3 weeks) [(6)].

D-**Discourage biting nails and scratching anal area** [(5)].

4-Pregnant women should be advised to practice hygiene measures for 6 weeks to break the cycle of infection [(2)].

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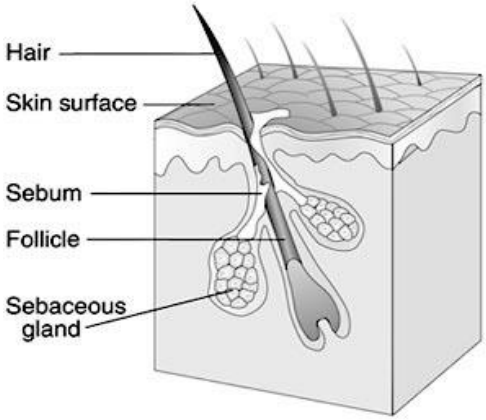
Chapter four: Skin conditions

1-Acne

Background:

1-Acne vulgaris is a common condition in young people. It is not usually serious and **resolves in most patients by the age of 25.** However, it can have **a significant psychological impact** as it affects young people at a stage in their lives when they are especially sensitive about their appearance [(1)].

2-The pilosebaceous units in the dermis of the skin consist of a hair follicle and associated sebaceous glands. These glands secrete sebum– a mixture of fats and waxes –to protect the skin and hair by retarding water loss and forming a barrier against external agents [(2)].



3-Peak incidence of acne is 14–17 years in females and 16–19 years in males. The condition normally resolves in the majority of patients within 10 years of onset [(1)].

Etiology:

Acne is the result of a combination of several factors. The main processes involved are as follows:

1-**The hormonal changes** that occur during puberty, especially the production of **androgens**, are thought to be involved in the causation of acne. Increased keratin and sebum production during adolescence lead to blockages of the follicles and the formation of **microcomedones** [(3)].

2-A microcomedone can develop into a non-inflammatory lesion (comedone) (**comedone:** a mass of sebum and keratin), which may be open (**blackhead**) [(3)] (as the keratinous material darkens in contact with the air [(1)]) or closed (**whitehead**), or into an inflammatory lesion [**papule** (raised reddened area on the skin), **pustule** (raised reddened area filled with pus) or **nodule**)] [(3)].

3-Excess sebum encourages the growth of bacteria, particularly ***Propionibacterium acnes***, which are involved in the development of inflammatory lesions. Acne can thus be non-inflammatory or inflammatory in nature [(3)].

Patient assessment with acne

A-Age [(3)]:

1-Acne is extremely ***rare in young children and babies*** and any such cases should be referred to the Dr. since an ***androgen secreting tumor may be responsible***.

2-For patients in whom **acne begins later than the teenage years**, **other causes** should be considered, including drug therapy and occupational factors (oils and greases used at work).

B-Severity:

Only mild acne can be managed by the pharmacist using OTC products, moderate and severe acne should be **referred** [4].

1-Mild acne: Patients suffering from mild acne characteristically have predominately open and closed comedones with few inflammatory (papulopustular) lesions mainly confined to the face [4]. Mild acne is therefore characterized by the presence of a few to several papules and pustules, but no nodules [5].

2-Moderate acne: A patient with moderate acne has many inflammatory lesions **that are not confined to the face**. lesion are often painful and there is **a possibility of mild scaring** [4].

3-Severe acne: A patient with severe acne has all the characteristics of moderate acne plus the development of **cysts**. Lesions are often widespread involving the upper back and chest. Scarring will usually result [4].

When to refer
1-**Moderate** or **severe** acne [4].
2-**Failed** medications [3].
3-Acne beginning or persisting **outside the normal age range** for the condition (teenage years and early 20s) [1].
4-Suspected **drug-induced acne** [1].
5-Suspected **occupational causes** [1].
6-Suspected **rosacea** [1].

C-Affected areas

In acne, affected areas may include the face, neck, center of the chest, upper back and shoulders, i.e. all areas with large numbers of sebaceous glands.

Rosacea is a skin condition that is sometimes confused with acne [3]. It is a common chronic inflammatory disorder of the **facial pilosebaceous** units, coupled with an increased reactivity of capillaries leading to flushing and telangiectasia [6] [rosacea has characteristic features of reddening (**flushing**), papules and pustules] [3]. It is normally seen in patients over 40 years of age and is more common in women than in men. comedones are not present [4]. Patients with suspected ***rosacea*** required referral [1].

D-Occupation:

Acne is commonly associated with **long-term contact with oils** [3] and required referral [1].

E-Medication

1-Acne of long duration where several products had been correctly used **without success required** referral [3].

2-A number of medicines can produce acne-like lesions. Steroids (oral or topical) are commonly implicated. Other medicines associated include lithium, oral contraceptives , phenytoin, azathioprine and rifampicin [4] and required referral [3].

Treatment timescale:

A patient with mild acne, which has not responded to treatment **within 8 weeks**, should be referred to the doctor [3].

Management:

Nondrug therapy:

Washing the skin with a mild soap and rinsed off with water before applying *benzoyl peroxide* can help by reducing the amount of sebum on the skin [3]. There is no evidence to link diet with acne [3].

Drug therapy:

A-Benzyl peroxide (2.5%, 5%, and 10% gels, lotion, cream …): which is the first line OTC treatment of acne.

Benzoyl peroxide has both antibacterial and anticomedogenic actions and is the first-line OTC treatment for inflammatory and noninflammatory acne. Anticomedogenic action is low and has the greatest effect at higher strengths. It has a keratolytic action, helping the skin to peel. Regular application can result in improvement of mild acne [3].

Administration guidelines for Benzyl peroxide

1-At first, **benzoyl peroxide** is very likely to produce **reddening** and **soreness** of the **skin**, and patients should be warned of this (see 'Practical points' below). Treatment should start with a 2.5 or 5.0% product, moving gradually to the 10.0% strength if needed [3].

2-**Gels can be helpful for people with oily skin** and **creams for those with dry skin** [3].

3-*Benzoyl peroxide* **prevents new lesions forming** rather than shrinking existing ones. Therefore it needs to be **applied to the whole of the affected area, not just to individual comedones**, and is best applied to skin following washing [3].

5-During the **first few days** of use, the **skin is likely to redden** and may feel **slightly sore**. Stinging, drying and peeling are likely. Warning should be given that such an irritant effect is likely to occur; otherwise treatment may be abandoned inappropriately [3].

6-One approach to minimize reddening and skin soreness is to begin with the lowest strength preparation and to apply the cream, lotion or gel sparingly and infrequently during the first week of treatment (**application once daily or on alternate days could be tried for a week and then frequency of use increased to twice daily**. After 2 or 3 weeks, a higher strength preparation may be introduced. If irritant effects do not improve after 1 week or are severe, use of the product should be discontinued) [3].

7-Sensitisation: Occasionally, **sensitization** to *benzoyl peroxide* may occur. The skin becomes reddened, inflamed and sore, and treatment should be discontinued [(3)].

8-Bleaching: Warning should be given that **benzoyl peroxide can bleach clothing and bedding** (If it is applied at night, white sheets and pillowcases are best used and patients can be advised to wear an old T-shirt or shirt to minimize damage to good clothes. Contact between *benzoyl peroxide* and the eyes, mouth and other mucous membranes should be avoided) [(3)].

9-Antibacterials: Skin washes and soaps containing antiseptic agents such as chlorhexidine are available. Such products may be useful in acne by degreasing the skin and reducing the skin flora. There is limited evidence of effectiveness [(3)].

B-Adapalene (Deferin® 0.1 gel)

1-Retinoids are highly effective in the treatment of acne, retinoids stimulate epithelial cell turnover and aid in unclogging blocked pores [(6)]. Thus, the retinoid family are highly active peelers. Available topical retinoids include tretinoin, adapalene, and tazarotene [(7)]. Adapalene is considered the drug of first choice because it has similar efficacy and a lower incidence of adverse effects [(6)]. Differin Gel 0.1% is the first in a class of retinoids to be made available OTC for the treatment of acne vulgaris in patients 12 years of age and older [(8)].

2-The drug should be applied once daily in a thin layer on the affected areas of skin. However, if there is no improvement in 3 months of daily use, patients should stop using the product and consult a physician [(8)].

3-Adapalene is photoirritants, and sun avoidance and sunscreen use are imperative [(7)].

Practical points

Diet

There is **no evidence to link diet with acne**, despite a common belief that chocolate and fatty foods cause acne or make it worse [(3)].

Continuous treatment

Acne is slowly responding condition to treatment and a period of **up to 6 months may be required for maximum benefit**. It is generally agreed that keratolytics such as *benzoyl peroxide* require a minimum of 6–8 weeks' treatment for benefit to be shown. Patients should therefore be encouraged to persevere with treatment, whether with OTC or prescription products, and told not to feel discouraged if results are not immediate. The patient also needs to understand that acne is a chronic condition and continuous treatment is needed to keep the problem under control [(3)].

Skin hygiene

Acne is not caused by poor hygiene or failure to wash the skin sufficiently often. Regular washing of the skin with soap and warm water or with an antibacterial soap or skin wash can be helpful as it degreases the skin and reduces the number of bacteria present [3].

Topical hydrocortisone and acne

The use of *topical hydrocortisone* is contraindicated in acne because steroids can potentiate the effects of androgenic hormones on the sebaceous glands, hence making acne worse [3].

Make-up

Heavy, greasy make-up can only exacerbate acne. If make-up is to be worn, water-based rather than oily foundations are best, and they should be removed thoroughly at the end of the day [3].

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2-Cold Sore

Background

1-A cold sore is a **painful** (not normally serious) **recurrent virus** infection of the area **around the lips** [1]. The virus responsible is the herpes simplex virus (HSV) of which there are two major types: HSV1 and HSV2. **HSV1 typically causes infection around or in the mouth**, whereas HSV2 is responsible for genital herpes infection [2].

2- Fluid from herpes vesicles contains live virus [3]. Infection is spread by viral shedding into saliva and results **from direct mucous membrane** (e.g. kissing) **contact** (at sites of abraded skin) between an infected and an uninfected individual [4].

3-The infection is usually contracted in childhood; it may not manifest clinically for several years or at all, but the virus is **never eliminated from the body** [1](Once the virus has infected a host, it can go through a period of dormancy and reactivation **but that person is infected for life**) [3].

Patient assessment with cold sore:

A-location:

Cold sore typically occurs **around the mouth** .They can also occur inside and around the nose, but this is less common [4]. **Lesions inside the mouth or affecting the eye** required referral [2].

B-Precipitating factors:

Attacks are frequently triggered by the **common cold**, hence the common name of the condition [1] , **fever** (during infections such as colds and flu) [2]. Outbreaks also often follow **exposure to the sun**. Other trigger factors include: **fatigue**; **stress**; **exposure** to **cold weather** and **wind**; **trauma** around the mouth; **and hormonal changes** associated with the menstrual cycle [1].

C-Appearance and Symptoms:

1-Patients with cold sores typically experience **prodromal symptoms** (prodromal phase) of **itching**, **burning**, or **tingling** of up to 24 hours before any visible signs appear [1].

2-**Erythema** then develops, followed by the **formation** of **painful fluid-filled blisters**, which break down into **weeping ulcers**. The ulcers then dry and form **crusts**, which are shed, and the area heals [5].

3-Cold sore is usually resolved within 1–2 weeks [2]. Cold sore of **more than 2 weeks duration** required **referral** [4].

4- Cold sores are extremely painful . Patient with **painless sore** required **referral** (serious lesions ex. **Cancer** is painless and usually of long duration) [2].

D-Previous history (help in the diagnosis):

If a cold sore is returning in the same place in a similar way, then it is likely to be cold sore [2] .

Note: when cold sore occur for the first time it can be confused with **impetigo** (**bacterial** infection), however, impetigo usually **more spread** , has a **honey**–**colored crust**, does **not necessarily start close to the lips**, and more common in **children** and it required referral [required oral or topical antibiotics] [2].

When to refer
-Babies and young children [2].
-Failure of an established sore to resolve [2].
-Severe or worsening sore [2].
-Sore lasting longer than 2 weeks [2].
-Painless sore [2].
-Eye affected [2].
-Uncertain diagnosis [2].
-Patients with atopic eczema [2].
-History of frequent cold sores [2] (> 6 times /years) [6].
-Immunocompromised patient [2].
-Cold sores located within the mouth [4].
-Systemic symptoms [1].

E-Severity

Lesions that are **severe** and **widespread** (e.g. spread rapidly over the face) required **referral** [4] .

F-Medication:

1-Medication used in the previous episodes.

2-**Immunocompromised patients** (e.g. patients taking cytotoxic chemotherapy, corticosteroid,……) are at risk of serious and **severe infection** and required **referral** [2].

Management:

A-Practical point: preventing cross–infection:

1-Patient should be aware that HSV1 is **contagious** and **transmitted** by **direct contact** [2].

2-Lesion **should be kept clean** by gently washing with **mild soap solution** [4].

3-For those patients in whom the sun triggers cold sores, a sun block would be the most effective prophylactic measure [4].

4-Patients should be encouraged to use a **separate towel and wash their** hands after applying products because viral particles are shed from the cold sore and can be transferred to others [4].

5-Risk of transmission is highest during the **first 1–4 days of symptoms** and people should be advised **not to kiss others** [4].

B-Aciclovir (5% cream)(zovirax®):

1-The cream is applied **five times daily**, at **4-hourly intervals**, starting, if possible, as soon as prodromal symptoms occur (it may shorten attacks by a day or two if use is begun early enough [1]).

2- Treatment should be **continued for 5 days** [4]. If healing is not complete, treatment can be continued for up to 5 more days, after which medical advice should be sought if the cold sore has not resolved [2].

3-Aciclovir cream is **licensed for use in children and pregnant women** [(1)] and breastfeeding women [(4)].

C-Penciclovir

For people over 12 years of age it should be applied every 2 hours and treatment continued for 4 days [(4)].

C-Bland creams

Keeping the cold sore moist will **prevent drying and cracking**, which might predispose to **secondary bacterial infection.** For the patient who suffers only an occasional cold sore, a simple cream, perhaps containing an antiseptic agent [e.g. cetrimide **(Celavex®)**], can help to reduce discomfort [(2)].

References

1-Nathan A. fasttrack. Managing Symptoms in the Pharmacy. Pharmaceutical Press. 2008.
2-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
3-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
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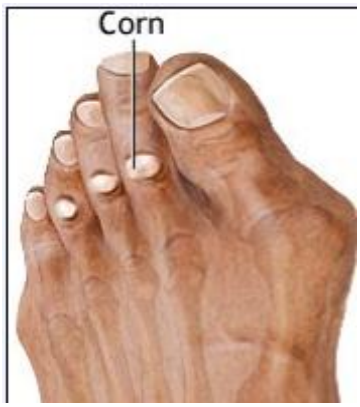
6-Canadian American pharmacists association (CPhA). CTMA: Compendium of Therapeutics for Minor Ailments. 2014.

3-Corn and Calluses

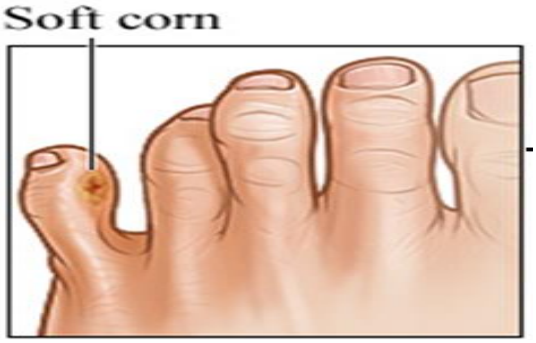
Corn form due to a combination of **friction and pressure** against one of the bony prominences of the feet. **Inappropriate footwear** is the frequent cause. (Continued pressure and friction cause hyperkeratosis) [1].
Friction (caused by **loosefitting shoes**), and walking **barefoot** contribute to the development of calluses [2].

A-Clinical features

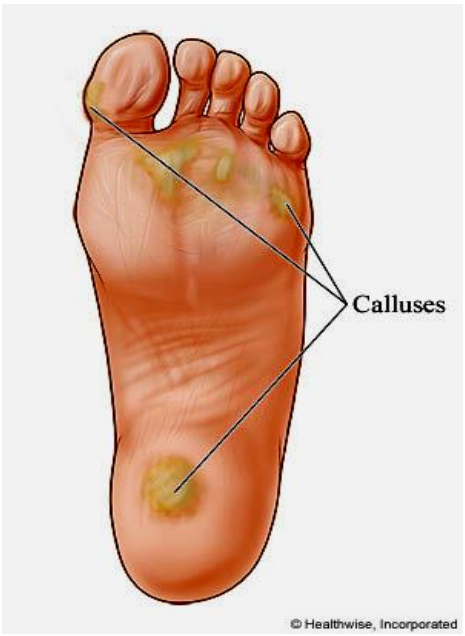
1-Corns:



Corns have been classified into **soft and hard corn. Hard corns** are generally **located on the top of the toes**. Soft corns **form between the toes rather on the top of toes** and are due to pressure exerted by one toe against another. Soft corns are most common in the fourth web space (they have whitened appearance and remain soft because of the moisture that is present between toes, which cause maceration of the corn) [1].



2-Calluses:



Calluses are more diffuse areas of thickening on the sole or the side of the foot [3]. Calluses appear as flattened, yellow-white, thickened skin. **In women, the balls of the feet** are a common site. Other sites that can be affected are the heel and lower border of the big toe [1].

B-Pain:

The resulting pain from corns may be severe and sharp (when downward pressure is applied) or dull and discomforting [2]. Pain experienced with corns is a result of pressure between footwear and the toes. If footwear is taken off, then the pain is relieved [1]. Patients with calluses frequently complain of a burning sensation resulting from fissuring of the callus [1].

C-Previous history:

Patients will often have a previous history of foot problems. The cause is usually due to prolonged wearing of poorly fitting shoes, such as high heels [1].

Treatment timescale:

Patient should Seek medical attention if corn or callus is not removed after 14 days of treatment [2] .

When to refer
-If the lesions bleed or oozing pus [2]. -If they extensive or painful and debilitating [2]. -Patient with anatomical defect in the feet[2]. -In elderly people and patients with diabetes or peripheral vascular disease [3]. -Treatment failure [2].

Treatment

Nonpharmacologic Therapy

A-Selection of the **properly fitted footwear** [2].

B-Epidermabrasion [3]:

Epidermabrasion is a physical process that **removes horny skin using a mechanical aid**. Several gently abrasive materials and appliances are available, including foot files, pumice stones and synthetic pumice-like blocks.

Careful technique is important for the safe and successful removal of corns and calluses, using the following procedure:

– To soften the skin, soak the foot in mild soapy water for a few minutes or apply a moisturizing or softening cream.

– Rub soap on to the appliance and gently rub the corn or callus for 5 minutes.

– Repeat the process nightly for 1 week, then review. There is no need to remove the hard skin completely, just enough to relieve pain or irritation.

Pharmacologic Therapy

Salicylic acid

1-Salicylic acid in collodion –like vehicle

Paints and liquids contain 11–17% salicylic acid, often in a collodion-based vehicle. Collodions contain a nitrocellulose derivative, dissolved in a volatile solvent. On application, the solvent evaporates, leaving on the skin an adherent, flexible, water-repellent film containing the medicament [3].

Apply product **once or twice daily** until the corn or callus is removed (but not more than 14 days) [2].

Note: **do not let adjacent area of normal skin come in contact with drug**. If they do, wash off the solution immediately with soap and water [2].

2- Salicylic acid plasters: Corn and callus plasters contain high concentrations (usually 40%). They should be changed every 1–2 days for about a week, after which the callosity should lift away easily [3].

3-An ointment containing 50% salicylic acid is also available; it should be applied nightly for 4 nights [3].

References :

1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017..
2-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
3-Nathan A. fasttrack. Managing Symptoms in the Pharmacy. Pharmaceutical Press. 2008.

4-Dandruff and seborrhoeic dermatitis

A-Dandruff (pityriasis capitis)

1-Dandruff is a **chronic relapsing condition of the scalp** which responds to treatment, but return when the treatment is stopped [1]. **Increased cell turnover rate** [2] (twice the rate of those without the condition) [1] is responsible for dandruff but the reason why cell turnover increases is unknown. The yeast *Malassezia ovale* may play a role in the pathogenesis of dandruff [2].

2-Dandruff is **rare in young children**, but incidence increases rapidly with age, **peaking in the second decade of life** and **declining gradually thereafter** [3]. Both sexes are affected equally [4].

Patient Assessment With Dandruff:

A-Appearance and location:

Appearance and location will help to distinguish dandruff from psoriasis and seborrheic dermatitis [1] (Table 4-1).
Seborrhoeic dermatitis results from accelerated epidermal proliferation **and sebaceous gland activity** on the scalp, face and trunk [3].
Psoriasis is an inflammatory clinical condition **with plaques and thick scales** [5].

Table 4-1:Appearance and location of dandruff, psoriasis and seborrhoeic dermatitis.

	Dandruff	**Seborrheic Dermatitis**	**Psoriasis**
Location	Scalp[1]	Areas where there is greatest sebaceous gland activity e.g., scalp, face, and chest [5].	Can affect the Scalp, but knees, and elbows are commonly involved. The **face is rarely affected** [1].
Appearance	Thin, white or grayish scales [5]	**Yellowish greasy scales** usually with some reddening [1].	**Silvery –white scales** associated with red **patchy plaques** and inflammation [1].

B-Severity:

Dandruff is generally a mild condition. However, the itching scalp may lead to scratching, which may break the skin, causing soreness and the possibility of infection. If the scalp is very sore or there are signs of infection (crusting or weeping), referral should be indicated [1].

C-Previous history:

Dandruff is a chronic relapsing condition and there is usually a seasonal variation in symptoms which generally improve in summer [1].

D-Medication:

Various treatments may already have been tried. It is important to identify what has been tried and how it was used. If an appropriate treatment has been correctly used with no improvement, referral should be considered [1].

Treatment timescale:

Patient should consult a doctor if the condition does not improve or if it worsens after 1-2 weeks of treatment with nonprescription medications [5].

Management:

Note: All the treatment need to be left on **the scalp for 3-5 minutes** for full effect [1].

1-Ketoconazole 2% shampoo (Ketonaz®):

Which is used to treat acute flare-ups of dandruff or as a prophylaxis:
To treat acute cases: the hair should be washed thoroughly and then leaving the shampoo for 3-5 minutes before rinsing it off. This should be repeated every 3-days (i.e. twice weekly) for 2-4 weeks.
If used as a prophylaxis: the shampoo should be used once every one or two weeks [2].
Note: **it can be used by all age groups including pregnant women** [2].

2-Selenium sulfide 2.5% shampoo (Selsun®):

Twice–weekly use for the first 2 weeks followed by weekly use for the next 2 weeks. Then it can be used as needed [12].
Note:
A-It can be used for patient above 5 years. Manufacturers state to avoid in pregnancy and while breastfeeding due to lack of safety data [2].

B-The hair and scalp should be rinsed thoroughly after using it to prevent discoloration of the hair. And should not be used within 48 hours after coloring or perming the hair [1] (hair should not be dyed or permed for at least 2 days **before or after** using the shampoo [3]).

C-It also has an unpleasant odor. Gold, silver, and other metallic jewels should be removed before application to prevent discoloration [2].

3-Other products containing **(Zinc pyrithione , salicylic acid, coal tar, …)** are also available (see the BNF for details of use) [6].

Practical Points

1-Patients need to understand that the treatment will not cure their dandruff permanently and that it will be sensible to use the treatment on a less frequent basis to prevent their dandruff from coming back [1].

2-It is the scalp that needs to be treated rather than the hair. The treatment should be applied to the scalp and massaged gently [1].

3-It is generally agreed that frequent washing (at least three times a week) is an important part of managing dandruff. Between applications of their treatment the patients can continue to use their normal shampoo [1].

4-Gel and hairspray can still be used and will not adversely affect treatment for dandruff [1].

B-Seborrheic dermatitis

1-Seborrheic dermatitis (Seborrhea) is the result of accelerated epidermal proliferation and sebaceous gland activity on the scalp, face, and trunk [3].

2-Seborrheic dermatitis is common in infant and is called cradle cap (see below), relatively rare in children, and again the incidence peaking between 18-40 years [3]. The adult form is more common in men than in women, and also more common in people with underlying neurological illness, for example, Parkinson's disease [2].

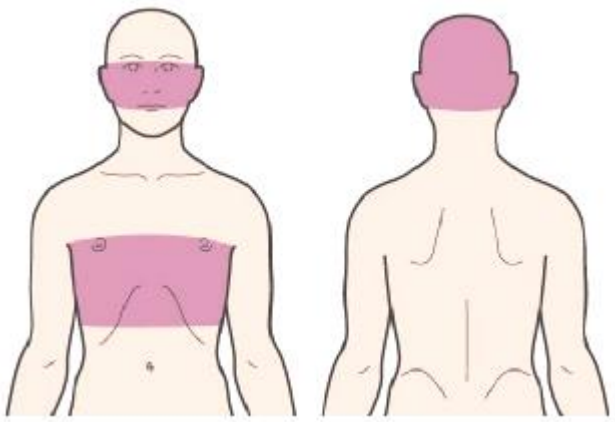


Figure 4-1: Typical distribution of seborrhoeic dermatitis [2].

2-As in dandruff , growth of *Malassezia ovale* may be a causative (a theory supported by the fact that Ketoconazole improves the condition) [3].

3-Typical distribution of seborrhoeic dermatitis is shown in (figure 4-1) [2].

Patient Assessment with Seborrheic Dermatitis:

The differentiation between seborrheic dermatitis, dandruff, and psoriasis had been discussed in dandruff (see dandruff).

In addition the following points may help in diagnosis of seborrheic dermatitis [2]:

1-Other symptoms: eyelid and ear problems are associated with Seborrheic dermatitis.

2-Physical signs: if you run your fingers through the hair of someone with seborrheic dermatitis little is felt. In psoriasis lumps are felt.

Management:

Treatment options for seborrhoeic dermatitis are the same as dandruff [2].

(Ketoconazole shampoo can be used for seborrheic dermatitis. Whilst shampooing, the lather can be applied to other affected areas and left before rinsing [1]).

C-Cradle Cap:

It is a form of seborrheic dermatitis of the scalp. It usually appears within the **first 3 months of life and resolve spontaneously within a year**. This form of seborrheic dermatitis cause scaling and crusting and its appearance may be worrying to the parents, **but it not usually serious** [3].

Treatment:

1-Simple measures, such as the daily use of a baby shampoo followed by gentle brushing, are usually only required to improve the condition [2].

2-If this fails, the scales can be removed by applying olive oil to the scalp overnight, followed by using a baby shampoo the next morning [2].

3-If symptoms persist a medicated shampoo containing coal tar or keratolytic–tar combination (e.g., Capasal®) could be tried. If this fails, the child should be referred to the doctor [2].

4-Ketoconazole has been shown to be effective and safe for the treatment of cradle cap , but it should be reserved for serious cases and preferably used under medical supervision [3].

References:

1-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
2-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
3-Nathan A. Non-prescription medicines. 4th edition. London: Pharmaceutical Press. 2010.
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6-BNF -74.

5-Eczema/dermatitis:

1-Dermatitis and **eczema** are terms used interchangeably to describe a range of skin conditions characterized by **dryness**, **erythema**, and **itch** of the skin, often with **weeping** and **crusting** [1].

2-However the term **dermatitis** is more correctly used when an **external precipitating factor is present** (contact dermatitis) [2]. While the term **eczema** is applied to conditions with an **endogenous** cause in atopic individuals [1].
Contact dermatitis may be classified into:

1-Irritant contact dermatitis (ICD): which is **the most common form** [3]. It caused by direct exposure to a substance that has a damaging effect to the skin.
It can occur on first exposure to a strong irritant or repeated exposure to milder one **[3].** The majority of ICD cases are related to occupation, particularly jobs that involve work with water or exposure to irritant substances [4].

2-Allergic contact dermatitis (ACD): Allergic dermatitis is the result of hypersensitivity to a sensitizing agent [5]. (Table 4-2)

Table 4-2: Differentiation of Irritant and Allergic Contact Dermatitis

	ICD	ACD
Causative agents	Water, urine, flour, detergents, hand sanitizers, soap, alkalis, acids, solvents, salts, oxidizers [4]	Metals [chromate (present in cement), nickels (in jewels)], rubber, dyes, certain plants and medications [2]
Substance conc. at exposure	Important [4]	Less important [4]
Mechanism of reaction	Direct tissue damage [4]	Immunologic reaction [4]
Common location	Hands, wrist, forearms, diaper area [4]	Anywhere on body that comes in contact with antigen [4]

Patient Assessment with Contact Dermatitis

A-Work related exposure:

To know whether or not contact dermatitis is the problem, pharmacist can ask about:
Site of rash, details of job and hobbies, onset of rash and agents handheld, and improvement of rash when away from work or on holiday [2].

B-Duration:

Rash of more than 2 weeks duration required referral [2].

C-Severity:

Severe contact dermatitis (badly cracked /fissured skin, bleeding), or sign of bacterial infection (weeping) required referral [2].

D-Medication:

1-Contact dermatitis may be caused or made worse by sensitization to topical medications (antibiotics, anesthetics, antiseptics, steroid…) [2].

2-Failed medication required referral [2].

When to refer [2].
-Evidence of infection (weeping, crusting, spreading) -Severe condition: badly fissured/cracked skin, bleeding -Failed medication -No identifiable cause (unless previously diagnosed as eczema) -Duration of longer than 2 weeks

Treatment timescale:

If no improvement has been noted after 1 week, referral to the doctor is advisable [2].

Management:

1-All form of dermatitis can cause redness, drying of the skin, and irritation / pruritus to varying degrees. Treatment should include three steps: **managing the itch**, **avoiding the irritant** [3] (i.e. non pharmacological advice e.g. : wearing gloves to protect the skin[2]), and **maintaining the skin integrity** [3].

2-The main agents used are emollients and steroid .**Emollient used on regular basis to keep the condition under control and the flare-up is treated by short course of steroid** [3].

A-Emollients (e.g. white soft paraffin):

They are used to sooth the skin, reduce irritation, prevent drying, and act as protective layer. It should be used **as often as needed to keep the skin hydrated and moist** (i.e. several daily applications are needed) [2].

B-Topical steroid:

1-Two topical steroids are now OTC (a mildly potent steroid : **hydrocortisone 1%Cream and ointment**, and moderately potent steroid : **clobetasone 0.05% cream only but not ointment**) [1].

2-Both have proven efficacy in treating dermatitis and should be considered **first-lin**e treatment for **acute dermatitis** [3].

3-The choice between hydrocortisone and clobetasone is based on the **severity** of the dermatitis and **where the dermatitis is**, with hydrocortisone being best for areas that have thin skin (e.g., flexures), and clobetasone possibly better for other areas (e.g., hands and palms) or where hydrocortisone has failed to control symptoms [3].

4-After using a corticosteroid an emollient can be applied to the same area 30 minutes later [3].

5-Although corticosteroids can be sold to patients OTC, there are a number of restrictions to their sale. In the UK these are :

- The patient must be over 10 years of age for hydrocortisone (over 2 years of age in Australia and USA) and over 12 years of age for clobetasone.
- Duration of treatment is limited to a maximum of 1 week (2 weeks for hydrocortisone in Canada).
- They cannot be used on facial skin, the anogenital region, or broken or infected skin [3, 4, 6].

Note: in USA the hydrocortisone can be applied to the face with avoiding applying the cream around the eyes or eyelids [4].

6-Cream is often the preferred product for most patients because of patient preference for a less greasy preparation. Ointment formulations, while often greasy, are preferred on areas of thick skin or if a patient's skin is dry, or scaly [45].

7-Hydrocortisone cream can be applied as frequently as two to four times per day [4].

8-Clobetasone should be applied twice a day [3].

9-**How much to apply?**

Patients should be instructed to use a **fingertip unit**. This is the distance from the tip of the adult index finger to the first crease. One unit is sufficient to cover an area **twice the size of an adult flat hand** [3].

10-Their use during **pregnancy is OK** [3].

11-Unlike the more potent steroids , hydrocortisone does not affect protein synthesis in human skin and is therefore unlikely to cause side effects such as thinning of the skin and **telangiectasis** (dilatation of superficial blood vessels) [1].

C-Antipruritic and local anesthetics:

1-Antipruritic preparations are sometimes useful, although evidence of effectiveness is lacking. Calamine (Drmocal®)or crotamiton (Eurax®)can be used in cream or lotion [2].

2-Topical ointments and creams containing anesthetics (e.g., benzocaine), **should not be used.** These agents are known sensitizers and can cause a drug induced ACD superimposed on the existing ACD [4].

References:

1-Nathan A. Non-prescription medicines. 4th edition. London: Pharmaceutical Press; 2010.
2-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
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6-Fungal skin infections

Terminology:

Most often, tinea infections are named based on the **area affected** [1]:

Site	Name
Scalp	Tinea capitis
Feet	Tinea pedis
Groin	Tinea cruris
Body	Tinea corporis
Nails	Tinea unguium (onychomycosis)

A-Athlete's foot (Tinea pedis):

Athlete's foot is the most prevalent cutaneous fungal infection in human and it is **more common in adult** [1]. The infection is easily transmitted in **moist or humid locations**, e.g. sports clubs, hence the common name of the condition [2].

Patient assessment with Athlete's foot:

A-Location:

Classically, the toes are involved, the web space between the fourth and fifth toes being the most commonly affected.
More severe infections may **spread to the sole of the foot and even to the upper surface in some cases** . This type are probably best referred to the doctor for further investigation [3].
If the **toenails** appear to be involved, referral to the doctor may be necessary [3].

B-Appearance:

The skin in the **web spaces appears white** and (soggy). The area is normally **itchy** and the feet **tend to smell** [4]. The **skin become macerated and begin to peel off** and the **underneath skin usually reddened** and may be sore [3].

C-Severity:

Severe athlete's foot [broken and macerated skin with signs of bacterial involvement (**weeping**, **pus** or **yellow crusts**)] required **referral** [3].

D-Previous history:

1-Athlete's foot may be recurrent, so we ask about the previous bouts and action taken about there [3].

2-**Any diabetic patient** [3] (or any other immunocompromised patients [1]) who present with athlete's foot are best **referred** (diabetics may have impaired circulation or innervation of the feet and are more prone to secondary infections in addition to poorer healing of open wounds) [3].

When to refer [3].
-Severe, affecting other parts of the foot -Signs of bacterial infection -Unresponsive to appropriate treatment -Diabetic patients -Involvement of toenails (see Tinea unguium below)

E-Medication:

To identify the identity and method (especially the duration) of use of any treatment. If an appropriate antifungal product has been used correctly without remission of symptoms, the patient is best referred to the doctor [3].

Treatment timescale:

If athlete's foot has not responded to treatment within 2weeks, patients should see their doctor [3].

Management:

A-practical advice to prevent reinfection:

1-**Clean the skin daily with soap and water** [1]. **Dry the skin thoroughly after bath**. Keep a personal towel and **don't share it** to prevent the infection spreading from person to person [4].

2-**Socks should frequently change** [4] and **washed regularly**. **Cotton sock** can facilitate the evaporation of moisture, whereas nylon socks will prevent this [3].

3-**Avoid wearing occlusive, non-breathable shoes** [1] (in summer, open toe sandals can be helpful and shoes should be left off where possible) [3].

4-Applying **antifungal foot powder daily** can protect against athlete's foot infections [5].

B-Antifungal: (table 4-3)

Table 4-3: topical Antifungals doses and duration

Antifungal	Dose (daily applications)	Duration
1-Ketocdonazole	2-3 times daily [6]	1 week [3](2-3 days after the disappearance of symptoms [4])
2-Terbinafine	1–2 times daily [6]	1 week [3]
3-Miconazole	Twice daily [6]	Treatment should continue for 10 days after all lesions have disappeared [4, 6]
4-Clotrimazole (fugidin®)	Twice daily [1]	1-2 weeks after the disappearance of lesion to prevent relapse [7]
5-Tolnaftate (tinaderm®)	Twice daily [3]	1 week after the disappearance of symptoms [4]

Note:

1-Benzoic acid (in combination with salicylic acid) is now rarely used [4].

2-Other OTC antifungal for athlete's foot are : Econazole cream (pevaryl®), sulconazole cream , griseofulvin spray, and undecenoates cream, powder and spray [8].

3-Antifungal/steroid combination: (Miconazole 2% with hydrocortisone 1%: Daktacort Hydrocortisone®) (Clotrimazole 1% with Hydrocortisone 1%: Canesten Hydrocortisone ®):

The license states that the maximum period of treatment is 7 days. Therefore they are probably best used to control initial symptoms of redness and itch before switching to an imidazole only product after the initial 7 days of treatment. They are suitable for children over 10 years of age [4].

Practical point:

1-Product should be applied **after careful cleaning and drying** of the foot especially between the toes [3].

2-They can be **used during pregnancy** [4].

3-Agents used for cutaneous fungal infections are formulated as: **creams**, **ointments**, **solutions**, **sprays**, and **powders**. **Creams or solutions are the most effective dosage form** for the delivery of active ingredient to the epidermis. **Sprays and powders** are less effective because they are often not rubbed into the skin. They are probably more useful as adjunct to creams and solutions or as a **prophylactic agents in preventing new recurrent infections** [1].

B-Tinea cruris:

It is the fungal infection of **the groin , inner thigh and may be spread to the buttocks**. The lesion is normally **intensely itchy**, reddish brown, and has **a well-defined edge** [4]. The problem is more common in **men than in women** [3].

Treatment: by the same above antifungals [2].

C-Tinea corporis:

Is a fungal infection of the major skin surface that do not involves hands, face, feet, groin or scalp [4].
It occurs as an **itchy circular lesion** (ringworm: central clear area with a red advancing edge.) [3] Lesion can occur singly, be numerous, or overlap to produce a large lesion that appear polycyclic (several overlapping circular lesion) [4].

Treatment: by the same above antifungals [2].

D-Pityriasis (tinea) versicolor

Pityriasis versicolor, a yeast infection (90% of cases are caused by to *Malassezia* spp.) [4]. The organism **is more common in hot, sunny areas** [2].

Signs and symptoms

1-Macular (flat) patches of altered pigmentation occurring mainly on the trunk and upper legs and arms. In white-skinned people patches are brownish and look as if suntanned, whereas on darker-skinned or heavily tanned people patches are pale or white [(2)].

2-The affected area has an overall **dappled appearance** [(2)].

3-There is a superficial scale that can be removed by scraping with a fingernail [(2)].

4-**Pruritus**, **if any, is mild** [(2)].

Differential diagnosis and circumstances for referral

The condition is most likely to be confused with **vitiligo**, but vitiligo is much more widespread over the body and usually **includes the face** [(2)].

Treatment

1-An imidazole (clotrimazole, miconazole, ketoconazole) cream **applied daily for 3 weeks** [(2)].

2-Or **ketoconazole 2% shampoo**. Apply (undiluted) [(2)] once daily for maximum 5 days, leave preparation on for 3–5 minutes before rinsing [(6)].

Additional advice

To prevent reinfection**, ketoconazole shampoo** should be used as above **once a fortnight** [(2)].

E-Tinea unguium and Tinea capitis

1-Individuals with tinea unguium or tinea capitis should be referred to a primary care provider for treatment [(1)].

2-However, The deregulation of **amorolfine** in the UK and other Western countries (e.g., Australia) now makes it possible for community pharmacists to treat infection affecting the toenails [(4)].

3-Amorolfine is available as a **5% nail lacquer**. It is used weekly and treatment lasts until the affected nail(s) have regrown and are clear of infection. This takes approximately **6 months for fingernails and 9 to 12 months for toenails** [(4)].

4-The product license restricts use to no more than two nails in people **over 18 years** of age and who have no underlying medical conditions that predispose them to fungal infection (e.g., immunocompromised and diabetics). The manufacturer states it should not be used in pregnant or breastfeeding women [(4)].

References

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7-Hair Loss:

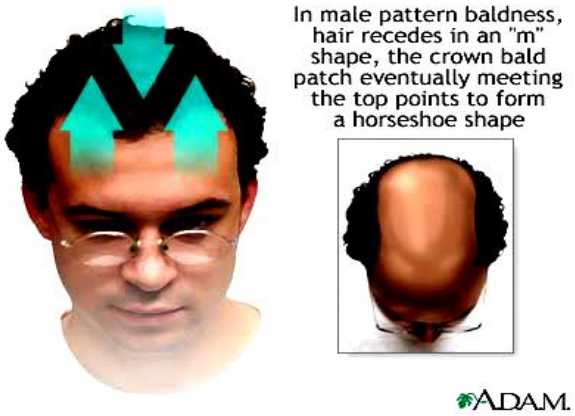
Hair loss affects both men and women and is associated with **strong emotional and psychological consequences**. People link a full head of hair with youth and vitality, whereas baldness gives a feeling of unattractiveness and loss of youth [(1)].
The two major types of hair loss are:
A-Alopecia androgenetica Alopecia androgenetica (male pattern baldness, sometimes known as common baldness because it can affect women) is the most common cause of diffuse hair loss and can be treated by the OTC Minoxidil [(2)].

B-Alopecia areata is a localized patches of hair loss which may be sudden **(required referral)** [(2)].

Patient assessment with alopecia androgenetica:

A-Age:

Patient **under 18 years** with hair loss required **referral** [(1)].(safety and efficacy of minoxidil are not established under this age) [(3)].



B-History and duration of hair loss:

Alopecia androgenetica is characterized by gradual onset where:
1-In men: the hair loss **begin at the front of the head** and recedes backward [(3)]. Or it may begin on the top of the scalp [(2)].

2- In women: hair loss tends to be diffuse and generalized [(1)].

C-Size of the affected area:

If the diameter of the **area is less than 10 cm**, then treatment is worth trying [(2)].

D-Other symptoms:

1-Coarsening of the hair and hair loss associated with recent **weight gain**, **deepening** of the **voice**, **feeling** of **tiredness** may indicate **hypothyroidism** and required **referral** [(2)].

2-Hair loss associated with **itching** and **redness** of the **scalp** may indicate **inflammatory scalp condition** (e.g. **Tinea capitis**) and required **referral** [(2)].

E-Specific events:

Hormonal changes during and after pregnancy mean that hair loss is common both during pregnancy and after the baby is born. **It is completely normal and she can be reassured that the hair will grow back.** Treatment is not appropriate [(2)].

(During pregnancy, circulating levels of oestrogen increase, with a resulting thickens of the hair. However, after delivery the hair follicles return to the resting phase and the hair is shed. Women might believe that they are experiencing hair loss when in reality the hair is returning to the normal pre-pregnancy state. Reassurance should be given that this is a temporary and self-limiting problem) [1].

When to refer
-Alopecia areata [2].
-Suspected drug-induced hair loss [2].
-Suspected hypothyroidism
-Menstrual disorders [2].
-Suspected anaemia [2].
-Patients under 18 years old [1].
-Fungal infection of the scalp [1].

F-Deficiency state:

Iron deficiency is associated with **female hair** loss [1] (suspected anaemia required referral) [2]. (If iron deficiency is the cause, a 2-month course of iron supplementation should result in a thickening of the hair) [1].

G-Medication:

1-Cytotoxic drugs are well known for causing hair loss. Anticoagulants (coumarins), and vitamin A (in overdose) have also been associated with hair loss. Such cases should be referred to the doctor. Other medications include allopurinol, beta-blockers, bromocriptine, carbamazepine, colchicine, lithium, sodium valproate [2] and **oral contraceptive** (seen 2 -3 months after stopping) [1].

2-If medicines other than cytotoxic are suspected of causing hair loss, the prescriber should be contacted to discuss other possible treatment options [1].

Treatment timescale:

Treatment with minoxidil may take up to 4 months to show full effect [2].

Management:

A-Minoxidil:

1-It is available in 2% and 5% concentrations [1]. The 2% and 5% products are approved for use in both men and women [3].
2-Either the 2% or 5% formulations can be recommended for use by women; however, men are usually advised to use the 5% concentration [3].
3-The earlier minoxidil is used in balding, the more likely it is to be successful [2].
4-Up to one in three users report hair regrowth of normal hair and stabilization of hair loss. A further one in three are likely to report some growth of vellus (fine, downy) hair. The final third will not see any improvement [2].
5-The patient should be counseled that if hair regrowth is achieved, long-term continuation of minoxidil will be necessary to maintain the regrowth [3] (new hair growth will fall out 2–3 months after the treatment is stopped) [2].
6-Manufacturer advice **avoid** in **hypertension**, **angina**, **heart disease**, **pregnancy**, and **lactation** [2].
7-After 30 months the effect is still greater than baseline but, on the whole, will not achieve cosmetically acceptable hair growth. In other words, the use of minoxidil

is **useful for specific patients who want to 'buy' themselves time from the inevitable balding process** [(1)].

8-Some patients have experienced changes in hair color and/or texture with minoxidil use. The patient should be warned of this possible problem before using the product [(1)].

9-Application: (table 4-4).

Table 4-4: Administration Guidelines for Nonprescription Minoxidil [(3)].
Minoxidil Solution
Apply minoxidil to clean, dry scalp and hair. • Rub about 1 mL of the product into the affected area of the scalp twice daily (morning and night). Some products have a measuring cap with a 1 mL fill line. • Wash and dry hands after applying the medication. If it gets into the eyes, mouth, or nose, rinse these areas thoroughly. • Do not participate in any activity that might wash away or dilute the drug (e.g., bathing or swimming without a cap) for 2-4 hours after application. • At night, apply the drug 2-4 hours before bedtime; if minoxidil is not fully dry, it can stain clothing and bed linen. • Do not dry the scalp with a hair dryer after applying the drug. This action will reduce the drug's effectiveness. • If applicable, apply hair grooming and styling products (e.g., sprays, mousses, or gels) or coloring agents, permanents, or relaxing agents after the minoxidil has dried. These products usually do not affect the efficacy of topical minoxidil.
Minoxidil Foam
• The foam may melt on contact with warm skin. Therefore, wash hands in cold water before applying. Dry hands thoroughly before applying foam. • Within the thinning hair area, part the hair into one or more rows to maximize contact of the foam with the scalp. The hair should be completely dry before application. • Holding the can upside down, apply one half of a capful of the foam to the fingertips. The 5% product for men should be applied twice daily, in the morning and at night. The 5% product for women should be applied once daily. • Using the fingertips, spread the foam over the thinning scalp area, and then massage gently into the scalp. Wash hands thoroughly after application. • Allow the product to dry completely before lying down or applying grooming, styling, or coloring products.

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8-Insect Bites and Stings

1-Insect bites and stings are common. These injuries usually cause only a local reaction, but they can produce a mild allergic reaction or life-threatening anaphylaxis in patients who are sensitive [(1)].

2-Insect bites and stings differ in the chemical composition of their constituents and in the type of reaction they provoke.

-Insect bites often go unnoticed at the time, and their effects may not be felt for some time afterwards, but they can then last for several days [(2)].

-**Stings are felt immediately**, and the pain and discomfort they cause often subsides within minutes or hours [(2)].

Bites

1-Insects usually bite in order to gain access to the victim's blood supply to feed on it. The skin is punctured and the insect's saliva is secreted into the dermis. The saliva contains enzymes or other agents to liquefy the blood in order to facilitate its flow back through the insect's feeding apparatus [(2)].

2-The saliva may also contain a local anaesthetic, so that the bite goes undetected by the victim and allows the insect to feed undisturbed. The reaction produced by the bite is essentially an irritant dermatitis provoked by the insect's saliva [(2)].

Stings

1-Insect stings are primarily weapons, either of attack or of defence and their effect is intended to be immediate. The pain and inflammation of a bee or wasp sting are caused by the direct pharmacological effects of the sting's constituents [(2)].

When to refer [(1)]
-Hypersensitivity to insects bites or sting resulting in systemic symptoms or symptoms away from bite area. -Children under 2 years. -Suspected spider bites. -Signs of secondary infection at bite area.

Treatment

Nonpharmacologic Therapy

1-Apply **ice pack** promptly to bite area to reduce swelling, itching, and pain.
2-**Avoid scratching** affected area; keep fingernails trimmed.
3-**Remove ticks** with tweezers by grasping the tick's head and gently pulling; the head should be removed.
3-After removal of the tick, **clean the area with rubbing alcohol** to disinfect the skin [(1)].
Nondrug measures include the two methods of preventing insect bites: **avoiding insects and using repellents** [(1)].

Preventive Measures

1-To prevent exposure, cover skin as much as possible with clothing and socks and cuff clothing around ankles, wrists, and neck.

2-Limit the amount of time spent outside at dawn and dusk.
3-Use barriers such as window screens and netting [1].

Insect Repellents

1-Insect repellents are useful in preventing bites from insects such as mosquitoes, fleas, and ticks, but these products are not effective in repelling stinging insects. Most commercial products contain n,ndiethyl-m-toluidine, commonly called **DEET** [1].

2-Repellents, available in sprays, solutions, creams, wipes, and other forms, are applied as needed to skin or clothing according to package directions, which usually is no more frequently than every 4-8 hours [1].

3-Concentrations below 30% are preferable for children, but use of DEET insect repellents on children younger than 2 months should be discouraged [1].

4-Skin irritation is the most frequent DEET related problem [1].

5-Table 4-5 summarized the guidelines for Safe Use of DEET [1].

Table 4-5: Guidelines for Safe Use of DEET [1].
• Read and follow all directions and precautions on the product label. • Do not apply over cuts, wounds, or irritated skin. • Do not apply to hands or near eyes and mouth of young children. • Do not allow young children to apply this product. • Use just enough repellent to cover exposed skin and/or clothing. • Apply the sunscreen first, followed by the repellent, when sunscreen needs to be used in conjunction with a repellent. • Do not use under clothing. • Avoid over application of this product. • After returning indoors, wash treated skin with soap and water. • Wash treated clothing before wearing it again. • Use of this product may cause skin reactions in rare cases. • Do not spray in enclosed areas. • To apply to face, spray on hands first, and then rub on face. • Do not spray directly onto face.

Pharmacologic Therapy

Preparations marketed for the treatment of bites and stings contain:
1-Antihistamines 2-Local anaesthetics 3-Astringents 4-Soothing constituents.
5-Hydrocortisone is also licensed for the treatment of insect bites [2].

A-Antihistamines

As one of the principal components of insect stings is histamine, and as histamine is also one of the principal mediators of the inflammatory response to bites, treatment with antihistamines, seems logical [2].

2-Oral antihistamines are more likely than topical preparations to bring sustained and effective relief. Non-sedating compounds are preferable, being as effective as the older antihistamines for peripherally mediated reactions but not being associated with central sedating and antimuscarinic side-effects [(2)]. (For further information on antihistamines, see Chapter two)

3-Some patients develop an allergic sensitivity to bites and suffer quite severe local reactions. Such patients should be advised to keep a supply of antihistamines with them, ready to take in case they are bitten, as well as taking precautions against being bitten [(2)].

4-A few individuals develop severe anaphylaxis to stings; they may be prescribed adrenaline (epinephrine) 1 : 1000 injection to keep at hand for intramuscular or subcutaneous use if they are stung [(2)].

B-Crotamiton

Crotamiton is not an antihistamine, but it has antipruritic properties and can be used for bites and stings. It is claimed to have a prolonged action of 6–10 hours following application [(2)].

C-Local anaesthetics (lidocaine, benzocaine)

1-Spray formulations may be more effective than creams or lotions as they contain higher concentrations of local anaesthetic. They are likely to be most useful immediately after a bite or sting because they will produce relief, although short-lived, when the pain is most intense. The cooling effect produced by the evaporation of the propellant will also contribute to the pain relief [(2)].

2-These products are generally applied to the bite area up to 3-4 times daily for no longer than 7 days [(1)].

D-Hydrocortisone

Hydrocortisone 1% topical preparations are indicated for temporary relief of minor insect bites. It should be applied as directed to the bite area 3 or 4 times daily for up to 7 days [(1)].

E-Calamine/zinc oxide (skin protectants)

1-Calamine is mildly astringent with soothing antipruritic action. Calamine is a popular preparation for treating urticaria and pruritus from many causes, including insect bites. It is cheap and there are few restrictions on its use. Zinc oxide has similar properties to calamine [(2)].

2-Apply protectant to affected area as needed up to 4 times daily [(1)].

Product recommendations

1-For insect bites – hydrocortisone cream or ointment or calamine lotion, and an oral antihistamine if necessary [(2)].

2-For stings – a spray containing a local anaesthetic used promptly, and an oral antihistamine if necessary [(2)].

References:

1-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
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9-Minor wounds and burns

Although the skin is well adapted to heal minor burns and wounds over time, use of the proper dressing and appropriate use of antiseptics and antibiotics will facilitate healing, minimize scar formation, and prevent secondary bacterial skin infections [(1)].

Pathophysiology of Minor Burns, Sunburn, and Wounds

1-Acute wounds include **burns**, **abrasions**, **punctures**, and **lacerations**. These wounds are typically caused by trauma, and with proper care, tend to heal within 1 month in healthy adults [(1)]. Patients with chronic wounds should always be encouraged to immediately seek medical attention for proper care to prevent complications such as infection [(2)].

2-Typically caused by a rubbing or friction injury, **abrasions** involve the epidermis. **Punctures** result from a sharp object piercing the epidermis, the dermis, and possibly deeper tissues. **Lacerations** are caused by sharpedged objects that have pierced various layers of skin [(2)].

3-**Burns** are wounds caused by **thermal**, **electrical**, **chemical**, or **ultraviolet radiation** (UVR) exposure [(1)]. In general, only superficial and some superficial partial-thickness burns are suitable for self-treatment. Patients with more severe burns should be referred for medical treatment [(3)].

A-The first-degree burn (superficial partial-thickness burn) is the most minor and common burn. **Damage is limited to the epidermis**, the skin's outermost layer. The **burn is pink to red and most are painful**. There may be a moderate amount of edema. The **burned area remains soft and unbroken**, since this type of burn **does not produce sufficient damage to create blisters**. Since the skin is not broken, there **is little risk of infection**. Skin can exfoliate ("peel"), but it usually returns to normal in 3 to 6 days without causing residual scarring [(4)].

B-Second-degree burns are also referred to as deep partial-thickness burns.. Damage extends through the full depth of the epidermis and into the dermis that lies beneath.

A superficial second-degree burn damages only the upper dermis, and is colored pink to bright red. The patient complains of severe pain since all superficial nerve endings are intact. The area may be so sensitive that even a current of air causes exquisite pain. Healing is normally complete in 5 to 21 days [(4)].

I**f the second-degree burn extends down into the deep dermis**, the skin appears dark red to mottled yellow-white. Moderate edema is present, decreasing skin elasticity, and healing may take 3 to 6 weeks.

Both superficial and deep second-degree burns may blister. Unless proper care is obtained for the second-degree burn, the patient may undergo scarring, with a possibility of restricted joint movements, and a need for grafting. Even when grafting is unnecessary, the burned area may retain a residual hyperpigmentation for 1 to 2 months or longer [4].

C-Third-degree burns (full-thickness): damage involves the subcutaneous tissues beneath the dermis. The skin **does not blister** in a third-degree burn, as the damage utterly obliterates the tissues that would respond by blistering. Similarly, there is **little or no pain with these burns**, as the nerves are also destroyed. Third-degree burns can even extend down into muscle and bone. Following debridement of necrotic tissue, grafting is mandatory with third-degree burns, since the tissue layers that normally allow post injury regeneration are also absent. **Scarring cannot be prevented**, so the damaged area remains fully visible [4].

4-There are several types of products the pharmacist can recommend for patients with **first-degree or minor second-degree burns** [4].

Treatment of Minor Burns, Sunburn, and Wounds

1-The goals in treating acute, minor skin injury are to relieve symptoms, to promote healing by protecting the burn or wound from infection and further trauma, and to minimize scarring [1].

2-If the patient has none of the exclusions for self-treatment listed in (table 4-6), the pharmacist should treat the patient (or guide the patient's treatment) using the treatment approach [1, 2].

3-Treatment should include a stepwise approach that involves cleansing the damaged area, selectively using antiseptics and antibiotics, and closing or covering with an appropriate dressing [1] (table 4-7).

Table 4-6: Exclusion from self-treatment of wounds and burns [2, 4].	
Wounds	**Burns**
1-Wound that don't stop bleeding after 5 minutes of applying direct pressure. 2-Wound from an animal or human bites. 3-Deep acute wound. 4-Chronic wound or puncture wounds. 5-Patients who are immunocompromised or have diabetes. 6-Wounds that required stiches. 7-Wounds that exhibit signs of infection (foul odor or pus). 8-Wound that show no signs of healing. 9-Wound that contain foreign matter after irrigation.	1-Brn that affect 2% or more of body surface area. 2-Burns that involve eyes, ears, face, hands, feet, and perineum. 3-Burns in individuals with diabetes or multiple medical conditions. 4-Burns in elderly patients. 5-Burns in immunocompromised patients. 6-Electrical or inhalation burns. 7-Chemical burns (use first aid measure then seek medical attention). 8-Burn that worsens or fails to improve within 7 days of the injury. 9-The burn occurred more than 7 days before the patient initially speaks to a pharmacist. 10-Children under the age of 2 years.

Table 4-7: General care of minor wound and burn	
General care of minor wound	**General care of minor burn without blisters.**
1-Cleanse the affected area thoroughly with soap and water [2]. 2-Apply a thin layer of topical antibiotic ointment to the wound to minimize or prevent infection [2]. 3-Cover the affected area with a sterile bandage to create a moist healing environment, promote healing, and minimizing scaring [2]. 4-Change the dressing as needed as dirty or not intact. Most dressing should be changed every 3-5 days because frequent changes may remove resurfacing layer of epithelium and slow the healing process [2].	1-Immerse the affected area in cool tap water for 10-30 minutes [2]. (If the patient does this properly for minor thermal burns, the burn may not blister) [4]. 2-Cleanse the area with water and a mild soap [2]. 3-if skin is not broken, apply a thin layer of skin protectant or local anaesthetic. If skin is broken, apply topical antibiotic to prevent infection. 4-Apply a nonadherent dressing or skin protectant the area of burn [2]. 5-Don not wrap burn in occlusive dressing. change the dressing as needed [2].

First-aid products for minor wounds and burns

1-Nonprescription **wound care products** for self-treatment include **antibiotics** (eg, **bacitracin**, **neomycin**, and **polymixin B sulfate**), wound **irrigants**, wound

antiseptics, **bandages** (including medicated bandages with topical antibiotics), and products that help reduce the appearance of scars [3].

2-Nonprescription products available for **minor burns** include skin **protectants**, such as formulations with **antiseptics** and **local anesthetics** [3].

A-Wound irrigation products

1-Wound irrigation may be warranted to **clean the wound surface if dirt or debris is present**. A **normal saline solution or a mild soap and water** can be used for this process [2].

2-In some cases, mechanical removal of debris with clean gauze is sometimes necessary [2].

B-First Aid Antiseptics

1-Antiseptics are chemical substances designed for application to **intact skin up to the edges of a damaged skin area** for disinfection purposes [1].

2-Alcohol-containing preparations should not be used within the wound bed because they dehydrate the area and also cause pain and cell damage. Therefore, antiseptics should be used to disinfect only intact skin surrounding the wound [1].

3-Antiseptic active ingredients recognized as safe and effective for use are listed in (table 4-8) [1].

Table 4-8:Nonprescription first aid antiseptic ingredients [1].

Antiseptic Agents	Concentration (%)
Ethyl alcohol	48-95
Isopropyl alcohol	50.0-91.3
Hydrogen peroxide topical solution	USP
Iodine tincture	USP
Iodine topical solution	USP
Phenol	0.5-1.5
Povidone/iodine complex	5-10
Quaternary ammonium compound	0.13

Hydrogen Peroxide

1-Hydrogen peroxide 3% topical solution USP is a widely used antiseptic. Enzymatic release of oxygen occurs when the hydrogen peroxide comes in contact with the skin, causing an effervescent, mechanical cleansing action [1].

2-Hydrogen peroxide should be used where released gas can escape; therefore, it should not be used in abscesses, nor should bandages be applied before the compound dries [1].

3-Because of the limited bactericidal effect and the risk of tissue toxicity, hydrogen peroxide has little benefit over soapy water for antisepsis [1].

Ethyl Alcohol

1-Alcohol has good bactericidal activity in 20%-70% concentrations. Caution must be used, however, when applying it to the intact skin surrounding the injured area, given that inadvertent, direct application of alcohol to the wound bed can cause tissue irritation [1].

2-Ethyl alcohol may be used 1-3 times daily, and the wound may be covered with a sterile bandage only after the washed area has dried [1].

Isopropyl Alcohol

1-Compared with ethyl alcohol, isopropyl alcohol 70% aqueous solution has somewhat stronger bactericidal activity. Isopropyl alcohol is generally used for its cleansing and antiseptic effects on intact skin [1].

2-It should not be used to clean open wound beds because of possible cytotoxic effects and higher reported infection rates.

3-Isopropyl alcohol also has a greater potential for drying the skin [1].

4-Similar to ethyl alcohol, isopropyl alcohol is flammable and must be kept away from a flame [1].

Iodine

1-An iodine solution USP of iodine 2% and sodium iodide 2.5% is used as an antiseptic for superficial skin injuries [1].

2-An iodine tincture USP of iodine 2%, sodium iodide 2.5%, and alcohol (approximately 50%) is **less preferable** than the aqueous solution because the tincture is irritating to the tissue [1].

3-Strong iodine solution (**Lugol's solution**) must not be used as an antiseptic. In general, bandaging should be discouraged after iodine application to avoid tissue irritation [1].

4-Iodine solutions stain skin, may be irritating to tissue, and may cause allergic sensitization in some people [1].

Povidone/Iodine

1-Povidone/iodine is a water soluble complex of iodine with povidone. It contains 9%-12% available iodine, which accounts for its rapid bactericidal activity [1].

2-Povidone/iodine is nonirritating to skin and mucous membranes. However,

when used as a wound irrigant, povidone/iodine is absorbed systemically; the extent of iodine absorption is related to the concentration used and the frequency of application [1].

3-When severe burns and large wounds are treated with povidone/iodine, iodine absorption through the skin and mucous membranes can result in excess systemic iodine concentrations, possibly causing transient thyroid dysfunction, clinical hyperthyroidism, and thyroid hyperplasia [1].

C-Topical first-aid antibiotics

1-Topical OTC antibiotics are indicated for preventing infection in minor cuts, wounds, scrapes, and burns and should be applied after a wound has been cleaned. It covered with a sterile dressing [2].

2-Topical antibiotics include polymyxin B and a combination of bacitracin, neomycin, and polymyxin B sulfate. Some topical antibiotics also contain the anesthetic lidocaine, and some manufacturers market medicated bandages that contain a topical antibiotic for added convenience [2].

D-Topical anesthetics

1-The pain associated with minor burns may be relieved with the use of topical anesthetics and are typically applied no more than 3 or 4 times a day, as needed [2].

2-Pain relief after application of OTC topical anesthetics typically lasts 15 to 45 minutes. The 2 most common topical anesthetics found in OTC products are **benzocaine** (5 % to 20%) and **lidocaine** (2% to 5%) [2].

E-Skin protectants

1-Skin protectants, such as **allantoin** and white **petrolatum**, are recognized by the FDA as safe and effective for the temporary protection of minor burns, but they provide only symptomatic relief [2].

2-Skin protectants shield burns from mechanical irritation caused by friction, prevent drying of the stratum corneum, and minimize the pain associated with minor burns [2].

F-Wound Dressings

Types of Wound Dressings

A-Gauze

Gauze is available in a variety of forms and is generally used to care for minor burns and wounds that are draining or those requiring debridement. It can be impregnated with nonadherent products such as petrolatum as well as with antiseptics and antimicrobials [1].

B-Antimicrobial

Antimicrobial dressings contain products like silver and iodine and are often used in the management of wounds that are colonized or infected [(1)].

C-Adhesive Bandages

Most superficial wounds (minor abrasions and lacerations) may simply require the application of adhesive gauze type bandages [(1)].

D-Surgical Tape

As the name implies, surgical tape is primarily used to hold in place bandages that cover a wound or surgical incision. The most adherent, and potentially irritating, tape is clear surgical tape. Thus, it should be reserved for wounds that do not require frequent dressing changes (e.g., to secure IVs or surgical drains) [(1)].

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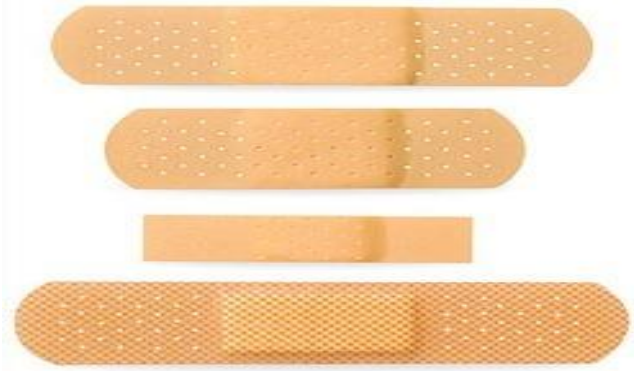
<tr><td>Gauze</td><td>Antimicrobial dressings</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Adhesive Bandages</td><td>Surgical tape</td></tr>
</table>

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10-Scabies

1-Scabies can be defined as a **pruritic skin condition** caused by the mite *Sarcoptes scabiei* [1]. The infestation occurs at all age and it is a common public health problem in poor communities [2].

2-The mite is transmitted by **direct physical contact** (e.g., holding hands, hugging or sexual contact). Mating occurs on the skin surface after which the female mite burrows into the stratum corneum to lay eggs. The faecal pellets she leaves in the burrow cause a local hypersensitivity reaction that trigger an allergic reaction invoking intense itching (This normally takes 15 to 20 days in a primary infestation but can take up to 6 weeks to develop. In subsequent infestations this hypersensitivity reaction develops much more quickly) [1].

3-During the asymptomatic period the mite can be passed onto others unknowingly. The eggs hatch and mature in 14 days after which the cycle can begin again [1].

Patient Assessment with Scabies

A-Symptoms:

1-Severe pruritus, especially at night, is the hallmark symptom of scabies [1] (can lead to loss of sleep) [3].

2-Location of rash: scabies classically affect the **finger's webs, the** sides of the fingers and wrists [1]. In adults, scabies rarely affects scalp and face, **but infants aged 2 years or under and in the elderly**, **involvement of the head is more common** [3].

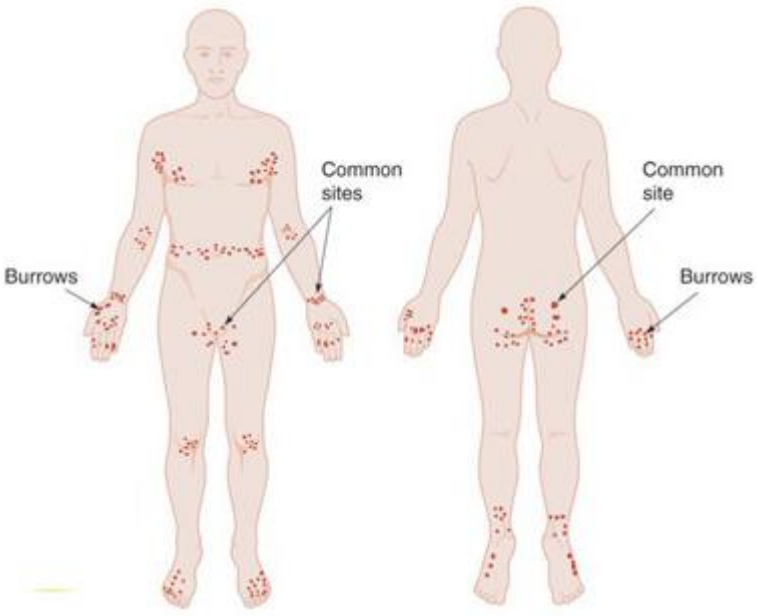


Figure 4-2: common sites for scabies

Besides the classic location of the lesions [1], **external genitalia** of both sexes and women's breasts can be affected [4]. (figure 4-2)

In **dermatitis herpetiformis**, hand involvement is rare [1]. (Dermatitis herpetiformis is a chronic condition characterized by intense itchy clusters of papules and vesicles. It commonly involves the elbows, knees, and sacral region (symmetrical distribution) **but hand involvement is rare** [1]).

3-Burrow can sometimes be seen as **small thread-like grey lines** [3] (blue-grey [1]). The lines are raised, wavy about 0.5-1 cm long [3].
For pharmacists who see a limited numbers cases, **it is probably best to concentrate on other clinical signs rather than the burrows** [1].

B-History:

The itch of scabies can take several (6-8 weeks) to develop in someone who has not been infested previously. The scabies mite is transmitted by close personal contact, so the patient **can be asked whether anyone else they know is affected by the same symptoms** (e.g. other family member) [3].
In addition history is required to exclude **possible allergic contact dermatitis** [1].

C-Signs of infection:

Scratching can lead to skin excoriation , so that secondary bacterial infection such as impetigo can occurs. The presence of a **weeping yellow discharge or yellow crusts** would be indications for referral to the doctor for treatment [3].

D-Age:

It may be best to refer **infants** and young children to the doctors if scabies is suspected (medical supervision is required for the treatment of scabies in children under 2 years) [3].

When to refer [1, 3].
-Babies and children.
-Infected skin.
-Treatment failure.
-Unclear diagnosis.
-Severe and extensive symptoms.
-Suspected dermatitis herpetiformis.

E-Medication:

It is important for the pharmacist to establish whether any treatment has been tried already and, if so, its identity. The patient should be asked about how any treatment has been used, since incorrect use can result in treatment failure [3].

2-The itch of scabies may continue for several days or even weeks after successful treatment, so the fact that itching has not subsided does not necessarily mean that treatment has been unsuccessful [3].
(Treatment failure may have occurred if **itching has not ceased after 3 weeks** or if **new area of itching continue to appear 7-10 days after treatment**. In this situation patient should be referred to the doctor) [4]. (Treatment failure should not be diagnosed before **six weeks** have elapsed) [2].

Management

1-Two treatments are recommended, **7 days apart** [3].

2-UK guidelines state that treatment should be applied to the whole body including the scalp, neck, face and ears [1]. Particular attention should be paid to the

webs of fingers, toes and soles of the feet, and under the ends of the fingernails and toenails [3]. Mittens or socks may be necessary for the hands of thumb or toe sucking infants and children [2].

3-**Application of lotion:** The lotion can be poured into a bowl and then applied on cool, dry skin using a clean, broad paintbrush, cotton wool [3] or a small sponge [4].

A-Permethrin cream (5% cream):

1-Permethrin appears to be the most effective scabicide [6] and is the drug of choice [1].

2-Apply 5% preparation over whole body including face, neck, scalp and ears then wash off after 8–12 hours [5].

3-If the hands are washed with soap and water within 8 h of application, cream should be reapplied to the hands [3].

4-Medical supervision is required for its use in children under 2 years and in elderly patients (aged 70 years and over). Permethrin can itself cause itching and reddening of the skin [3].

5-For single application in adult 30-60 grams (one to two 30 grams tubes) is needed [3]. For children under 12 years of age the manufacturers suggest the following: 1/4 tube for those 2 months to 5 years of age and 1/2 tube for those between 6 and 12 years of age [1].

B-Benzyl benzoate (25% in an emulsion basis):

1-Benzyl benzoate has been used to treat scabies for many years [1]. It has now been superseded by more effective products [4]. It has **lower efficacy**, and causes **skin irritation** and a transient burning sensation in approximately **25% of patients**. This is usually mild but can occasionally be severe in sensitive individuals. In the event of a severe skin reaction the preparation should be washed off using soap and warm water. It is also irritating to the eyes, which should be protected if it is applied to the scalp [1]. In addition, benzyl benzoate has an unpleasant smell [4].

2-Apply over the whole body; repeat without bathing on the following day and wash off 24 hours later; a third application may be required in some cases [5].

C-Crotamiton (Eurax®):

Crotamiton has antipruritic and weak scabicidal activity. It is recommended for **controlling residual itching after treatment with a more effective scabicide**. It required application only **two or three times a day** [4].

D-Malathion Aqueous solutions (0.5%):

Products are licensed for use without prescription from the age of 6 months [5]. The aqueous lotion should be used in scabies [3].

The lotion is applied to the whole body. The lotion should be left on for 24 h, without bathing, after which it is washed off. If the hands are washed with soap and water during the 24 h, malathion should be reapplied to the hands. Skin irritation may sometimes occur [3].

Practical Points

1-Patient should be told **that the itch will continue and may become worse in the first few days after treatment**. Crotamiton cream or lotion can be used to relief the symptoms and oral antihistamines may be considered in severe itching [3]

2-Good practical advice is to apply the treatment **immediately before bedtime** (leaving time for it to dry) [3].

3-Because the hands are likely to be affected by scabies, it is important **not to wash the hands after application of the treatment and to reapply the treatment if hands are washed within the treatment period** [3].

4-The treatment should be applied to cool, dry skin [3].

5-**All the family members should be treated**, preferably on the same day because they may be infested but symptomless [3].

6-The scabies mite can live only for around 1 day after leaving its host and transmission is almost always caused by close personal contact. It is possible that reinfestation could occur from bedclothes or clothing and this can be prevented by washing them at a minimum temperature of 50˚C after treatment [3].

Product recommendations:

1-Permethrin cream–First choice for eradication of infection [4].
2-For the treatment of residual pruritus, a systemic antihistamine , with additional application of calamine lotion or crotamiton cream or lotion , if desired [4].

References:

1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
2-Graham Johnston and Mike Sladden. Scabies: diagnosis and treatment. BMJ 2005;331:619-622 (17 September).
3-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
4-Nathan A. Non-prescription medicines. 4th edition. London: Pharmaceutical Press. 2010.
5-BNF-74.

11-Skin hyperpigmentation

1-Hyperpigmentation, manifested as an area of skin darker than the surrounding skin, is usually a benign phenomenon [1].

2-Hyperpigmentation may be perceived by the patient as a disfigurement, especially when the altered pigmentation occurs on the face and neck [1].

Etiology

Systemic as well as localized skin diseases may cause pigment cells to become overactive (resulting in skin darkening) [1].
1-**Endocrine imbalances** caused by Addison's disease, Cushing's disease, or hyperthyroidism and conditions such as pregnancy are capable of altering skin pigmentation [1].
2-Metabolic alterations affecting the **liver**, as well as certain **nutritional** deficiencies, can be associated with diffuse melanosis [1].
3-**Inflammatory dermatoses** (e.g., contact dermatitis from poison ivy or acne lesions) or physical trauma to the skin (e.g., thermal burn) may cause prolonged postinflammatory hyperpigmentation [1].
4-In addition, certain **drugs** (Table 4-9) have an affinity for melanin and may cause hyperpigmentation [1].
5-The melanocyte is believed to provide protection from UVR. Dark skin usually has more active melanocytes compared with light skin, which explains why UVR induced skin cancers of all types are less common in dark skin than in light skin [1].

Table 4-9: Medications That May Cause Hyperpigmentation [1].
Amiodarone
Anticonvulsants (e.g., phenytoin, phenobarbital, carbamazepine)
Antimalarial agents (e.g., chloroquine, hydroxychloroquine)
Antineoplastic agents (e.g., cyclophosphamide, daunorubicin, doxorubicin, fluorouracil, busulfan)
Clofazimine
Hormone replacement therapy
Minocycline
Oral contraceptives
Phenothiazines (e.g., chlorpromazine, thioridazine, imipramine, clomipramine)
Tricyclic antidepressants (e.g., imipramine, desipramine, amitriptyline)
Zidovudine

Clinical Presentation of Skin Hyperpigmentation

1-Most notably, patients complain of persistent **discoloration** on the **face or other sun exposed areas** [1].

2-Discoloration typically consists of a **more intense brown coloration** than that of surrounding normal skin and may range from dark to faint in appearance [1].

Treatment timescale:

If no improvement is seen **within 2 months**, its use should be discontinued and a doctor should be consulted [(1)].

When to refer [(1)].
-Under 12 years. -Hyperpigmentation of large body surface area. -Disease-induced or drug-induced hyperpigmentation. -Lesions that change in size, shape or colour. -Failed medication.

Treatment

Hydroquinone

1-Hydroquinone in concentrations of 1.5%-2% is currently available OTC for the treatment of skin hyperpigmentation. It is considered to be the **mainstay and gold standard of hyperpigmentation therapy** [(1)].

2-Hydroquinone 2% should be rubbed gently but thoroughly into affected areas **twice daily.** The agent should be applied to clean skin before application of moisturizers or other skin care products. **It should not be applied to damaged skin or near the eyes** [(1)].

3-**Once the desired benefit is achieved**, hydroquinone can be applied as often as needed in a **once or twice daily regimen** to maintain lightening of the skin [(1)].

4-Time to **initial response averages 6-8 weeks**, but it may **take up to 3 months** to see noticeable results [(1)].

5-Because of the lack of safety data, **hydroquinone is not recommended for children younger than 12 years**. Contraindications to the use of hydroquinone include hypersensitivity to the product [(1)].

6-Although not directly contraindicated, **it should be used during pregnancy only if absolutely needed** [(1)].

7-Adverse effects, such as **tingling** or **burning** on application, are mild with low concentrations of topical hydroquinone [(1)].

8-A disadvantage of treatment with hydroquinone is that it tends to overshoot the intended degree of lightening and may produce treated areas that are **lighter than the surrounding normal skin color**. Therefore, the patient must carefully observe the degree of lightening as the treatment progresses and must subsequently decrease applications when sufficient lightening has occurred [(1)].

9-Even visible light may cause some darkening. Therefore, when the patients are **outdoors for even a short time**, **they should apply an opaque sunblock or broad spectrum sunscreen to the affected area after applying the hydroquinone**, unless the product already contains a sunscreen in the formulation [(1)].

References

1-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.

12-Sun exposure and melanoma risk

Background

1-The ultraviolet spectrum is subdivided in to three regions: **UVA** (320 to 400 nm); **UVB** (290 to 320 nm); and **UVC** (200 to 290 nm). Light from the **UVA spectrum causes skin tanning** and **UVB light sunburn**, whereas UVC light is effectively filtered out by the ozone layer [(1)].

2-It is now well recognized that excessive or prolonged exposure to the sun's rays and inadequate skin protection can result **in pre-cancerous and cancerous neoplasms** [(1)].

3-There are many types of skin cancer, but three types are associated with sun exposure : **squamous cell carcinoma** (SCC), **basal cell carcinoma** (BCC) and **malignant melanoma** (MM) - and are responsible for **more than 95°/o of all skin cancers** [(1)].

4-**SCC and BCC result from chronic long-term exposure to sunlight whereas** MM is associated with acute, intense, and intermittent blistering sunburns. BCC and SCC are often grouped together as **non-melanoma skin cancer (NMSC)** [(1)].

Etiology

1-The body's response to the effects of UVA and UVB light is protective. **On exposure to ultraviolet light melanocytes increase production of melanin**, thus causing a darkening of the skin, the **melanin absorbs both UVA and UVB** and effectively protects the skin from damage, unfortunately melanin synthesis is slow and skin damage might well have already occurred manifesting as sunburn [(1)].

2-**Sunburn is an inflammatory response to excessive exposure to ultraviolet light** whereby an increase in inflammatory mediators results in capillary vasodilatation and increased capillary permeability [(1)].

3-In addition to melanin production, **epidermal hyperplasia occurs**, causing the skin to thicken; this provides further protection against the skin [(1)].

Clinical features of malignant melanoma

1-MM is one of the few cancers which is associated with young adults. It can appear on all body sites yet **their distribution between men and women does differ** (Fig. 4-3) [(1)].

2-The first sign of melanoma is often a **change in the size, shape, or colour of a mole**, although melanoma can also appear on the body as a new mole [(1)].

3-Early identification is essential and **two commonly used checklists are used to aid diagnosis**; the **'7 point'** check list and the '**ABCDE**' list [(1)].

A-The 7 point list .

This checklist consists of 3 major and 4 **minor points:**

Major (scores 2)

1-Change in **shape**
2-Change in **size**
3-Change in **color**

Minor (scores 1)

1-Largest diameter **7 mm or more**
2-**Inflammation**
3-**Oozing**
4-Change in **sensation** (e.g. itch or irritation)

Any lesion should be suspected **as MM with a score of 3 or more** [(1)].

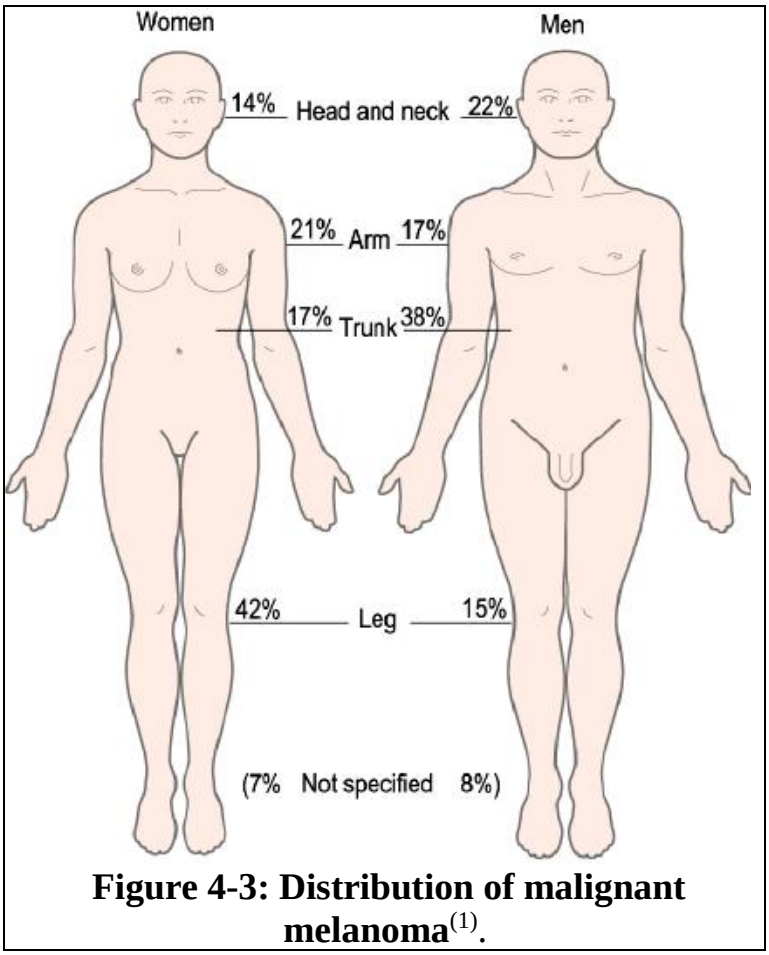


Figure 4-3: Distribution of malignant melanoma[(1)].

B. The ABCDE Rule

In this checklist 5 points are used:

1-Asymmetry - Ordinary moles are usually symmetrical in shape. **Melanomas are likely to be irregular or asymmetrical.**

2-Border - Moles usually have a well-defined regular border. **Melanomas are more likely to have an irregular border** with jagged edges.

3-Colour - Moles are usually a uniform brown. **Melanomas tend to have more than one colour**. They may be varying shades of brown mixed with black, red, pink, white or a bluish tint.

When to refer [(1)]
-Facial lesions, especially in people over 60 -Lesions that have become itchy, irritated or are prone to bleeding -Moles that have changed in size, shape or colour

4-Diameter - Moles are normally no bigger than the blunt end of a pencil (about 6mm across). **Melanomas are usually more than 7mm in diameter.**

5-Evolution - the symmetry, border, colour, or diameter of a mole has **changed over time.**

It is likely that patients will ask for advice and reassurance on skin lesions which they are concerned could be melanoma. It is essential that these people are given

information, **regarding the changes that might subsequently suggest MM** and instructed to seek medical help as soon as they notice changes [(1)].

Non-Melanoma Skin Cancer (NMSC).

1-NMSC are associated with older people, with the average age of diagnosis in the early 70s. The cancers are rarely fatal but can cause substantial morbidity [(1)].

2-Both cancers commonly occur on skin surfaces that are exposed to a lifetime accumulation of UV radiation **such as the hands, face and scalp**. They are more common in people who have worked outdoors, and in fair skinned people [(1)].

3-BCC and SCC vary in their appearance. SCC initially present as raised lesions that exhibit a horny or scaly appearance that later become non-healing lesions often larger than 1 cm which can ulcerate; **BCC** starts as small translucent papule with obvious **telangiectasia over the surface**. Over time (growth can be very slow) the size of the papule increases and can ulcerate and crust over [(1)].

Avoidance measures

1-The most effective strategy for preventing skin damage/ sunburn and reducing the chance of developing cancers **is avoidance of UV light** [(1)].

2- The acronym SMART highlights the key sun avoidance measures that should be promoted to the public:

S-Spend time in the shade between 11 am and 3 pm [(1)](the rays of the sun are the most direct and damaging during this time, therefore the customer should avoid sun exposure during this time of day as much as possible) [(2)].
M-Make sure you never bum [(1)].
A-Aim to cover up with a T-shirt, hat and sunglasses [(1)]. Wear protective clothing such as long pants, a long sleeved shirt, and a hat with brim [(2)].
R-Remember to take extra care with children [(1)].
T-Then use factor 15+ sunscreen [(1)].

Sunburn can occur on a cloudy or overcast day; 70%-90% of UVR penetrates clouds [(2)].

Sunscreens

1-While sunscreens play an important role in sunburn protection, they should **never replace minimizing sun exposure** [(1)].

2-Sunscreens use the sun protection factor (SPF) system to indicate the level of protection against UV radiation. **It is a measure of the protection from UVB radiation** [(1)].

3-It is important that patients and consumers **do not assume a linear increase in protection as the SPF increases**. For example, a sunscreen with an SPF of 15

blocks 93% of UVB, whereas a doubling to SPF 30 only increases protection by 4 to 97% [1].

Practical prescribing and product selection

1-All products should be applied **20 minutes before exposure to the sun**, and reapplied every 2 to 4 hours and after swimming to ensure maximum protection [1] .

2-Standard practice until recently was to match skin type with the level of SPF protection the person required. However, this approach whilst preventing sunburn does not prevent long-term skin damage. Rather than selecting a specific sunscreen for skin type it is advocated that all **white skinned people should use a sunscreen with an SPF of at least 15** because this level of protection is effectively a sun block [1].

3-Wet clothing and **water allow significant transmission of UV radiation**. Consider time in the water, even if the body is completely submerged, as part of the total time spent in the sun [2].

4-**Snow** and **sand reflect** UV **radiation,** therefore; proper precautions should be made such as wearing sunglasses and using sunscreens to protect exposed skin [2].

5-Two major causes of poor sun protection with sunscreen are the application of an adequate amounts and infrequent application [2].

A-Sunscreen must be applied to all exposed areas of the body including the nose ad lips but avoid contact with eye [2].

B-Sunscreen should be reapplied as often as the product instruction leaflet directs [usually every 40 minutes or 80 minutes (as directed on the label) for water resistant sunscreens while swimming or sweating or after towel drying. Apply every 2 hours for non-water resistant products or for water resistant products if you are not swimming or sweating] [2].

6-Useful tips relating to patients asking for advice about protection from the sun are given in (table 4-10) [1].

Chemical sunscreens

1-Chemical sunscreens work by **absorbing UV energy** and give protection against either UVA or UVB, although they tend to be more effective against UVB radiation [1].

The majority of marketed products contain a combination of agents including benzophenones, cinnamates, dibenzoyl-methanes and para-aminobenzoic acid. The latter is now infrequently used, as **para-aminobenzoic acid was frequently associated with contact sensitivity [1].**

Physical sunscreens

Physical sunscreens are **opaque reflective agents** and offer protection against UVA and UVB radiation. Examples of physical sunscreens include **zinc and titanium oxide** [(1)]**.**

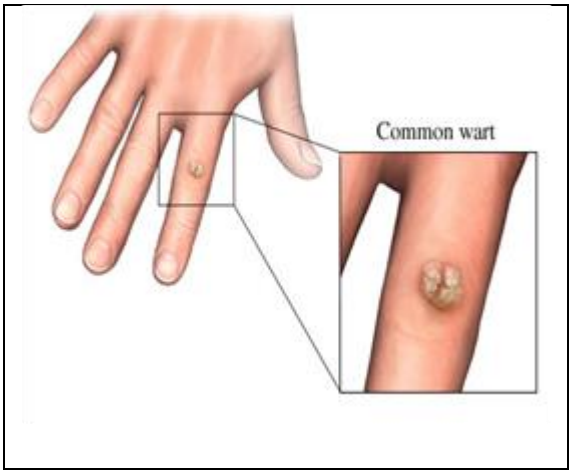
Table 4-10: Hints and tips about sunscreen and sun induced skin damage [(1)].	
Water-resistant sunscreens	These are claimed to be effective after immersion in water. However, studies have shown that sunscreen effectiveness decreases after water exposure. It would be prudent therefore, to re-apply sunscreens after swimming.
Eye protection	Prolonged (over years) sun exposure can contribute to age-related macular degeneration. Therefore, wraparound sunglasses and lenses that effectively filter UV light should be worn.
Treatment of sunburn?	Mild sunburn can be managed with a combination of topical cooling preparations, such as calamine, moisturizers and systemic analgesics.
Medicine-induced photosensitivity	NSAIDs, tetracyclines, chlorpromazine, phenothiazines and amiodarone can cause pruritus and skin rash when the skin is exposed to natural sunlight, primarily due to UVA radiation. Patients on photosensitive drugs should use a broad-spectrum sunscreen, as these filter both UVA and UVB radiation.
Sun protection and vitamin D deficiency	The UK Department of Health issued guidance to healthcare professionals on the danger of vitamin D deficiency. This, in part, has been caused by the use of sunscreens. Guidance is not to stop using sunscreen, but certain patient groups should take Supplements.

References:

1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
3-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.

13-Warts (common warts) and verrucas (plantar warts)

Warts and verrucas are benign growth of the skin caused **by human pappilloma virus (HPV)**. Although self-limiting, they are **cosmetically unacceptable** to many patients [(1)].

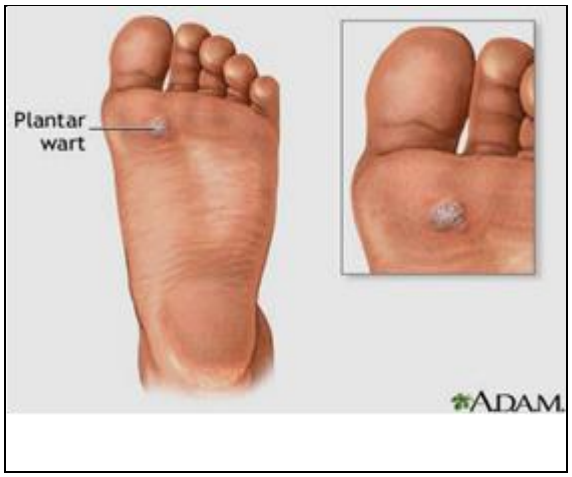


HPV infection is **very contagious**; infection is easily spread from one site to another on an infected person, and from one person to another [(2)].
Untreated, half of warts and verrucas clear in 1 year and two-thirds in 2 years, but they are usually treated to get rid of them faster [(2)].

Significance of questions and answers

A-Age

Warts occur more frequently in children and adolescents than in infants and adults, with the peak incidence among 12 to 16 year olds [(3)].



Patients aged **over 50 years** presenting with a first-time wart required referral [(1)].
Patients aged **below 4 years** presenting with wart required referral [(3)].

B-Appearance

Warts appear as raised lesions with a roughened surface. Plantar warts occur on the **weight-bearing areas of the sole and heel (verrucae)** , the pressure from the body's weight pushes the lesion inwards, eventually producing **pain** when weight is applied during walking. Warts have a network of capillaries and, if pared, thrombosed, blackened capillaries or bleeding points will be seen. The presence of these capillaries provides a useful **distinguishing feature** between **callouses and verrucae** on the feet: if a corn or callous is pared, no such dark points will be seen; instead layers of white keratin will be present [(4)].
Warts that itch or **bleed without provocation** required referral [(1)].
Note : **Warts are normally painless** while **Verrucas are painful** because of downward pressure on nerve endings in the skin [(2)].

C-Location:

The palms or backs of the hands are common sites for warts, as is the area around the fingernails. Plantar warts (verrucae) are found on the sole of the foot and may be present singly or as several lesions [(4)].

1-Warts sometimes occur on the **face** required referral to the doctor (since treatment with OTC products can lead to scarring) [4].

2-**Anogenital** warts are caused by a different type of human papilloma virus and required medical referral for examination, diagnosis and treatment [4].

D-Multiple warts: Patients with **multiple warts** and widespread warts required referral [1].

E-Duration and history: It is known that most warts will disappear spontaneously within a period of 6 months to 2 years. The younger the patient, the more quickly the lesions are likely to remit [4]. Any **change in the appearance of a wart** [4] (wart that have **grown and changed color**) [1] required referral [1, 3].

When to refer
-Changed appearance of lesions: size and colour [4]. -Genital warts [4]. -Facial warts [4]. -Immunocompromised patients [4]. -Diabetic patients [1]. -Multiple and widespread warts [1]. -Patients over 50 years of age presenting with a first-time wart [1]. -Warts that itch or bleed without provocation [1]. - Patients under 4 years [3].

F-Medication:

1-**Diabetic patients** required referral (since impaired circulation can lead to delayed healing, ulceration or even gangrene) [4].

2-Warts can be a major problem if the **immune system is suppressed** by either disease (e.g. lymphoma) or drugs (e.g. ciclosporin (cyclosporin), referral is required [4].

Treatment timescale

Treatment with OTC preparations should produce a successful outcome **within 3 months**; if not, referral is necessary [4].

Note: it is important to explain to the patient (that treatment need weeks or months of continuous application) if compliance with treatment is to be achieved [4].

Management

A-Salicylic acid

1-Salicylic acid may be considered to be the **treatment of choice for warts;** it acts by softening and destroying the skin, thus mechanically removing infected tissue [4].

2-Preparations are available in a variety of strengths, sometimes in **collodion-type bases** that help to retain the salicylic acid in contact with the wart [4].

3-**Lactic acid** is included in some preparations with the aim of enhancing availability and effects of the salicylic acid [2, 4].
However, there is **no evidence** to support greater efficacy when lactic acid (or other ingredients) is added [1].
4-Ointments, gels and plasters containing salicylic acid provide a selection of methods of application [4].

Practical points: Application of treatments (table 4-11)

1-Treatments containing salicylic acid should be applied **daily** [4].
2-The treatment is helped by **prior soaking of the affected hand or foot in warm water for 5–10 min** to soften and hydrate the skin [4].
3-Removal of dead skin from the surface of the wart by gentle rubbing with a pumice stone or emery board ensures that the next application reaches the surface of the lesion [4].
4-Patients especially the **children** should be **warned not to pick, bite or scratch warts.** This process is responsible for multiple lesions becoming established and transferred to other part of the body [1].
5-**Protection of the surrounding** healthy **skin** is important and can be achieved by applying a layer of petroleum jelly [4].
6-Application of the liquid or gel using **an orange stick** will help to confine the substance to the lesion itself [4].
7-Application of salicylic acid is **Ok during pregnancy** [1].

Table 4-11: Guidelines for Treating Warts with Salicylic Acid 17% Liquid in Collodion Vehicle [3].
• Wash the affected area. • May soak the affected area for 5 minutes in warm water. • Dry the affected area thoroughly. • Apply one drop at a time to cover the wart. Protect adjacent healthy skin from coming into contact with the drug. • Let solution dry completely. • Cover wart with self-adhesive cover-up discs or an occlusive tape. • Repeat procedure 1-2 times a day until the wart is removed. This product may be used for up to 12 weeks.

B-Other treatment options

Other treatment options for wart are formaldehyde, glutaraldehyde, cryotherapy and silver nitrate [1].

References

1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
2-Nathan A. fasttrack. Managing Symptoms in the Pharmacy. Pharmaceutical Press. 2008.
3-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
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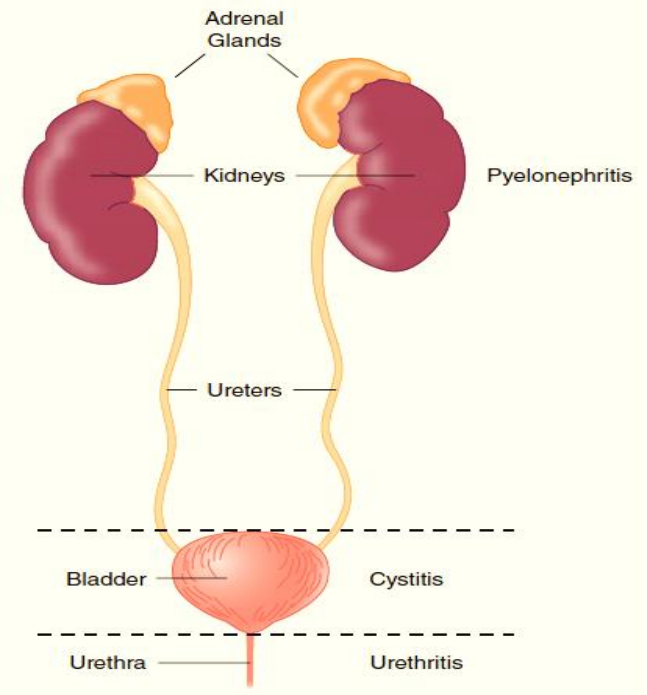
Chapter five: Women's Health

1-Cystitis

Background:

1-Cystitis means inflammation of the bladder [1]. Cystitis is common in women **but rare in men** [2] because of the **longer urethra**, which provides a greater barrier to bacteria entering the bladder; **fluid from the prostate** gland also confers some **antibacterial** property. This is especially so in men under the age of 50. After 50 years of age urinary tract infections in men become more common due to prostate enlargement [1].



2-OTC products are available for the treatment of cystitis, but when the symptoms are **mild** or for use until the patient can consult the Dr. [2].

Etiology

1-The majority of patients who present in the community pharmacy will have acute uncomplicated cystitis (Table 5-1) [1]. Bacterial infection is responsible for about 50% of all cases, and ***Escherichia coli*** is the most common causative organism [3].

2-The source is often the gastrointestinal (GI) tract [2] [(The **female urethra is very short** (about 3 cm) and infecting organisms are readily transferred from the perineum and anus to the bladder where they proliferate] [4].

3- *E. coli* infection results in **increased acidity of the urine**, which causes the inflammation that produces the symptoms of cystitis [3]. About half of cases will resolve within 3 days even without treatment [2].

Table 5-1: Causes of cystitis symptoms and their relative incidence in community pharmacy [1]

Incidence	Cause
Most likely	Acute uncomplicated cystitis
Likely	Pyelonephritis
Unlikely	Sexually transmitted disease, oestrogen deficiency
Very unlikely	Medicine-induced cystitis, vaginitis

Patient assessment with cystitis:

A-Gender:

Any **man** who present with symptoms of cystitis should be referred because of possibility of more serious problems such as **renal stone** or **prostate problems** [2].

B-Age:

1-Any **child** under 16 years old should always be referred (**cystitis is unusual in children** and it may be a sign of **structural urinary tract abnormality**) [1].

2-Elderly female patients **(>70 years**) have a **higher rate of complications** associated with cystitis **are, therefore, best referred** [1].

C-Symptoms:

1-In cystitis the desire to pass urine become frequent (**urinary frequency**), and women may feel the need to pass urine urgently (**urinary urgency**) but pass only a few **burning**, painful drops. This frequency of urine occurs throughout the day and night [2].

2-Dysuria (pain on urination) is a classical symptom of cystitis. After urination the bladder may not feel completely empty, but even straining produce no further flow. Cystitis may be accompanied by suprapubic (lower abdominal) pain and tenderness [2].

3-Associated symptoms that required referral:
Hematuria (the presence of the blood in urine) [2].
Vaginal discharge (may indicate local fungal or bacterial infection) [2].
Nausea, vomiting, fever, loin pain and tenderness (may indicate **upper UTI** (kidney and ureters) [2].

D-Pregnancy:

Any **pregnant** present with symptoms of cystitis should be **referred** because bacteruria (the presence of bacteria in urine) can lead to **kidney infection** and other problem [2].

When to refer
-All men [2].
-Recurrent cystitis [2].
-Failed medication [2].
-Loin pain or tenderness [2].
-Children under 16 years of age [1].
-Patients with diabetes [1].
-Duration longer than 7 days [1].
-Haematuria [1].
-Vaginal discharge [1].
-Immunocompromised [1].
-Patients with associated fever and flank pain [1].
-Pregnancy [1].
-Women older than 70 years of age

E-Previous history:

Women with history of **recurrent cystitis** should be referred [2].

F-Duration:

Symptoms that have lasted longer **than 5 to 7 days** should be referred because of the risk that the person might have developed pyelonephritis [1].

G-Diabetes:

Recurrent cystitis can sometimes occur in diabetic patients and required referral [2].

H-Honeymoon cystitis:

Sexual intercourse may precipitate cystitis attack (honeymoon cystitis) due to minor trauma or resulting infection when bacteria are pushed along the urethra [2].

I-Medications:

1-Failed medication required referral [2].

2-Cystitis can be caused by **cytotoxics** drugs such as **cyclophosphamide** [2].

Treatment timescale:

If symptoms have not improved within **2 days** of beginning treatment, the patient should see the Dr. [2].

Management:

A-Non-pharmacological advice:

Patients should be advised to drink about 5 L of fluid during every 24-h period. This will help promote bladder voiding, which is thought to help 'flush' bacteria out of the bladder [1].

B-Pharmacological treatment:

1-The acidic urine produce by bacteria is thought to be responsible about dysuria [2]. OTC treatment is limited to products that contain **alkalinizing agents** such as Sod. Citrate, Sod. Bicarbonate and Potassium citrate [1]. e.g. of preparation available in Iraq is Citrogran® effervescent granules.

2-**Product taste:** The taste of potassium citrate mixture is unpleasant. Patients should be advised to dilute the mixture with water to make the taste more palatable [1].

Contraindications:

Potassium citrate: not recommended for anyone in home hyperkalemia may result (Patient taking ACE inhibitors, K^+-sparing diuretics, Aldosterone antagonist, Angiotensin II receptor antagonists…) [2]. It is also not recommended for hypertensive patient, anyone with heart diseases or pregnant women [2].

2-For pain relief, offer paracetamol or ibuprofen for up to 2 days [2].

References:

1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
2-Nathan A. Non-prescription medicines. 4th edition. London: Pharmaceutical Press. 2010..
3-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014..
4-Nathan A. fasttrack. Managing Symptoms in the Pharmacy. Pharmaceutical Press. 2008.

2-Dysmenorrhea (period pain)

Background:

1-The menstrual cycle usually lasts 28 days but this varies and it can last between 21-45 days. Menstruation itself lasts between 3 and 7 days [1].

2-Dysmenorrhea is usually categorized as **primary** or **secondary**; primary dysmenorrhea (PD) is defined as **menstrual pain without organic pathology** whereas in secondary dysmenorrhea an **identifiable pathologic condition** can be identified [1] like endometriosis [Endometriosis simply means presence of endometrial tissue outside of the uterus [1]. Each section of endometrium is sensitive to hormonal changes occurring during menstrual cycle and goes through the monthly changes of thickening, shedding and bleeding. This cause pain wherever the endometrial tissue is found] [2]

Patient assessment with dysmenorrhea:

A-Age:

1-The peak incidence of PD occurs in women between the ages of 17 and 25 years [2].

2-Secondary dysmenorrhea (SD) is most common in women aged over 30 years and is rare in women aged less than 25 years [2].

Therefore, **women over 30 years** should be referred [3].

B-Previous history

Dysmenorrhea is often **not associated** with the start of menstruation (menarche). This is because during the early months (and sometimes years) of menstruation, ovulation does not occur. These anovulatory cycles are usually, but not always, pain free and, therefore, women sometimes describe period pain that begins after several months or years of pain-free menstruation [2].

C-Severity of pain:

Pain is rarely severe in PD; the severity decrease with the onset of menses .Any patient presenting with **severe lower abdominal pain should be referred** [1].

D-Timing and nature of pains (table 5-2)

Table 5-2: Primary versus secondary dysmenorrhea

Primary dysmenorrhea (PD)	Secondary dysmenorrhea (SD)
Classically presents as a cramping lower abdominal pain [2]. **Starts very shortly before or within 24 hours of the onset of menses** and rarely lasts for more than 3 days [1].	Pain typically starts **a few days (up to 1 week)** before the onset of menses [1, 2].
The pain **gradually eases after the start of menstruation** and is often **gone by the end of the first day of bleeding** [2].	The pain can be relieved **or worsened by menstruation** [2].

Therefore, any woman with symptoms suggest SD [2] (**pain experienced not shortly before menses**, **pain that increase at the onset of symptoms**) should be referred [1].

E-Other symptoms:

1-Women who experience dysmenorrhea will often describe other associated symptoms. These include **nausea**, **vomiting**, general GI discomfort, constipation, headache, backache, fatigue, feeling faint and dizziness [2].

2-Any woman with the following symptoms should be referred:

Heavy unexplained bleeding [1].
Presence of abnormal **vaginal discharge** [2].
Presence signs of **systemic infection** (**such as fever**, **malaise**) [1].

3-Premenstrual syndrome
(see page 143**)**

When to refer
-Heavy or unexplained bleeding [1].
-Pain experienced days before menses [1].
-Pain that increases at the onset of menses [1].
-Women over the age of 30 with new or worsening symptoms [1].
-Accompanying systemic symptoms, such as fever and malaise [1].
-Vaginal bleeding in postmenopausal women [1].
-Presence of abnormal vaginal discharge [2].

F-Medication:

Women taking **oral contraceptive** usually find that symptoms of dysmenorrhea are reduced or eliminated altogether, therefore, any woman with symptoms of dysmenorrhea **and who is taking the pill is** probably best referred to the Dr. for further investigations [2].

Treatment timescale:

If the pain of PD is not improved after **two cycles' treatment**, referral to the Dr. advisable [2].

Management:

A-Nonpharmacological advices:

1-Symptomatic treatment with a warm bath or locally applied heat (such as hot water bottle) may provide relief [3].
2-Exercise decreases the severity of menstrual cramps through generation of endorphins, ‘the body’s own painkillers’ [3].

B-Pharmacological therapy:

1-Analgesics: treatment with simple analgesics is often very effect in dysmenorrhea [2].

A-NSAIDs (Ibuprofen, and naproxen)

NSAIDs can be considered the treatment of choice for dysmenorrhea, provided they are appropriate for the patient [2]. In addition to their analgesic

properties, NSAIDs also inhibit prostaglandin production, **decreasing uterine contractions** [4]. (table 5-3).

Table 5-3: doses of Ibuprofen and Naproxen for dysmenorrhea	
Drugs	**Dose**
Ibuprofen	200-400mg three times daily [2].
Naproxen 250mg tablets	Two tablets are taken initially then one tablet 6–8 hours later if needed. Max. daily dose is 750mg and maximum treatment time is 3 days [2].

B-Aspirin and Paracetamol:

1-Aspirin :Aspirin is less effective than ibuprofen in relieving the symptoms of dysmenorrhea and is more irritant to the stomach than NSAIDs (best avoided in women who experienced nausea and vomiting with dysmenorrhea) [2].
Dose: for dysmenorrhea, the dose is 650- 1000mg every 4-6 hours (max. 4 gm/day) [5].

2-Paracetamol: It is theoretically less effective for the treatment of dysmenorrhea than NSAIDs (because it does not inhibit PG synthesis), however, it may buy used by patients who cannot take NSAIDs because of stomach problems or because of sensitivity [2].

C-Hyoscine butyl bromide (Buscopan® 10 mg tablet) :

The recommended dose for adult is **two tablets four times** a **day** [1].

Side effects: Anticholinergic side effects such as dry mouth, visual disturbances and constipation can be experienced but are generally mild and self-limiting [1].
It is contraindicated in patients with narrow- angle glaucoma [1].
Interactions: Side effects are potentiated if it is given with tricyclic antidepressants, and antihistamines [1].

D-Caffeine

Some OTC products contain caffeine .There is some evidence that caffeine may enhance analgesic effect [2].

Practical points

1-Take the first dose as soon as your pain begins or as soon as the bleeding starts, whichever comes first [2].

3-Take the tablets **regularly**, for 2–3 days of menstrual each period, rather than ‘now and then’ when pain builds up [2].

4-A patient with dysmenorrhea may respond better to **one NSAID than to another**. If the maximum nonprescription dosage of one agent does not provide adequate benefit, then **switching to another** agent is recommended [5].

References:

1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
2-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
3-Nathan A. fasttrack. Managing Symptoms in the Pharmacy. Pharmaceutical Press. 2008.
4-Marie A. Chisholm-Burns .Pharmacotherapy Principles & Practice. 4th edition. 2016.
5-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.

3-Emergency hormonal contraception

Dealing with requests for emergency hormonal contraception (EHC) requires sensitive interpersonal skills from the pharmacist. **Enabling privacy for the consultation is essential** [1].

Assessment

A-Age:

EHC can be supplied OTC for women **aged 16 years and over in UK (17 years and older in USA).** For women under 16 years the pharmacist can refer to the doctor [1, 2].

B-Why EHC is needed:

The most common reasons for EHC to be requested **are failure of a barrier contraceptive method** (e.g. condom that splits), **missed contraceptive** pill(s) and **unprotected sexual intercourse** (UPSI) [1]. (table 5-4)

Table 5-4: Recommendations for use of EHC.

Combined pills	If two or more active ethinyloestradiol pills have been missed in the first week of pill taking (i.e. days 1–7) and UPSI occurred in week 1 or the pill-free week [1]. **Note**: If two or more pills are missed from the last seven in a pack, EHC is not necessary providing that the next pack is started immediately, i.e. without the normal pill-free break [3].
Progestogen-only pills (POPs)	If one or more POPs have been missed or taken >3 h late (>12 h late for desogestrel) and UPSI has occurred in the 2 days following this [1].
Progestogen-only injectable	If the contraceptive injection is late (>14 weeks from the previous injection for medroxyprogesterone acetate or >10 weeks for norethisterone enantate) and UPSI has occurred [1].
Barrier methods	If there has been failure of a barrier method [1].

C-When unprotected sex/contraceptive failure occurred:

1-**levonorgestrel** needs to be started within **72 h** of unprotected intercourse. The sooner it is started, the higher is its efficacy [1].

2-**Ulipristal**: taken as soon as possible but no later than **120 hours** (5 days) after unprotected sex or contraceptive failure [4].

D-Could the woman already be pregnant?

If pregnancy is suspected [if the period is different from normal (lighter, shorter) or more **than 3 days later than usual**], the pharmacist can suggest that the woman has a **pregnancy test**. EHC will not work if the woman is pregnant. There is no evidence that EHC is harmful to the pregnancy [1].

E-Other medicines being taken:

1-Women taking the following medicines should be referred to an alternative source of supply of EHC: [Anticonvulsants (carbamazepine, phenytoin, primidone, Phenobarbital, phenobarbitone), Rifampicin and rifabutin, Griseofulvin, Ritonavir] [(1)].

2-There is an interaction between *ciclosporin* and *levonorgestrel*. Here, the progestogen inhibits the metabolism of *ciclosporin* and increases levels of the latter. A woman requesting EHC who is taking *ciclosporin* should be referred [(1)].

Treatment timescale

EHC must be started within 72 h of unprotected intercourse in case of **levonorgestrel** [(1)] and within 120 h of unprotected intercourse in case of **ulipristal** [(4)].

Treatment

Levonorgestrel (1.5 mg tablet) and **Ulipristal** (30 mg tablet) are taken as a dose of one **tablet as soon as possible after unprotected intercourse** [(1)].

Mode of action:

Levonorgestrel is thought to act in one of several ways, depending on the point in the menstrual cycle at which it is used:

1-Before ovulation it may prevent ovulation by delaying or inhibiting the release of the ovum from the ovary.
2-After ovulation it may **prevent fertilization** by affecting the motility of the fallopian tube and preventing sperm from meeting the ovum.
3-fter fertilization it induces changes in the endometrium that render it unreceptive to the ovum and **prevent implantation**.
All mechanisms are considered to be **contraceptive rather than abortifacient**, as clinically conception and the start of the pregnancy are not considered to have occurred until a fertilized ovum is implanted in the endometrium [(3)].

Ulipristal works by inhibiting or delaying ovulation via suppression of the luteinizing hormone surge [(4)].

Side-effects

1-**Levonorgestrel** : The most likely side-effect is **nausea**, which occurred in about 14% of women taking levonorgestrel EHC. Far fewer women (1%) actually **vomited** [(1)].
2-**Ulipristal**: Common side effects that affect up to 10% of women are mood disorders, headache, dizziness, nausea, pain (abdominal, back or period), breast tenderness and fatigue [(4)].
3-For both drugs, if vomiting occurs within 3 hours of taking the tablet another tablet should be taken [(4)].

Women who should not take EHC

The product should not be taken by a woman who is **pregnant** (because it will not work), has **severe hepatic dysfunction** or has **severe malabsorption** (e.g. **Crohn's disease**) [(1)].

References:

1-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
2-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
3-Nathan A. fasttrack. Managing Symptoms in the Pharmacy. Pharmaceutical Press. 2008
4-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.

4-Menorrhagia (Heavy menstrual bleeding)

Heavy menstrual bleeding (HMB) may be defines as **'excessive menstrual blood loss** which interferes with a woman's physical, social, or emotional **quality of life'** [1].

Patient assessment with HMB:

A-Clinical features of HMB

The key symptom will be blood loss that is perceived to be **greater than normal** [1].

B-Timing of bleeding

Symptoms that might suggest structural or pathological abnormality include bleeding at **times other than at menses** [1].
Irregular bleeding between periods especially if associated with postcoital bleeding is extremely significant and suggests pre-cancerous/cancer of the cervix [1].

(**Endometrial and cervical carcinoma are usually occurs in postmenopausal women)** [1].

C-Medications

1-Occasionally, medicines can change menstrual bleeding patterns (Table 5-5). If an adverse drug reaction is suspected then the pharmacist should contact the prescriber and discuss other treatment options [1].

Table 5-5:Medication that can alter menstrual bleeding [1].
Anticoagulants
Cimetidine
Monoamine oxidase inhibitors
Phenothiazines
Steroids
Thyroid hormones

2-The incidence of menstrual pain is higher in patients who have had an intrauterine device fitted [1].

Management and Treatment timescale

1-If menorrhagia/HMB coexists with dysmenorrhoea, the use of NSAIDs should be preferred to tranexamic acid [1].

2-If there is no improvement in symptoms **within 3 menstrual cycles**, then use of NSAIDs and/or tranexamic acid should be stopped [1].

When to refer
-Presence of abnormal vaginal discharge [2].
-Intermenstrual and/or postcoital bleeding [2].
-Pelvic pain [2].
-Pain on intercourse (dyspareunia) [2].
-Dysmenorrhea [2].
-Presence of fever [2].
-Treatment failure [1].

Note: prostaglandins in the endometrium of women who suffer from menorrhagia is higher than in normal women. The exact mechanism by which the excessive blood loss occurs remains speculative. **NSAIDs in adequate dosages decrease ovulatory bleeding** by approximately 30-40% [3].

1-**Tranexamic acid** (cyklokapron® 500 mg tablet) is effective medicine in decreasing menstrual blood loss. It reduces blood loss by up to 50% [(1)].

2-Tranexamic acid is an **antifibrinolytic** and stops the conversion of plasminogen to plasmin - an enzyme that digests fibrin and thus brings about clot dissolution [(1)].

3-Tranexamic acid should be taken **once bleeding starts.** The dose is two tablets 3 times a day for a maximum of 4 days. The dose can be increased to two tablets 4 times a day in very heavy menstrual bleeding. The maximum dose is eight tablets (4 g) daily [(1)].

4-Side effects are unusual. Those reported include mild nausea, vomiting and diarrhoea (affecting between 1% and 10% of patients) [(1)].

5-Tranexamic acid should not be taken in patients on anticoagulants, taking the combined oral contraceptive, unopposed oestrogen or tamoxifen [(1)].

References:

1-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
2-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.
3-Anna Livshits and Daniel S. Seidman. Role of Non-Steroidal Anti-Inflammatory Drugs in Gynecology. Pharmaceuticals. 2010; 3: 2082-2089.

5-Pregnancy Detection Tests

1-Early detection of pregnancy is desirable for many reasons, including allowing the woman to make decisions regarding prenatal care and lifestyle changes to avoid potential harm to the fetus [(1)].

2-As early as day 7 after conception, the placenta produces hCG, some of which is excreted in the urine. The concentration of hCG continues to increase during early pregnancy, reaching maximum levels 6 weeks after conception. The levels of hCG decline over the following 4-6 weeks and then stabilize for the remainder of the pregnancy [(1)].

3-Home pregnancy tests detect hCG in the urine. hCG, is detectable in the urine within 1-2 weeks after fertilization. Product labeling for most tests states that women may use the test as early as the first day of a missed menstrual period (some tests can be used 3 days before the missed period). The earlier a pregnancy test is used, the greater the likelihood of a false negative result [(1)].

Interferences

1-A false positive result may occur if the woman has had a miscarriage or given birth within the previous 8 weeks because hCG may still be present in the body [(1)].

2-Medications such as Pergonal (menotropins for injection) and Profasi (chorionic gonadotropin for injection) can produce false positive results [(1)].

3-Unreliable results may occur in patients with ovarian cysts or an ectopic pregnancy. Oral contraceptive use does not affect test results [(1)].

4-Because hCG levels are very low in early pregnancy and may be below the sensitivity of a particular test, false negative results may occur with home pregnancy tests if they are performed on or before the first day of a missed period [(1)].

5-Erroneous results may also result from not allowing refrigerated urine to warm to room temperature before testing, using waxed cups to collect urine, or collecting urine in household containers that contain soap residue [(1)].

Avoidance of Incorrect Results

1-The most accurate results will be obtained by waiting at least 1 week after the date of the expected period [(1)].

2-Performing the test too early may produce false negative results [(1)].

3-Be sure to use the urine collection device provided in the kit. Wax particles in waxed cups can clog the test matrix, causing false results. Soap residue in household containers can also interfere with test results [(1)].

4-Try to test the urine sample immediately after collection. If the sample must be tested later, store it in the refrigerator but allow the sample to warm to room temperature for 20-30 minutes before testing [(1)].

5-Chilled urine may produce false negative results. Be careful not to redisperse or shake up any sediment present in the sample [(1)].

Usage Guidelines

1-Unless package instructions specify otherwise, use the first morning urine because the levels of hCG, if present, will be concentrated at that time [(1)].
2-If testing occurs at other times of the day, restrict fluid intake for 4-6 hours before urine collection [(1)].
3-Check the expiration date of the packaging. Remove test stick or cassette from packaging just before use [(1)].
4-For test sticks, remove cap, if present, from absorbent tip [(1)].
5-Apply urine to testing device using whichever of the following methods is specified in package instructions:
-Hold test stick in the urine stream for designated time (figure 5-1: A)
-Urinate into testing well of test cassette (figure 5-1: B), or
-Collect urine in a collection cup and dip the strip in the urine (figure 5-1: C) [(1)].
6-After the urine is applied, lay the testing device on a flat surface. Wait the recommended time (1-5 minutes) before reading the results [(1)].
7-Waiting the maximum allowed time may improve the sensitivity of the test [(1)].
8-After reading the results, discard the testing device. If the test result is negative, test again in 1 week if menstruation has not started [(1)].

Evaluation of Patient Outcomes with Pregnancy Tests

1-If the pregnancy test result is positive, the woman should assume she is pregnant and contact her health care provider as soon as possible. In addition, if the patient is taking a medication with teratogenic potential (e.g., Accutane or methotrexate) or any medications for chronic conditions, she should be advised to discuss with her health care provider any possible effects the drugs may have on a fetus [(1)].

2-If the test result is negative, the woman should review the procedure and make sure she performed the test correctly. She should test again in 1 week if menstrual flow has not begun. If the results of the second test are negative and menses still has not begun, the woman should seek the advice of a health care provider [(1)].

Reference:

1-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.

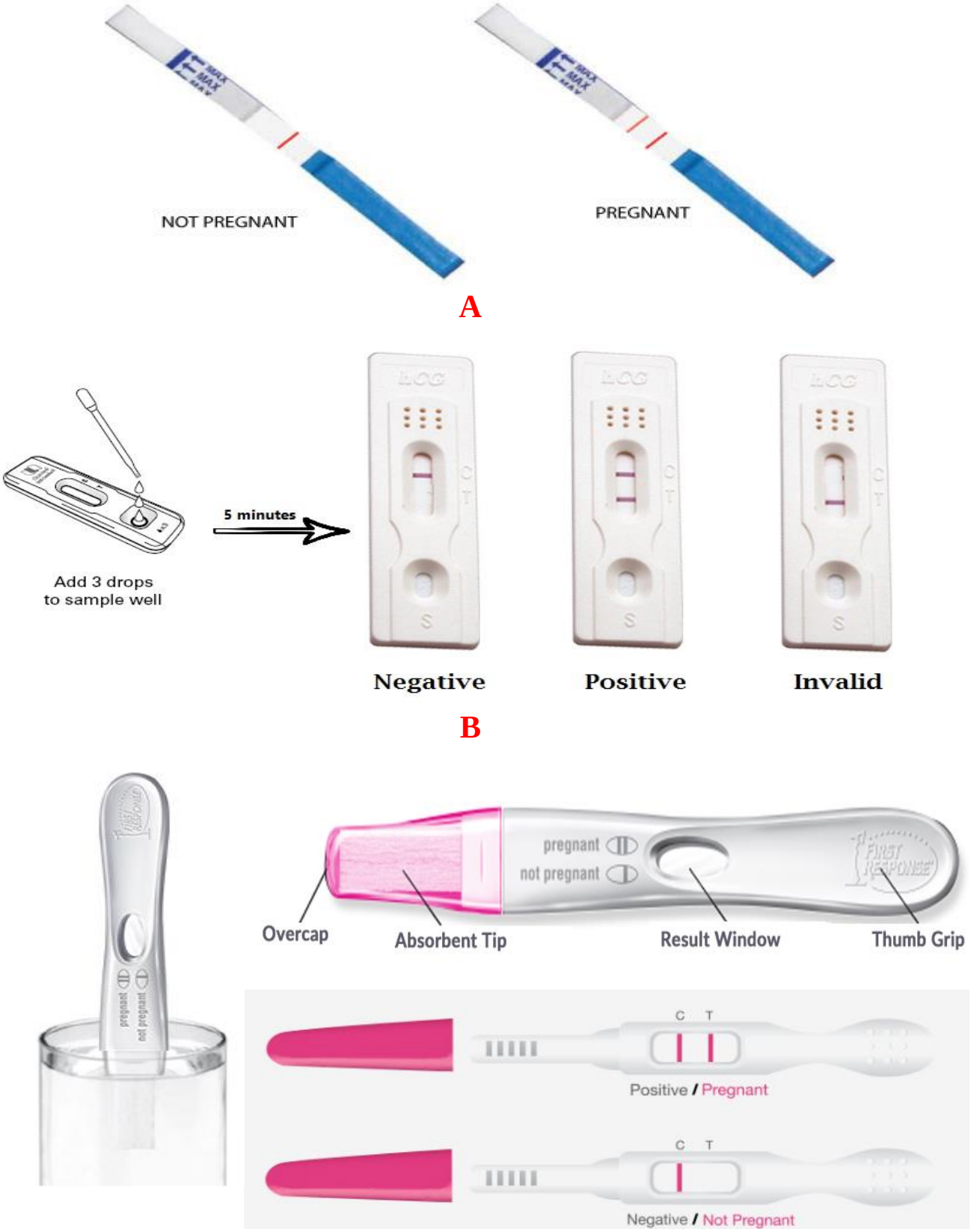


Figure 5-1: pregnancy test detection methods

6-Premenstrual syndrome

The term premenstrual syndrome (PMS) describes a collection of symptoms, both **physical** and **mental**, whose incidence is related to the menstrual cycle. Symptoms are experienced cyclically, usually from 2 to 14 days before the start of menstruation. Relief from symptoms generally occurs once menstrual bleeding begins [(1)].

Causes

The cause of PMS is unknown, but it is **associated with ovulation** as it does not occur before puberty, during pregnancy or after the menopause, or in women who do not ovulate. One theory is that women with PMS are abnormally sensitive to progesterone secreted following ovulation, and that this reduces levels of pyridoxine. **Pyridoxine** is a coenzyme in the final step of the biosynthesis of **serotonin**, a neurotransmitter known to have potent effects on mood, and its deficiency may contribute to the depressive symptoms [(2)].

Symptoms (table 5-6)

Sufferers often complain of a **bloated abdomen**, **increase in weight**, **swelling of ankles** and **fingers**, **breast tenderness** and **headaches**.

Women who experience PMS describe a variety of mental symptoms that may include any or all of **irritability**, **tension**, **depression**, **difficulty in concentrating** and **tiredness** [(1)].

Table 5-6: Common symptoms of PMS [(3)].

Physical	Behavioral	Mood
Swelling	Sleep disturbances	Irritability
Breast tenderness	Appetite changes	Mood swings
Aches	Poor concentration	Anxiety/tension
Headache	Decreased interest	Depression
Bloating/weight	Social withdrawal	Feeling out of control

Treatment

Treatment of the symptoms of PMS is a matter for debate and **there is a high placebo response** to therapy [(1)].

1-Pyridoxine (B6) : The dosage of pyridoxine should be limited to 100 mg daily because of the risk for peripheral neuropathy with higher dosages [(4)]. **If no benefit is perceived within 3 months, treatment should be discontinued** [(5)].

2-Calcium

Calcium supplementation should provide at least **1200 mg of elemental calcium per day**. It is important to ensure that a product taken by the patient provides the required amount of elemental calcium. Calcium supplements can cause mild gastrointestinal disturbances such as nausea and flatulence [(3)].

3-Evening primrose oil (EPO) has been used to **treat breast tenderness** associated with PMS. The active component of **evening primrose oil is gamma-linolenic (gamolenic) acid** [(1)].

A systematic review concluded that, on the limited evidence available, EPO was of little value in the management of PMS. All preparations of EPO have since been withdrawn in UK, and there are no licensed medicines containing it, although it remains available in products marketed as food supplements [(5)].

References:

1-Alison Blenkinsopp, Paul Paxton and John Blenkinsopp. Symptoms in the pharmacy . A guide to the managements of common illness. 7th edition. 2014.

2-Nathan A. fasttrack. Managing Symptoms in the Pharmacy. Pharmaceutical Press. 2008.

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4-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.

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7-Vaginal discharge

Background:

Patients of any age can experience vaginal discharge. The three most common causes of vaginal discharge are **bacterial vaginosis**, **vulvovaginal candidiasis** [fungal infection (**thrush**)] and **trichomoniasis** (a protozoan infection) (table 5-7). Thrush is the only condition that can be treated OTC [1].

Table 5-7: Causes of vaginal discharge and their relative incidence in community pharmacy [1]	
Incidence	**Cause**
Most likely	Bacterial vaginosis
Likely	Thrush (medicine-induced thrush)
Unlikely	Trichomoniasis, atrophic vaginitis, cystitis

Notes:

1-**Bacterial vaginosis:** this is the commonest cause of vaginal discharge. The exact cause of bacterial vaginosis is unknown although *Gardnerella vaginalis* is often implicated. Approximately half of patients will experience a thin white discharge with a strong fishy odor [1].

2-Trichomoniasis: a protozoan infection (*Trichomonas vaginalis*) is primarily transmitted through sexual intercourse. It is uncommon compared to bacterial vaginosis and thrush. Up to 50% of patients are asymptomatic. If symptoms are experienced a **profuse, frothy, greenish-yellow and malodorous discharge accompanied by vulvar itching and soreness is typical** [1].

Patient assessment with vaginal thrush:

A-Age:

Women **under the age of 16 or over 60** complaining of symptoms of vaginal thrush should be Referred [2].

The vagina harbours an extensive flora of bacteria and fungi. In **women of child-bearing age**, oestrogen promotes the production of glycogen in the vaginal epithelium. The glycogen breaks down to glucose and lowers the pH of vaginal secretions, promoting an environment favourable to the growth of Candida [3].

The lack of oestrogen in children and postmenopausal women means this protective barrier is not present, with a consequent increased tendency to bacterial (but not fungal) infection [2].

B-symptoms:

1-Discharge:

Discharge that has a **strong odor** and is **not white and curd- like** should be referred, as trichomoniasis or bacterial vaginosis are more likely causes [1]. Any **blood** staining of vaginal discharge should be referred [2]

2-Itch (pruritus):

Vaginal itching tends to be most prominent in thrush compared with bacterial vaginosis and trichomoniasis where itch is slight or absent [(1)].
(The hallmark symptoms of vaginal thrush in most women are vulvar pruritus and burning. This is usually accompanied with soreness and irritation) [(4)]

Vaginal pruritus may actually be caused by some of the products used to relieve the symptoms that often contain local anesthetics which may cause sensitivity reactions [(2)].
Allergic or irritant dermatitis may be responsible for vaginal itching, therefore, pharmacist needs to ask the patient if she **recently** used any new toiletries (e.g. soap, bath or shower products) or vaginal deodorants.
Women sometimes use a harsh soap, antiseptics, and vaginal douches in over enthusiastic cleansing of the vagina. Regular washing with warm water is all that needed to keep the vagina clean and to maintain healthy vaginal environment [(2)].

3-Dysuria (pain on urination): Vaginal thrush associated with lower abdominal pain or **dysuria** may indicate a urinary tract infection and required referral [(3)].

C-Previous history:

1-Any woman with **first occurrence of the symptoms** required referral [(2)].
2-Patients with recurrent attacks: **more than two within the previous 6 months** may indicate an **underlying cause such as diabetes** and should be referred [(3)].

D-Pregnancy:

Any pregnant woman with vaginal thrush should be referred [(1, 2)].
(During pregnancy almost **one in five women** will have an episode of vaginal candidiasis. This high incidence has been attributed to hormonal changes with a consequent alteration in the vaginal environment leading to the presence of increased quantities of glycogen) [(2)].

E-Diabetes:

Diabetic woman with vaginal thrush required referral [(1)].
[Patients with poorly controlled diabetes (type 1 or 2) are more likely to suffer from thrush because hyperglycaemia can enhance production of protein surface receptors on C. *albicans* organisms. This hinders phagocytosis by neutrophils, thus making thrush more difficult to eliminate] [(1)].

F-Sexually Transmitted Diseases (STDs):

Women who have **previous history of STDs** should be referred (with previous history of STDs the current condition may not be thrush or may include dual infections with other organisms) [(2)].

G-Medication:

What treatment had the patient tried before seeking our advice (failed medication required referral) [2].

Broad spectrum **antibiotics**, **corticosteroids**, **cancer chemotherapy**, and medication that affecting the **estrogen status** of the patient (oral contraceptives, hormone replacement therapy (HRT), tamoxifen) can predispose women to thrush. So the prescriber should be contacted to discuss suitable treatment options and, if appropriate, alternative therapy [1]. (Some women find that an episode of thrush follows every course of antibiotics they take. The Dr. may prescribe an antifungal at the same time as the antibiotic in such cases) [2].

When to refer
-First occurrence of symptoms [2].
-Known hypersensitivity to imidazoles or other vaginal antifungal products [2].
-Pregnancy or suspected pregnancy [2].
-More than two attacks in the previous 6 months [2].
-Previous history of STD [2].
-Exposure to partner with STD [2].
-Patient under 16 or over 60 years [2].
-Abnormal or irregular vaginal bleeding [2].
-Any blood staining of vaginal discharge [2].
-Vulval or vaginal sores, ulcers or blisters [2].
-Associated lower abdominal pain or dysuria [2].
-Adverse effects (redness, irritation or swelling associated with treatment) [2].
-No improvement within 7 days of treatment [2].
-Patients with diabetes [1].

Treatment timescale:

Patient should seek medical advice if symptoms **do not improve within 3 days** or are not gone within 1 week [5].

Management:

Topical imidazoles and **one systemic (oral) triazole (fluconazole)** are available OTC to treat vaginal thrush. Treatment choice is driven by patient acceptability and cost [1].

A-Oral Fluconazole:

Dose: single dose (150 mg) taken at any time of the day [1]. It is well absorbed when taken by mouth, and symptoms usually improve 12–24 hours after administration [3].

S/E: GIT disturbances (nausea, vomiting, diarrhea, and flatulence) occur in up to 10 % of patients [1].

D-D interactions: Oral fluconazole interacts with some drugs: anticoagulants, oral sulphonylureas, ciclosporin (cyclosporin), phenytoin, rifampicin and theophylline [2].

(However, these drug interactions relate to the use of multiple-dose fluconazole and the relevance to single-dose fluconazole has not yet been established. It would be prudent to avoid these combinations until further evidence is available with single-dose fluconazole) [1].

Fluconazole is not recommended during pregnancy (which already should be referred) and in breast feeding mother (present in milk) [1, 2].

B-Topical imidazoles (clotrimazole, econazole, miconazole, butoconazole and tioconazole):

1-**A number of formulations are** available including vaginal **tablets**, **creams**, and **pessaries** [1]. Creams are also available for application to the **vulva to treat irritation** [6] (the cream should be applied twice daily, morning and night) [2].

2-All **internal preparations** should be administered **at night** (this give the drug time to be absorbed, and eliminate the possibility of accidental loss which is more likely to occur if the person is mobile) [1][a product called **Monistat** 1 ® (miconazole nitrate 1200 mg suppository) has also been approved for insertion **in the morning or at bedtime**, allowing flexibility for patients][5]..

3-They come in 1-, 3-, and 7-night regimens, in a variety of formulations including suppositories (vaginal tablets/ovules), creams, and ointments and in combination packages [4].

4-Topical agents are safe and effective during pregnancy but pregnant need referral [1].

Practical points:

Patient seeking an advice about vaginal symptoms may be **embarrassed**, it is therefore **important to ensure privacy** [2].

1-Vaginal antifungal can be used during the menstrual period. If desired, wait and treat the infection after the menses end. Do **not, however, interrupt a course of therapy** because of the beginning of period [5].

2-**Sexual intercourse should be avoided until cure is complete**, to avoid transfer of infection and reinfection [3.

3-Treatment of husband: Asymptomatic husband does need to be treated. Symptomatic male (typical symptoms for men are an irritating rash on the penis) with candidal balanitis (penile thrush) and whose wife has vaginal thrush should be treated with topical azoles **twice daily for 6 days**. Oral fluconazole can also be used [2].

4-Prevention: Thrush thrives in a moist, warm environment, so keep the area cool and dry by careful hygiene, use of cotton rather than synthetic underwear and careful drying after washing the vaginal area [1, 3].

7-The protective lining of the vagina is stripped away by foam baths, soaps and douches and these are best avoided. Vaginal deodorants can themselves cause

allergic reactions and should not be used. If the patient wants to use a soap or cleanser, an unperfumed, mild variety is best [(2)].

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Chapter six: Central nervous system

1-Headache

The most common types of headache that the community pharmacist is likely to encounter are **tension headache**, **migraine** and **sinusitis** (table 6-1) [1].
Careful questioning can distinguish causes that are potentially more serious so referral to the doctor can be advised [1].

Table 6-1: Causes of headache and their relative incidence in community pharmacy [1]

Incidence	Cause
Most likely	Tension-type headache
Likely	Migraine, sinusitis, eye strain
Unlikely	Cluster headache, medication-overuse headache, temporal arteritis, trigeminal neuralgia, depression
Very unlikely	Glaucoma, meningitis, subarachnoid haemorrhage, raised intracranial pressure

Patient assessment with headache

A- Age

Children **under the age of 12 years** required referral [1, 2].
Children with **fever**, **sever pain across the back** of the **head and neck rigidity** (or difficulty in placing the chin on the chest) or **rash** may suggest **meningitis** and **urgent referral** is required [1, 3].

It is unusual for patients to present with their **first migraine episode over the age of 40 years** and such patients should be referred [1].

B-Duration

Most acute (or uncomplicated) cases will last less than 2 weeks. Headache of **more than 2 weeks** duration required referral [3].

C-Nature and site of pain (figure 6-1)

1-Tension headache:

Tension-type headache is often bilateral, either in frontal or occipital areas, and described as a tight band (may be described as **a band around the head**) [1].
The pain is usually **non-throbbing** [3] rather than the throbbing sensation associated with migraines [1].

2- Migraine:

There are two common types of migraine: **migraine without aura** (**common migraine**), which occurs in 75% cases, and **migraine with aura** (**classic migraine**) [1].
Classic migraine: Classic migraine is **unilateral**, affecting one side of the head, especially **over the forehead**.

Classic migraine is often associated with **alterations in vision** before an attack starts, the so-called **prodromal phase**. Patients may describe seeing **flashing lights or zigzag lines**. During the prodromal phase, patients may experience **tingling** or **numbness** on one side of the body, in the **lips**, **fingers**, **face** or **hands**. Migraines are also associated with **nausea and sometimes vomiting**. Patients often get relief from lying in a **darkened room** and say that bright light hurts their eyes during an attack of migraine. Classic migraine is three times more **common in women** than in men [(1)].

Common migraine: In common migraine there **is no prodromal phase** (**no aura**); the headache maybe one sided but both sides of the head may be affected and gastrointestinal (GI) symptoms such as nausea and vomiting may occur [(1)].

3-Cluster headaches

A-Cluster headaches involve, as their name suggests, a **number of headaches one after the other** [(1)].

B-This is a condition of unknown cause that predominantly affects men between the ages of **40 and 60**. Typically, headaches occur at the same time each day and last for **between 10 minutes and 3 hours** [(2)]. About half of sufferers have attacks at **night** [(2)] (Patients are woken 2 to 3 h after falling asleep) [(3)].

C-**Pain is sudden in onset, intense and 'boring' and localized around one eye.** The affected eye becomes red and watery and there may be nasal congestion. Attacks persist for **between a few weeks and a few months**, (with sufferers experiencing between one to three attacks per day) with periods of remission of months or years. Refer immediately to a doctor [(3)].

D-Symptoms suggestive of **cluster headache** required **referral** [(2)].

4-Sinusitis

Sinusitis may complicate a respiratory viral infection (e.g. cold) or allergy (e.g. hay fever), which causes inflammation and swelling of the mucosal lining of the sinuses. The increased mucus produced within the sinus cannot drain, a secondary bacterial infection develops and the pressure builds up, causing pain.

The pain is felt **behind and around the eye** and **usually only one side is affected**. The headache may be associated with **rhinorrhoea** or **nasal congestion**. The affected sinus often feels **tender** when pressure is applied. It is **typically worse on bending forwards or lying down** [(1)].

5-Subarrachnoid hemorrhage:

It occurs when a small blood vessel at the base of the brain leaks blood into the cerebrospinal fluid surrounding the brain [(1)].

This causes severe intense pain located in the **occipital region**. **Nausea**, **vomiting** and **decreased consciousness** is often present, **immediate referral** is required [(3)].

6-Space-occupying lesions

These lesions may be caused by **tumor**, **hematoma** (a mass of blood**)** or **abscess**. The pain can be localized or diffuse but it is usually **worse in the morning and**

improves during the day, worsen by **coughing**, **sneezing**, **bending** or **lying down** [3]. **Refer if suspected** [2].
Symptoms may sometimes be confused with sinusitis, but the latter is usually associated with symptoms of upper respiratory tract infection or allergic rhinitis [2].

7-Temporal arteritis

Temporal arteritis is inflammation of the **temporal artery** running down the side of the head just in front of the ear. It occurs almost exclusively in **elderly people**. There is severe unilateral pain, and the area of the **temple is inflamed and tender to the touch**. **Refer** immediately to a doctor [2].
Temporal arteritis is a curable disease and delay in diagnosis and treatment may lead to **blindness**, because the blood vessels to the eyes are also affected by inflammation. Treatment usually involves high-dose steroids and is effective, provided the diagnosis is made sufficiently early [1].

8-Hypertension

Occasionally, headache is caused by hypertension, but contrary to the popular opinion, such **headaches are not common** and **only occur when the BP is extremely high** [1].

9-Eye strain and glaucoma:

A-Eye strain can be responsible for **frontal headaches**. There may be **occupational** pointers, e.g. people using **computers** for long periods. **Refer to an optometrist** [2].
B-Headache may also be a symptom of **glaucoma**; if suspected, **refer** immediately to a doctor [2]. **(**Patients experience a **frontal/orbital** headache with pain **in the eye**. The eye appears red and is painful. Vision is blurred and the **cornea can look cloudy**. In addition, the patient might notice haloes around the vision) [3].

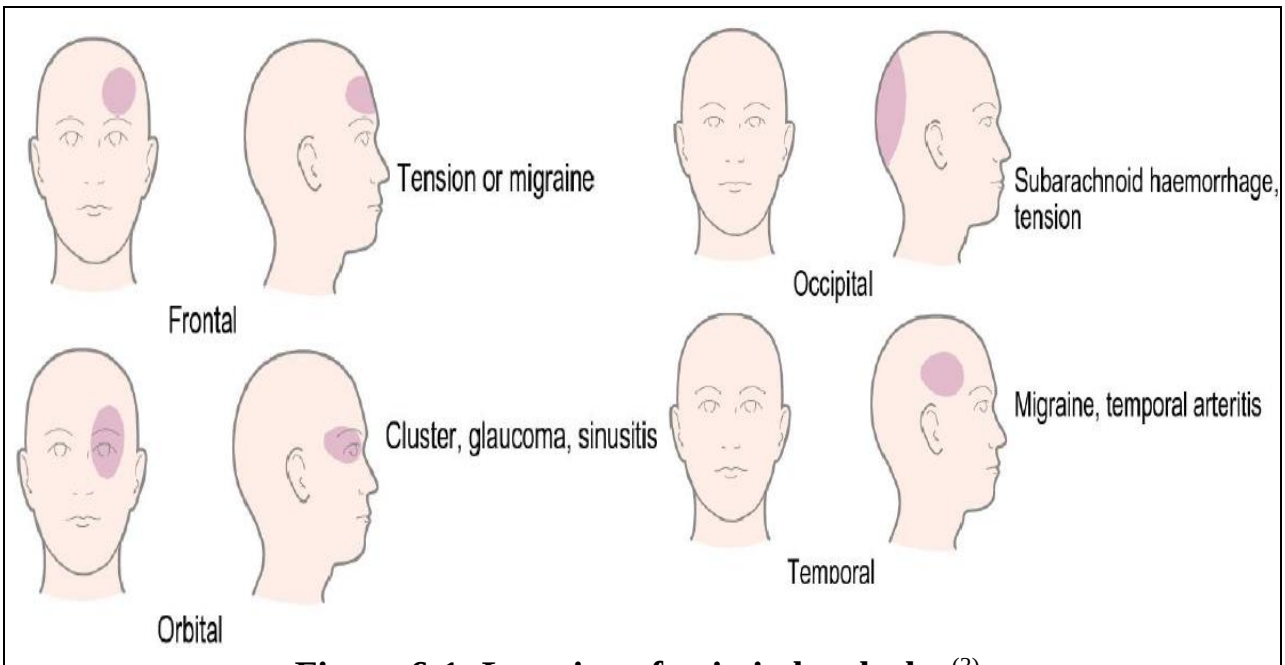

Figure 6-1: Location of pain in headache [3].

D-Precipitating factors

Tension (psychogenic) headache and migraines may be precipitated by **stress**, e.g. pressure at work or a family argument. Some migraine sufferers experience their attacks after a period of stress, e.g. when on **holiday** or at **weekends** [(1)].
Certain foods have been reported to precipitate migraine attacks, e.g. **chocolate** and **cheese**. Migraine headaches may also be triggered by hormonal changes. In **women**, migraine attacks may be associated with the **menstrual cycle** [(1)].

E-Frequency and timing of symptoms

Pharmacists should regard a headache that is worse **in the morning and improves during the day** as particularly serious, since this may be a **sign of raised intracranial pressure** [(1)].
Cluster headaches typically happen daily for 2–3 months and each episode of pain can last up to 3 h. A person who has headaches of **increasing frequency or severity** should be referred [(1)].
Any **recurrent**, **persistent** or **severe headache** needs **referral** for a **diagnosis** [(1)].

F-Recent trauma or injury

Any patient presenting with a headache who has had a **recent head injury or trauma** [(1)] (last 1-3 months) [(3)] to the head should be referred to the doctor immediately because **bruising or hemorrhage** may occur, causing a rise in intracranial pressure [(1)].
The pharmacist should look out for **drowsiness** or **any sign of impaired** consciousness. Persistent **vomiting after the injury** is also a sign of raised intracranial pressure [(1)].

G-Medication

1-The nature of any prescribed medication should be established, since the **headache might be a side-effect of medication**, e.g. **nitrates** used in the treatment of angina [(1)].

2-Contraceptive pill

Any woman taking the combined oral contraceptive (COC) pill and **reporting migraine-type headaches**, either for the first time or as an exacerbation of existing migraine, should be referred to the doctor, **since this may be an early warning of cerebrovascular changes** [(1)].

3-The patient may already be taking a non-steroidal anti-inflammatory drug (NSAID) or other analgesic on prescription and **duplication of treatments should be avoided**, since toxicity may result. If OTC treatment has already been tried without improvement, referral is advisable [(1)].

4-Medication overuse headache (MOH) results from a rebound effect after the **withdrawal of an analgesic**. This type of headache differs from a headache related to a medication side effect. Some patients who suffer from migraine or tension headaches receive some relief from nonprescription medication, and over time may

increase their use of the nonprescription treatment, which can lead to MOH. These headaches are usually associated with frequent use (more than twice weekly) for 3 months or longer and occur within hours of stopping the agent; re-administration of the agent provides relief [4].
When MOH is suspected, the use of offending agent(s) should be tapered and subsequently eliminated. Most often, **tapering of an agent should be done with medical supervision** because use of prescription therapies may be needed to combat the increased headaches that temporarily ensue during the days to weeks of the withdrawal period [4].

When to refer
-Headache associated with injury/trauma [1].
-Severe headache of more than 4-h duration [1].
-Suspected adverse drug reaction [1].
-Headache in children under 12 years [1].
-Severe occipital headache (across the back of the head) [1].
-Headache that is worse in the morning and then improves [1].
-Associated drowsiness, unsteadiness, visual disturbances or vomiting [1].
-Associated neck stiffness [1].
-Frequent migraines requiring prophylactic treatment [1].
-Frequent and persistent headaches [1].
-Headache in last trimester of pregnancy [4].
-Cluster headache symptoms [2].

Treatment timescale

If the headache does not respond to OTC analgesics **within a day**, referral is advisable [1].

Management

1-The pharmacist's choice of oral analgesic comprises three main agents: **paracetamol**, **NSAIDs** (**ibuprofen**) and **aspirin**. These may be combined with other constituents such as **codeine**, **dihydrocodeine**, **doxylamine** and **caffeine** [1].

2-OTC analgesics are available in a variety of dosage forms and, in addition to traditional tablets and capsules, syrups, soluble tablets and sustained-release dosage forms are available for some products. The peak blood levels of analgesics are achieved **30 min after taking a dispersible dosage form**; after a traditional *aspirin* tablet, it may take up to 2 h for peak levels to be reached [1].

4-The timing of doses is important in migraine where the analgesic should be taken at the **first sign of an attack**, preferably **in soluble form**, since **GI motility is slowed during an attack and absorption of analgesics delayed** [1].

6-Sumatriptan 50-mg tablets can be used for **acute relief of migraine** with or without aura and where there is a '**clear diagnosis of migraine'** [1] (previously diagnosed migraine) [5].

OTC Products

1-Paracetamol (see chapter seven)
2-NSAIDs (ibuprofen) (see chapter seven)

3-Aspirin (see chapter seven)

4-Codeine and Dihydrocodeine (see chapter seven)

5-Caffeine

Caffeine is included in some combination analgesic products to produce wakefulness and increased mental activity. A cup of tea or coffee would have the same action. Products containing caffeine are best avoided near bedtime because of their stimulant effect. It has been claimed that caffeine increases the effectiveness of analgesics but **the evidence for such claims is not definitive** [(1)].

6-Doxylamine succinate

Doxylamine is an **antihistamine** whose **sedative and relaxing** effects are probably responsible for its usefulness in treating **tension headaches**. Like other older antihistamines, doxylamine can cause **drowsiness** and patients should be warned about this. Doxylamine should not be recommended for children under 12 years [(1)].

7-Buclizine

Buclizine is an **antihistamine** and is included in an OTC compound analgesic for migraine because of its **antiemetic action** [(1)].

8-Buccal Prochlorperazine

Buccal Prochlorperazine is indicated for **previously diagnosed migraine** sufferers aged 18 years and over who experience nausea and vomiting.
The dosage is one or two tablets twice daily [(3)] (tablets are placed high between upper lip and gum and left to dissolve) [(5)] (table 6-2) [(3)]. Side effects include drowsiness, dizziness, dry mouth, insomnia, agitation and mild skin reactions. Because it crosses the blood brain barrier, it will potentiate the effect of other CNS depressants and interact with alcohol. The manufacturer advises avoidance in pregnancy unless absolutely necessary. Minimal prochlorperazine passes into the breast milk and could be used [(3)].

Table 6-2: Hints and tips about migraine [(3)].

Analgesia	Recommend a soluble or orodispersible formulation to maximize absorption before it is inhibited by gastric stasis
Administration of buccal tablets	1. Place the tablet either between the upper lip and gum, above the front teeth, or between the cheek and upper gum 2. Allow the tablet to dissolve slowly. The tablet will soften and form a gel-like substance after 1–2 hours 3. The tablet will take between 3–5 hours to completely dissolve. If food or drinks are to be consumed during this time, place the tablet between the upper lip and gum, above the front teeth 4. The tablets should not be chewed, crushed or swallowed 5. Touching the tablet with the tongue or drinking fluids can cause the tablet to dissolve faster

9-Sumatriptan (5HT agonists) 50 mg tablet:

Sumatriptan was deregulated to OTC status in the UK in 2006 [3]. Licensing conditions and dosage for sumatriptan are summarized in (table 6-3) [6].

Table 6-3: Licensing conditions and dosage for sumatriptan [6].
Sumatriptan is licensed for acute relief of migraine attacks, with or without aura, in adults aged 18–65 years.
Treatment **may not** be supplied for prophylaxis or for patients who: 1-Are pregnant or breastfeeding. 2-Have existing medical conditions, including cardiovascular conditions, hypertension, peripheral vascular disease, and liver and kidney disorders 3-Have any neurological condition or symptoms, including epilepsy 4-Are allergic to either drug. 5-Are taking concurrent medication for migraine. 6-Are assessed as having a high cardiovascular risk.
Dosage One 50 mg tablet should be taken as soon as possible after the onset of an attack. A second dose may be taken after 2 hours if migraine recurs. If there is no response to the first tablet, a second tablet should not be taken for the same attack. The maximum dosage is two tablets in 24 hours.
Side-effects Side-effects associated with sumatriptan are usually mild and transient. The most common include sensations of tingling, heat, heaviness, pressure or tightness of any part of the body. Flushing, dizziness, feelings of weakness, fatigue, and nausea and vomiting may also be experienced.
Interactions Sumatriptan should be avoided by patients taking selective serotonin reuptake inhibitors, monoamine oxidase inhibitors, moclobemide, St John's wort and other vasoconstrictor migraine treatments, especially ergotamine and methysergide. Some patients have cross-sensitivity to sumatriptan and **sulphonamides**; patients who are allergic to sulphonamides should not take sumatriptan.

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2-Insomnia

Background:

The length of sleep people need varies but typically people aged between 20 and 45 **require 7 to 8 hours per day**. Sleep requirements also **decrease with increasing age** and people over 70 commonly have 6 hours sleep per day [(1)].

Insomnia has three features:
1-Difficulty in ***initiating*** sleep; 2-difficulty in ***maintaining*** sleep; or 3-***waking*** up too early. In addition a fourth characteristic may be added: sleep that is perceived to be **nonrestorative** (i.e. not restore the body from the day's exertions) or of poor quality [(2)].
Insomnia will affects the next day alertness and the tiredness can lead to poor performance at work [(1)].

Insomnia is classified by its duration; **transient** (lasting less than 1 week) [(3)], **short-term** (up to 3 weeks) or **chronic** (greater than 3 weeks) [(4)]. Transient insomnia is often caused by a change of routine, for example, time zone changes, excessive noise, sleeping in a new environment (e.g. hotel) or extremes of temperature. Short-term insomnia is usually related to acute stress such as sitting exams, bereavement, loss of job, forthcoming marriage or house move [(1)].

The pharmacist can manage most patients with transient or short-term insomnia, however cases of **chronic insomnia are best referred** as there is usually an underlying cause [(1)]. The key to restoring appropriate sleep pattern is the advice on **sleep hygiene** (see below).OTC product can help during **transition period** and can also be useful in periodic and transient sleep problems [(4)].
Insomnia can arise from many different causes (Fig. 6-2) [(4)].

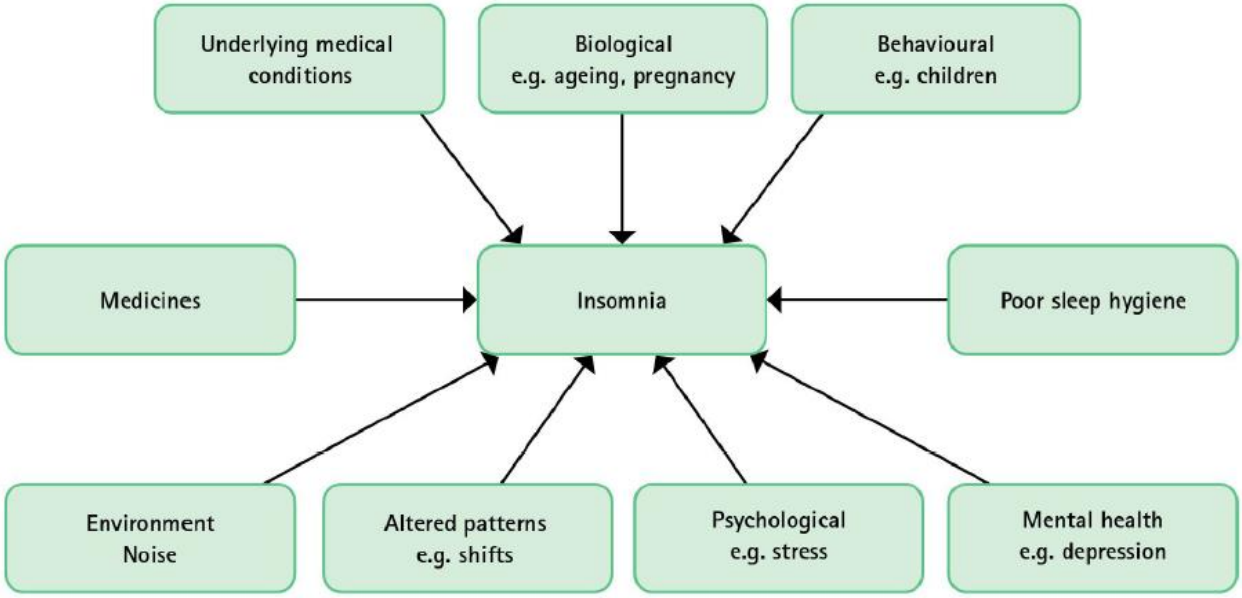

Fig. 6-2: Causes of insomnia [(1)].

Patient assessment with insomnia:

A-Age:

In elderly people the total **duration of sleep is shorter**. **Nocturnal waking** is more likely because sleep is generally more **shallow**. However, people may still feel that they need more sleep and wish to take a medicine to help them sleep [4]. Elderly people may **nap during the day and this reduces their sleep** need at night even further [1].

Patient **under the age of 16 years** required referral [4].

B-Duration:

Chronic insomnia (longer than 3 weeks) required referral [4].

C-Recent travel:

Time zone changes will affect the person normal sleep pattern and **can take a number of days to re- establish normality** [1].

D-Symptoms:

It is important to differentiate between the different types of sleep problems:

Difficulty in falling asleep.
Waking during the night.
Early morning waking.
Poor sleep.
Snoring.

Depression is an important cause of insomnia. **Early morning waking is a classic symptom of depression** (here the patient may describe no problems in getting to sleep but waking in the early hours and not being able to get back to sleep) [4]. The **pharmacist should look to other symptoms of depression** (fatigue, loss of interest and appetite, feeling of guilt, difficulty in concentration and constipation) [1].

Patient with **suspected depression** should be referred [4].

Anxiety can also cause insomnia. This usually associated with ***difficulty in getting off to sleep*** because of an **overactive mind**. This is may be experienced by many people, particularly before an **important occasion**, for example **an exam**. If, however this occurs as a more regular pattern, referral is required [4].

When to refer
-Suspected depression [4].
-Chronic problem (longer than 3 weeks' duration) [4].
-Children under 16 years [4].
-Snoring, apnea, restless legs [4].
-Associated physical conditions [4].
-Suspected alcohol dependency [4].
-Insomnia for which no cause can be ascertained [1].

E-Contributing factors [4]:

1-***Shift work*** with changing shifts is a classic cause of sleep problems. Those who work away also may have insomnia.

2-***life change***s, for example [loss of job, moving house, loss or separation of wife (or husband) and menopause].
3-Heavy continuous ***alcohol*** consumption.
4-Other ***stressful events*** like exam, job interview, celebration...
5-***Obesity*** can be associated with sleep apnea and snoring, both of which can interrupt sleeping.

D-Medications and medical problems:

1-Some drug can cause or contribute to insomnia (table 6-4) [4].

Table 6-4: Medication that may cause insomnia [1]	
Stimulants	Caffeine, theophylline, sympathomimetics amines (e.g., pseudoephedrine), MAOIs (especially in early treatment).
Antiepileptics	Carbamazepine, phenytoin.
Alcohol	Low to moderate amounts can promote sleep but when taken in excess or over a long period, it can disturb sleep
Beta-blockers	Can cause nightmares, especially propranolol. Limit by swapping to a beta-blocker that does not readily cross the blood-brain barrier.
SSRIs	Especially fluoxetine.
Diuretics	Ensure doses not taken after midday to stop the need to urinate at night.
Griseofulvin	
MAOIs, monoamine oxidase inhibitors; SSRIs, selective serotonin reuptake inhibitors.	

2-Medical problems can be associated with insomnia e.g.:
Through pain: Angina, arthritis, cancer and Gastro-esophageal reflux disease (GERD). **Through breathing difficulties :**(heart failure, COPD, and asthma). In addition other medical condition such hyperthyroidism (night sweats), menopausal symptoms (hot flushes) and Parkinson's disease [4]. (In both cases the Dr. should be consulted and the treatment options discussed /suggested) [1].

Treatment timescale:

Improvement should be obtained within **days**: refer **after week** if the problem is not resolved [1].

Management:

A-non-pharmacological advices:

1-Sleep hygiene: (tables 6-5) [1, 4]:

2-Bathing
A ***warm bath*** 1–2 h (not immediately) before bedtime can help induce sleep [4].

Table 6-5: Key steps to good sleep hygiene
1-Establish a regular bedtime and waking time [4]. 2-Consciously create a relaxation period before bedtime [4]. 3-No meals just before bedtime [4]. 4-No naps during the daytime [4]. 5-No caffeine after early afternoon [4]. 6-Reduce extraneous noise (use earplugs if necessary) [4]. 7-Get up if you can't sleep – go back to bed when you feel 'sleepy, tired' [4]. 8-Avoid alcohol [1]. 9-Restrict nicotine intake immediately before bedtime [4]. 10-Avoid sleeping in very warm rooms [1]. 11-No strenuous mental activity at bedtime (e.g., doing a crossword in bed) [1]. 12-Associate bed with sleep – try not to watch TV [1].

B-Pharmacological treatment:

A-Antihistamine: Diphenhydramine and promethazine: can be recommended for adults and children ***over 16 years*** in UK [1] (older than 12 years of age in USA) [5] .

1-They reduce sleep latency (time taken to fall asleep) and also reduce nocturnal waking [4].

2-Diphenhydramine should be taken **20-30 minutes** before bedtime [1]. The dose is 50 mg [1, 4, 5].

3-**Promethazine**: 20 or 25 mg taken **an hour** before bedtime [1].

4-Advise the patient to take the drug every night for 3 nights then skip 1 night and evaluate ability to sleep. If not improved, continue diphenhydramine for 3 more nights, and reevaluate ability to sleep without it. If symptoms persist for 10 days, the patient should seek medical evaluation." [5] **(tolerance** to their effect can develop) [1, 4].

5-*Diphenhydramine* and *promethazine* should not be recommended for pregnant or breastfeeding women [4].

6-Summaries of practical points are listed in (tables 6-6) [4].

Table 6-6: Practical prescribing: Summary of medicines for insomnia [4].

Drug	Likely side-effects	Drug interactions of note	Patients in whom care should be experienced
Antihistamines (**Diphenhydramine** and **promethazine**)	Dry mouth, sedation	Increased sedation with alcohol, opioid analgesics, anxiolytics, hypnotics and antidepressants	Glaucoma, prostate hypertrophy.

B-Melatonin:

Melatonin is an endogenous hormone produced by the body's **pineal gland** during darkness and is thought to regulate sleep [(4)].

Melatonin tablets are available as an OTC product for insomnia in USA[(4)].

Melatonin is advocated for sleep disturbance, particularly associated with jet lag. The timing of the dose is critical. It has to be taken at bedtime [(1)] (1–2 hours before bedtime) [(5)] after darkness has fallen on the first day of travel then again in the same way on the second, and any subsequent day, of travel. Once at the final destination it should be taken for the following few days at the same time [(1)].

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5-BNF-74.

3-Motion sickness

Background:

Motion sickness is a travel (air, sea and land) sickness characterized by **nausea** (and sometimes vomiting), **pallor**, and **cold sweats** [1, 2]. Patients may feel **relief after a single bout of vomiting**, but in a few cases, the vomiting can be protracted and severe [3].

Motion sickness is thought to be caused by a conflict of messages to the brain, where the vomiting center receives information from the eyes, the GI tract and the vestibular system in the ear [1].

Pharmacists are often asked to recommend a travel-sickness remedy especially by parents for their children in whom the problem is most common. Effective **prophylactic** treatment is available OTC [1].

Epidemiology

1-Motion sickness is more common in women than men [4].

2-It is uncommon in children under 2 years [4] (***don't usually required treatment***) [1] and **most common in children between 2 and 12**, reaching a peak at 12 years . Incidence reduces thereafter and after 21 declines significantly with age [4] (although some adults still experience the problem) [1].

3-Studies demonstrate that the person in control of a vehicle is less prone to become motion sick. Thus, the **driver or pilot is protected**, while the passengers are at higher risk [3].

Patient assessment with motion sickness:

A-Age:

The minimum age at which products designed to prevent motion sickness can be given varies, so for a family with several children, careful product selection can provide **one medicine to treat all cases** [1]. (See treatment below)

B-length of time of the travel:

The duration of action of the available drugs varies, if it is a long travel , then it may be necessary to **repeat the dose** while traveling according to the dosing interval of each drug [1].(see treatment below).

C-Previous history:

To know which member of the family have previous problem for whom treatment will be needed [1].

D-Medication [1]: To know:

1- Any treatment used in the past for motion sickness and their level of success or failure.

2-Other medication taken by the patient which may interact with selected OTC drugs.

Treatment:

1-Non-Pharmacological therapy:

A-General advice:

1-Children are **less likely** to feel or be sick if they **can see out of the car,** so appropriate seats can be used to elevate the seating position of small children so that they can lock outside and see still objects which may be helpful [(1)].
2-Keeping the line of vision fairly **straight ahead** [(5)].
3-For many patients, **reading** exacerbate the feeling of nausea [(1)]. (Not reading during the travel) [(5)].
4-Avoiding excess of **food** before and during the extended travel [(5)].
5-Staying where motion is felt the least (e.g. **front of the car**) [(5)] (**Planes** - sit over the wing) (**Ships** - sit in the **middle** close to the water line) [(6)].
6-Avoiding strong **odors** particularly from food or tobacco smoke [(5)].
7-Ensure **good ventilation**, for example open a window [(6)].

B-Acupressure wrist:

It is elasticated **wrist bands** that apply pressure to a defined points on the inside of the wrists are available. Although there is **no consistent evidence** (till now) about their effectiveness, such wrist band may be worth trying for **drivers or pregnant women** [(1)].

2-Pharmacological therapy:

It includes: **Antihistamines**: (meclozine, **cinnarizine**, promethazine).
Anticholinergics: Hyoscine hydrobromide.
Summaries of medicines for travel sickness are listed in (tables 6-7 and 6-8).

Table 6-7: Summary of medicines for travel sickness (part 1)

	Minimum age for use (year)	Timing of 1st dose in relation to journey	Dose interval (hour)	Dose for prevention of Motion sickness
Cinnarizine	5	2 h before	8	Child 5–11 years: Initially 15 mg, then 7.5 mg. Child 12–17 years: Initially 30 mg, then 15 mg. Adult: Initially 30 mg, then 15 mg [(7)].
Hyoscine hydrobromide	3	20 min before	6	Child 4–9 years: 75–150 mcg. Child 10–17 years: 150–300 mcg. Adult: 150–300 mcg [(7)].
Meclozine	2	Previous evening or 1 h before	24	2–12 years: 12.5 mg. Adult: 25 mg [(1)].
Promethazine teoclate	5	Previous evening or 1 h before	24	Child 5–9 years: 12.5 mg once daily. Child 10–17 years: 25 mg once daily. Adult: 25 mg once daily [(7)].

Table 6-8: Summary of medicines for travel sickness (part 2) [6]			
	Likely side effects	**Drug interactions of note**	**Patients in which care is exercised**
Cinnarizine, Meclozine, Promethazine teoclate	Dry mouth, sedation	Increased sedation with alcohol, opioid analgesics, anxiolytics, hypnotics and antidepressants	Angle-closure glaucoma, Prostate enlargement
Hyoscine hydrobromide	Dry mouth, sedation	Increased anticholinergic side effects with Tricyclic antidepressants and neuroleptics	Angle-closure glaucoma, Prostate enlargement

Note :**(Dry mouth):** many people complain of the side effect of dry mouth. This is easily overcome by **sucking a sweet,** which will stimulate saliva production [6].

3-Herbal remedy (Alternative or complementary medicine)

Ginger (Zingiber officinale)**:** Ginger has been used for many years for travel sickness. Clinical trials have produced conflicting findings in travel sickness [1]. Ginger would be worth trying for **drivers** who suffered from motion sickness and it may be worth considering for **pregnant** women for whom other antiemetics may not be used [1].

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4-Nicotine Replacement Therapy (NRT)

1-Tobacco use remains the single largest preventable cause of mortality [1]. Globally, nearly 6 million deaths attributable to tobacco occur annually; unless tobacco control efforts are able to reverse this trend, the number of annual deaths is likely to exceed 8 million by 2030 [2].

2-Cigarette smoke, is a complex mixture of thousands of compounds—including nitrogen, carbon monoxide, ammonia, hydrogen cyanide, benzene, and nicotine—in gaseous and particulate phases. The particulate fraction, excluding the nicotine and water components, is collectively referred to **as tar** [2].

3-Three compounds of real clinical importance have been identified in tobacco smoke, these are:

A-Tar-based products: which have ***carcinogenic properties*** (about 43 carcinogenic compounds).

B-CO: Which reduce the O2 carrying capacity of RBCs.

C-Nicotine: which produce ***dependence*** [3].

4-In the brain, nicotine leads to the activation of many receptors and release of numerous neurotransmitters, which induce a range of effects such as pleasure, arousal, cognitive enhancement, appetite suppression, learning and memory enhancement , mood modulation, and reduction of anxiety and tension [2]. Withdrawal symptoms are relieved by the next cigarette [4].

5-Light and **ultra-light** cigarettes may deliver **the same amount of nicotine** as regular cigarette regardless of the reported nicotine content**, and are not safer than regular cigarette** [5].

6-All forms of tobacco us**e (pipe tobacco, cigars and hookah)** have **harmful** effects [5].

Health risks from smoking [6]

Cigarette smoking substantially increases the risk of

(1) **Cardiovascular diseases** such as stroke, sudden death, and heart attack.

(2) **Nonmalignant respiratory diseases** including asthma and chronic obstructive pulmonary disease (COPD).

(3) **Lung cancer**, and **other cancers** (e.g., mouth, pharynx, larynx, esophagus, stomach, pancreas, uterus, cervix, kidney, ureter, and bladder).

In addition there are many compounds in tobacco that **induce hepatic enzyme** causing increase in the clearance (reduce half-life) of many drugs e.g. (**theophylline** clearance increased by about 60-100%).

Other forms of tobacco [7].

Other forms of tobacco include cigar, hookah/water pipe, and smokeless tobacco (SLT),

A-Cigars and pipes

The smoke from cigars and pipes is **not typically inhaled as deeply into the lungs** as is cigarette smoke and, for this reason, **the risk of developing lung cancer** from

smoking cigars and pipes **is lower** than the risk from smoking cigarettes but higher than the risk for a non-smoker.

B-Water pipes or hookahs

1-This is a traditional form of tobacco use in the **Middle East**.

2-The amount of nicotine and toxins varies based on the type of tobacco used and how it is smoked. **Water pipe smoking is associated with lung cancer and other respiratory diseases**.

3-Studies found that **water pipe smoking negatively affects lung function**, particularly in reducing forced expiratory volume in one second (FEV1). Water pipe smoking is likely to be a cause of obstructive lung disease.

C-Smokeless tobacco

1-Smokeless tobacco (SLT) products are put in the mouth and are available in several forms including chewing tobacco and **snuff/snus pouches**.

2-SLT products **provide sufficient nicotine exposure to cause nicotine addiction**.

3-SLT **causes cancer of the oral cavity** and may be associated with increased risk for **cardiovascular disease**. However, the health risks for certain diseases may be substantially less with SLT than with smoking.

Passive Smoking (second-hand smoke)

Second-hand smoke refers to involuntary exposure of non-smoker to smoke liberated from a cigarette that exhaled by the smoker [(2)]. There is an increased risk of lung cancer and ischemic heart disease caused by passive smoking. Childhood asthma, middle ear diseases, sudden infant death syndrome (cot death)……and other diseases are strongly linked to parent smoking [(6)].

Facts about the benefits of smoking giving up [(6)].

1-In **20 minutes**, blood pressure and pulse rate return to normal.
2-In **8 hour**s, CO level reduce by half and oxygen level returns to normal.
3- After:

1 day lung start to clear the mucus.
2 days, the sense of taste and smell improve
3 days, breathing become easier and bronchioles begin to relax.
2-12 weeks, circulation improves.
3-9 months, lung function increase by up to 10 %.
5 years , the risk of heart attack falls to half that of smoker.
10 years, the risk of lung cancer falls to half that of smoker and the risk of heart attack falls to the same as someone who never smoked.

Research has shown that **people who stop smoking before the age of 35 years survive about as well as lifelong non-smokers.**

Physiological effect of giving up [6]

1-***Cough may initially worsen*** as ciliary's clearance begins.
2-Some people ***feel light headed*** or ***dizzy*** as the O2 supply to the brain increase.
3-Improved peripheral circulation may cause ***tingling in the hand and the feet***.
4-***Diarrhea*** and ***constipation*** may occur.
5-***Mood swing*** and ***irritability*** are common.

Theoretical Model of Smoking Cessation

1-Before recommending any treatment, it is important that the patient does want to stop smoking (motivation is a major determinant for successful smoking cessation) and interventions based on the theoretical model of change have proved effective [4].

The model identifies six stages and patients need varying types of support and advice at each stage (Fig. 6-3). [3].

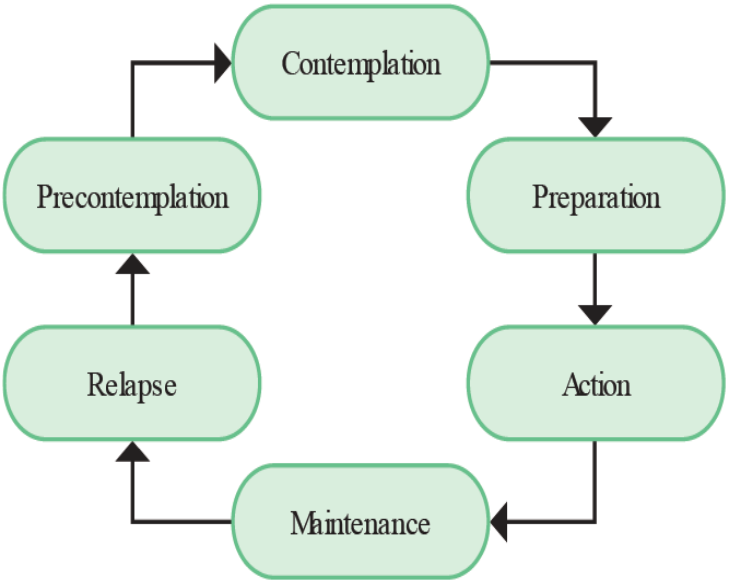

Fig. 6-3: Stages of Change Model [4].

1-**Precontemplation** : During the precontemplation stage, **smokers are not seriously considering smoking cessation in the next six months**. They overestimate the benefits of smoking, underestimate the risks.
In this stage, providing patients with awareness of the **adverse effects of smoking is helpful** [2]. **Empower patients with belief in their ability to quit** [5].

2-**Contemplation:** during this stage patients **intend to change within the next six months but have not set a quit date**. They recognize that the risks of smoking outweigh the benefits. In this stage, it is important to emphasize the adverse effects of smoking to the patient [1]. Provide **encouragement and positive reinforcement** (it is great that you are thinking about quitting. This is the first step towards success) [5].

3-**Preparation**: In the preparation stage, there is intent to take action **within the next month, but no action has been taken at this point** [1]. During this stage, assistance in moving the patient toward smoking cessation (by giving NRT) is useful [2]. Help patients set quit date (ideally within the next 2 weeks) [5].

4-**Action:** Smokers move into this stage when they **take steps to stop smoking. Interventions that prevent relapse** are most effective in this stage and help reduce the high initial relapse rate [5].

Suggest strategies to deal with craving (e.g., distraction such exercise), **suggests avoiding triggers** (by removing ashtrays, lighters) from the home and vehicle and cleaning areas to remove the smell of smoke. **Continue to provide reinforcement** [5].

5-After six months in the action stage, patients move into the **maintenance** phase. Typically, patients are more confident in their smoking cessation and are **at less risk of relapse**, compared to patients in the action stage [1].

6-Relapse: Individual is unable to maintain the changes. View as part of the learning process, not as a failure. Help individual understand the circumstances that caused the relapse and make a plan to avoid relapse in the future [8].

Nicotine Replacement Therapy (NRT)

Nicotine produce dependence rapidly, therefore, once plasma nicotine level fall below a threshold, patient begin to suffer nicotine withdrawal symptoms and will crave another cigarette. **Treatment is therefore bases on maintaining plasma nicotine just above this threshold using NRT** [3] which provide much **lower doses of nicotine** than are obtained by smoking and are **not complicated by the additional toxic effects of tar and CO** generated in tobacco smoke [9].

NRT is formulated as a **Gum**, **Lozenges**, **Patches**, **Nasal spr**ay, **Inhalator**, **Sublingual tablets**, **Mouth (oral) spray**, **and Orodispersible tablets** [3, 10] .

Notes :

1-**Low dependency smokers** (fewer than 10 cigarettes /day) who are highly motivated to give up probably **do not need any kind** of NRT [9].

2-There is a **little difference in efficacy overall between the various forms of NRT**, but a particular strength or dosage form may be best suited to a particular type of smokers [9].

3-**Smokers should stop smoking completely while using any NRT product**, although some products are licensed for use **for smoking reduction** before a quit attempt [4]. (Between cigarettes to prolong the smoke-free period) [3].

4-Different NRT presentations **should not be used together** [4].

5-Nicotine replacement therapy usage guidelines are summarized in (able 6-9).

A-Nicotine patches:

1-Transdermal patches have the convenience of a **once-daily application** and may be most suitable for people in whom the **behavioral aspects of smoking are less important** [4].

2-All brands are available in **three strengths** to allow for a smooth reduction in nicotine intake [4].

3-The recommended starting strength is generally the highest (step 1), except for **light smokers** for whom the medium (step 2) strength should be used first [4]. (Patients smoking more than 10 cigarettes daily begin with Step 1, and those smoking 10 or fewer daily begin with Step 2) [11].

4-The recommended treatment period and the length of time on each strength vary between **brands**, but the overall strategy is a stabilization period on the high strength for 4–8 weeks, followed by a progressive stepping down of strength over a further 2–8 weeks, before stopping altogether [4].

8- 16-or-24 h patches?

There are two types, both changed daily: one left on for 24 hours and the other used for 16 hours [4].

A 16 h patch will be suitable for most patients, however, if a patients **required a cigarette within the first 20 to 30 minutes of waking then a 24-h patch should be given**. If sleep disturbances are experienced with the 24-h patch then the patients can switch to a 16-h patch or alternatively remove the 24–h patch at bed time [3].

B-Nicotine Gum (2 and 4 mg):

1-The contents of a piece of gum are intended to be **released over about 30 minutes** [9].

2-Nicotine from the gum is released using the "chew and park" method (table 6-10) [2].

Table 6-10: Chewing technique [2]

1-Chew each piece of gum slowly several times.
2-Stop chewing at the first sign of a peppery, minty, fruity, or citrus taste, or after experiencing a slight tingling sensation in the mouth. This usually occurs after about 15 chews, but the onset varies.
3-Park the gum between the cheek and gum to allow absorption of nicotine across the lining of the mouth.
4-When the taste or tingling dissipates (generally after 12 minutes), slowly resume chewing.
5-When the taste or tingle returns, stop chewing and park the gum in a different place in the mouth. This will decrease the incidence of mouth irritation.
6-The chew and park steps should be repeated until most of the nicotine is gone, which is when the taste or tingle does not return after continued chewing. On average, each piece of gum lasts 30 minutes.

C-Nicotine Sublingual Tablet:

One sublingual tablet is bioequivalent to one piece of nicotine 2mg chewing gum, and the recommended dosage is comparable. Like lozenges, sublingual tablets may be a useful method for smokers **who do not like or have difficulty in chewing gum**. Placed under the tongue, the tablet slowly disintegrates in about 30 minutes [4].

D-Nicotine Lozenges (2 and 4 mg):

Lozenges may be preferred by those who do not like or have difficulty chewing gum, such as denture wearers [4].

E-Inhalation Cartridge:

1-The device is composed of a two-part plastic mouthpiece and holder, into which is inserted a cartridge impregnated with nicotine [9].**The inhaler is intended to address both the physical and behavioral components of smoking** (i.e. hand-to-

mouth movement) as it involves putting the inhaler to the mouth, as in smoking, and inhaling as desired [4].
2-It may be particularly useful for the **highly behavior-dependent smoker**. The plug is flavored with menthol, and the disappearance of the flavor indicates that the nicotine is exhausted [9].

F-Nicotine Nasal Spray

This presentation provides a fast acting and flexible method of nicotine delivery for **highly dependent smoker** [4].
Side effects, including nose and throat irritation, watering eyes and coughing, are fairly common especially in the first couple of weeks [4].

G-Orodispersible Tablets

1-They are indicated to aid smokers wishing **to quit or reduce** prior to quitting [12].
2-It is suitable for smokers who have their first cigarette of the day **more than 30 minutes** after waking up [12].

H-Mouth (Oral) spray (oromucosal spray)

1-The mouth spray can be used for either **smoking cessation or smoking reduction** [4].
2-Smokers wanting to **reduce the number of cigarettes smoked** should use the mouth spray, as needed, between smoking episodes to prolong smoke free intervals [3].
3-For **smoking cessation**, one spray should be used when cravings emerge. If this first spray fails to control cravings a second spray can be used [3].

NRT Cautions and contraindications [4].

Note :
A-NRT products provide much lower doses of nicotine than are obtained by smoking, are free from the toxic effects of tar and carbon monoxide, and **can be supplied without prescription** to people in the following 'risk' groups:
1-Pregnant and breastfeeding women.
2-Adolescents aged 12–18 years.
3-Smokers with underlying disease such as cardiovascular, hepatic and renal disease, diabetes mellitus and those taking concurrent medication
They should be used with caution in these groups.
B-Smokers with any chronic or serious **skin condition** should **avoid patches** as there is a possibility of localized skin reactions.
C-Nicotine can exacerbate symptoms of **peptic ulcer** or **gastritis**, particularly with **gum** or **lozenges**, as nicotine may enter the stomach directly.
D-Transfer of dependence from smoking to NRT products is unlikely, but possible.

Interactions [4].

Tobacco smoke reduces serum levels of a wide range of drugs and dose adjustment may be necessary when smokers have given up, particularly with theophylline,

beta-blockers, adrenergic agonists, nifedipine, tricyclic antidepressants, phenothiazines, benzodiazepines and insulin.

Electronic cigarettes

1-Electronic cigarettes: electronic cigarettes look and behave like cigarette but they contain battery–powered mechanism to heat and vaporize a liquid chemical mixture composed of varying amount of **nicotine**, **propylene glycol**, and other chemicals [(5)].

The user activates the atomizer, which heats the liquid and produces a vapor to inhale [(13)].

2-Across all brands, the main components in e-cigarette liquids are **nicotine**, **propylene glycol** or **glycerol**, and **flavorings**. A variety of other compounds have also been identified [(13)].

3-**The long-term health consequences of e-cigarette use are largely unknown** but are likely to be **considerably less than continuing to smoke conventional cigarettes** because e-cigarettes do not expose the user to many of the toxins in tobacco smoke [(13)].

4-E-cigarettes expose users to nicotine as well as heated and aerosolized propylene glycol and glycerol and other compounds. **The toxicity of chronic exposure to these and the other components of e-cigarettes is uncertain** [(13)]. In 2015 Public Health England concluded that e-cigarettes are 95% safer than smoking tobacco [(3)].

5-**The safety and efficacy of e-cigarette use for smoking cessation is unknown**. Clinicians should encourage smokers who seek to quit smoking and ask about e-cigarettes to use **FDA-approved smoking cessation aids** as a first choice [(13)].

6-If a smoker is not willing to use these evidence-based approaches and asks about using e-cigarettes, the clinician need not discourage e-cigarette use as long as the smoker is informed about the uncertainties of the devices' safety and efficacy [(13)].

7-Public health concerns regarding e-cigarettes include their potential to increase **youth initiation of tobacco products** and to **renormalize tobacco use in places where cigarette smoking is not acceptable**. **Accidental nicotine poisoning in children** has been reported. The health effects of secondhand vapor exposure are unknown [(13)].

8-**Regulation** for e-cigarettes varies worldwide and is changing [(13)]. In 2016, the **MHRA** (Medicines and Healthcare Products Regulatory Agency) **issued a license for an e-cigarette, paving the way for it to be prescribed by doctors** [(3)].

Table 6-10: Nicotine replacement therapy usage guidelines		
Dosage form	**Practical points**	**Dose**
Nicotine Gum (2 and 4 mg)	1-If the time to first cigarette (TTFC) is 30 minutes or less, therapy should be initiated with the 4 mg gum. If the TTFC is more than 30 minutes, therapy should be initiated with the 2 mg gum [2, 3]. However BNF stated that **2-mg gum is used for** Individuals who smoke fewer than 20 cigarettes each day while 4-mg gum is used for individuals who smoke more than 20 cigarettes each day [10]. 2-Acidic beverages such as coffee, juices, wine, or soft drinks may transiently reduce the salivary pH, resulting in decreased absorption of nicotine across the buccal mucosa. Patient should not eat or drink anything (except water) 15 minutes before or while using the nicotine gum [2]. 3-To minimize withdrawal symptoms, use the nicotine gum on a scheduled basis rather than as needed [3]. However BNF stated that (chew 1 piece of gum when the urge to smoke occurs) [10].	Weeks 1-6: 1 piece every 1-2 Hours. Weeks 7-9: 1 piece every 2-4 Hours. Weeks 10-12: 1 piece every 4-8 hours [2].
Nicotine Lozenges (2 and 4 mg):	1-As with nicotine gum, dosing for the lozenge is based on the time to first cigarette (TTFC) of the day. If the TTFC is 30 minutes or less, therapy should be initiated with the 4 mg lozenge. If the TTFC is more than 30 minutes therapy should be initiated with the 2 mg lozenge [2]. However BNF stated that Individuals who smoke less than 20 cigarettes each day should usually use the lower-strength lozenges; Individuals who smoke more than 20 cigarettes each day should use the higher-strength lozenges [10]. 2-Place the lozenge in the mouth and allow it to dissolve slowly (20-30 minutes for standard lozenge; 10 minutes for mini lozenge) [2]. 3-As the nicotine is released from the lozenge, you may experience a warm, tingling sensation [2]. 4-Occasionally rotate the lozenge to different areas of the mouth to decrease mouth irritation. 5-To minimize withdrawal symptoms, use the nicotine lozenge on a scheduled basis rather than as needed [2]. 6-Follow the same guidelines regarding use of the lozenges with food and beverages as they would with nicotine gum [2].	Weeks 1-6: 1 lozenge every 1-2 Hours. Weeks 7-9: 1 lozenge every 2-4 Hours. Weeks 10-12: 1 lozenge every 4-8 hours [2].
Nicotine Sublingual Tablet (2 mg)	Each tablet should be placed under the tongue and allowed to dissolve [10].	**Individuals who smoke more than 20 cigarettes each day** : 2 tablets every 1 hour, if attempting smoking cessation, treatment should continue for up to 3 months before reducing the dose; maximum 40 tablets per day [10].

		Individuals who smoke less than 20 cigarettes each day : 1 tablet every 1 hour, increased to 2 tablets every 1 hour if required, if attempting smoking cessation, treatment should continue for up to 3 months before reducing the dose; maximum 40 tablets per day [10].
Nicotine patches (10 mg, 15 mg, and 25 mg patches /16 hours) **(7 mg, 14 mg, and 21 mg patches /24 hours)**	1-Patches should be applied on waking to dry, non-hairy skin on the hip, trunk, or upper arm and held in position for 10–20 seconds to ensure adhesion [10]. 2-To minimize the possibility of localized skin reaction, a new site of application should be chosen each day, and several days should be allowed to elapse before a patch is reapplied to the same area [9]. 3-Used patches should be folded in half with the adhesive side inwards and disposed carefully, as they still contain enough nicotine to poison a child [9].	Individuals who smoke more than 10 cigarettes daily should apply a high-strength patch daily for 6–8 weeks, followed by the medium-strength patch for 2 weeks, and then the low-strength patch for the final 2 weeks. Individuals who smoke fewer than 10 cigarettes daily can usually start with the medium strength patch for 6–8 weeks, followed by the low strength patch for 2–4 weeks [10].
Nicotine inhalation Cartridge (10-mg and 15-mg)	1-Insert the cartridge into the device and draw in air through the mouthpiece; each session can last for approximately 5 minutes. The amount of nicotine from 1 puff of the cartridge is less than that from a cigarette, therefore it is necessary to inhale more often than when smoking a cigarette [10]. 2-A single 10 mg cartridge lasts for approximately 20 minutes of intense use; a single 15 mg cartridge lasts for approximately 40 minutes of intense use [10]. 3-Patient with severe asthma or chronic bronchitis may find inhalation from the inhaler difficult , and should therefore avoid this product [9].	As required, the cartridges can be used when the urge to smoke occurs or to prevent cravings, individuals should not exceed 12 cartridges of the 10-mg strength daily, or 6 cartridges of the 15-mg strength daily [10].
Orodispersible Tablets 2.5 mg Oral Film	Place one film on the tongue. Close the mouth and press the tongue gently to the roof of the mouth until the nicotine film dissolves (**approximately 3 minutes**). The film should not be chewed or swallowed whole [12]	Weeks 1-6: 1 film every 1-2 Hours. Weeks 7-9: 1 film every 2-4 Hours. Weeks 10-12: 1 film every 4-8 hours [12].

Nicotine Nasal Spray 500 mcg/ spray	Initially 1 spray should be used in both nostrils but when withdrawing from therapy, the dose can be gradually reduced to 1 spray in 1 nostril [10].	1 spray as required, individuals can spray into each nostril when the urge to smoke occurs, up to twice every hour for 16 hours daily, if attempting smoking cessation, treatment should continue for 8 weeks before reducing the dose; maximum 64 sprays per day [10].
Mouth (Oral) spray	The oral spray should be released into the mouth, holding the spray as close to the mouth as possible and avoiding the lips. The patient should not inhale while spraying and avoid swallowing for a few seconds after use. If using the oral spray for the first time, or if unit not used for 2 or more days, prime the unit before administration [10].	1–2 sprays as required, individuals can spray in the mouth when the urge to smoke occurs or to prevent cravings, individuals should not exceed 2 sprays per episode (up to 4 sprays every hour); maximum 64 sprays per day [10].

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5-Snoring

1-Snoring is another sleep-related problem for which pharmacists can recommend a product. Snoring disrupts the patient's sleep, **but is usually more troublesome for the spouse/bed partner, and for children** whose bedrooms are in close proximity. Snoring is more common in **males**, perhaps because they have smaller caliber airways than females [(1)].

2-Most snoring is unrelated to any underlying medical condition and is known as ***primary snoring***. Patients predisposed to snoring include those who are **overweight** (due to pressure on the airways from excessive neck tissue); females who are pregnant (especially in the last trimester); those with **nasal congestion** from the common cold or allergic rhinitis; those with inflammation of tonsils; and those with **certain anatomical predispositions** (e.g., abnormal facial bones, large tongue, ……) [(1)].

3-Patients who are able to **breathe normally through the nose do not snore**, since the mouth is closed. However, nasal obstruction forces patients to mouth breathe. Thus, opening the nasal airways may eliminate some cases of snoring. The use of topical or oral nasal decongestants may accomplish this objective, although the accompanying CNS stimulation often interferes with sleep [(1)].

4-Another viable method to stop snoring is the use of FDA-approved, **adhesive thin plastic nasal strips** [(1)]. These adhesive nasal strips work by opening the nostrils wider [(2)] (When the strip is released, it gradually opens the nasal passages)[(1)] and enabling the breathing through the nose rather than through the mouth [(2)].

5-Nasal strips should not be used over any wound on the nose, or if the skin is irritated or sunburned. The maximum time of use **is 12 hours daily**, and those allergic to adhesives or tape should not use them. If strips cause skin irritation, they should not be used. Pharmacists should instruct patients that mouth breathing is often a long-standing habit, **and it may take 7 to 10 nights of strip use before the patient learns to breathe through the nose again** [(1)].

6-Nasal strips are available in several options to fit patient preference. Most are sized for adults, but a "kids" strip is available. Another option is color. Since patients may object to having a visible tan strip placed over the nose, less noticeable transparent strips are available [(1)].

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Chapter seven: Musculoskeletal Problems

Pharmacists are frequently asked for advice about **muscular injuries**, **sprains** and **strains**. Simple practical advice combined with topical or systemic OTC treatment can be valuable [1].

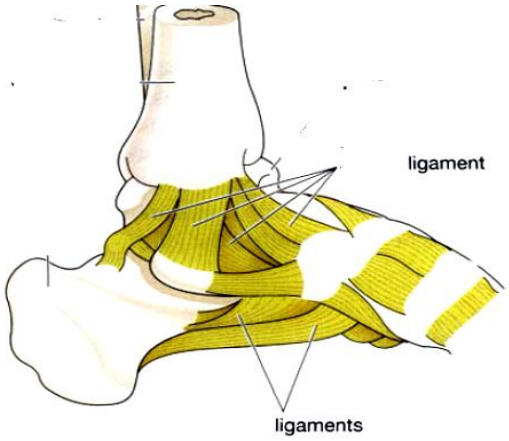
Patient assessment with musculoskeletal problems

A-Age

In **elderly patients, a fall is more likely to result in a fracture**; elderly women are particularly at risk because of **osteoporosis**, so referral to the Dr. is required (X-rays may be the best course of action in such cases) [1].

B-Symptoms and history

Injuries commonly occur as a result of a fall or other trauma and during physical activity such as lifting heavy loads or taking part in sport. **Exact details of how the injury occurred should be established by the pharmacist** [1].



1-Sprains and strains

Note: **Tendons** and **ligaments** are made of fibrous connective tissue. **Tendons connect muscle to bone; ligaments connect bone to bone**

Sprains: a sudden or violent twist or wrench of a joint causing the **stretching or twisting of ligaments** [2] and sometimes with **tearing** [1].

Strains: injury to a muscle, often caused by overuse, resulting in swelling and pain [2].

Early mobilization, strengthening exercises and coordination exercises are all important after both sprains and strains. The return to full activity must occur gradually [1].

2-Muscle pain: Stiff and painful muscles may occur simply as a result of strenuous, such as gardening, or exercise, and the resulting discomfort can be reduced by treatment with OTC medicines [1].

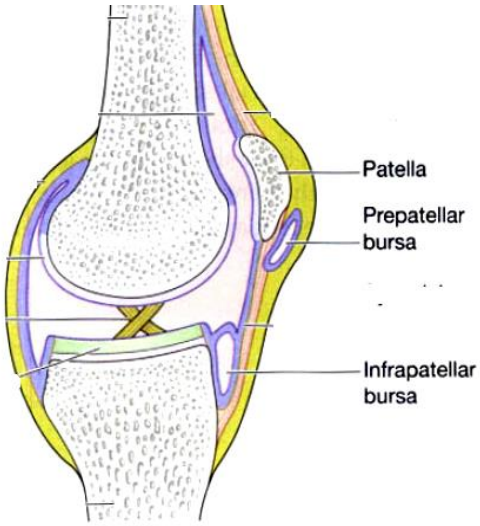
3-Bruising: Bruising as a result of injury is common and some products that minimize bruising are available OTC. **The presence of bruising without apparent injury should alert the pharmacist to the possibility of a more serious condition**. Spontaneous bruising may be symptoms of an underlying blood disorder, e.g. ***thrombocytopaenia*** or ***leukaemia***, or may result from an adverse drug reaction or other cause [1].

4-Head injury:

Pain occurring as a result of head injury should always be viewed with suspicion and such patients, **particularly children**, are best referred for further investigation [(1)].

5-Bursitis

Other musculoskeletal problems about which the pharmacist's advice might be sought include bursitis, which is inflammation of a bursa. (This is the name given to tissues around joints and where bones move over one another. The function of a bursa is to reduce friction during movement) [(1)].
Clinically, **joint swelling** is the predominant feature together with associated **pain** and **tenderness** [(3)].



6-Frozen shoulder

Frozen shoulder is a common condition where the **shoulder is stiff and painful.** It is more prevalent in older patients. The shoulder pain sometimes radiates to the arm and is often worse at night [(1)].

As the condition worsens, marked stiffness and restriction in all the major ranges of motion is observed. NSAIDs could be offered but if symptoms fail to respond with treatment after 5 days, then referral for alternative treatment and physiotherapy should be considered [(3)].

7-Painful joints

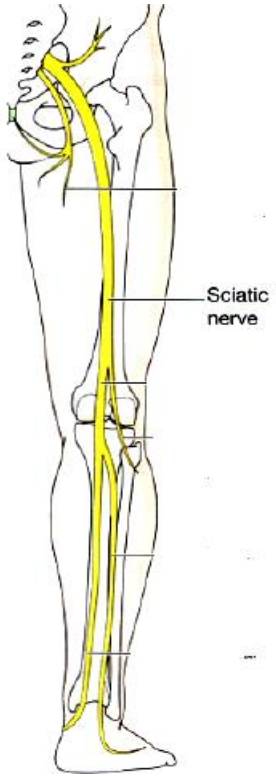
Pain arising in joints (**arthralgia**) may be due to arthritis, for which there are many causes. The pain may be associated with **swelling**, overlying inflammation, **stiffness**, **limitation of movement** and **deformity of the joint**. A common cause of arthritis is **osteoarthritis** (**OA**), which is due to wear and tear of the joint. This often affects the **knees and hips**, especially in the **older population** [(1)].

Another form of arthritis is **rheumatoid arthritis (RA**), which is a more generalized illness caused by the body turning its defenses on itself (**autoimmune disease**). Other forms of arthritis can be caused by **gout** or **infection**. A joint infection is rare but serious and occasionally fatal. It is often difficult to distinguish between the different causes and it is therefore necessary to **refer to the doctor** [(1)].

8-Back pain

The main cause is a strain of the muscles or other soft structures (e.g. ligaments and tendons) connected to the vertebrae .Lower back pain that is not too severe or debilitating and comes on after gardening, awkward lifting or bending may be due to muscular strain and appropriate advice may be given by the pharmacist [(1)].

Bed rest is not recommended for simple low back pain. The emphasis is on maintaining activity, supported by pain relief [1].
Pain that is more severe, causing difficulty with mobility or radiating from the back down one or both legs may indicate *Sciatica* and required referral [1].



Back pain that is felt in the **middle to upper part of the back is less common**, and if it has been **present for several days**, it is best referred to the doctor [1].

Kidney pain can be felt in the back, to either side of the middle part of the back just below the ribcage (**loin area**). **If the back pain in the loin area is associated with any abnormality of passing urine** (discoloration of urine, pain on passing urine or frequency), then a **kidney problem** is more likely, referral is advised [1].

9-Repetitive strain disorder

This condition is also termed **chronic upper limb pain syndrome**, often results after **prolonged period of steady hand movement** involving repeated grasping, turning, and twisting. The predominant feature is **pain in all or one part of one or both arms**. The person's job usually involves **repetitive tasks**, such as **keyboard operations** [3].

There may be **crepitus** (a **creaking**, **grating sound**) when the wrist is moved. Sometimes the symptoms disappear on stopping the job, but they may return when the work is restarted [1].

C-Medication

Prescribed medication

Sufferers, for example, of RA or chronic back pain are likely to be taking painkillers or NSAIDs prescribed by their doctor. Although the recommendation of a topical analgesic would produce no problems in terms of drug interactions, if the patient is in considerable and regular pain despite prescribed medication, or the pain has become worse, referral back to the doctor would be appropriate [1].
Side-effects. In elderly patients, it should be remembered that falls may occur as a result of **postural hypotension, dizziness or confusion as adverse effects from drug therapy**. Any **elderly** patient **reporting falls** should be carefully questioned about **current medication**, and the pharmacist should contact the doctor if an adverse reaction is suspected [1].

Self-medication
The pharmacist should also enquire about any preparations used in self-treatment of the condition and their degree of effectiveness [1].

Treatment timescale

Musculoskeletal conditions should respond to treatment **within a few days**. A maximum of 5 days' treatment should be recommended, after which patients should see their doctor [1].

When to refer
-Suspected fracture [1]. -Possible adverse drug reaction: falls or bruising [1]. -Head injury [1]. -Medication failure [1]. -Arthritis [1]. -Severe back pain [1]. -Back pain (and/or pins and needles/numbness) radiating to leg [1]. -Back pain in the middle/upper back (especially in the older patient) [1]. -Problems with bladder function [2]. -Patients unable to bear weight on an injured ankle/foot [3].

Management

A wide range of preparations containing systemic and topical analgesics is available

The oral analgesic of choice would usually be an NSAID, such as *ibuprofen*, provided there were no contraindications. Taking the **analgesic regularly** is important to obtain full effect and the patient needs to know this. Topical formulations include creams, ointments, lotions, sticks and sprays [1].

1-Paracetamol

Paracetamol has **analgesic** and **antipyretic** effects but little or **no anti-inflammatory action**. It is **less irritating** to the stomach than is *aspirin* and can therefore be recommended for those patients who are unable to take *aspirin* for this reason [1].

According to BNF : the patient should not take more than 2 tablet at any one time and not take more than 8 in 24 hours (note: each tablet contain 500 mg) [4].

Paracetamol is the drug of choice in pregnancy and breastfeeding [3].

Liver toxicity

At high doses, *paracetamol* can **cause liver toxicity** and damage may not be apparent until a few days later. All overdoses of *paracetamol* should be taken seriously and the patient should be referred [1].

2-Aspirin

Dosage: adults and children over 16 years of age, 300–900 mg every 4–6 hours when required; maximum daily dose 3600 mg [5].

Unlike paracetamol, aspirin is associated with problems in its use [3].

A-It should not be given (**as an analgesic or antipyretic**) to children under 16 years because of its suspected link with Reye's syndrome [1].

B-Indigestion
Gastric irritation (indigestion, heartburn, nausea and vomiting) is sometimes experienced by patients after taking *aspirin*, and for this reason the drug is best taken with or after food.
When taken as soluble tablets, *aspirin* is less likely to cause gastric irritation and it is also available as an enteric-coated version which is designed so that the *aspirin* is released lower down the GI tract to try and prevent adverse effects.
However, evidence indicates that enteric coating does not reduce the risk of *aspirin*-induced gastric bleeding [(1)].

The pharmacist should also remember that **enteric-coated preparations will not be released quickly and so they are inappropriate where rapid pain relief is required**. The local use of *aspirin*, e.g. dissolving a soluble tablet near an aching tooth, is best avoided, since ulceration of the gums may result [(1)].

C-Bleeding
Aspirin can cause **GI bleeding** and should not be recommended for any patient who either currently has or has a history of peptic ulcer. *Aspirin* affects the platelets and clotting function, so bleeding time is increased, and it has been suggested that it should not be recommended for pain after tooth extraction for this reason.
The effects of anticoagulant drugs are potentiated by *aspirin*, so it should never be recommended for patients taking these drugs [(1)].

D-Pregnancy
Aspirin (as an analgesic) is best avoided in pregnancy [(1)].

E-Hypersensitivity
Hypersensitivity to *aspirin* occurs in some people; it has been **estimated that 4% of asthmatic patients have this problem and *aspirin* should be avoided in any patient with a history of asthma**. When such patients take *aspirin*, they may experience skin reactions (rashes and urticaria) or sometimes shortness of breath, bronchospasm and even asthma attacks [(1)].

3-NSAIDs
Note: ibuprofen is OTC in UK (naproxen OTC in UK only for primary dysmenorrhea) while in USA ibuprofen and naproxen are OTC [(1, 4, 6)].
Ibuprofen has analgesic, anti-inflammatory and antipyretic activity and causes less irritation and damage to the stomach than does *aspirin*.
The maximum **daily** dose allowable for OTC use of *ibuprofen* is 1200 mg and *ibuprofen* tablets or capsules should not be given to children under 12 years.
Ibuprofen suspension 100 mg in 5 mL is available OTC [(1)].

The **OTC** dose of naproxen in USA is 220 mg every 8-12 hours (maximum 660 mg) [in case of patients over age 65 years: 220 mg every 12 hours (maximum 440 mg)] [(6)].

Indigestion
NSAIDs can be irritating to the stomach, causing indigestion, nausea and diarrhoea, but less than *aspirin*. Gastric bleeding can also occur. For these reasons, it is best to advise patients to take NSAIDs with or after food, and they are best avoided in anyone with a peptic ulcer or a history of peptic ulcer. Elderly patients seem to be particularly prone to these effects [(1)].

Hypersensitivity
Cross sensitivity between *aspirin* and NSAIDs occurs, so it would be wise for the pharmacist not to recommend them for anyone with a previous sensitivity reaction to *aspirin*. Since asthmatic patients are more likely to have such a reaction, the use of NSAIDs in asthmatic patients should be with caution [(1)].

Contraindications
Sodium and water retention may be caused by NSAIDs and they are therefore best avoided in patients with congestive heart failure or renal impairment and during pregnancy, particularly during the third trimester. Breastfeeding mothers may safely take *ibuprofen*, since it is excreted in only tiny amounts in breast milk [(1)].

Caution
NSAIDs is best avoided in *aspirin*-sensitive patients and should be used with caution in asthmatics. Adverse effects are more likely to occur in the elderly and *paracetamol* may be a better choice in these cases [(1)].

4-Codeine and Dihydrocodeine
Codeine is a narcotic analgesic. It is commonly found in combination products with *aspirin*, *paracetamol* or both. **Constipation** is a possible side-effect and is more likely in elderly patients and others prone to constipation.
Codeine can also cause drowsiness and respiratory depression, although this may be unlikely at OTC doses.
Dihydrocodeine is related to *codeine* and has similar analgesic efficacy. Side effects include constipation and drowsiness. Like *codeine*, the drug may cause respiratory depression at high doses [(1)].

5-Caffeine
Caffeine is included in some combination analgesic products to produce wakefulness and increased mental activity. A cup of tea or coffee would have the same action. Products containing *caffeine* are best avoided near bedtime because of their stimulant effect. It has been claimed that *caffeine* increases the effectiveness of analgesics but **the evidence for such claims is not definitive** [(1)].

Topical analgesics

There is a **high placebo response to topical analgesic products**. This is probably because the act of massaging the formulation into the affected area will increase blood flow and stimulate the nerves, leading to a reduction in the sensation of pain [(1)].

Counterirritants and rubefacients

Counterirritants and rubefacients cause vasodilatation, inducing a feeling of warmth over the area of application. Counterirritants produce mild skin irritation, and the term rubefacient refers to the reddening and warming of the skin. The theory behind the use of topical analgesics is that they **bombard the nervous system with sensations other than pain (warmth and irritation) and this is thought to distract attention from the pain felt**. Simply rubbing or massaging the affected area produces sensations of warmth and pressure and can reduce pain [(1)].

A-Methyl salicylate

Methyl salicylate is one of the most widely used and effective counterirritants [(1)].

B-Menthol

When applied to the skin in a topical analgesic formulation, *menthol* gives a feeling of coolness, followed by a sensation of warmth [(1)].

C-Capsaicin/capsicum

Capsicum preparations produce a feeling of warmth when applied to the skin. A small amount of *Capsaicin* needs to be rubbed well into the affected area. Patients should always wash their hands after
use; otherwise they may transfer the substance to the eyes, causing burning and stinging [(1)].

Topical anti-inflammatory agents

Topical gels, creams and ointments containing NSAIDs are widely used . *Ibuprofen, diclofenac , ketoprofen and piroxicam* are available in a range of cream and gel formulations.
Topical NSAIDs should not be used by patients who experience adverse reactions to *aspirin*, such as asthma, rhinitis or urticaria [(1)].

Because of the higher likelihood of *aspirin* sensitivity in patients with asthma, caution should be exercised when considering recommending a topical NSAID [(1)].

Heparinoid and hyaluronidase

Heparinoid and hyaluronidase are enzymes that may **help to disperse edematous fluid in swollen areas.** A **reduction in swelling and bruising** may therefore be achieved. Products containing *heparinoid* or *hyaluronidase* are used in the treatment of bruises, strains and sprains [(1)].

Glucosamine and chondroitin

There is some evidence that glucosamine sulphate (**which stimulates cartilage production**) and chondroitin (which **inhibits cartilage destruction)** improve the symptoms of OA in the knee and that *glucosamine* may have a beneficial structural effect on joints [(1)].

Practical points

First-aid treatment of sprains and strains

The priority in treating sprains and soft-tissue injuries is to apply **compression**, **cooling** and **elevation immediately**, and this combination should be **maintained for at least 48 h**. The aim of the treatment is to **prevent swelling**. If swelling is not minimized, the resulting pain and pressure will limit movement, lead to muscle wasting, cause pain and delay recovery [(1)].

The area should be wrapped around with a cotton-wool pad and held in place with a crepe bandage.

Once the injury has been protected and a **compression bandage applied**, an ice pack should be used. Its function is to produce vasoconstriction, thus preventing further blood flow into the injured area from the torn capillaries and, in turn, **minimizing further bruising and swelling** [(1)].

Ice packs by themselves will reduce metabolic needs of the tissues, reduce blood flow and result in less tissue damage and swelling, but will not prevent hemorrhage [(1)]. Ice packs applied at least 3-4 times a day. Ice should not be applied for more than 15-20 minutes because excessive icing causes considerable vasoconstriction and reduces vascular clearance of inflammatory mediators from the damaged area [(6)].

The **affected limb should be elevated** to reduce blood flow into the damaged area by the effect of gravity. **This will, in turn, reduce the amount of swelling caused by oedema**.

Finally, the injured limb should be rested to facilitate recovery. The acronym **RICE** is a useful aidememoire for the treatment of sprains and strains.

R – **R**est **I** – **I**ce/cooling **C** – **C**ompression **E** – **E**levation [(1)].

Heat

The application of heat can be effective in reducing pain. However, **heat should never be applied immediately after an injury has occurred,** because heat application at the acute stage will dilate blood vessels and increase blood flow into the affected area – the opposite effect to what is needed. After the acute phase is over (1 or 2 days after the injury), heat can be useful [(1)]. Heat should be applied to the affected area in the form of a warm wet compress, heating pad, or hot water bottle [(6)].

Prevention of recurrent back pain

Good posture, lifting correctly, a good mattress and losing excess weight can help [(1)].

Irritant effect of topical analgesics

Preparations containing topical analgesics should always be kept well away from the eyes, mouth and mucous membranes and should not be applied to broken skin. **Intense pain and irritant effects can occur following such contact.**

Sensitization to counterirritants can occur; if blistering or intense irritation of the skin results after application, the patient should discontinue use of the product [1].

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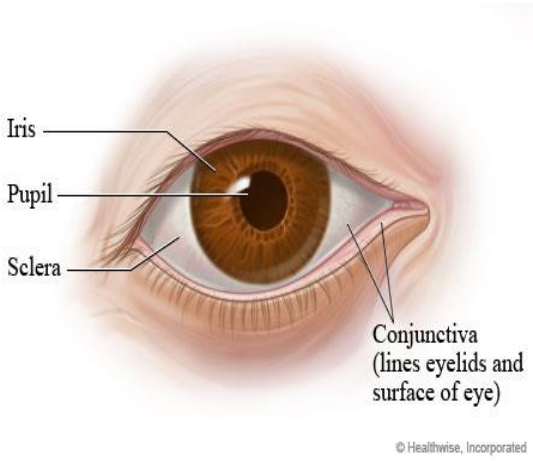
Chapter eight: Minor Eye Disorders

1-Conjunctivitis

Conjunctivitis (bacterial, viral and allergic forms) is the most common ocular condition encountered by community pharmacists [1].



Conjunctivitis is an acute inflammation of the conjunctiva, the transparent surface **covering the white of the eye** and the **inside of the eyelids.**
In the conjunctiva there are tiny blood vessels, which are normally almost invisible .The conjunctiva, can become inflamed due to infection, allergy or irritation. The blood vessels dilate and become more obvious, making the **eye look red or pink** [2]. **Pharmacist should differentiate types of conjunctivitis**, and to diagnose the cases that required referral [1].

Patient Assessment with Red Eye:

A-Duration: Minor eye problems are usually self-limiting and resolve within a few days. Therefore, any ocular redness (apart from subconjunctival hemorrhage, and allergic conjunctivitis) that **last more than 1 week requires referral** [1].

B-Discharge: Most commonly seen in conjunctivitis. It can vary from watery to mucopurulent depending on the type [1]. (table 8-1)
Mucopurulent discharge is more suggestive of bacterial conjunctivitis especially if the eyes are **glued together** [1].

However, patient with copious purulent discharge that re-accumulates after being wiped away required referral [2].

C-Associated rhinitis: Sign and symptoms of an upper respiratory tract infection points towards viral cause of conjunctivitis [1]. (table 8-1)

D-Visual changes: Any **loss of vision**, **photophobia**, or **haloes around the objects** required referral [1].

When to refer (red eyes) [1].
-Clouding of the cornea
-Associated vomiting
-Redness caused by a foreign body
-Irregular-shaped pupil or abnormal pupil reaction to light
-Photophobia
-True eye pain
-Distortion of vision
-Redness localized around the pupil

E-Pain/discomfort/itch: **True pain** required referral [1].
Pain associated with conjunctivitis is often described as a gritty/ foreign-body type pain [1].(see the table 8-1)

F-Location of redness: Redness localized near or around the pupil (colored part of the eye) required referral [1]. Generalized redness or redness towards the corners of the eye is more indicative of conjunctivitis [1]. (table 8-1).

Table 8-1: symptoms help to distinguish the different type of conjunctivitis [1]:

	Bacterial	Viral	Allergic
Eyes affected	Both , but one eye affected first by 24–48 hours	both	both
Discharge	purulent	watery	watery
Pain	Gritty feeling	Gritty feeling	itching
Distribution of redness	Generalized and diffuse	Generalized	Generalized
Associated symptoms	None commonly	Cough and cold symptoms	Rhinitis (may also have family history of atopy)

Management

A-Bacterial conjunctivitis.

Nonpharmacological advices [1].

1-**Bathe the eyelids with lukewarm water** to remove any discharge.
2-Tissues should be used to **wipe the eyes** and thrown away immediately.
3-**Avoid wearing contact lenses** until symptoms have resolved.
5-**Wash hands** regularly and **avoid sharing pillows** and **towels**.

Pharmacological therapy:
Chloramphenicol eye drop and ointment:

Note: Bacterial conjunctivitis is regarded as self-limiting (65% of people will have clinical cure in 2 to 5 days with no treatment) yet antibiotics are routinely given by medical practitioners (and pharmacists) as they are considered clinically desirable to speed recovery and reduce relapse [1].

1-In 2005, chloramphenicol eye **drops** and in 2007 chloramphenicol **ointment** became OTC in the UK [1].

Dosage: The dosage for the OTC product (for adults, and children aged two years and over) **is 1 drop every 2 hours for the first 48 hours, then 1 drop every 4 hours for a further 3 days.** Patients can be advised that (**sleep need not be interrupted** in order to administer eye drops) [3].The course should be **completed even if symptoms improve** [4].

The ointment, if used **in conjunction with the drops**, should be only applied **at night**. Approximately 1 cm of ointment should be applied to the inside of the eyelid, after which blinking several times will spread the ointment [(1)].

If ointment used alone, then the ointment should be used **3 or 4 times a day** [(1)].

In pregnancy and breastfeeding there is a lack of manufacturer data for them to recommend their use. Practically, during pregnancy hygiene measures should be adopted and if absolutely necessary, they can be used in breastfeeding women [(1)].

Treatment timescale:

If the symptoms do not improve within **two days**, the patient should be referred [(3)].

Adverse effects:

Side-effects such as mild stinging or burning in the eye on application and blurring of vision are usually minor and transient [(4)].

Note: Patients with glaucoma or who have had eye surgery or laser treatment in the past six months required referral [(2)].

B-Allergic conjunctivitis:

Nonpharmacological advices:

Applying **cold compresses** to the eye 3-4 times daily will reduce redness and itching. Other measure includes avoiding or reducing the exposure to the causative allergen [(5)].

Pharmacologic-therapy

These include **Mast cell stabilizers** (sodium cromoglicate), **Sympathomimetic** e.g. Naphazoline , **Anti-histamine** (Antazoline) , and **Decongestants—antihistamine** combination (Naphazoline-Antazoline) [(1)].(See table 8-2)

C-Viral conjunctivitis:

Viral conjunctivitis is usually self-limiting, with symptoms resolving over 2-3 weeks [(5)].

Nonpharmacological advices:

Viral causes are highly contagious and the pharmacist should instruct the patient to follow strict hygiene measures (e.g., not sharing towels, washing hands frequently),which will help control the spread of the virus [(1)].

Pharmacologic-therapy

Viral conjunctivitis is treated by **ophthalmic decongestant** which had been discussed under allergic conjunctivitis [(4)].

Table 8-2: Doses of some eye drops used for allergic conjunctivitis [1].		
Drug	**Use in children**	**Dose**
Mast cell stabilizers (sodium cromoglicate)	>6 years	1 drop four times daily
Sympathomimetic : Naphazoline	>12 years	1 drop 3-4 times daily
Anti-histamine : Antazoline	>12 years	1 drop 2-3 times daily
Decongestants—antihistamine : (Naphazoline-Antazoline)	>12 years	1 drop 2-3 times daily

Table 8-3:Hints about conjunctivitis [1].	
Children and school	children with conjunctivitis do not need to be kept away from schools.
Contact lens wearers	Patients who wear soft contact lenses should be advised to stop wearing them while treatment continues and for 48 hours afterwards. This is because preservatives in the eye drops can damage the lenses.
Choramphenicol drops	These must be stored in the fridge. If they are put into the eye cold it will be uncomfortable, so patients should be told to remove them from the fridge prior to use to allow them to warm up to room temperature.

2-Dry Eye

Dry eye is among the most common disorders affecting the anterior eye [5]. The condition **is chronic with no cure** [1].

Essentially, a reduction in tear volume or alteration in tear composition causes dry eyes. Underproduction of tears can be the result of increased evaporation from the eye, increased tear drainage and a decrease in tear production by the lacrimal gland [1].

Patient Assessment with Dry Eye:

A-Age: Dry eye is most often associated with **aging process**, especially postmenopausal women [5]. **Dry eye is rare in children and required referral** [1].

B-Symptoms: Usually affecting both eyes. Symptoms that are frequently reported are eyes that **burn, feel tired , itchy, irritated** (decreased tear production results in irritation and burning) **or gritty** and **feel as if something is in the eyes** [1, 6].

C-Clarifying questions: Have you had daily, persistent, troublesome dry **eyes for more than 3 months**? Do you have a **recurrent sensation of sand or gravel in the eyes**?

A positive response to at least one of these questions would indicate dry eye syndrome [1].

D-Associated Symptoms: **Normally no other symptoms are present in dry eye**. If the patient complains of a dry mouth, check for medication that can cause dry mouth (table 8-4). If medication is not implicated, then symptoms could be due to an autoimmune disease [(1)].
Sometimes the lower eyelid turns outward (a condition called **Ectropion**), this will over expose the conjunctiva to atmosphere leading to eye dryness. Referral is required [(1)].

Management:

Dry eye are managed by instillation of **artificial tear preparations.** They act by stabilizing the tear film and decreasing tear evaporation) [(5)].

Table 8-4: Medication that can cause dry eye [(1)].
-Diuretics -Drugs that have an anticholinergic effect – e.g., tricyclic antidepressants (TCAs) and antihistamines -Isotretinoin -HRT (particularly oestrogen alone) -Androgen antagonists -Cardiac arrhythmic drugs, beta-blockers -Selective serotonin reuptake inhibitors (SSRIs)

Drops can be divided into those which contain a **preservative and those which do not** (**i.e. preservative free**).
The preservative is nearly always **benzalkonium chloride**, usually present at 0.01 per cent. **Preservatives can damage the corneal epithelium.** If a patient is likely to be using artificial **tears for a long time**, a preservative-free preparation should be considered [(6)]. **Examples** of the compound used are:

When to refer [(1)]
-Associated dryness of mouth and other mucous membranes -Outward turning lower eyelid

1-Hypromellose (hydroxypropylmethylcellulose): (Tears Naturale ® eye drop)
2-Polyvinyl alcohol (Liquifilm Tears® eye drop)
Patients with **mild** dry eye may benefit from instillation of one of these artificial tear drops up to **four times** a day. However, in **moderate to severe** cases, these preparations need to be instilled more frequently [(7)].

3-Carbomers: (Liquivisc ® Gel : Viscotears ® gel): To overcome the problem of frequent instillation , preparations containing **a longer-acting polymer**, known as **carbomer**, have been introduced. Such preparations have a much longer retention time in the eye and symptom relief is obtained with **significantly fewer instillations** [(7)].

4-Lubricating ointments: Ophthalmic lubricating ointments contain white **soft paraffin (**Lubri-Tears ®Eye ointment), **lanolin and liquid paraffin**. These preparations **melt at the temperature of the ocular tissue** and are retained longer than other ophthalmic vehicles. They are not generally recommended as tear substitutes during **the day because the vision is blurred after instillation**. They are, however, a useful adjunct to artificial tears **if used at bedtime** [(7)].

3-Eyelid Disorders:

A-(Stye and Chalazion):

Styes are caused by bacterial infection and can either be external (outside the surface of the eyelid) or internal (in the inner surface of the eyelid) [1]. Internal stye generally has a more prolonged course than external [8].
Occasionally, internal stye can evolve into **chalazion** (a granulomatous inflammation that develops into a **painless lump**) [1].
A chalazion can be confused with a stye. **Stye often has a head of pus** at the lid margin and will **be tender and sore**, whereas a chalazion presents as painless lump [1].

Although styes are caused by bacterial pathogens the use of antibiotic **therapy is not usually needed**. Topical application of ocular antibiotics does not result in speedier symptom resolution [1].

Patient with stye should avoid **touching the eyes and wash the hands** after any contact with infected eye [8]. Without treatment, a stye will usually resolve within seven to 14 days [8].
A warm compress applied for 5–10 minutes three or four times a day might bring to a head an external stye, and once it bursts the pain will subside and the symptoms will resolve [1] (External stye usually drains spontaneously, but warm compress will hasten resolution which usually occurs within 48 hours). Internal stye generally resolves within 1-2 weeks [8].

A chalazion is self-limiting, although it might take a **few weeks to resolve completely** [1]. Initial treatment for chalazion is similar to that of stye especially for small chalazion (warm compress applied several times a day. About 25-50% resolves with this treatment. If the lesion does not begin to resolve within few days, referral is required [8])

If the patient complains that it is particularly **bothersome** and is affecting **vision** or associated with eye **pain**. Referral in these circumstances is needed for surgical removal [1, 8].

B-Blepharitis:

Blepharitis is chronic inflammation of the lid margins, affecting both eyes [9].

Signs and symptoms:

1-Typically Blepharitis is **bilateral** [1].The **lid margins appear red**, with irritation, burning and itching [9].

2-**Scales are frequently seen on the lashes of both upper and lower lids**, which tend to be greasy in seborrhoeic blepharitis [9]. (excessive crusty debris or skin flakes around the eyelash) [1].

3-**Lashes are frequently lost** or may be distorted, turn inwards and rub on the cornea; this in turn can cause conjunctivitis [9].

Patient Assessment with blepharitis

A-Other existing conditions:

Patients who suffer from blepharitis often have a co-existing skin condition, such as **seborrhoeic dermatitis** or **rosacea** [1].

Patients with swollen eyelid and associated feeling of being unwell required referred [1].

B-Duration:

A long standing history of sore eye is indicative of blepharitis which is a chronic persisting condition (although it may be intermittent with period of remission) [1].

C-Eye involvement:

Conjunctivitis is a common complication of blepharitis [1].

D-Recent use of products:

Many products (especially cosmetics) can results in itching and flaking skin that mimics blepharitis [1].

E-Medication:

Failed medication required referred [1].

Management

The goals of treatment are to reduce the discomfort and inflammation associated with blepharitis and to reduce the risk of recurrence of severe symptoms [8].
The mainstay of treatment for blepharitis is improved **lid hygiene** [1].

1-First, the eyelids should be cleaned using a warm compress applied to closed eyelids for 5-10 minutes [1, 8] (this step softens gland secretions and promotes evacuation and cleansing of secretory passages) [10]. A diluted mixture of baby shampoo (1:10) with warm water should then be applied to the eyelids using a cotton bud. This should be done twice a day initially and can be reduced to once a day if symptoms improve [1].

2-Failure to respond to hygiene measures requires referral [1] (an improvement would be expected **after four weeks**) [6].

4-Subconjunctival hemorrhage

The rupture of a blood vessel under the conjunctiva causes subconjunctival hemorrhage. A segment or even the whole eye will appear **bright red**. Most sub conjunctival hemorrhages are **idiopathic** (it occurs **spontaneously**) but can be

precipitated by coughing, straining or lifting [1]. The patient will wake up with the hemorrhage, which is not noticed until he or she looks in a mirror [11].
The condition appears alarming but is usually harmless [11]. There is no pain and the patient should be reassured that **symptoms will resolve in 10 -14 days without treatment**. However, a patient with **history of trauma should be referred** to exclude ocular injury [1].
Hypertension is also a possible cause so pharmacists can advise patients to have their **blood pressure checked**. Anticoagulant or antiplatelet drugs (e.g. warfarin, aspirin, clopidogrel) can also cause a hemorrhage so patients should **be asked about their medicines** and those taking warfarin should have their international normalized ratio (INR) measured [11].

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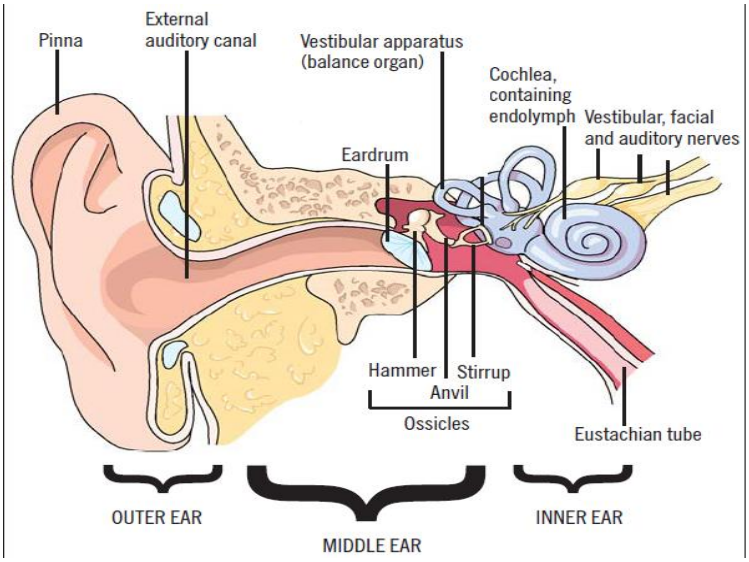
Chapter nine: Ear Conditions

Background

Currently, community pharmacists can only offer help to patients with conditions that affect the **external ear** [1].

General overview of ear anatomy

The external ear consists of the auricle (also called the pinna) and the **External Auditory Canal** (EAC) (see the Figure), and is closed by the tympanic membrane (**eardrum**), which separates the external ear from the mid dle ear [2].



1-Ear Wax Impaction

Background

1-Ear wax is produced in the ear canal by the ceruminous glands [1]. Cerumen **lubricates the canal**, **traps dust** and **foreign materials**, and provides a waxy, **waterproof barrier to the entry of pathogens**. It also contains various **antimicrobial** substances such as lysozymes, and it has an **acidic pH which aids in the inhibition of bacterial and fungal growth** [2].

2-The debris-laden cerumen slowly migrates outward with jaw movements (such as chewing and talking). This migration serves as a process of self-cleaning [2].

3-The high number of presentations may be due to patient **misconception that ear wax needs to be removed** [1]

4-Additionally, a number of patient groups appear to be more prone to ear wax impaction than the general population [1], for example, individuals **with abnormally narrow** ear canal and/or excessive hair growth in the canal are predisposed to impacted cerumen. These physiologic anomalies disrupt the normal migration of cerumen to the outer EAC. Individuals who **wear hearing aids**, **earplugs**, ……often suffer from impacted cerumen. Such devices worn in the ear can inhibit the migration of cerumen, causing wax buildup. Frequent removal and proper cleaning of ear devices may help prevent wax buildup.
The **elderly are more susceptible to impacted cerumen**. This population secretes drier cerumen, which is more difficult to expel from the ear [2].

Patient Assessment with Ear Wax Impaction

A-Course of symptoms:

The most common symptoms of impacted cerumen are a sense of **fullness** or **pressure** in the ear and a **gradual hearing loss** [2].

B-Associated symptoms

Dizziness and **tinnitus** indicates an **inner ear problem** and should be **referred**. Ear wax impaction rarely causes tinnitus, vertigo or true pain [1].

C-History of trauma

Check if the person has recently tried to clean the ears. This often leads to wax impaction [1].
Hardened cerumen generally does not cling to cotton-tipped applicators [2]. The common use of cotton-tipped swabs to remove earwax is ineffective and potentially dangerous [3] (force the cerumen plug further into the canal) [2], increasing the risk of eardrum perforation [3].
Trauma might also lead to **discharge from the ear canal.** These cases are probably best referred [1].

D-Use of medicines

If a patient has used an appropriate OTC medication correctly without success, this would necessitate referral for further investigation and possibly **ear- irrigation** [1].

E-Foreign bodies:

Symptoms can mimic ear wax impaction but, over time, **discharge** and **pain** is observed. ***Children*** are the most likely age group to present with foreign body in the ear canal and suspected cases need referral [1].

Treatment Goals

The goal of treating excessive/impacted cerumen **is to soften and remove** it using proper methods. Proper treatment should eliminate temporary hearing loss and other symptoms [2].

Nonpharmacologic Therapy

1-Earwax should be removed only when it has migrated to the outermost portion of the EAC. The only recommended nonpharmacologic method of removing cerumen is to use a **wet**, **wrung-out washcloth draped over a finger**. Making this proce dure part of **daily aural hygiene** can **prevent impacted cerumen** (if physiologic abnormalities or physical devices are not the cause of the impaction). **This method is not effective once cerumen becomes impacted** [2].

Pharmacologic Therapy (Cerumunolytics)

1-Although agents used to soften ear wax **have limited evidence of efficacy**, they are **very safe**. They can be given **to all patient groups**, do not interact with any medicines and can be used in children. They have very few side effects, which

appear to be limited to local irritation when first administered. They might, for a short while, increase deafness and the patient should be warned about this possibility [1].

2-Constituents of cerumenolytic products include fixed and volatile oils (olive, arachis, almond and camphor oils), glycerol, docusate, and urea hydrogen peroxide [4].

1-Docusate (dioctyl sodium sulpho-succinate) (Dewax ®)

The manufacturers of Dewax® recommend that adults and children use **enough ear drops to fill the affected ear** then place a **small plug of cotton wool in the ear** and repeat **for two consecutive nights** [1].

2-Sodium bicarbonate

This product should be instilled **two to three times a day for up to 3 days** [1].

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2-Water-Clogged Ears

Some patients are more prone to retaining water because of the shape of their ear canals or the presence of excessive cerumen. Excessive moisture in the ears can result from hot humid climates, sweating, swimming, bathing,…….. Therefore, simple attempts to remove water by mechanical manipulation may be insufficient [(1)].

Clinical Presentation of Water-Clogged Ears

A feeling of **wetness or fullness in the ear**, accompanied by **gradual hearing loss**, can occur after exposure to any of the etiologic factors. The trapped moisture can compromise the natural defenses of the EAC, causing **tissue maceration** that, in turn, can lead to **itching**, **pain**, **inflammation**, or **infection. Severe pain, inflammation, or signs of infection** required referral [(1)].

Treatment of Water-Clogged Ears

A-Nonpharmacologic therapy

1-Tilting the affected ear downward and gently manipulating the auricle can expel excessive water from the ear. This procedure should be performed after swimming or bathing, or during periods of excessive sweating, especially by persons who are prone to developing this disorder [(1)].

2-Using a blow-dryer on a **low setting around** (not directly into) the ear immediately after swimming or bathing may help dry the ear canal [(1)].

B-Pharmacologic therapy

FDA has approved only isopropyl alcohol 95% in anhydrous glycerin 5% as a safe and effective ear-drying aid.
In addition, a 50:50 mixture of acetic acid 5% and isopropyl alcohol 95% has also commonly been recommended to help dry water-clogged ears.
Ear-drying agents, which are recommended for use in adults and children ages 12 years and older, may be used whenever ears are exposed to water.
Medical referral is necessary if symptoms persist after several days of simultaneous use of ear-drying agents and prevention of exposure of ears to water [(1)].

1-Isopropyl Alcohol in Anhydrous Glycerin

Alcohol is highly miscible with water and **acts as a drying agent.** In concentrations greater than 70%, it is also an effective skin disinfectant. Glycerin has been used in pharmaceutical preparations for its solvent, emollient, or hygroscopic properties. Combined with alcohol, glycerin provides a product that reduces moisture in the ear **without over-drying** [(1)].

2-Acetic Acid

The **acetic acid** in a 50:50 mixture of (acetic acid 5% and isopropyl alcohol 95%) has **bactericidal and antifungal properties**. Species of ***Pseudomonas****, and*

Candida, and are particularly sensitive to this agent. The solution may sting or burn slightly, especially if the skin is abraded [(1)].

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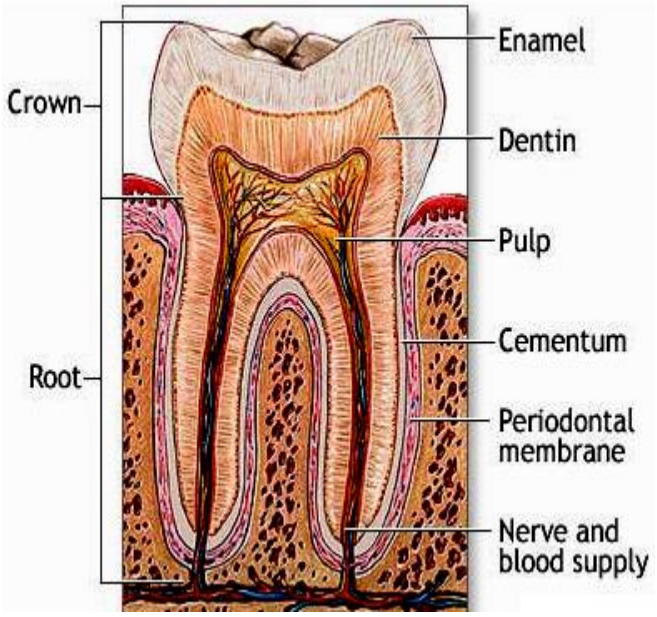
Chapter ten: Oral Care

Nearly all dental diseases are **preventable**, and by far the most important factor in prevention is an effective daily oral hygiene regimen [(1)].



General Oral Care

A-Toothbrushes:

1-Teeth should be brushed **twice daily**. Once should be before **going to bed** because **salivary flow decrease during sleep** and its **natural cleansing action is correspondingly reduced**, but the precise timing of the 2nd brushing is not important [(1)].

2-It is, however better **not to brush within 20 minutes of consuming acidic food or drink** (e.g. fruit juice), when the **enamel is particularly susceptible to wear** [(1)].

3-There are some widely accepted principles about the design of manual toothbrushes [(1)]:

A-**Nylon bristles are better** than natural bristles, which soften when wet and readily harbor bacteria.

B-**Medium texture bristles are appropriate for most people**. Soft bristles are less effective in removing plaque, while hard ones may damage the gums and abrade the teeth.

C-**Round ended bristles cause less damage to gums** than angular-ended bristles

D-A straight rather than an angled handle is easier to manipulate.

4-Toothbrushes should be **changed** as soon as the bristles start to splay outwards, for most people this happened after **about 10 weeks** [(1)].

5-There are almost many tooth brushing methods, but:

A-Whatever the method is employed, it must ensure that **every accessible surface of every tooth is cleansed** without damaging the teeth or soft tissues [(1)].

B-**Don't use excessive force** that may cause bristle damage and irritation of the gingival tissues [(2)].

C-Gently **brush the upper surface of the tongue** to reduce debris, plaque, and bacteria that can cause oral hygiene problems [(2)].

B-Toothpaste:

As a general rule, people **should use a fluoride containing toothpaste** to reduce susceptibility to decay (Fluoride converts the calcium hydroxyapatite in enamel to calcium fluoroapatite and reduce susceptibility to decay). Some patient with **exposed dentine** may have been advised by the dentist to use desensitizing **toothpaste, and again should use a brand containing fluoride** [(1)].

C-Dental floss:

1-Toothbrushes bristles are unable to remove plaque from **area directly between the teeth**. These inaccessible areas should be **cleansed once a day using dental floss** [(1)].

2-Dental floss usually available in waxed and unwaxed, however, there is **no clinical difference between both type** and it is a matter of personal choice which one is used [(1)].

3-**Correct technique is vitally important** and the in and out movement should not employed because this can damage the periodontal ligament and severely traumatize the gum [(1)]. (Table 10-1)

Table 10-1: Guideline for proper use of dental floss
1-Pull out approximately 30 cm of dental floss, and wrap most of it around the middle finger [(2)]. 2-Wrap the remaining floss around the same finger of the opposite hand. About 3 cm of the floss should be held between the thumbs and forefingers [(2)]. 3-Do not snaps the floss between the teeth: instead, **use a gentle, sawing motion to guide the floss to the gumline** [(2)]. 4-When the gumline is reached, **curve the floss into C-shape against one tooth**, and gently slide the floss into the space between the gum and tooth until you feel resistance [(2)]. 5-Hold the floss tightly against the tooth, and gently scrape the side of the tooth while moving the floss away from the gums (repeat it several times) [(2)]. 6-Curve the floss around the adjoining tooth, and repeat the procedure [(2)]. 7-Change the section used for cleaning once it becomes soiled [(1)]. 8-On completion, the mouth should be vigorously rinsed with water or mouthwash [(1)].

4-**Note**: it is common for people who **are new to flossing to experience bleeding gums** afterwards, but this should stop if a good technique is developed [(1)].

D-Diet:

Food may be involved in two dental problems: **dental caries** and **dental erosion**. **Dental caries:** in which the **bacterial** plaque on the **teeth ferment the sugar in food to produce lactic acid**, which in turn dissolve (dematerializes) tooth surface creating a carious cavity [(1)].

Dental erosion: it is loss of tooth tissue caused by a **chemical process not involving bacteria**. But it caused mainly by acidic drink (or even from gastric reflex) [(1)].

The greatest benefits are obtained by observing the following guidelines [(1)]:

1-**Overall sugar consumption should be reduced** as much as possible (table sugar, fruit juice with added sugars, honey…)

2-The **frequency of sugar consumption should be minimized** (Because the number of times the sugar enter the mouth is very important factor in tooth decay since teeth are exposed to lactic acid for approximately 20 minutes on each occasion). And it is therefore better for a child with a packet of sweets (to eat them all at once rather than gradually throughout the day).

3-**Sticky, sweet food should be avoided** because they adhere to teeth and prolong exposure to bacterial acids.

4-**Sweet should be consumed as a part of meal rather than as a snack,** this is because salivary flow is higher at this time and recovery from an acidic attack is quicker.

5-**Fruit and vegetables** should be eaten in preference to cakes and biscuits.

6-Any necessary **medications should be sugar free** if possible.

7-**Reduce exposure to acidic drinks** (such as fizzy, colas, citrus juice ...), limiting consumption to meal-times, chilling drinks (to slow the rate of reaction between acid and teeth tissue) and using a straw.

E-Fluoride:

1-Topical fluoride is proved to prevent dental cries where fluoride-containing toothpaste is the main reason for decreasing caries in the last 20 years [(1)].

2-Systemic fluoride is less significant in preventing decay than topical fluoride [(3)].

3-**If oral tablet is recommended by dentist**, then tablets should be sucked or dissolved in the mouth and taken preferably in the evening [(4)].

F-Dentures:

Dentures are one of the most widely abused medical devices. The following are some of the guideline points:

1-When being not worn, **dentures should be kept in cold water** to avoid distortion and loss of fit. Hot water should not be used because it can cause warping [1].

2-It essential to **brush dentures thoroughly once or twice daily**. Soap and water is preferably adequate for this, but **denture toothpaste** is better. While **ordinary toothpaste should be avoided** because it is too abrasive and will damage denture surface. **Hard brushes should also be avoided** and either a soft brush or a denture brush is used [1].
3-Brushing should be carried **over a bowl of water or other soft surface** in case the dentures are accidentally dropped, this being a major cause of breakage [1].

4-People who have broken their dentures should advise not to attempt repair themselves but should be referred to dental laboratory [1].

G-Oral Hygiene for Children:

1-It is good idea to begin cleaning children teeth as soon as they appear. Young infants may object to having their teeth brushed and rubbing with **toothpaste – impregnated flannel may be more acceptable** [1].

2-Most children cannot brush their teeth satisfactory until they **are about 6 years old**. And even in young children the effectiveness of their routine should be checked occasionally. In addition tooth brushing should be made into a fun habit [1].

3-Parents must also ensure that the **amount of toothpaste used is no more than the size of a small pea**, because about 70% of it may swallowed, increasing the risk of **fluorosis** and consequent **mottling of enamel** [1].

H-Regular check up:

Although the home oral hygiene is important to prevent dental diseases, **everyone, should have an oral examination once a year**. In order to detect and treat any oral problem as soon as possible. In the early stage, both caries and periodontal (Gum) diseases are reversible, but the treatment of caries become more complex and extensive the longer tooth destruction is allowed to continue [1].

Some oral problems

A-Bleeding socket [4]:

After tooth extraction, patient may be concerned that the socket is still oozing blood. In this event, they:
1-**Should roll a piece of gauze to form a pad**. Place it over the socket and **bite firmly for about 15 -20 minutes**. This is usually sufficient to affect haemostasis, but if bleeding continued for **more than one hour** it is necessary to return to the dentists.

2-The patient may be advised to a**void rinsing the mouth, spitting, smoking, or drinking hot drink for 24 hours after an extraction** to avoid dislodging the clot.

3-**After 24 hours, the socket can be gently rinsed with salt and water** (one teaspoon of salt in a cup of warm water) **after meals and at bedtime**.

B-Sensitive teeth (Tooth hypersensitivity):

1-**Cold**, **hot**, **sweet** or **sour foods** and **drinks** can **trigger sharp**, **sudden pain** in **sensitive teeth**. The most common cause of hypersensitivity is that the **dentine has become exposed** .This can be due to, for example, **brushing too vigorously** [(5)].

When **stimuli** such as heat, cold, pressure, or acid **touch exposed dentin,** the underlying nerves are stimulated, **resulting in pain** [(2)].

The etiology of dental erosion is primarily attributed to the presence of extrinsic or intrinsic **acid**. (Enamel, which covers the anatomic crowns of the teeth, is resistant to abrasion by normal tooth brushing, but **excessive brushing** with abrasive toothpaste or a medium- or **hard**-bristled toothbrush can be problematic) [(2)].

Treatment of tooth hypersensitivity

1-A person with sensitive teeth needs to maintain good oral hygiene, but may be advised to avoid acidic food and drinks, switch to a softer toothbrush and used desensitizing toothpaste [(5)].

2-Pharmacologic treatment of tooth hypersensitivity involves the use of desensitizing toothpaste that contains a **potassium salt**. Potassium diffuses along the dentinal tubules to decrease **the excitability of intradental nerves and alter their membrane potential**. A tooth desensitizer acts on the dentin to block the perception of stimuli that patients with normal teeth usually do not experience [(2)].

3-Combination products containing **potassium nitrate 5% and fluoride** are available. When used as directed, these products can **relieve tooth hypersensitivity and prevent dental caries** [(2)]. (table 10-2)[(2)].

Table 10-2: Selected Nonprescription Desensitizing Toothpastes [(2)].

Trade Name	Primary Ingredients
Colgate Sensitive Multiprotection	Potassium nitrate 5%; sodium fluoride 0.24%
Crest Sensitivity: Clinical Sensitivity Relief Extra Whitening	Potassium nitrate 5%; sodium fluoride 0.243%
Sensodyne Maximum Strength with Fluoride	Potassium nitrate 5%; sodium fluoride 0.15%

4-A **single application** of these toothpastes **has no effect**; for some patients, long-term **use (**twice daily **for 2-4 weeks) may be necessary to relieve the symptoms** [(2)].

5-The desensitizing toothpaste should be used until **the sensitivity subsides** or as long as a dentist recommends its use. In about 25% of adults, hypersensitive teeth are a chronic problem and require long-term treatment provided by a dentist [(2)].

C-Bleeding Gum:

1-Periodontal disease is extremely wide spread, **initially** it affects the gums (Gingiva), but if left untreated it can spread to the **periodontal ligament** and bony socket, leading to the loss of teeth [(5)].

2-When only the gums are involved the condition is termed **gingivitis**, but once the supporting structures are affected it is called **periodontitis** [(5)].

Periodontitis.

Gingivitis

3-A number of risk factors are associated with gingivitis and periodontitis, and include diabetes mellitus, cigarette smoking, poor nutritional status and poor oral hygiene [(6)].

4-The cause of booth condition **is toxins and enzymes, produced by plaque bacteria,** which damage the tissue [(3)]. Other possible etiologies include **medications** such as calcium channel blockers, cyclosporine, and phenytoin [(2)].

5-Progress is slow and painless, but even during early chronic gingivitis, patients may **notice that their gums tend to bleed** (especially when brushing**) and halitosis** (mouth odor) is present. The gums also appear red and swollen [(5)].

6-Pharmacist can make the patient aware that treatment **at this stage consists essentially of a thorough oral hygiene (brushing and flossing).** This can prevent the condition progressing to the point where teeth become loose and cannot be saved [(5)].

7-**Changes in gingival color**, size, and shape, as well as the ease with which gingival bleeding occurs, are common indications of chronic gingivitis that both the patient and the practitioner can recognize [(2)].

8- Left untreated, chronic gingivitis may advance to the **periodontitis** [2]. Chronic periodontitis is usually treated by the **dentists** by scaling and root planing [5].

D-Halitosis

1- Halitosis, **oral malodor** usually known as bad breath. Causes of halitosis may be related to both systemic and oral conditions; however, about 85% of cases are generally related to an oral cause (**in 90% of cases, poor oral hygiene is the cause)** [2].

2-Oral causes may include dental caries, periodontal disease, oral infections, mucosal ulcerations, tongue coating, and impacted food or debris [2].

3-Most foul breath odors occur because of a breakdown of sulfur-containing proteins into **volatile sulfur compounds (VSCs)** including hydrogen sulfide, and dimethyl sulfide." [2].

4-**Xerostomia** can also cause mouth odor. Medications that have anticholinergic properties often cause xerostomia [2].

4-**Garlic**, **tobacco**, **onions**, and other substances commonly placed into the mouth have their own odors that are not always appreciated by others [2].

Prevention of Halitosis [2]

1-Brushing the teeth and tongue are helpful.

2-**Zinc salts** and **chlorine dioxide** are most effective in the chemical prevention of oral malodor. Zinc chloride, citrate, and acetate reduce the receptor binding necessary for VSC production. Chlorine dioxide breaks disulfide bonds and oxidizes the precursors of VSCs. The zinc-salts also kill gram-negative bacteria [2].

4-Any patient who complains of severe halitosis without a readily identifiable cause (e.g., smoking) should be advised to see a dentist for a thorough evaluation. Masking foul taste and odor with cosmetic mouth rinses may delay necessary dental or medical assessment and any needed treatment [2].

E-Xerostomia

Xerostomia, commonly referred to as **dry mouth**, is a disorder in which **salivary flow is limited or completely arrested**. A person with normal salivary flow reportedly produces **up to 1.5 liters of saliva every 24 hours**. Between 10%-50% of the population is said to be afflicted with persistent dry mouth [2].

Pathophysiology of Xerostomia

1-Patients with **certain disease states**, including **Sjögren's syndrome** (an autoimmune condition in which the salivary glands become partly or completely

dysfunctional and patients typically present with dry mouth and/or dry eyes), diabetes mellitus, and Crohn's disease, are prone to xerostomia [2].

2-**Medications with anticholinergic activity** or that cause depletion of salivary flow volume (e.g., antihistamines, antidepressants,) can cause xerostomia. (If xerostomia is drug-induced and the medication can be discontinued, the condition may be reversed in some cases) [2].

3-Other causes of xerostomia include use of alcohol, tobacco, or caffeine: salivary gland stones (sialolithiasis); and mouth-breathing [2].

Clinical Presentation of Xerostomia [2]

1-Xerostomia can result in **difficulty talking and swallowing**, **stomatitis**, and **halitosis**.

2-**Unmoistened food cannot be tasted**; therefore, xerostomia can cause **loss of appetite** and eventual **decline in nutritional status**.

3-**Patients' teeth can become hypersensitive**, which can be related to a decrease in salivary flow and the lack of buffering capacity that saliva provides.

4-This disorder also can increase the incidence of **caries**, **gingivitis**, and more severe **periodontal disease**.

5-Furthermore, reduced flow of saliva can disturb the balance of microflora in the oral cavity and predispose it to **candidiasis**.

Nonpharmacologic Therapy

1-The patient should **avoid substances that reduce salivation, including tobacco** [2].

2-Modification of medication schedules, in consultation with the treating medical provider, to coincide with periods of natural stimulation should be considered. For example, **patients could take medications that cause dry mouth 1 hour prior to meals**, because **eating naturally stimulates an increase in salivary flow**. Consequently, **the duration of dry mouth would be reduced** [2].

3-**Chewing gum** sweetened with sugar alcohols (e.g., xylitol), may be beneficial. **Chewing gum increases salivary flow**, and xylitol has not been shown to be cariogenic. In mild cases, using sugarless sweets and chewing gums or sucking on ice chips can help to stimulate residual salivary flow [2].

4-**Increasing water intake** [2] (frequent sips of cool drinks) [4], especially if it is fluoridated, would also be of benefit [2].
5-Finally, the use of **very soft toothbrushes** will help prevent decay by minimizing tissue abrasion [2].

Pharmacologic Therapy (Artificial Saliva Products)

1-Artificial saliva products are the primary agents for relieving the discomfort of dry mouth [2].

2-They are designed to mimic natural saliva both chemically and physically. However, **they do not contain the many naturally occurring protective components** that are present in innate saliva [2].

3-Because they do not stimulate natural salivary gland production, however, they must be considered **replacement therapy, not a cure for xerostomia** [2].

4-Selected nonprescription saliva substitutes and other xerostomia products are shown in (Table 10-3) [2].

Table 10-3: Selected Nonprescription Saliva Substitutes and Other Xerostomia Product [2].

Trade Name	Primary Ingredients
Biotene (Oral Balance Gel/Liquid) Biotene (Moisturizing Mouth Spray)	Glucose oxidase 10,000 units; lactoferrin 16 mg; Lactoperoxidase 15,000 units; lysozyme 16 mg; sodium monofluorophosphate 0.14% (w/v fluoride ion)
Entertainer's Secret Spray	Sodium carboxymethylcellulose; dibasic sodium phosphate; potassium chloride; parabens; aloe vera gel; glycerin
Biotene Dry Mouth Gum	Sorbitol; gum base; xylitol; maltitol syrup
Biotene (Dry Mouth Toothpaste)	Sodium monofluorophospate 0.14%

4-The **majority** of artificial saliva products **are available as a spray**. Some is also available as a gel (placed gel onto the tongue and spreading thoroughly in the mouth) [2].

5-These products can be used at any time (can be used on an **as-needed basis** in patients with little or no saliva); a minimum suggested use is **after meals and before going to bed** [2].

6-Patients on **low-sodium diets** should **avoid artificial salivas** that **contain sodium** [2].

F-Teething Discomfort

Teething is the eruption of the primary or baby teeth through the gingival tissues. **Usually, this normal physiologic process is uneventful** [2]. However, it can cause **pain**, **sleep disturbances**, or **irritability** in some individuals for whom nonprescription products can provide symptomatic relief [2].

Teeth eruption can begin as early as 6 months of age, and for each tooth that erupts, the teething period usually occurs over **an 8 day window** [2].

Clinical Presentation of Teething Discomfort

1-Mild **pain**, **irritation**, **reddening**, excessive **drooling**, low-grade fever or **slight swelling** of the **gums** may precede or accompany sleep disturbances or irritability.

2-Teething is **not associated** with **vomiting**, **diarrhea**, **fever**, or **rashes**, but these symptoms may be a sign of **infection** [2].

Nonpharmacologic Therapy

1-If possible, **massage the gum around the erupting tooth** to provide relief [2].

2-Babies may be made more comfortable by giving them a **teething ring** [2].

Pharmacologic Therapy

1-Pharmacologic management of infant teething discomfort is limited to **pediatric doses of systemic analgesics** (e.g., acetaminophen).
(Nonpharmacologic management and systemic analgesics, given at the appropriate pediatric doses, should be used for symptom management) [2].

2-The FDA recommend that prescription oral viscous lidocaine 2% solution should not be used to treat infants and children with teething pain [2].

3-In 2018, the FDA announced that OTC oral health products containing the pain reliever benzocaine for the temporary relief of sore gums due to teething in infants or children **should no longer be marketed** and is asking companies to stop selling these products for such use because of the lack of efficacy for teething and the serious safety concerns with OTC benzocaine oral health products (risk of methemoglobinemia) [7].

References:

1-Derrick Grawood. Oral care (4) Oral hygiene . The pharmaceutical journal. 2003; 270: 619-621.
2- American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
3-Alison Blenkinsopp, Rhona Panton, Claire Anderson. Health promotion for pharmacists. 2000.
4-BNF-74.
5-Derrick Grawood. Oral care (3) Oral problems. The pharmaceutical journal. 2003; 270: 574-576.
6-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.
7-FDA. FDA takes action against the use of OTC benzocaine teething products due to serious safety risk, lack of benefit. Available at: https://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm608325.htm. Accessed at 8/6/2018

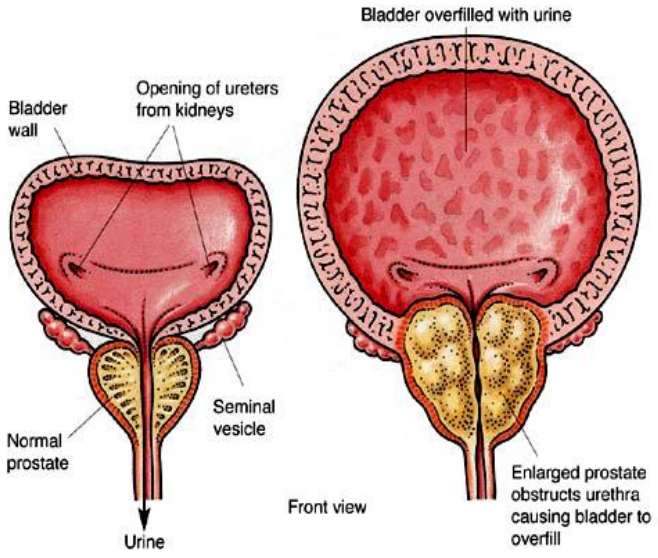
Chapter eleven: Urologic conditions

1-Benign prostatic hyperplasia (BPH)

1-The prostate is a gland surrounds the urethra below the bladder. It secretes a fluid that is expelled with the seminal fluid and improves the motility, prolongs the survival of sperm. It also has a bactericidal effect [1].

2-BPH is defined as benign enlargement of the prostate gland. Prevalence is estimated at **one in four men over the age of 40 years** and incidence increases markedly with age [1].

3-The cause of BPH is unknown but probably involves hormonal changes associated with aging [1].



Clinical Manifestations

In BPH, the enlarged prostate compresses the urethra, thus obstructing urine outflow [1].

Symptoms of BPH are classified as **obstructive** or **irritative**.

A-Obstructive symptoms: ***result from failure of the urinary bladder to empty urine*** [2] due to urethral compression from prostate gland hyperplasia [3]. It include:

1-**Hesitancy**: hesitancy is difficulty in initiating urination. (because the bladder detrusor muscle taking a longer time to generate pressure to overcome urethral resistance) [3].

2-**Decrease in urinary force**.

3-Occasional **midstream stoppage**.

Urinary stream intermittency is caused by the inability of the bladder detrusor muscle to maintain the pressure until the end of voiding.

4-Postvoiding **dribbling**.

5-Feeling of **incomplete bladder emptying** [3].

B-Irritative symptoms: ***result from the failure of the urinary bladder to store urine*** [2].

The patient complains of :

1-**Nocturia** approximately four to five times a night.

2-**Daytime urinary frequency** of eight to ten times a day.

Incomplete emptying of the bladder results in shorter intervals between voiding, explaining the complaint of frequency [3].

The symptoms of urinary frequency are more pronounced at night because cortical inhibitions are lessened and **bladder sphincter tone is more relaxed during sleep** [3].

Treatment

Tamsulosin, an alpha1-adrenergic blocker, was reclassified from POM to OTC in March 2010, for the treatment functional symptoms of BPH in men between the ages of 45 and 75 years [(1)]. This represents the first UK OTC medicine to **treat** a chronic condition. This reclassification was made due to the fact that the majority of men with BPH do not consult their doctors when they experiencing BPH symptoms [(4)].

A-Mode of action: In the prostate, bladder neck and urethra, the alpha-1A receptor is predominant. Tamsulosin is selective drug for alpha-1A receptors, so it relax smooth muscle to improve outflow and symptoms of BPH [(1)].

B-Adverse reactions: Dizziness is the most commonly reported side effect (about 1.3% of patients) [(4)].

C-Conditions for supply of tamsulosin without prescription

1-Tamsulosin is available as capsules containing tamsulosin hydrochloride 0.4 mg; the dose is one capsule daily (strength and dose are the same as the POM version) [(1)].

2-On initial request from a man for supply of the product or advice on lower urinary tract symptoms, the pharmacist assesses the severity of symptoms [(1, 4)].

Symptoms-check questionnaire

This incorporates a quality-of-life score and the International Prostate Symptom Score. **Low scores on both scales** suggest mild symptoms and a good quality of life, and **tamsulosin would not be appropriate** [(4)]. (Figure 11-1)

3-If treatment is deemed appropriate an initial 2-week supply is made, at the end of which the situation is reviewed by the pharmacist and, if symptoms have improved and the drug is well tolerated, a further supply for four weeks is made. If his symptoms are not relieved, referral is advised [(1)].

4-**After six week**s, tamsulosin will only be supplied if a doctor has carried out a clinical assessment of the patient to confirm that pharmacy supply continues to be suitable [(1)].

Conditions that required referral [(1)].

Referral must be made to a physician if a man reports any of the following:

* Aged **less than 45 or more than 75 years**
* Any age if urinary symptoms are associated with any of the following:
  (pain on urination, blood in urine, **cloudy urine, fever and excessive thirst)**
* Currently receiving **prescription medications for BPH**
* Currently receiving **alpha1 blockers for the treatment of hypertension**
* **History** of **orthostatic hypotension**, **heart**, **liver** or **kidney** disease
* **Prostate surgery** in the medical history
* planned **eye surgery for cataract** (tamsulosin can cause profound loss of tone of the dilator muscle of the iris, increasing the technical difficulty of cataract surgery for patients on the drug).

International Prostate Symptom Score (I-PSS)

Patient Name: _____ _____ **Date of birth:** _____ **Date completed** _____

In the past month:	Not at All	Less than 1 in 5 Times	Less than Half the Time	About Half the Time	More than Half the Time	Almost Always	Your score
1. Incomplete Emptying How often have you had the sensation of not emptying your bladder?	0	1	2	3	4	5	
2. Frequency How often have you had to urinate less than every two hours?	0	1	2	3	4	5	
3. Intermittency How often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4. Urgency How often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Weak Stream How often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Straining How often have you had to strain to start urination?	0	1	2	3	4	5	
	None	**1 Time**	**2 Times**	**3 Times**	**4 Times**	**5 Times**	
7. Nocturia How many times did you typically get up at night to urinate?	0	1	2	3	4	5	
Total I-PSS Score							

Score: 1-7: *Mild* 8-19: *Moderate* 20-35: *Severe*

Quality of Life Due to Urinary Symptoms	Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	**0**	**1**	**2**	**3**	**4**	**5**	**6**

Figure 11-1: Quality-of-life score and the International Prostate Symptom Score

References

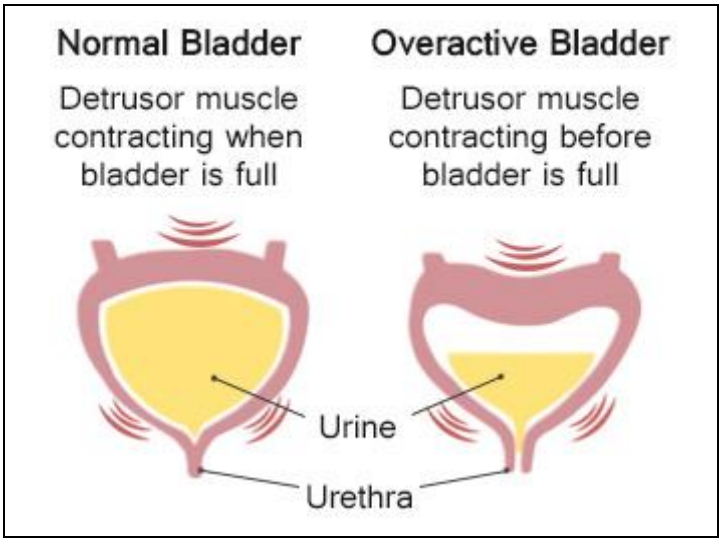
1-Nathan A. Non-prescription medicines. 4th edition. London: Pharmaceutical Press; 2010.
2-Marie A. Chisholm-Burns .Pharmacotherapy Principles & Practice Copyright © 2016 by The McGraw-Hill Companies
3-Zeind, Caroline S and Carvalho, Michael G. Applied Therapeutics: The clinical use of drugs, 11th ed., 2018.
4-Paul Rutter. Community Pharmacy. Symptoms, Diagnosis and Treatment. 4th edition. 2017.

2-Overactive Bladder in Women

1-**Urinary incontinence** (UI) is defined as the complaint of any involuntary leakage of urine [(1)].
2-UI is twice as common in women, but men also suffer from the symptoms [(1)].
3-UI can be classified as **overactive bladder** (OAB), stress incontinence, mixed incontinence (OAB plus stress incontinence), overflow incontinence, or functional incontinence, depending on the underlying etiologies [(1)].
4-In 2013, **oxybutynin transdermal patch (Oxytrol for women ®)** was available OTC in USA for Overactive Bladder in Women [(2)].

Overactive Bladder

1-Although OAB occurs in women of all ages, it exhibits a strong age association. The median age is 52 years, and the most common age range is 45 to 60 years [(2)].



2-In classical OAB, bladder muscles are overactive. **Patients with little or no urine in the bladder may feel a strong urge to urinate (urge incontinence), often along with nocturia** [(2)].

3-OAB exists on a range of severity. When some OAB patients lose bladder control, they only notice a mild leakage that cannot be stopped. However, patients with a more severe form of OAB may experience uncontrolled voiding. More severe OAB can decrease the patient's quality of life, increase the risk of depression, and reduce productivity at work [(2)].

4-Some women experience a different type of bladder problem that also results in incontinence. They have weak bladder muscles that cannot hold urine back when they cough, sneeze, laugh, or lift a heavy object. This is not OAB, but is known as **stress incontinence** [(2)].

Treatment timescale

Patients are cautioned to stop use and ask a physician if the condition does not improve **after 2 weeks of use** [(2)].

Treatment

Nonpharmacologic Therapy

Behavioral techniques decrease the frequency of UI in most patients, have no reported side effects. Example of such behavioral techniques is **toileting assistance** which includes routine or scheduled voiding performed at fixed, regular intervals (every 2-4 hours) [(1)].

Pharmacologic Therapy

Oxybutynin transdermal patch (Oxytrol For Women ®)

1-Oxybutynin is an **anticholinergic** and antispasmodic agent. It relaxes bladder smooth muscle cells, which increases the maximum capacity of the bladder and also increases the volume to which the bladder fills before the patient begins to experience contractions of the detrusor muscle [(2)].

2-The FDA approval of nonprescription (Oxytrol for women®) (oxybutynin transdermal system, 3.9 mg/day) form women with OAB if they experience **two or more of the following symptoms for at least 3 months:**

A-**Urinary frequency** (a need to urinate more often than normal, especially more than 8 times in 24 hours)

B-**Urinary urgency** (strong and immediate need to urinate).

C-**Urge incontinence** (leaking or wetting if the urge to urinate cannot be controlled) [(2)].

When to refer [(2)].
1-Male gender. 2-Uunder the age of 18 years. 3-Allergy to oxybutynin. 4-Narrow-angle glaucoma. 5-Symptoms of a UTI or other serious condition for which patients should see a physician immediately (e.g., pain or burning when urinating, accompanied by fever or chills); blood in the urine; unexplained lower back or side pain; urine that is cloudy or foul smelling; urine loss only when the patient coughs, sneezes, or laughs (since the product is not effective for stress incontinence). 6-Patients have risk factors or symptoms of diabetes (e.g., a history of diabetes in the immediate family, excessive thirst, extreme hunger, increasing tiredness, or unexplained weight loss). 7-A history of kidney stones, or liver or kidney disease. 8-Pregnant or breast-feeding mothers. 9-Patients who are already taking a prescription medication for OAB or a diuretic.

3-Patients are warned that, when using the product, they may notice mild redness when the patch is removed, which usually abates after a few hours. They may also notice sleepiness, dizziness, or blurred vision. Ingestion of alcohol may worsen the drowsiness. Users are cautioned to be careful when driving a vehicle or operating machinery [(2)].

4-Patients are cautioned to stop use and ask a physician if they are not able to empty the bladder; if the condition worsens or new symptoms appear; if the condition does not improve after 2 weeks of use; if they experience an allergic reaction to the product; or if they have severe redness, itchiness, or blistering at the site of application [(2)].

5-To use Oxytrol For Women, patients should open a patch and apply it immediately to a clean, dry, and smooth area of skin on the abdomen, hips, or buttocks. They should avoid oily, damaged (cut or scraped), or irritated skin (e.g., with an active rash) [(2)].

6-They should not place patches on skin that is treated with lotions, powders, or oils, as the patch may not adhere to those areas. They should wear the patch under clothing, avoiding areas exposed to sunlight [(2)].

7-Patches should be applied whole and not cut into pieces. Patients should wear only one patch at a time, **for 4 consecutive days**, after which they remove and discard the used patch and apply a new one [(2)].

8-They should continue to change the patch every 4 days, **rotating application sites** each time to reduce the risk of skin irritation. To dispose of a used patch, they should fold the sticky sides together and discard the patch where it cannot be retrieved and ingested by a child or pet [(2)].

Other Useful Counseling Information

1-Patients using anticholinergics such as oxybutynin should be warned not to enter hot environments, since that group of medications reduces the ability to sweat, and the wearer may suffer heat prostration, with fever and heat stroke [(2)].

2-Oxybutynin is not recommended for patients with gastric retention because anticholinergics decrease gastric motility. It is also vital to know that patients with **gastroesophageal reflux should use Oxytrol For Women with caution**, a warning that also includes patients who are taking bisphosphonates (e.g., alendronate, ibandronate, risedronate), since these drugs can induce or worsen reflux [(2)].

3-Patients purchasing Oxytrol For Women should be warned that it might induce other adverse beside that listed above . These include application site abnormalities (rash, macules, pruritus, or burning), back pain, dry mouth, constipation, nausea, abdominal pain, flatulence, fatigue, headache, flushing, or diffuse rash. Most of these events are mild or moderate in severity [(2)].

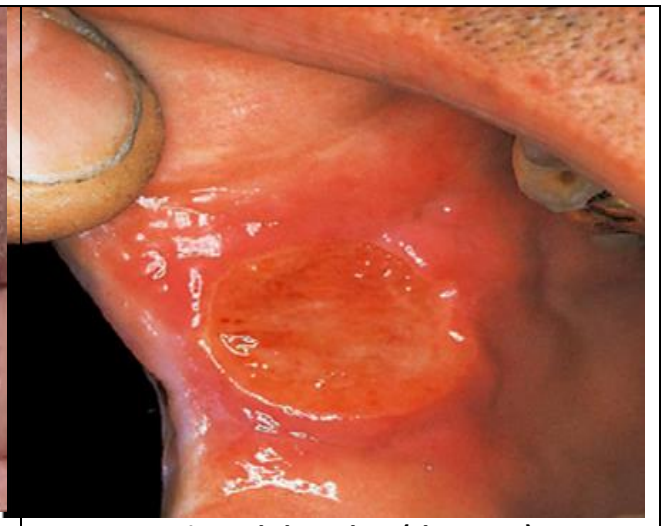
4-Water may come into contact with the patch during routine activities such as swimming, bathing, showering, or exercising. This does not affect the patch. However, the manufacturer cautions patients not to rub the patch area when carrying out those activities [(2)].

References

1-American pharmacists association. Handbook of Non-prescription drugs: An Interactive Approach to Self-Care. 18th edition. 2016.
2-W. Steven Pray, Gabriel E. Pray. A New Nonprescription Product for Overactive Bladder in Women. US Pharm. 2013;38(8):8-11.

Photo section

Minor aphthus ulcer (chapter 1)



Major aphthus ulcer (chapter 1)

Herpiteform ulcers (chapter 1)

Napkin rash (chapter 3)

Napkin rash with secondary bacterial infection (chapter 3)

Napkin rash with secondary fungal infection (chapter 3)

Oral thrush (chapter 3)

Mild acne (chapter 4)

Moderate acne (chapter 4)

Severe acne (chapter 4)

Rosacea (chapter 4)

Cold sore (chapter 4

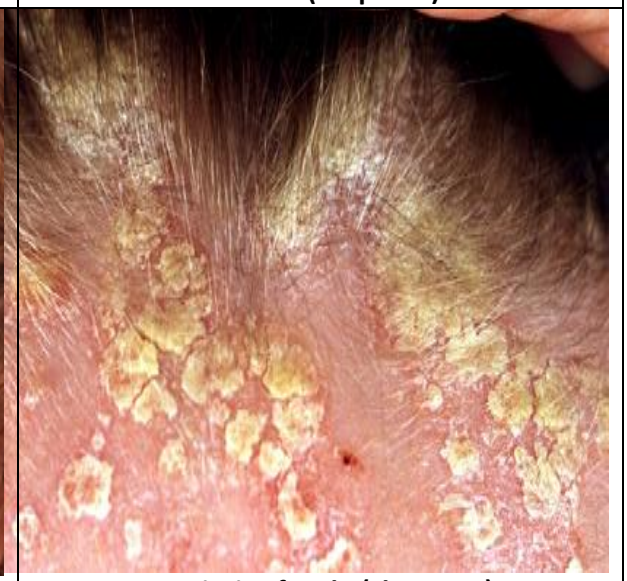
Impetigo (chapter 4)

Soft corn (chapter 4)

Hard corn (chapter 4)

Calluses (chapter 4)

Seborrheic dermatitis (chapter 4)



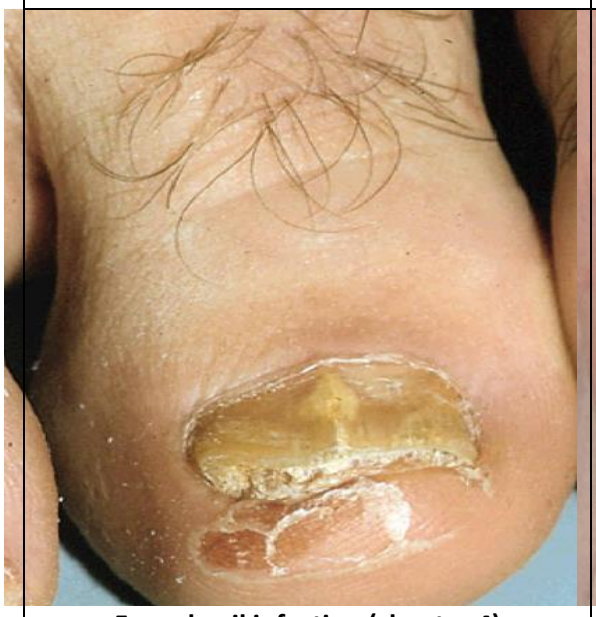
Psoriasis of scalp (chapter 4)

Cradle cap(chapter 4)

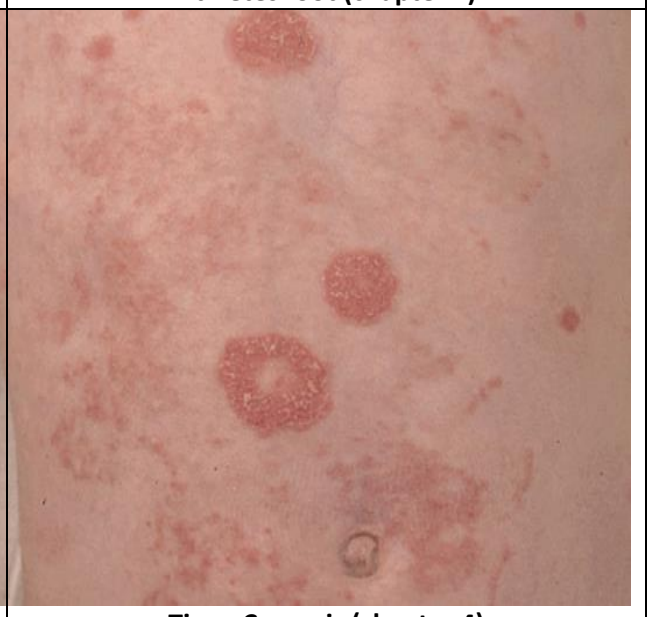
Allergic Contact Dermatitis (chapter 4)

Irritant Contact Dermatitis (chapter 4)

Athletes foot (chapter 4)



Fungal nail infection (chapter 4)

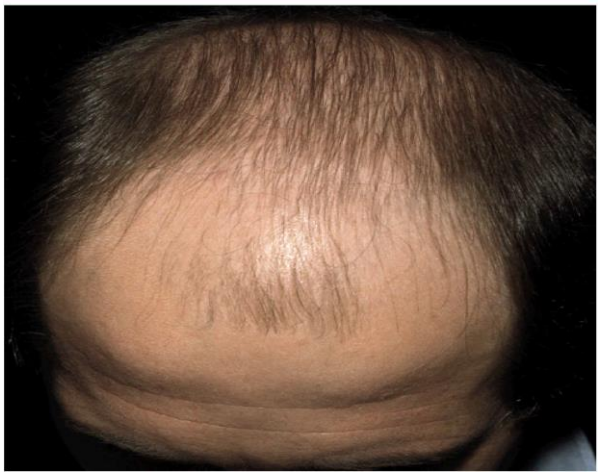


Tinea Corporis (chapter 4)

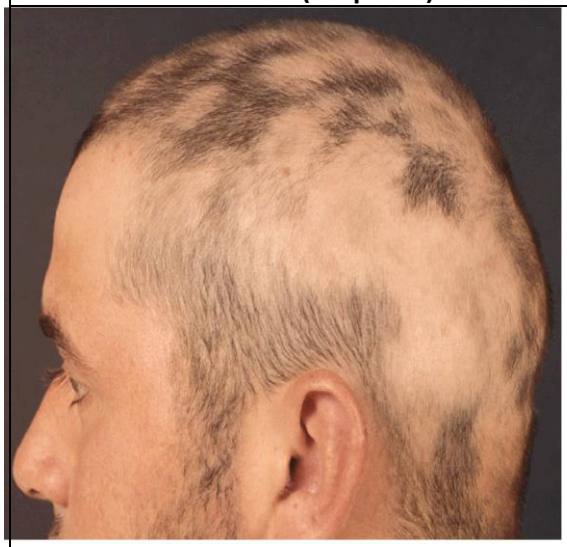
Pityriasis(tinea) versicolor (chapter 4)

Tinea capitis (chapter 4)

Tinea cruris (chapter 4)



Androgenetic alopecia (chapter 4)

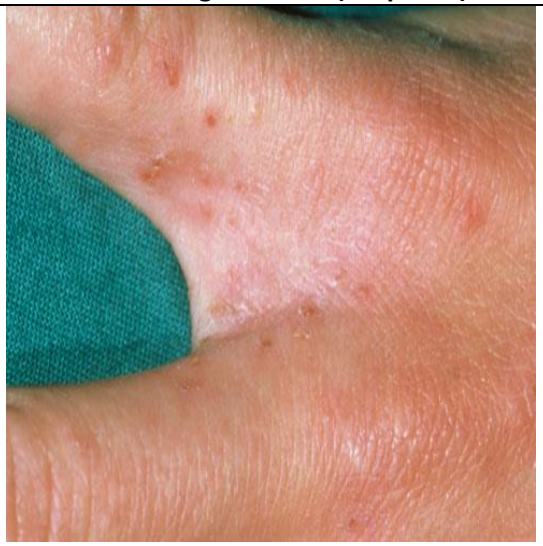


Alopecia areata (chapter 4)

First degree burns (chapter 4)

Second degree burns (chapter 4)

Third degree burns (chapter 4)

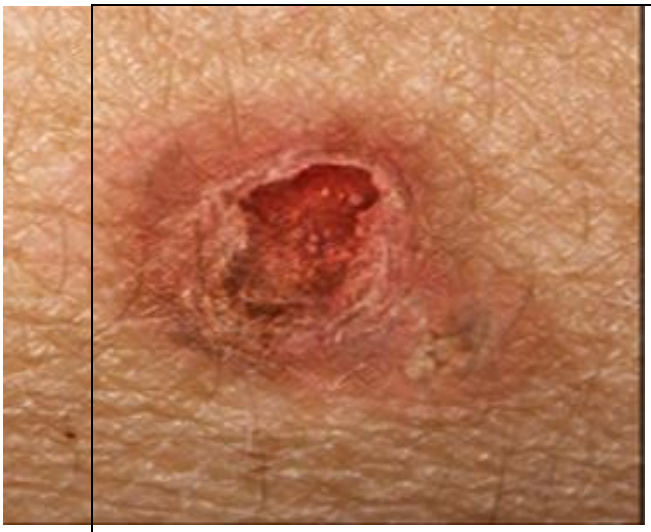


Scabies (chapter 4)

Dermatitis herpetiformis elbow (chapter 4)

Malignant melanoma (chapter 4)

Basal cell carcinoma (chapter 4)



Squamous cell carcinoma (chapter 4

Common wart (chapter 4)

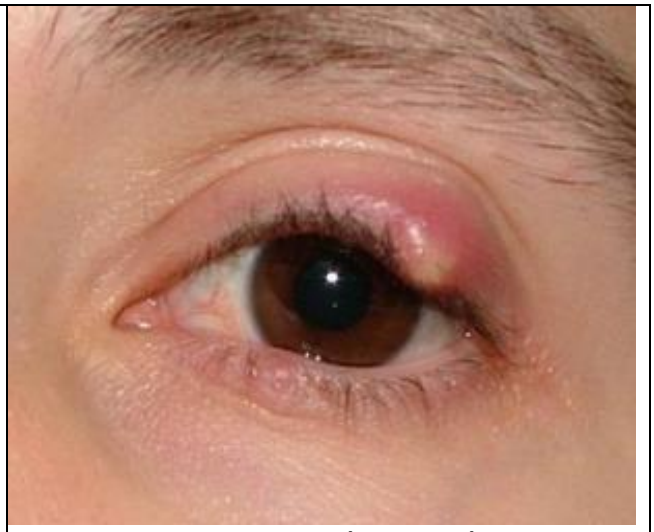
Verrucae (chapter 4)

Bruising (chapter 7)

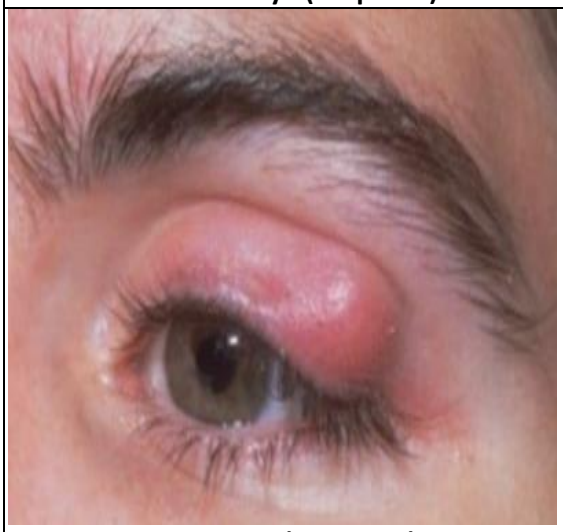
Allergic conjunctivitis (chapter 8)

Bacterial conjunctivitis (chapter 8)

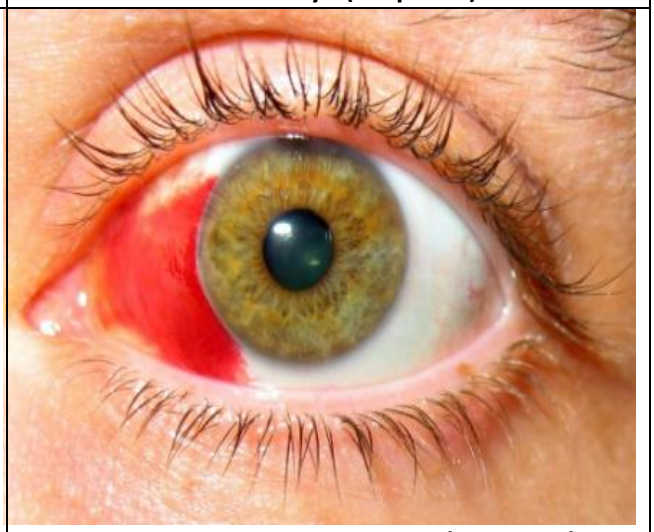
Internal stye (chapter 8)



External stye (chapter 8)

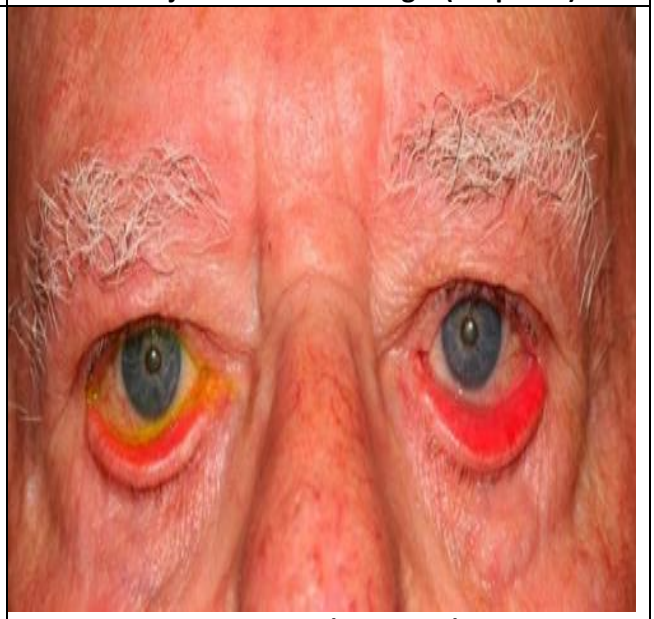


Chalazion (chapter 8)



Subconjunctival hemorrhage (chapter 8)

Blepharitis (chapter 8)



Ectropion (chapter 8)