

SEARO Regional Health Papers No.16

ESSENTIAL DRUGS for Primary Health Care

A MANUAL FOR
HEALTH CARE WORKERS



World Health Organization
Regional Office for South-East Asia
New Delhi
September 2000

Essential Drugs for Primary Health Care

This monograph was prepared by Dr Kin Shein, Regional Adviser in Essential Drugs and Medicines Policy (EDM) in collaboration with Dr B.B. Gaitonde, former Senior Public Health Administrator, WHO Regional Office for South-East Asia and Professor S.D. Seth, former Professor and Chairman of the Department of Pharmacology, All India Institute of Medical Sciences, New Delhi. Thanks are expressed to the following officials for reviewing and contributing to the book: WHO headquarters: Dr G. Baghdadi, DAP, and Dr R. Gray, PAR; WHO Regional Office for South-East Asia: Dr P.R. Arbani, MAL, Dr S. Acharya, MCH, Dr T. Frieden, STB, Dr A. Louhenapessy, former Regional Adviser, LEP and Dr J.P. Narain, HSI-STB. Dr Narain also contributed the chapter on Sexually Transmitted Infections.

First edition, 1988
Second edition, 1992
Third edition, 2000

ISBN 92 9022 185 2
© World Health Organization 2000

Publications of the World Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. For rights of reproduction or translation, in part or in toto, of publications issued by the WHO Regional Office for South-East Asia, application should be made to the Regional Office for South-East Asia, World Health House, Indraprastha Estate, New Delhi 110002, India.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication are those of the author and do not necessarily reflect the decisions or stated policy of the World Health Organization; however they focus on issues that have been recognized by the Organization and Member States as being of high priority.

Printed in India

Contents

Part I – Essential Drugs: How and when to use them

	<i>Page</i>
<i>Preface</i>	v
1. Aspirin	1
2. Atropine	3
3. Benzyl Benzoate	5
4. Gamma Benzene Hexachloride (Lindane)	7
5. Calamine Lotion	8
6. Chlorhexidine	10
7. Chloroquine	12
8. Chlorpheniramine	15
9. Codeine	17
10. Co-Trimoxazole	19
11. Ferrous Sulphate	22
12. Folic Acid	24
13. Gentian (Crystal) Violet	26
14. Ispaghula	27
15. Magnesium Hydroxide	29
16. Mebendazole	31
17. Metronidazole	33
18. Neomycin-Bacitracin Ointment	35
19. Oral Rehydration Salts (ORS)	36
20. Oral Contraceptive Pill	42
21. Paracetamol	44
22. Penicillin	46
23. Amoxicillin and Ampicillin	49
24. Pyrantel	51
25. Povidone Iodine	53

	<i>Page</i>
26. Primaquine	55
27. Ringworm Ointment (Whitfield's Ointment)	57
28. Salbutamol	59
29. Senna	61
30. Sulphadimidine	63
31. Tetracycline Eye Ointment	65
32. Vitamin A	67
33. Vitamin B Complex	69
34. Vitamin D	71

Part II – Common Medical Problems: How to treat and when to refer cases to the doctor

1. Anaemia	73
2. Breathlessness	75
3. Constipation	78
4. Contraception	80
5. Cough	82
6. Diarrhoea	85
7. Ear Problems	88
8. Eye Problems	89
9. Fever	92
10. HIV / AIDS	95
11. Leprosy	97
12. Malaria	99
13. Pain	101
14. Pediculosis	104
15. Poisoning	106
16. Sexually Transmitted Infections	107
17. Snakebites and Insect Stings	109
18. Skin Problems including Allergic Reactions	113
19. Tooth Problems	115
20. Tuberculosis	117
21. Vomiting	120
22. Wounds, Burns and Shock	123

Preface

Primary health care is the key approach for achieving Health for All. At the primary health care level community health workers and other paramedical personnel are playing an important role in the delivery of health care. Although the emphasis is on health promotion and prevention of disease, health workers must learn how to use simple drugs to treat common illnesses and thus gain the confidence of the community. They also need to learn when to refer the patient to a doctor.

Countries in WHO's South-East Asia Region have now prepared lists of essential drugs to be used by primary health workers. The drugs have been selected on the basis of their proven quality, efficacy, safety, availability and low cost and based on the WHO model list of essential drugs.*

For the proper management of some common illnesses, it is not only necessary to know about the properties, uses and possible adverse effects of essential drugs, but also to have a reasonable knowledge about the ailments. The health worker should also be able to identify the stages of illness that call for assistance from a doctor.

This manual is intended to provide guidelines for the use of essential drugs by community health workers and auxiliary health personnel. It also gives guidelines for treating certain common illnesses and identifying patients who should be referred to a doctor. Furthermore, it provides information regarding the management of injuries due to accidents, burns and poisoning, including snake-bite. The manual should prove useful to trainers of paramedical and health workers.

An attempt has been made to write the manual in a simple language, and to give clear and practical instructions to help the user in making decisions when faced with a specific situation. Wherever necessary, illustrations have been included to amplify the technical information.

The responsibilities given to community health workers and paramedical personnel vary from country to country, and also the number of drugs allowed to be used by such persons. Although a single manual may not be able to fulfil the needs of all countries, it is hoped that this manual will serve as a core book to which additions or deletions can be made depending upon the specific needs of a country. It is essentially a prototype. Accordingly, the number of drugs and other topics discussed have purposely been kept large in order to facilitate the work of those who will be selecting material and adapting it to suit specific needs at the country level.

* Bangladesh, Bhutan, DPR Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka and Thailand

Part I – Essential Drugs:
How and when to use them

Aspirin

How does it help?

Aspirin (acetylsalicylic acid) relieves headache, bodyache, toothache, earache, muscular pain and pain in the joints. It also lowers fever (but does not correct the cause).

Aspirin has a specific action in a disease called rheumatic fever. This disease usually occurs in children and is associated with swelling and pain in many joints.

Aspirin is *not useful* in severe pain such as that following an accident, burns or a heart attack, or pain in abdomen.

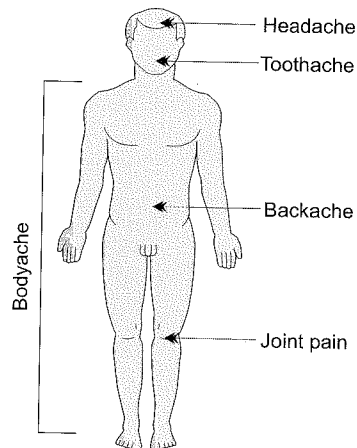
When should it be used?

1. To relieve aches and pains of muscles and joints.
2. To lower fever.
3. To relieve the symptoms of common cold.
4. To relieve pain and fever of rheumatic fever.

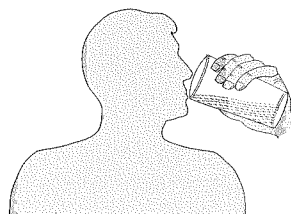
How is it supplied and given to patients?

Aspirin is supplied in tablets each containing about 300 or 500 mg of aspirin.

Types of pain in which aspirin is indicated



Plenty of water should be taken with aspirin



It is taken by mouth, with plenty of water and after some food (not on empty stomach).

It is mostly used in a single dose (one tablet) for relieving pain. However, the dose can be repeated after 6 hours if pain persists. For fever, aspirin is given 6 hourly.

Table 1.1 *Dosage of aspirin according to age*

Age group (Years)	Dose
3 – 5	300 mg, single dose, repeated every 8 hours, if necessary.
6 –12	300 mg, repeated every 6 hours, if necessary.
13 and above	300 – 500 mg, repeated every 6 hours, if necessary.

What are its side effects?

Aspirin may cause nausea and burning pain in the stomach; sometimes, the patient may vomit. In these cases stop aspirin and give magnesium hydroxide and refer to a doctor. In persons sensitive to aspirin, it may cause giddiness, tightness in the chest and breathlessness (asthma-like attack). In these cases also stop aspirin and refer to a doctor. In children suffering from influenza or chickenpox, aspirin may produce a severe reaction such as difficulty in breathing, disorientation, etc. (Reye's syndrome).

What precautions should be taken?

1. Aspirin should not be given to relieve pain and fever in children below 3 years as it has been reported to produce difficulty in breathing and changes in mental status varying from forgetfulness, lethargy, episodes of disorientation, agitation, damage to liver, progressive unresponsiveness, convulsions and respiratory arrest (Reye's Syndrome).
2. Do not give aspirin to patients who have nausea and/or stomach pain, use paracetamol instead. It is recommended that paracetamol (in place of aspirin) should be used to relieve pain and fever in children (see section on paracetamol).
3. Do not give aspirin in patients with a history of intolerance to aspirin (aspirin allergy/use paracetamol).
4. Do not give doses larger than recommended and avoid repeated use for a long time (not more than one week).
5. Children above two years, with fever, sore throat and joint pains may have rheumatic fever. They should be given paracetamol and refer to a doctor.

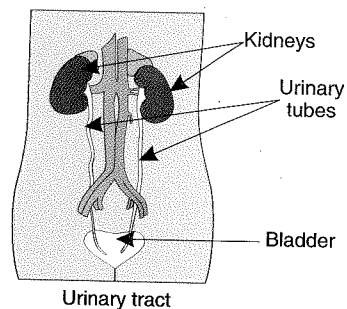
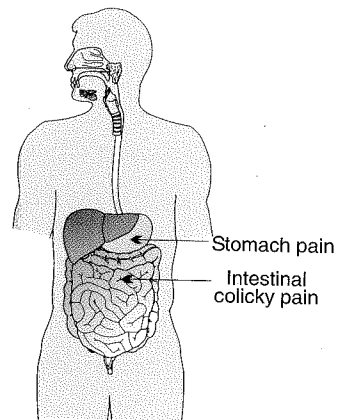
Atropine

How does it help?

Atropine sulphate relieves spasm of muscles of intestines, stomach and urinary tract. Contractions of such muscles gives rise to colicky (spasmodic) pain in abdomen. Further, it counters the toxic effects caused by swallowing insecticides, such as fenitrothion (Tik 20), diazinon or malathion (FINIT).

When should it be used?

1. Atropine sulphate is useful for relieving colicky pain in the abdomen arising from spasms of intestines or muscles of the urinary tract. Intestinal colic usually produces a gripping pain that comes in waves and may be associated with diarrhoea or constipation. Pain arising from the urinary tract is also severe and often radiates to the groin. It may be associated with vomiting and exhaustion.
2. Atropine sulphate can be life-saving in patients suffering from insecticide poisoning. A person who has swallowed insecticide develops nausea, vomiting, diarrhoea and abdominal pain. He/she may also experience breathing difficulties, muscle weakness and in severe cases convulsions and death may occur. Case of insecticide poisoning should be immediately referred to a doctor, where atropine injection can be given.



How is it supplied and given to patients?

Atropine sulphate is given orally as tablets or by injection. It is supplied as:

1. Atropine sulphate tablet, 1 mg.
2. Atropine sulphate injection, 0.5 mg or 1 mg/ml in 1 ml ampoule.

For abdominal colicky pain in adults, give $\frac{1}{2}$ to 1 tablet of atropine orally as a single dose. Children below 10 years may be given $\frac{1}{4}$ tablet. However, the dose can be repeated after 1 hour if pain persists. If still the pain is not controlled refer to a doctor.

What are its side effects?

Atropine sulphate causes dryness of mouth, blurring of vision, rapid pulse, flushing of skin and feeling of warmth. Old people may experience difficulty in passing urine.

What precautions should be taken?

1. Do not exceed the dose.
2. Do not give atropine to old people, especially those who have difficulty in passing urine (due to enlarged prostate) or who have any disturbance of vision (due to raised tension of the eye – glaucoma).
3. Do not give it to persons with known heart disease.
4. If abdominal pain persists or aggravates in spite of atropine, refer the patient to a doctor.
5. Patients suspected of insecticide poisoning should be referred to a doctor immediately.



Benzyl Benzoate

How does it help?

This drug, when applied to the body, kills the itch mite, a tiny insect that causes scabies. The mite usually resides between the fingers, on the wrist, in armpits and in between the buttocks. It is also found in palms, soles, around breasts and genitals. It causes small sores (burrows) with intense itching, which is usually worse at night. Following scratching these sores get infected with the formation of pus. Scabies is a disease caused by unhygienic conditions and spreads through close body contact and infected clothing.

When should it be used?

Benzyl benzoate is used to treat scabies.

How is it supplied and given to patients?

Benzyl benzoate is supplied as an emulsion containing 25 per cent of benzyl benzoate. In adults, it is used as supplied. For use in children, it is diluted with an equal volume (1:1) of clean water. For use in infants (below 1 year), one part is mixed with three parts of water (1:3).

Benzyl benzoate is applied over the whole body below the neck, preferably after a hot water bath. The application is painted on the dry skin and left for 24 hours. Every time hands are washed, the emulsion should be applied again. The application is repeated on the second day without a bath. At the end of two days, all the lotion is scrubbed off by a hot water bath.

What are its side effects?

Benzyl benzoate is an irritant to the skin. Hence, only diluted lotion should be used in children. For the same reason, it is not applied to the face or the neck. Care should be taken to avoid getting benzyl benzoate in the eyes.

What precautions should be taken?

1. It is not recommended for infants. Special care should be taken in children because it may cause irritant reactions specially on face and scrotum.
2. All members of the affected person's family, or at least those sharing the person's bed, should be treated at the same time.
3. In order to effect a complete cure, cover the whole body below the neck with benzyl benzoate.
4. Bathe and scrub the body before and after a course of treatment.
5. If the patient also has, or develops, a skin infection, treat it with oral co-trimoxazole or sulphadimidine (refer to relevant sections).
6. Explain to the patient that the itch may sometimes persist for as long as three weeks and that the application must not be repeated during this period. However, the patient may be given a tablet of chlorpheniramine to control itching (see section on Chlorpheniramine).
7. Following the treatment, all infected clothing and bedding should be disinfected by boiling, or airing in the hot sun.

Gamma Benzene Hexachloride (Lindane)

How does it help?

This drug is used in the treatment of scabies. It is also effective in the treatment of body louse (pediculosis).

When should it be used?

Lindane is used in the treatment of scabies and lice in hair.

How is it supplied and given to patients?

Lindane is supplied as 1 per cent lotion, cream or shampoo.

Lindane cream or shampoo is rubbed into hair to treat lice infestation and left on for 8 hours. Single application eradicates the lice.

For scabies, lotion is applied over the entire body from neck down and is not removed for 24 hours. Itching usually stops within this period. All the lotion is removed with a hot water bath. One application is enough to cure scabies. Rarely, a second or third application is needed. If so, may be made at weekly interval.

What are its side effects?

Lindane is odourless and nonirritant. It is relatively safe for external application to the skin but, if taken orally, causes convulsions.

What precautions should be taken?

Same as those mentioned under benzyl benzoate.

Calamine Lotion

How does it help?

Calamine lotion, when applied to the skin, has a protective and soothing effect, as well as a mild antiseptic action. Calamine is a pink-coloured powder insoluble in water. Its chemical name is zinc carbonate. The lotion is initially watery. When it is applied to the skin, the evaporation of water produces a cooling effect and the oozing of watery discharge is reduced.

When should it be used?

It is used to produce a soothing and protective effect on skin lesions caused by sunburn, eczema or allergic rash. Eczematous patches usually occur on the upper surface (dorsum) of feet, hands and outer surface of ears. Eczema and other allergic rashes are associated with itching. They can be distinguished from fungal skin diseases, such as ringworm, by the fact that allergic rashes do not cause scaling and that the borders of patches are not red and raised. The borders of ringworm patches are red and raised. Calamine lotion helps to reduce itching and allows the affected skin to heal naturally. It may also be applied to insect bites or stings for soothing effect.

How is it supplied and given to patients?

Calamine lotion is supplied as a pink-coloured lotion containing 15 g calamine, 5 g zinc oxide, 3 g bentonite, 0.5 g sodium citrate, 0.5 g liquified phenol, and 5 ml glycerol in 100 ml of freshly-boiled and cooled water.

Calamine is applied locally with clean cotton swab without rubbing. If there is watery discharge from the skin, the lotion should be applied repeatedly so that the skin does not become excessively dry.

What are its side effects?

Calamine has no side effects if applied externally.

What precautions should be taken?

Do not apply to open wounds and infected skin lesions associated with pus.

Chlorhexidine

How does it help?

Chlorhexidine is an antiseptic which is applied to the skin. It acts against many bacteria but has no action against bacteria causing tuberculosis or leprosy. It is also not effective against fungal diseases such as ringworm. When applied to the skin, it is well tolerated and hence is useful for treating or preventing skin infections.

When should it be used?

1. Chlorhexidine is used to treat superficial skin infections, such as superficial ulcers (open wounds), abrasions and boils.
2. It is used as an antiseptic solution to clean the skin – for example, in the cleaning of the vulva and perineum during labour.
3. It can also be used as mouth wash and for washing hands before carrying out any surgical procedures.

How is it supplied and given to patients?

Chlorhexidine gluconate is available as a 20 per cent concentrated solution and chlorhexidine hydrochloride in powder form.

It is used in the form of a diluted solution or an ointment to be applied locally.

Chlorhexidine gluconate 0.5 per cent is used for washing hands before any surgical procedure and for cleaning the skin. It is prepared by diluting one part of 20 per cent solution to forty parts of water.

It is used for bathing mothers and babies in maternity units, as a 0.025 per cent solution, prepared by diluting 0.5 per cent solution with twenty volumes of clean water. Solution of the same strength can also be used for cleansing wounds.

Chlorhexidine hydrochloride (0.5 per cent) is used as a dusting powder or as an ointment for application to ulcers and skin infections.

For use as a mouth wash, 0.1 per cent of chlorhexidine gluconate solution is used thrice daily and held in the mouth for one minute. This solution can be prepared by diluting 1 ml of 20 per cent concentrate solution to 200 ml with drinking water, preferably boiled and cooled, or by diluting 2 ml of 0.5 per cent solution to 10 ml with drinking water.

What are its side effects?

Rarely, chlorhexidine may cause allergic rash. The concentrated solution may cause irritation of the mucous membranes.

What precautions should be taken?

1. Do not mix chlorhexidine with soap.
2. Cork and cork-liners inactivate chlorhexidine and hence should not be used for containers in which chlorhexidine is stored.
3. Do not use chlorhexidine in the ears of patients with perforated ear drums.
4. Store chlorhexidine solution in a cool, dark place protected from light.
5. Do not store diluted solution for more than two days.



Chloroquine

How does it help?

Chloroquine acts against the parasite that causes malaria. The parasite is introduced into human body through a bite of infected female Anopheles mosquito. A patient with malaria has repeated attacks of high fever with rigors. The fever keeps coming back at intervals and between the attacks, body temperature remains normal. Fever may be accompanied by headache and backache. Chloroquine suppresses the attack and cures some types of malaria.

When should it be used?

Chloroquine is highly effective in sensitive cases of malaria. In certain areas, it may fail when the malarial parasites are resistant to chloroquine. If a patient fails to respond to the drug, refer to a doctor. It can be given safely to children and pregnant women.

How is it supplied and given to patients?

Chloroquine is supplied as tablets each containing 150 mg of chloroquine base, which is equivalent to tablets containing 200 mg of chloroquine sulphate, or as tablet containing 250 mg of chloroquine phosphate. The syrup contains 50 mg of chloroquine base per 5 ml (1 teaspoonful). Chloroquine is usually given orally as tablet or syrup. In severe cases associated with vomiting, an injection of chloroquine is used by doctors.

Table 7.1 *Dosage of chloroquine for the treatment of an attack of malaria*

Patient's age (Years)	Day of treatment	Dose
Up to 1	1	1½ teaspoonful (½ tablet) initially, ¼ teaspoonful (¼ tablet) to be repeated after 6 hours
	2 and 3	½ teaspoonful (¼ tablet)
1 – 3	1	3 teaspoonful (1 tablet) initially, and 1 – ½ teaspoonful (½ tablet) 6 hours later
	2 and 3	1½ teaspoonful (½ tablet)
4 – 6	1	1½ tablets initially and ¼ tablet 6 hours later
	2 and 3	¾ tablet
7 – 11	1	2 tablets initially, and 1 tablet 6 hours later
	2 and 3	1 tablet
12 and above	1	4 tablets initially, and 2 tablets 6 hours later
	2 and 3	2 tablets

Note: If it is possible to weigh the child, you may calculate how much chloroquine to give the child as follows: 10 mg per kilogram of body weight initially, and 5 mg per kilogram 6 hours later and on the second and third days.

Chloroquine is also used to prevent malarial attacks. When visiting known malarial areas, advise people to take the following doses:

Table 7.2 *Dosage of chloroquine according to age for prevention of malarial attacks*

Patient's age (Years)	Patient's weight (kg)	Dose
Under 1	up to 5 kg	1½ teaspoonful of syrup once a week
1 – 5	5 to 20 kg	3 teaspoonful (1 tablet) once a week
6 – 12	20 to 40 kg	1½ tablets once a week
Above 13	over 40 kg	2 tablets once a week

What are its side effects?

Chloroquine is bitter and can cause stomach upset, nausea and sometimes vomiting. It may sometimes also cause a rash. However, chloroquine is relatively safe if given in the doses recommended above.

What precautions should be taken?

1. If possible, take a blood smear from the patient before starting treatment and send it to a laboratory for examination to confirm the diagnosis of malaria.
2. Use chloroquine in all suspected cases of fever with rigor.
3. Chloroquine should be taken after food.
4. For preventive use, start administering the drug a day before the likely exposure to malaria and continue on a weekly basis for at least four weeks after leaving the malarious area.
5. Children may not be able to swallow a tablet because it is very bitter. If chloroquine syrup is not available, give the child a tablet crushed and mixed with honey or thick syrup.
6. If a patient with fever and rigor also becomes delirious or develops a stiff neck - is suspected to have malaria of the brain - refer the patient immediately to a doctor.



Chlorpheniramine

How does it help?

Chlorpheniramine (chlorphenamine) is used in the treatment of allergy. Some persons develop reactions to allergens, which may be certain foods, perfumes, toiletry articles, chemicals, plastics, synthetic fibres, drugs and even certain plants, flowers and animal hair. Allergic reactions occur after eating, inhaling or touching such agents. Patients start to itch; develop a skin rash in the form of tiny raised red areas, their noses run, their eyes become red, and they may experience breathlessness or wheezing. Sometimes, they get fever and joint pains. A severe allergic attack can even result in a drop in blood pressure and shock (Anaphylaxis). These symptoms are due to the release of a chemical substance called histamine in the body in response to the allergen. Chlorpheniramine gives relief in such conditions by blocking the actions of histamine.

When should it be used?

1. Chlorpheniramine can be used to treat allergic reactions. It does not correct the cause of allergy. The cause should be identified, if possible, by trying to find out what the patient ate, drank or breathed prior to the onset of allergic reactions.
2. It can be used to treat allergic drug reactions, such as those which may occur following the administration of penicillin or sulphonamides.
3. It is also used for allergic reactions following insect bites.
4. It can also be used to provide relief in cold and cough due to viral infection.

How is it supplied and given to patients?

Chlorpheniramine is given orally. It is supplied as tablets each containing 4 mg of chlorpheniramine maleate and syrup containing 2 mg of chlorpheniramine maleate per 5 ml (one teaspoonful).

Table 8.1 *Dosage of chlorpheniramine according to age*

Patient's age (Years)	Dose
Under 1	1 mg ($\frac{1}{2}$ teaspoonful) two times daily
1 – 5	1 mg ($\frac{1}{2}$ teaspoonful) three times daily
6 – 12	2 mg ($\frac{1}{2}$ tablet or 1 teaspoonful) three times daily
13 and over	4 mg (1 tablet) three times daily

What are its side effects?

Chlorpheniramine may cause sleepiness, mental dulling and dryness of mouth.

What precautions should be taken?

1. All patients who have allergic reaction associated with a fall in blood pressure (Anaphylaxis) should be referred to a doctor immediately.
2. The patient should be informed that his/her ability to drive a car or operate a machine may be temporarily affected, after taking chlorpheniramine.
3. The patient should be advised not to drink alcohol in any form during chlorpheniramine administration.
4. The drug should not be used for more than four days and the dose should not be exceeded. If there is no response, the patient should be referred to a doctor.

Codeine

How does it help?

Codeine has three important properties: it suppresses dry, irritating cough; relieves mild to moderate pain, and induces constipation.

When should it be used?

1. Codeine is used to suppress a dry, irritating cough, particularly when it disturbs the sleep. This is a purely temporary measure to make the patient comfortable. It is more important to treat the disease that is causing the cough.
2. Codeine can be used to relieve mild to moderate pain. It acts in a way different from aspirin, and can be combined with it for more potent action. This may be necessary in patients with severe bodyaches, joint pains, accidental injuries or burns.

How is it supplied and given to patients?

Codeine is given orally. It is supplied as tablets each containing 15 mg of codeine phosphate and as syrup containing 15 mg/5 ml (one teaspoonful) of codeine phosphate.

Dose

Please refer to the table given below:

Table 9.1 *Dosage of codeine according to age*

Indication	Patient's age (Years)	Dose
Cough suppressant	1 – 5	1 ml (¼ teaspoonful) syrup three times a day
	6 – 12	2.5 ml (½ teaspoonful) syrup three times a day
	13 and over	5 ml (1 teaspoonful) syrup three times a day Do not give for more than four days
Pain	13 and over	15 mg (1 tablet) initially, repeated at 8 hours interval. Do not give for more than 48 hours.

What are its side effects?

Codeine causes constipation, sleepiness and giddiness. Old people may experience difficulty in passing urine.

What precautions should be taken?

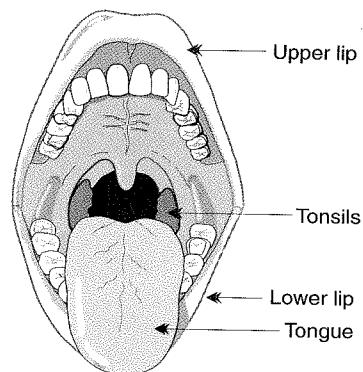
1. Codeine is used as a temporary measure to make the patient comfortable. Do not exceed the dose or duration of therapy.
2. Avoid giving to children below one year of age, to old people and women in late pregnancy.
3. Do not use codeine to treat a patient with cough of over two weeks' duration. Refer the patient to a doctor.
4. Avoid giving codeine to persons with known liver disease or jaundice.
5. Advise the patient to avoid drinking alcohol during codeine treatment.

Co-Trimoxazole

How does it help?

Co-trimoxazole is a mixture of two drugs, and contains 400 mg of sulphamethoxazole (a sulphonamide) and 80 mg of trimethoprim per adult tablet. It cures infections caused by certain types of bacteria. It is not effective in virus infections, such as common cold, influenza and chickenpox or in tuberculosis and leprosy. It can be used in patients who cannot tolerate penicillin, or when it is not possible to administer injectable penicillin.

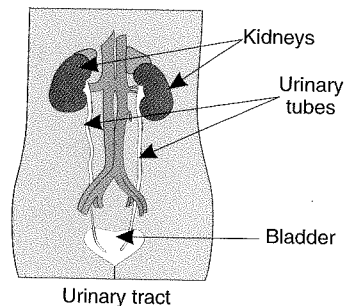
Interior view of the mouth showing tonsils where infection can occur



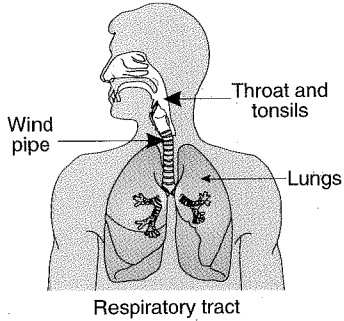
When should it be used?

1. In the treatment of the infection of tonsils called tonsillitis. Ask the patient to open his mouth and look at the tonsils and throat with torch light or in good light. In tonsillitis, the tonsils situated on either side of the base of the tongue are swollen and red. They may also show whitish or greyish spots. The patient usually complains of pain in the throat and difficulty in swallowing. In children, if you see grey membrane adherent to tonsils and the throat, suspect diphtheria and refer to a doctor.
2. In infections of the urinary passages. In such conditions, the patient complains of pain in the groin, fever and burning while passing urine.

Organs involved in urine formation and collection where infection can occur



Organs involved in breathing (respiration) which can get infected



3. In infection of respiratory passages of short duration. These are characterized by cough and sputum. In children, a cough associated with rapid breathing (60 or more per minute), fever and chest indrawing suggests acute respiratory infection (see section on Ampicillin).
4. In the treatment of acute dysentery caused by bacteria. In this condition, the patient passes large, liquid stools, mixed with blood and mucus (whitish slimy matter).
5. In the treatment of infection of middle ear (otitis media). In this condition, the patient complains of earache and fever, and may have ear discharge.

6. In skin infections and abscess. Co-trimoxazole can also be used in the treatment of skin infections, for example, infected scabies and abscess (pus formation).
7. In chancroid. This is a sexually-transmitted disease. The patient has a painful ulcer on the penis with swellings in the groin.
8. In the treatment of typhoid fever. Typhoid fever occurs as a continuous fever and it does not respond to penicillin or sulphadimidine. Any continuous high fever lasting more than 5 – 6 days should be suspected as typhoid and refer to a doctor.

How is it supplied and given to patients?

Co-trimoxazole is given orally. It is supplied as co-trimoxazole tablets for adults containing sulphamethoxazole (400mg) and trimethoprim (80mg) and a paediatric tablet containing sulphamethoxazole (100mg) and trimethoprim (20mg). A syrup for use in children contains 200 mg of sulphamethoxazole and 40mg trimethoprim per 5 ml (one teaspoonful). However, syrup is expensive and may deteriorate in tropical countries.

Table 10.1 *Dosage of co-trimoxazole according to age*

Patient's age	Dose
2 months to 1 year	½ adult tablet or two paediatric tablets crushed and mixed with honey or sugar and water two times daily at 12-hour intervals
1 – 5 years	1 adult tablet or three paediatric tablets administered as above two times daily
6 – 12 years	1½ adult tablets two times daily
13 years and over	2 tablets two times daily

Note: If the child can be weighed, you can calculate proper dose on that basis: 50 mg of sulphamethoxazole per kg per day in two divided doses.

The treatment is continued for 5 days in the case of tonsillitis, otitis media, dysentery and acute respiratory infections, and for 10 days in the case of infections of the urinary passages.

What are its side effects?

Co-trimoxazole may cause mild stomach upsets, nausea and vomiting. Skin rashes, liver damage or a decrease in blood cells are some of the rare serious toxic effects.

What precautions should be taken?

1. Do not use this drug if the patient has a history of rashes and fever following any sulphonamide. Similarly, if you notice a skin rash or if the patient complains of joint pains following the treatment, do not continue the drug. Refer the patient to a doctor.
2. Ensure that the patient passes an adequate amount of urine before and during treatment by advising the patient to drink plenty of water.
3. Do not use the drug during pregnancy, lactation and in infants under six weeks of age, or in a patient with known liver damage or decreased urine output.
4. Do not continue the drug beyond the recommended period. If the patient does not improve within four days of starting therapy, refer the patient to a doctor.
5. Do not use the drug to treat infection in a patient with AIDS. Refer the patient to a doctor immediately.

Ferrous Sulphate

How does it help?

Ferrous sulphate contains iron required for the production of haemoglobin, which gives red colour to blood. Deficiency of iron causes deficiency of haemoglobin resulting in anaemia. An anaemic person looks pale, feels weak and gets tired easily. In severe cases, swelling of the feet may develop. Iron-deficiency anaemia is common in women of child-bearing age due to loss of blood in menstruation and following repeated pregnancies. Patients who suffer from bleeding piles, stomach ulcer or hookworm infestation also suffer from anaemia. Administration of ferrous sulphate corrects iron deficiency and cures this type of anaemia. It is the cheapest and the most effective iron preparation.

When should it be used?

1. In the treatment of iron-deficiency anaemia.
2. It is also used to prevent anaemia in pregnant women, young children and in women who complain of heavy loss of blood during menstruation.

How is it supplied and given to patients?

It is supplied as tablet each containing 200 mg of dried ferrous sulphate equivalent to 60 mg of elemental iron. It is given orally. For children, a tablet can be crushed and given mixed with honey or syrup or an oral solution containing 25 mg of iron (as sulphate) in 1 ml.

Table 11.1 *Dosage of ferrous sulphate according to age*

Patient's age (Years)	Dose
Up to 1	¼ tablet powdered and mixed with honey, milk or water two times daily (¼ portion of crushed tablet) or liquid preparation 5 drops two times a day with milk
1 – 5	½ tablet powdered and mixed with honey, milk or water two times a day or liquid solution 1 ml two times a day.
6 – 12	1 tablet two times daily
12 and over	1 table three times daily

Note: Continue the treatment for six months. For the prevention of anaemia in adults, give one tablet daily.

What are its side effects?

In a few patients, it causes stomachache, nausea, diarrhoea or constipation.

What precautions should be taken?

1. If the initial dose causes stomach upset, use a smaller dose and increase it gradually.
2. Instruct the patient to take the dose after food and not on an empty stomach. Mothers should be told to give iron preparations to a child after food.
3. If the patient is unable to tolerate ferrous sulphate, refer the patient to a doctor.
4. Keep iron tablets, which are usually sugar coated, away from children. Swallowing of such tablets in large amounts as candy by children can cause death.
5. In pregnancy or in patients with general nutritional deficiency, give iron tablets containing ferrous sulphate and folic acid. Of course, correction of diet and food habits is also important.
6. While under treatment, refer the patient to a doctor for finding out the cause of anaemia, which will need correction.

Note: Green leafy vegetables (spinach, watercress etc.), cereals and lentils are rich source of iron. Ask the patient to eat plenty of green leafy vegetables.

Gentian (Crystal) Violet

How does it help?

Gentian violet is a purple-coloured dye available in crystal or powder form. When applied as a solution, it has an antiseptic action against a number of bacteria and certain fungi which cause infection of skin and mucous membrane.

When should it be used?

1. It is used locally in the form of a solution to treat boils, burns and infections of the skin.
2. It is used as an antiseptic to treat chronic ulcers.
3. It is used to treat fungus infections of skin and mucous membranes of the mouth and vagina. Fungus infection in the mouth presents as creamy white or grey patches which may be deep and extensive enough to cause difficulty in swallowing. It is particularly useful for fungus infection which affects the skin between the toes and fingers characterized by soddening of skin and itching.

How is it supplied and given to patients?

It is supplied as a watery solution (0.5 per cent) to be applied undiluted to the lesions.

What are its side effects?

None.

What precautions should be taken?

Remember that it stains clothes.

Ispaghula

How does it help?

These are dried seeds of a plant. They are hard, dull white in colour, and contain slimy material. When put in water, the seeds absorb water and swell. When such a mixture is swallowed, the seeds are not digested but remain swollen, contributing to the bulk of faecal matter. This results in the evacuation of the bowel.

When should it be used?

It is used to treat constipation. It is safe, does not cause griping pain in the abdomen and reduces the need for straining at the time of passing stools. Ispaghula is particularly useful in the treatment of constipation in old people, in patients with heart disease, during pregnancy and in patients with piles or anal fissure.

How is it supplied and given to patients?

It is supplied as ispaghula husk, dull white in colour, or as a processed powder. The required amount of seeds or powder is mixed with a glass of water or milk and a small amount of sugar is added to taste. The mixture is stirred and then taken orally, usually at bedtime. It causes bowel evacuation the next morning.

Dose

For adults, two teaspoonful of husk or powder in a glass of water or milk is given once daily at bedtime. For children, give $\frac{1}{2}$ to 1 teaspoonful mixed with water or milk once daily at bed time.

What are its side effects?

It is safe and well tolerated. Rarely, it may cause bloating of the abdomen and formation of gas.

What precautions should be taken?

1. Ispaghula should not be swallowed dry.
2. Instruct the patient to take plenty of water.
3. Do not give it to a patient who develops sudden constipation, associated with abdominal pain, vomiting and tightness of abdominal muscles. Such cases should be referred to a doctor.

Magnesium Hydroxide

How does it help?

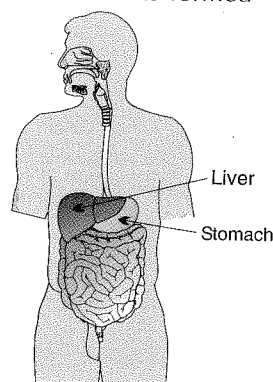
Magnesium hydroxide neutralizes the acid in the stomach. It is called antacid. When given orally, it gives relief from abdominal pain due to irritation of stomach, stomach ulcer, or heartburn (pain behind the breastbone occurring after food). It also relieves a feeling of bloating after food. It forms a gel-like material with water. The gel covers the stomach lining and exerts a protective effect.

When should it be used?

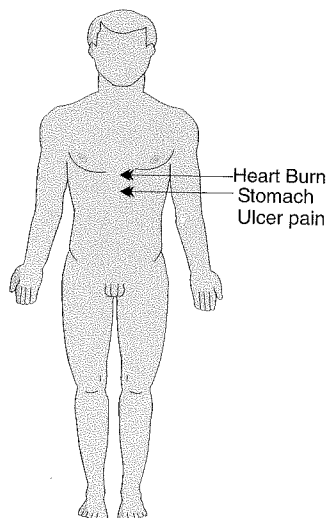
1. In the treatment of stomach irritation and stomach upsets following eating of certain irritant foods.
2. In the treatment of suspected or known stomach ulcers. In this condition it is used in larger doses and over a longer period. It not only relieves pain but also helps to heal the ulcer.

Pain due to stomach ulcer usually occurs in the upper abdomen. It may be described as "hunger pain", which slowly builds up, is steady for 1–2 hours and then gradually subsides. Sometimes, the patient may describe it as "burning". The pain is promptly relieved by taking food or antacid drugs but reappears within 2–3 hours. Pain that awakens the patient from sleep 1–2 hours after retiring is characteristic of stomach ulcer.

*Organs of digestive system:
Stomach is the site where
acid is formed and pain
is felt if ulcer is formed*



*Location of heart burn and
stomach ulcer pain*



3. In patients who complain of regurgitation of sour (acid) stomach juice and pain behind the breastbone (heartburn) after eating.

How is it supplied and given to patients?

It is supplied as tablet each containing 300 mg of magnesium hydroxide and liquid preparation containing magnesium hydroxide (about 8%).

It can be given orally, either as a chewable tablet or a mixture. Though liquid preparation is more effective, tablets are convenient.

Dose

For indigestion due to acidity and heartburn, give 2 tablets of magnesium hydroxide or 5 – 10 ml of liquid preparation, 3 – 4 times a day usually after meals, when the symptoms are most intense.

For stomach irritation and suspected stomach ulcers, similar doses are given between meals, and the dose is doubled (4 tablets or 10 – 20 ml) at bedtime. If pain persists, additional doses may be given at hourly intervals or less frequently.

For better effect, instruct the patient to chew the tablet.

What are its side effects?

Magnesium hydroxide is not absorbed, and therefore, does not produce any serious side effects. Magnesium hydroxide may cause loose stools.

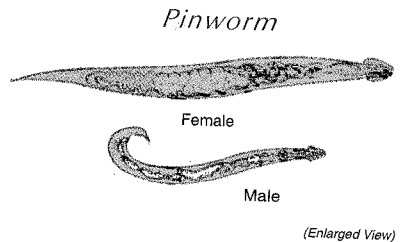
What precautions should be taken?

1. Magnesium hydroxide may interfere with the absorption of drugs prescribed for other ailments. It should, therefore, be administered separately.
2. If the stomach pain is not relieved or symptoms become worse at any time, refer the patient to a doctor. Similarly, refer all patients who get repeated attacks of abdominal pain.

Mebendazole

How does it help?

Mebendazole acts on roundworms and pinworms. In addition, it also acts against hookworms and, to a certain extent, against whipworms and tapeworms. It is thus, useful in the treatment of a variety of worms found in the intestines. After taking mebendazole, the worms are paralyzed and passed out in stools.



When should it be used?

1. It is a drug of choice in pinworm infestation. Pinworms are white in colour, small, about 0.5 – 1 cm in length. The motile worms are found in large numbers in stools, particularly in children. They may also be found in the folds of the skin round the anus and cause itching.
2. It is also useful in roundworm infestation (see section on Pyrantel).
3. It is useful in hookworm disease. Hookworms are small (like a piece of thread) about 1 – 1.5 cm in length and whitish in colour. They suck blood from the intestinal wall and thus cause iron-deficiency anaemia.
4. It has a limited effect on the whipworms. These worms are thin about 3 – 5 cm long and look like tiny whips.

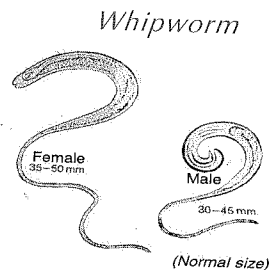
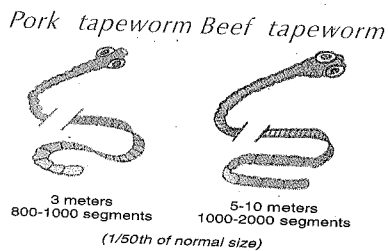
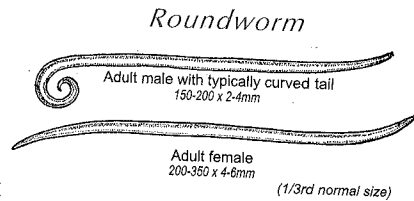


Table 17.1 *Dosage of metronidazole in adult patients suffering from amoebic dysentery, vaginal infections and infected wounds*

Indication	Dose
Amoebic dysentery	2 tablets of 400 mg each three times daily for five days.
Vaginal infection	1 tablet of 400 mg two times daily for 7 days or a single dose of 5 tablets.
Infected wounds	1 tablet of 400 mg three times daily for 7 days.

Table 17.2 *Dosage of metronidazole in children suffering from amoebic dysentery*

Patient's age (Years)	Dose for amoebic dysentery	
1 – 2	100 mg (1 teaspoonful)	All the doses are given three times daily for 5 days.
2 – 3	200 mg (2 teaspoonful)	
4 – 7	300 mg (3 teaspoonful)	
8 – 12	400 mg (1 tablet)	

What are its side effects?

It has a bitter taste and causes gastric upset, nausea and, rarely, vomiting. It may cause headache and a metallic taste in the mouth. Usually these are mild.

What precautions should be taken?

1. Inform the patient that it may cause mild gastric upset. However, if the gastric upset is severe, stop the drug and give magnesium hydroxide and refer the patient to a doctor.
2. Do not give the tablet on an empty stomach.
3. Advise the patient not to drink alcohol while on this drug.
4. In the case of vaginal infection, treat also the male partner. In such cases, sexual intercourse should be avoided until the discharge has stopped completely.
5. Do not use the drug during pregnancy and lactation.
6. Promptly discontinue the drug if patient has unsteady gait, confused state or convulsion. Refer the patient to a doctor.

Neomycin–Bacitracin Ointment

How does it help?

It is an ointment containing two antibiotics, effective against a wide range of germs (bacteria) but not against fungus infections. The ointment is applied to the skin for treating infected wounds.

When should it be used?

It is used to treat skin infection such as infected ulcers, wounds and abrasions.

How is it supplied and given to patients?

The ointment contains 5 mg of neomycin sulphate and 500 IU bacitracin per gram in a tube of 5 g.

It is applied to the infected wound which is covered with sterile gauze and bandaged. It can be applied two times a day for 2 – 4 days.

What are its side effects?

It is safe for local application only. It may rarely cause a skin rash.

What precautions should be taken?

1. Advise the patient to wash hands before applying the ointment.
2. Apply the ointment after cleaning the wound or abrasion with clean water, preferably boiled previously.
3. Never use the ointment for eyes.
4. Store the ointment in a cool place.
5. Do not use the ointment after its expiry date.

Oral Rehydration Salts (ORS)

How does it help?

A person who passes frequent watery stools (diarrhoea) loses a large amount of water and salts from the body. Sudden loss of water and salt (dehydration) results in marked weakness, thirst and sunken eyeballs. Severe diarrhoea produces decreased urine output, increased pulse rate and unconsciousness resulting in death. It is estimated that about one out of every ten children born in developing countries dies of diarrhoea before reaching the age of five years. Oral rehydration salts (ORS) contain sugar and mineral salts needed by the body. When taken dissolved in water, they promptly replace the water and salts lost during diarrhoea and correct dehydration.

When should it be used?

Oral rehydration salts (ORS) are intended for the replacement of water and salts lost in acute diarrhoea. It is vital that these losses are rectified as rapidly as possible, particularly in infants and young children.

How is it supplied and given to patients?

Packets are recommended, each containing the following:

Table 19.1 *Composition of oral rehydration salts*

ORS – bicarbonate			ORS – citrate	
Sodium chloride	3.5 g	OR	Sodium chloride	3.5 g
Sodium bicarbonate	2.5 g		Trisodium citrate dihydrate	2.9 g
Potassium chloride	1.5 g		Potassium chloride	1.5 g
Glucose	20.0 g		Glucose	20.0 g
Total weight:	27.5 g			27.9 g

Dissolve, immediately before use, one packet in one liter of clean, boiled and cooled water, or, in the quantity of water indicated on the packet. If a liter measure is not available, use a glass. Average medium-size glass has about 180–200 ml capacity. Sometimes soft drink bottles (for example, Coca Cola or milk bottles) with known capacity may be available. The volume of fluid required and the rate at which it should be given depend upon:

- the weight or age of the child;
- the initial degree of dehydration;
- the rate of fluid loss as long as diarrhoea persists.

Initial Treatment

The degree of dehydration is determined by the general appearance of the child and the signs given in table 19.2

Table 19.2 *Features to assess the degree of dehydration*

General appearance and condition of infant or child		No dehydration	Some dehydration	Severe dehydration
Look at	General	Well alert	Restless, irritable	Lethargic Unconscious
	Eyes	Normal	Sunken	Very sunken
	Thirst	Drinks water, not thirsty	Thirsty, drinks eagerly	Drinks poorly or not able to drink
	Skin Pinch	Goes back quickly	Goes back slowly	Goes back very slowly
Decide		The patient has no sign of dehydration	If the patient has two of the above mentioned signs, there is some dehydration	If the patient has two of the above mentioned signs - there is severe dehydration
Treat		Use Treatment Plan A (to be given by mother)	Weigh the patient if possible and use treatment Plan B (to be given under supervision of Health Worker)	Weigh the patient & use treatment Plan C urgently (to be given by Health Worker)

Treatment Plan A (At Home By Mother)

Three rules for treating diarrhoea at home.

1. Give the child more fluids than usual to prevent DEHYDRATION (See table 19.3)
2. Continue to feed the child to prevent undernutrition.
3. Take the child to the health worker if the child does not get better in 3 days or develops any of the following
 - Many watery stools
 - Repeated vomiting
 - Marked thirst
 - Eating or drinking poorly
 - Fever
 - Blood in the stool

Table 19.3 *Requirements of ORS according to age at home in case of diarrhoea*

Age	Amount of ORS after each loose stool	Amount of ORS to provide for use at home per day
Less than 2 years	½ glass	2 glasses
2 to 10 years	1 glass	4 glasses
10 years or more	As much as the child wants	8 glasses

Treatment Plan B (By Health Worker)

Table 19.4 *Approximate amount of ORS solution to be given in the first 4 hours*

Age	Months			Years		
	Less than 4	4–11	12–23	2–4	5–14	15 or older
Local measure (glass)	1 ¼	2	3	4 ½	6	12

- If the child wants more ORS than shown, give more.
- Encourage the mother to continue breast feeding in infants.
- For infants under 6 months who are not breast fed, also give ⅔ glass of clean boiled and cooled water during this period.

Observe the child carefully and help the mother give ORS solution.

- Show her how much solution to give her child.
- Show her how to give it – a teaspoonful every 1 – 2 minutes for a child under 2 years, frequent sips from a cup for an older child.
- If the child vomits, wait for 10 minutes and then continue giving ORS, but more slowly, for example, a spoonful every 2 – 3 minutes.
- If the child's eye lids become puffy, stop ORS and give plain water or breast milk. Give ORS according to Plan A when the puffiness is gone.

Treatment Plan C (By Health Worker)

Components if the patient can drink

- Start rehydration by mouth with ORS solution giving 20 ml / kg/hour for 6 hours.
- Reassess the patient every 1 – 2 hours.
 - If there is repeated vomiting, give the fluid more slowly.
 - If hydration is not improving after 3 hours, refer to a doctor for IV therapy.

After 4 hours, reassess the child using the Assessment Chart, then select Plan A or B for treatment

- If there are no signs of dehydration, shift to Plan A. When dehydration has been corrected, the child usually passess urine and may also be tired and fall asleep.
- If signs indicating some dehydration are still present, repeat Plan B, but start to offer food, milk as described in Plan A
- If signs indicating severe dehydration have appeared shift to Plan C if the patient can drink, otherwise send the patient to a centre where facility for intravenous treatment is available.

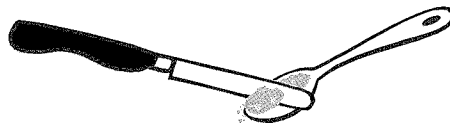
If the mother must leave for home before completing treatment Plan B

- Show her how much ORS to give to finish the 4 hour treatment at home.
- Give her enough ORS packets to correct dehydration, and for 2 more days as shown in Plan A.
- Show her how to prepare ORS solution.
- Explain to her the three rules in Plan A for treating her child at home.
 - To give ORS or other fluids until diarrhoea stops.
 - To feed the child.
 - To bring the child back to health worker, if necessary.

Home-made ORS

1. If preformulated ORS packets are not available, ORS solution can be prepared from home ingredients namely common salt, baking soda and sugar. Instead of glucose, use sucrose (common table sugar). Forty grams of table sugar (about 8 teaspoonful) is equivalent to 20 g (4 teaspoonful) of glucose. Mix well 8 teaspoonful of sugar with approximately $\frac{3}{4}$ teaspoonful of salt and $\frac{1}{2}$ teaspoonful of baking soda with 1 liter of boiled and cooled water or clean drinking water. Give the child as indicated for packaged ORS.

Levelling of teaspoon



As potassium chloride is not usually available at home give the child any one of the following every 24 hours:

- 2 large-size ripe bananas (mashed)
 - 3 small-size ripe bananas (mashed)
 - 3 cups of tender coconut water – wherever available
2. If baking soda is not available, prepare the solution with common salt and sugar. For this take salt in a teaspoon. Level it with a knife or a flat object. Add one level spoonful of salt to one liter of water and mix. Taste the mixture. If it tastes more salty than tears, pour away and make it again with less salt. Finally, add 8 level teaspoonful of sugar and mix it well.
 3. For making a solution, always use boiled and cooled drinking water.
 4. Give instructions to the relatives regarding the preparation and administration of ORS solution (see section on Diarrhoea).

Additional Measures

The child should be offered its normal food as soon as possible. Infants over 4 months should be started on semi-solid foods. Fruit juices, bananas or coconut water if available are particularly useful in repairing losses of potassium.

What are its side effects?

If used properly, it is quite safe.

What precautions should be taken?

1. The solution should be prepared fresh every day using a clean utensil and a spoon after washing hands thoroughly. It should be kept covered in a cool place.
2. During ORS administration, measure the amount of urine passed. A patient who has received adequate amounts of ORS will pass normal (usual) amount of urine i.e., 1500 to 2000 ml in 24 hours. Failure to increase urine output suggests a need for administering more ORS. Continue ORS therapy till diarrhoea stops or the patient is referred to a doctor.
3. If ORS packets are stored at high temperature (more than 30°C) and high humidity for a long time the product is likely to cake. If you have a limited supply of ORS, do not throw away ORS that has become caked. It can still be used provided it dissolves completely in water. If the ORS has turned to a brown colour, it should not be used.
4. All cases of mild or severe dehydration should be started on ORS fluid, as mentioned above, and referred to a doctor.
5. Educate families and encourage them to use ORS – either complete formula or sugar and salt solution – on their own initiative as soon as a child develops diarrhoea, rather than wait for a health worker. The same is true for adults.
6. Educate the mother to continue breastfeeding and other supplementary foods given to the child.

Oral Contraceptive Pill

How does it help?

For pregnancy to take place, the egg (ovum) in the woman's womb must meet the sperm from the man and fuse together (fertilization).

The pill usually contains two active substances (estrogen and progesterone hormones) which prevent the formation of an egg (ovum) in the female.

The pill, therefore prevents pregnancy and thus acts as a contraceptive. In some countries, an injection, instead of a pill, is used (i.e. depot medroxyprogesterone acetate (DMPA) or Depo Provera) for contraception. It is administered by a doctor every three months.

World population is growing fast particularly in the developing countries which have limited capacity to supply food, shelter, energy and health facilities. It is therefore necessary to control human fertility through education and use of one of the several methods available for contraception such as the oral pill, intrauterine device (IUD) etc.

When should it be used?

1. It is used by a woman of child bearing age (usually 18 to 40 years) for contraception (prevention of pregnancy).
2. It is also used to treat some disturbances of monthly periods in females (menstruation) such as painful periods (dysmenorrhea), irregular periods, premenstrual tension etc. For such complaints, the patient should be referred to a doctor.

How is it supplied and given to patients?

The pill contains a combination of estrogen and progesterone in varying amounts. Most preparations are dispensed as convenient calendar-like packets containing 21 active pills and seven blank pills (sometimes containing iron). The woman is instructed

to take orally one pill with water at bedtime every day without fail from the 5th day of the onset of the monthly period. If she forgets to take one any day, she should be asked to take two pills on the following day. Normal period will start on the 28th or 29th day. This is the most effective and convenient method of contraception. If the pill is discontinued, pregnancy may occur.

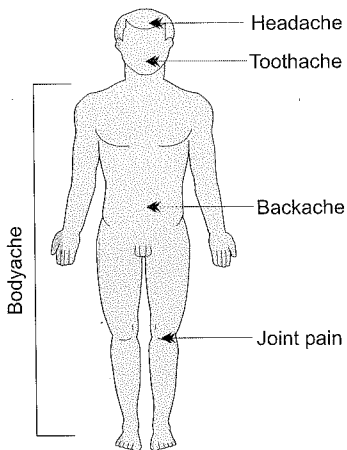
What are its side effects?

1. In a few users, nausea, occasional vomiting, headache, discomfort in breast, and weight gain may occur. Assure the woman that these will disappear after two or three menstrual cycles.
2. Irregular menstrual bleeding or breakthrough bleeding may occur in some women. If there is spotting on any day, the woman should be asked to take two pills the next day. If bleeding continues, refer her to a doctor.
3. If the woman complains of persistent headache, palpitations, giddiness, jaundice, leg cramps or painful swollen legs, disturbances of vision, ask her to discontinue the pill and refer her to a doctor immediately.

What precautions should be taken?

1. Advise the woman to see a doctor before starting to take the pill.
2. Instruct that the pill has to be taken every day without fail.
3. If there are mild reactions as stated above, assure the woman that these will disappear in the second or third cycle.
4. If there are serious reactions, advise her to stop the pill and refer her to a doctor.

Paracetamol



How does it help?

Like aspirin, paracetamol relieves pain such as bodyache, headache, toothache, earache, muscle pain and joint pain. It also lowers fever without correcting the cause, but is not useful in rheumatic fever or in pain associated with swelling. It has an advantage over aspirin in that it does not cause nausea, stomach pain or increase in stomach acid (hyperacidity). It can be given safely to patients who cannot tolerate aspirin. It can also be given in liquid form to children and is preferred to aspirin.

It is not useful in colicky abdominal pain.

When should it be used?

Like aspirin it can be used:

1. to relieve pain.
2. to relieve fever.
3. to relieve symptoms of common cold and influenza.

How is it supplied and given to patients?

It is supplied as tablets each containing 500 mg of paracetamol and as a syrup containing 125 mg of the drug per 5 ml (one teaspoonful).

It is taken orally with plenty of water. It can be taken on an empty stomach. Liquid preparation should be used in children.

Table 21.1 *Dosage of paracetamol according to age*

Patient's age	Dose	
2 – 6 months	50–100 mg ($\frac{1}{3}$ – $\frac{2}{3}$ teaspoonful)	– 4 times a day, if required
$\frac{1}{2}$ – 1 year	60–120 mg ($\frac{1}{2}$ – 1 teaspoonful)	– 4 times a day, if required
1 – 6 years	120–250 mg (1 – 2 teaspoonful)	– 4 times a day, if required
6 – 12 years	250–500 mg ($\frac{1}{2}$ – 1 tablet, or 2 – 4 teaspoonful)	– 4 times a day, if required
Adults	1– 2 tablets	– 4 times a day, if required

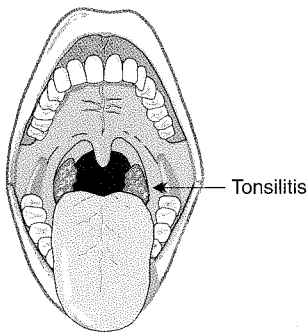
What are its side effects?

It is better tolerated than aspirin and hence preferred for relieving pain and fever. Rarely, it causes skin rash. Accidental swallowing of very large doses – 20 tablets – at a time can damage the liver.

What precautions should be taken?

Keep tablets and syrup away from children. Do not use the drug for more than seven days at a time.

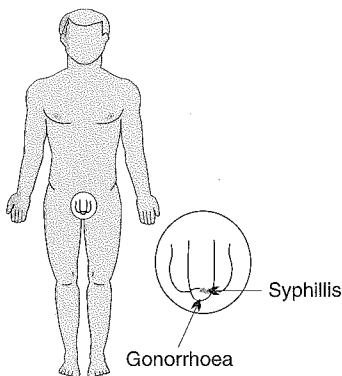
Penicillin



How does it help?

This is an antibiotic which kills certain types of bacteria and cures diseases produced by them. It *does not act against* (a) most bacteria that cause urinary tract infections or diarrhoea, (b) viruses of common cold, influenza and chickenpox and (c) bacteria of tuberculosis and leprosy.

When should it be used?



1. In tonsillitis with fever. Ask the patient to open the mouth. You will find that the throat is red and the two glands at the base of the tongue called tonsils are red, and swollen. They may have small whitish or grayish spots on the surface. In children, diphtheria should be excluded in which dirty gray membrane like that of precipitated curd is formed on the tonsils.
2. In sexually-transmitted diseases, such as syphilis (where there is ulcer on penis) and gonorrhoea (where there is discharge of yellowish pus from the urethral opening of penis). In these two conditions, penicillin is to be administered by injection only. Refer the patient to a doctor.

How is it supplied and given to patients?

For oral use, it is supplied as penicillin V (phenoxymethyl penicillin) tablets each containing 125 mg or 250 mg of the drug. Liquid preparation for use in children is

to be prepared freshly with water boiled and cooled, the final concentration of liquid is 125 mg of penicillin V per 5 ml (1 teaspoonful). The freshly prepared liquid should not be used after five days since it deteriorates. It should be stored in a cool place.

Procaine penicillin and benzathine penicillin are given by intramuscular injection and should be given by doctors only after doing sensitivity test.

Dosage

For adults suffering from mild throat or acute respiratory infections, give 2 tablets (500 mg) every 6 hours (total 8 tablets per day).

For children, follow the regimen shown below:

Table 22.1 *Dosage of oral penicillin in children according to age*

Patient's age (Years)	Dose
Up to 6	1 teaspoonful of syrup (125 mg) every 6 hours
6 – 12	2 tablets of 125 mg each (250 mg) every 6 hours (total 8 tablets of 125 mg each per day)

Note: Treatment is given for seven days or till three days after the symptoms disappear.

What are its side effects?

Oral penicillin is a safe drug. Rarely, it may result in allergic reactions such as skin rash. Injection of penicillin, however, may occasionally produce very severe allergic reaction. The patient has difficulty in breathing and tries to open the collar of the shirt, blood pressure falls; the patient becomes pale and cold and goes into shock within a short time after the injection, and may even die immediately after the injection.

What precautions should be taken?

1. Always ask if a patient has a history of allergy to penicillin. Do not give penicillin if the patient is known to be allergic to it.
2. If the patient develops any reactions, such as skin rash following administration of penicillin, the drug should be stopped. Warn the patient not to take penicillin in any form again or give him a warning card stating this for future reference.

3. Do not use oral penicillin to treat common cold. Most upper respiratory tract infections are mild and viral in origin. They do not need an antibiotic.
4. Injection of penicillin may sometimes cause very severe allergic reaction with difficulty in breathing and fall of blood pressure and may even cause death. Hence it should be given only by a doctor after sensitivity test and patient advised to remain seated in the hospital for $\frac{1}{2}$ hour after injection to observe development of any allergic reaction.



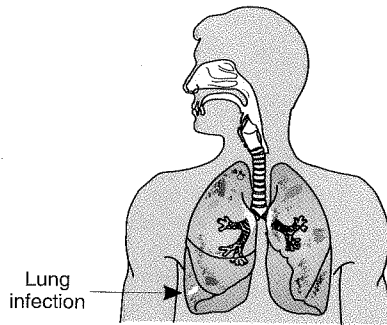
Amoxicillin and Ampicillin

How does it help?

These antibiotics act against a wide range of bacteria as compared to penicillin. They are, therefore, used to treat bacterial infections in which penicillin is not effective, such as urinary tract or gastrointestinal infections.

When should it be used?

In the treatment of pneumonia, particularly in infants and children below the age of five years. Pneumonia should be diagnosed if the child has fast breathing, the respiration rate being more than 60 per minute in an infant less than 2 months of age, or 50 per minute or more in an older child and there is chest indrawing. The treatment for pneumonia should be started with amoxicillin or ampicillin and patient should be immediately referred to a doctor.



In urinary tract infections, the patient may complain of burning, coloured urine and fever with chills.

In gastrointestinal infections, such as bacterial dysentery, the patient complains of loose motions with pain in the abdomen, and blood and mucus in stools.

How is it supplied and given to patients?

For oral use, amoxicillin and ampicillin are supplied as capsules or tablets each of 250 or 500 mg (anhydrous) and syrup containing 125 or 250 mg in 5 ml. Amoxicillin may be preferred to ampicillin for oral use. But availability and cost should be the important considerations for choosing one or the other.

Dose

For adults suffering from acute respiratory, urinary or gastrointestinal tract infections, give two tablets or capsules, each of 250 mg of amoxicillin three times a day (8 hourly) for seven days, or two tablets or capsules of ampicillin, each of 250 mg should be given four times a day (6 hourly) for seven days.

Dosage for children for acute infections

Dose to be given daily for seven days as per the following schedule:

Table 23.1 *Dosage of amoxicillin and ampicillin in children according to age*

Age/Weight	Amoxicillin syrup 125 mg/5 ml	Ampicillin syrup 125 mg/5 ml
Less than two months or less than 5 kg	2.5 ml (½ teaspoonful) three times a day	Same amount 4 times a day
2 to 12 months 6 to 10 kg	5 ml (1 teaspoonful) three times a day	Same amount 4 times a day
2 to 5 years 11 to 20 kg	10 ml (2 teaspoonful) three times a day	Same amount 4 times a day

Note: Newborns up to two weeks of age should receive the drug every 12 hours.

What are its side effects?

1. Skin rash is seen in some patients after administration of the drug. In such cases, discontinue the drug and refer the patient to a doctor.
2. Ampicillin produces mild to moderate diarrhoea. If there are loose motions four times a day or more, then refer the patient to a doctor after discontinuing the drug.
3. Injection of the drug may produce severe allergic reactions.

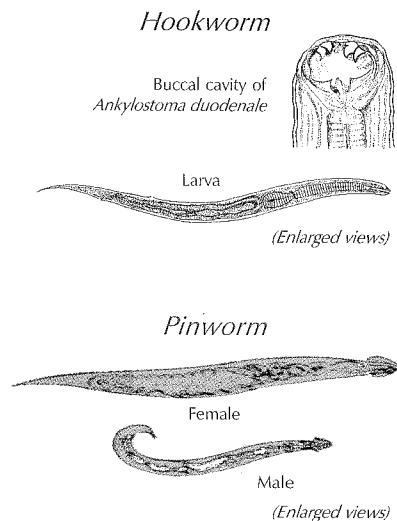
What precautions should be taken?

1. Precautions mentioned under penicillin should be taken for both these drugs.
2. Children with pneumonia should be referred to a doctor after starting the treatment.

Pyrantel

How does it help?

Pyrantel acts on round worm, hookworm, pinworm and thread worm, which infest the intestinal tract. A large number of people in developing countries suffer from these infestations. The presence of these worms in the intestines gives rise to vague abdominal pain, loss of appetite, nausea, failure to gain weight, sometimes diarrhoea, and allergic reactions such as itching and coughing. Pyrantel paralyses the round worm, hookworm, pinworm and thread worm, which are then expelled through stools.



When should it be used?

1. It is the drug of choice in the treatment of round worm. Common round worm is pinkish, glistening white in colour, about 0.3 – 0.5 cm thick and 15 – 20 cm long.
2. It is useful in hookworm disease (see section on Mebendazole).
3. It is also useful in pinworm disease (see section on Mebendazole).

How is it supplied and given to patients?

It is supplied as pyrantel pamoate tablets 250 mg and as a liquid preparation containing pyrantel pamoate 50 mg per 5 ml (1 teaspoonful).

Dose

For round worm and hookworm, it is given as 3 tablets (of 250 mg) as a single oral dose. In pinworm, the above dose should be repeated after two to four weeks and all members of the household should be treated concurrently.

In children, liquid preparation (pyrantel pamoate 50 mg/5 ml) is preferred to tablets. One tablet (250 mg) is equal to 5 teaspoonful of (50 mg/5 ml) liquid preparation.

What are its side effects?

Pyrantel pamoate is a safe drug. Occasionally it may cause abdominal pain and diarrhoea. Rarely it may cause headache, dizziness and sleepiness.

Table 24.1 *Dosage of pyrantel pamoate according to age in intestinal worm infestations*

Patient's age (year)	Patient's weight (Kg)	Dose
Under 1	up to 5	1 teaspoonful as a single dose
1 – 5	5 to 20	3 teaspoonful as a single dose
6 – 12	20 to 40	1½ tablets as a single dose
Above 13	over 40	3 tablets as a single dose

What precautions should be taken?

Do not exceed the dose or duration of treatment.

Instructions to patients?

1. Instruct the patient to wash hands and finger nails thoroughly after each visit to the toilet. Nails should be cut regularly.
2. In case of pinworm, all members of the family require treatment.
3. Patients should be informed that worm infestation occurs on account of unhygienic conditions, by eating raw vegetables and salads without washing them, by consuming contaminated water or food, and by playing or walking barefoot on ground contaminated by stools.

Povidone Iodine

How does it help?

Povidone iodine is a complex of iodine which releases elemental iodine and acts against many bacteria as well as certain fungi. Like tincture iodine, it is an antiseptic. However, it does not irritate or stain the skin. Further, it is quite stable.

When should it be used?

It can be used for:

1. hand washes, mouth washes and gargling.
2. cleansing of the skin prior to surgery.
3. treating minor abrasions, wounds, burns and skin infections.
4. treating trichomoniasis – an organism causing foul-smelling, frothy white, vaginal discharge (leucorrhoea).
5. treating ringworm.

How is it supplied and given to patients?

It is available as 15 per cent povidone iodine (stock solution), to be used only after dilution. For cleaning the skin, it can be used directly without dilution. For handwashes and mouthwashes, 1 per cent solution is used. For this purpose, dilute one part of stock solution with 14 parts of water.

It is also available as an ointment containing 5 per cent povidone iodine for application to skin infections, such as boils, impetigo, mild burns and infected ulcers. For the treatment of burns, a 5 per cent solution or ointment may be used. For treating vaginal infections, povidone iodine vaginal tablet (200 mg) may be used two times

daily for 2 weeks. For this purpose the tablet is moistened with water before inserting into vagina.

What are its side effects?

Patients sensitive to iodine may show allergic reactions, although this is rare. Povidone iodine should be avoided in pregnancy.

What precautions should be taken?

1. Do not use it in patients with a history of iodine allergy.
2. Do not use it in cases of extensive burns.
3. Povidone iodine and chlorhexidine are used for similar purposes. Hence, the cost of preparation should be taken into account while making a choice.



Primaquine

How does it help?

Primaquine is an antimalarial drug which kills the parasites present in liver cells. It is not useful for treating an acute attack, but is administered along with chloroquine for the complete cure of certain types of malaria. Further, it is also used to interrupt transmission of malaria by mosquitoes.

When should it be used?

1. It is used to treat patients suffering from malaria who get repeated attacks of the disease after visiting known malarious places. In such cases, chloroquine should be given first, followed by primaquine for 14 days to produce complete cure. It is not required if the patient continues to live in the endemic area.
2. In areas where falciparum (malignant) malaria is known to occur, a single dose of 45 mg of primaquine after chloroquine prevents transmission of the disease.

How is it supplied and given to patients?

It is available as primaquine phosphate tablets each containing 7.5 mg or 15 mg of primaquine base. For the complete cure of malaria, give 15 mg of primaquine (2 tablets) for 14 days along with standard chloroquine therapy of three days. If the patient is unable to tolerate 15 mg of primaquine daily, 6 tablets once a week (45 mg base) for 8 weeks may be given.

For preventing the transmission of malaria, primaquine is administered in a single dose of 45 mg following the dose of chloroquine.

What are its side effects?

At the above doses, primaquine is well tolerated. However, in some people with a deficiency of certain blood-cell enzyme, it may cause destruction of red blood cells,

anaemia and dark coloured urine may be passed. Rarely, it may lead to gastric upset, vomiting and jaundice.

What precautions should be taken?

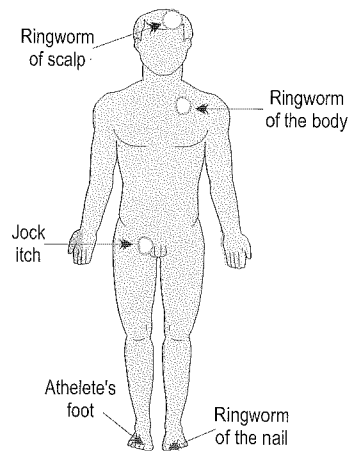
1. Do not exceed the prescribed dose.
2. Watch for the colour of urine. If colour of the urine becomes dark, stop treatment immediately and refer to a doctor.
2. Watch for the development of jaundice. If the eyes and urine become yellow or there is passage of dark coloured urine, stop the drug immediately and refer to a doctor.
3. The drug should be avoided in first 3 months of pregnancy. Treat malaria during pregnancy with chloroquine alone.
4. Do not give sulphadimidine or co-trimoxazole to patients who are taking primaquine tablets.

Ringworm Ointment

(Whitfield's Ointment)

How does it help?

This ointment is used to treat fungal infections of skin. Whitfield's ointment contains benzoic acid 6 per cent and salicylic acid 3 per cent. Certain fungi attack hair on the head, nails and superficial parts of the skin. Fungal infection of hair causes localized redness, itching, discharge of fluid, and flake formation. Finally, hair is lost in patches. Fungal infection of the body produces typical ring-like (circular or annular) patches, hence the name ringworm. The border of such patches is raised, reddish in colour as compared to the central portion, and there is itching. There may be oozing of fluid. The rings go on increasing and may reach a diameter of 10 cm or more. These patches can occur on any part of the body, but are common in moist areas such as armpits, waist, under the breast, groin, buttocks and the back. Any growing lesion which looks reddish, with a definite raised border, scaling and itching suggests fungal infection. Fungus also attacks spaces between the toes of the feet. These spaces get sodden and cause itching. Itching is worse when the affected foot comes in contact with water. It may extend also to the sole of the foot. Small blisters may be formed which may later get infected.



When should it be used?

It is used to treat ringworm of the body. When applied locally and adequately, it cures the infection. It is partially effective in fungal infection of the toes. It does not cure fungal infection of hair or nails. Such cases should be referred to a doctor.

How is it supplied and given to patients?

It is supplied as an ointment containing benzoic acid (6 per cent) and salicylic acid (3 per cent) in vaseline base.

It is applied on patches with gentle rubbing, two times daily for four weeks. Older patches need longer treatment. It is advisable to apply the ointment after cleaning the area with soap and hot water and making it dry.

What are its side effects?

Rarely, it may cause mild irritation and allergic reaction. Stop the application of ointment and refer to a doctor.

What precautions should be taken?

Do not allow the ointment to come in contact with eyes.

Instructions to patients

1. Fungal infections are transmitted through direct contact, infected clothes and infected combs. Hence, patient's clothes should be properly washed and dried in hot sun.
2. Like scabies, ringworm infection is a disease caused by unclean habits. People should be taught cleanliness and personal hygiene, in order to prevent fungal infections.

Salbutamol

How does it help?

Salbutamol relieves the spasm of muscles of respiratory tubes (bronchi), and therefore used in the treatment of acute attack of asthma. It can also be used to prevent an attack. It has a specific action on special areas (called beta receptors) on the muscles of respiratory tubes.

In asthma, the patient has repeated attacks during which the breathing (bronchial) tubes become narrow, causing him to wheeze and experience difficulty in breathing. When an asthma patient takes a breath, the skin behind the collar bones and between the ribs may be sucked in. There is no fever. An attack is often set off by eating particular food item or inhaling chemical or flower pollens to which the patient is allergic or after an attack of cold and cough. Asthma often begins in childhood, may start in middle age also and runs in families.

When should it be used?

1. In the treatment of an attack of asthma. It should be given as soon as an attack starts and can be repeated every 4 to 6 hours.
2. It is also used to prevent an attack in a known asthmatic patient.

How is it supplied and given to patients?

Salbutamol is supplied as salbutamol sulphate tablets each containing 2 mg or 4 mg of the drug; or a syrup containing 2 mg per 5 ml (a teaspoonful). It is also available as an inhalation (aerosol) 100 microgrammes per dose.

Table 28.1 *Dosage of Salbutamol according to age*

Patient's age (Years)	Dose
2 to 5	$\frac{1}{2}$ teaspoonful of syrup as a single dose, to be repeated after 8 hours, if necessary
6 to 12	1 teaspoonful of syrup or 1 tablet of 2 mg, repeated every 8 hours, if necessary
Above 12	1 tablet of 4 mg as soon as an attack starts, repeated every 8 hours, if necessary. To prevent an attack, give 1 tablet two times or three times a day

What are its side effects?

1. It increases the heart rate. This can be observed by counting the pulse.
2. Patient may complain of headache. Reduce the dose.
3. Patients may show fine tremors (shaking) of hands, and anxiety. These can be minimized by starting treatment with a lower dose than recommended.
4. It can cause restlessness, and if given at bed time, disturbs sleep.
5. In old people, sometimes it can cause retention of urine, refer to a doctor immediately.

What precautions should be taken?

1. Do not exceed the dose indicated above. If the attack persists refer the patient to a doctor.
2. Do not use the drug in a patient of heart disease or high blood pressure. Refer the patient to a doctor.
3. Do not use salbutamol over a long period (over one month). Refer the patient to a doctor.
4. Avoid the drug at bed time, especially in patients who experience difficulty in having sound sleep after salbutamol.
5. Patients with asthma usually have a history of repeated attacks. Do not use salbutamol in an elderly person who develops difficulty in breathing for the first time, particularly if the patient also has chest pain and is sweating, or has pain in left shoulder travelling down the inner arm. The patient may be having a heart attack and should be referred to a doctor immediately.
6. Inhalation (aerosol) is preferred to a tablet, but is more expensive.

Senna

How does it help?

These are dried pods or leaves of a plant. They contain sennosides which act on large bowel and increase its motility. The drug decreases absorption of water from faecal matter. It, therefore, produces a single thorough evacuation of bowel after 6–8 hours. The stool is semisolid in consistency.

When should it be used?

It is used to treat constipation. In old people, it may be necessary to use laxatives more often. In such cases, Ispaghula may be preferred (see section on Ispaghula). However, the mainstay in the treatment of constipation is to advise the patient to take sufficient high-residual diet (dietary fibres) and drink adequate quantities of water.

How is it supplied and given to patients?

It is supplied as a tablet containing 7.5 mg sennosides. A tablet is taken with plenty of water usually at bedtime. It causes evacuation next morning.

Dose

For adults, give 2 – 3 tablets at bedtime.

For children, 1 tablet at bedtime.

What are its side effects?

Mild griping pain may occur. Faeces and urine may become yellow to red-coloured.

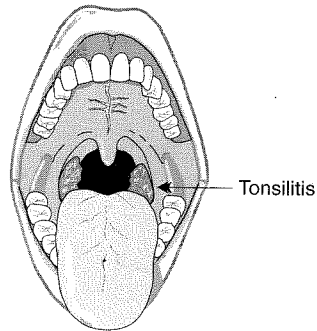
What precautions should be taken?

1. Do not give senna to a patient who develops sudden constipation, associated with abdominal pain, vomiting and tightness of abdominal muscles. Such cases should be referred to a doctor.
2. Do not give it to a child below the age of three years.
3. Do not use it repeatedly to treat patients having frequent constipation. Instead, correct dietary habits.
4. Avoid giving senna to lactating mothers as it may cause diarrhoea in breastfed infants.
5. Avoid it in patients with fever.
6. Warn the patient that urine may be coloured yellowish brown or red and it is due to drug and is not harmful.

Sulphadimidine

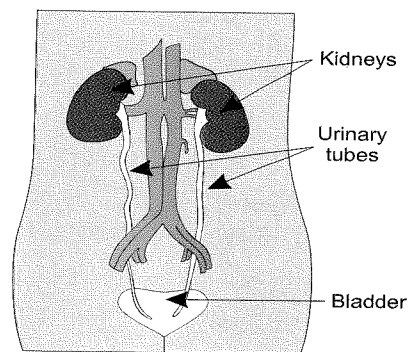
How does it help?

This drug is useful in certain bacterial infections. It is particularly useful in urinary tract infections and in diarrhoea with fever and blood/mucus in stools; in these conditions penicillin is not useful. Sulphadimidine is not useful in common cold or influenza, typhoid, tuberculosis or leprosy.



When should it be used?

1. In tonsillitis with fever. Look at the tonsils and throat for redness. The tonsils may show white spots. The patient usually has fever, pain in the throat and cough. However, penicillin is the drug of choice in this condition.
2. In acute lung infections characterized by fever, cough and yellow sputum, amoxicillin, ampicillin or co-trimoxazole is the drug of choice.
3. In urinary tract infections, in which the patient complains of pain in loin, fever and burning sensation while passing urine.
4. In dysentery characterized by fever, frequent liquid stools and pain in abdomen. The stools may contain blood or mucus.
5. In skin infections, such as boils, and in scabies, complicated by pus formation (not to be used for local application).



Locations of urinary tract infection

What are its side effects?

It is quite safe. Rarely, it may give rise to local skin rash.

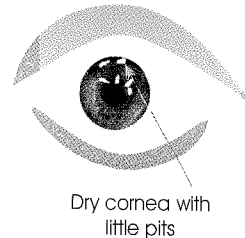
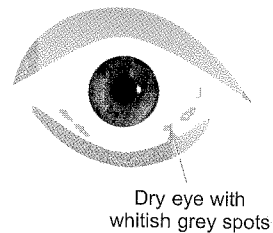
What precautions should be taken?

1. Before applying the ointment or drops, instruct the patient to wash hands with soap and water thoroughly.
2. Do not apply the ointment to the skin.
3. Store the ointment and the drops in a cool place.

Vitamin A

How does it help?

Vitamin A (Retinol) is naturally present in milk, eggs, liver, vegetables such as carrots, sweet potato and amaranth (spinach) and fruits such as papaya and mango. It is essential for growth, normal skin texture and night vision. Deficiency of vitamin A is one of the causes of blindness in developing countries; it is usually associated with malnourishment. Such type of blindness is prevented by the administration of vitamin A.



When should it be used?

1. It is used to treat vitamin A deficiency. In the initial stages, the patient has difficulty seeing in the dark. A child cannot see the mother in a darkened room. The eyes become dry and sometimes small, whitish, foamy spots appear on the white surface of the eye ball. If this condition is not treated, small ulcers are formed which can get infected, leading to local destruction, scarring and blindness. Likewise, the skin also becomes dry and scaly. Children with vitamin A deficiency often suffer from diarrhoea. Except ulceration, all other changes will be readily reversed by the administration of vitamin A.
2. Prophylactic use of vitamin A in undernourished children prevents damage to the eyes and therefore prevents blindness.
3. To improve outcome as it prevents death in children with measles.

How is it supplied and given to patients?

It is supplied as capsules or pearls containing 25 000 IU (International units) and 200 000 IU of vitamin A (Retinol palmitate). Vitamin A drops containing 50 000 IU per ml may be used in children.

Fish liver oil, such as shark liver oil or cod liver oil, contains both vitamin A and vitamin D.

For the treatment of vitamin A deficiency in children, give one capsule containing 200 000 IU or an oily solution containing an equivalent amount of vitamin A and refer the patient urgently to a doctor.

For the prevention of vitamin A deficiency in undernourished children above one year of age, give one capsule of 200 000 IU every six months. Undernourished mothers may be given 20 000 IU once a week during pregnancy and lactation. However, advise the patients regarding diet, particularly to take green, leafy vegetables, carrots and papaya. Newborns may be given 50 000 IU vitamin A at birth and the dose repeated at six months. Women of child-bearing age should receive 300 000 IU within one month of giving birth to a baby.

What are its side effects?

The doses recommended are safe. Repeated large doses of vitamin A may result in loss of appetite, dry itchy skin, loss of weight, and liver damage (vitamin A toxicity).

What precautions should be taken?

1. Do not exceed the dose recommended.
2. Do not use large doses during pregnancy.
3. Keep the vitamin capsules out of reach of children.
4. Educate people about the preventive aspect of blindness due to vitamin A deficiency and advise them about taking proper diet. Mother should be encouraged to breastfeed their children.

Vitamin B Complex

How does it help?

Vitamin B complex is naturally present in whole cereals, unpolished rice, beans, groundnuts, leafy green vegetables, milk and yeast. Its deficiency occurs as a part of general nutritional deficiency. Patients with B complex deficiency complain of lack of energy, burning and tingling in the limbs, pain in the legs, and sore tongue. The lips and tongue become red and the lips show cracks, particularly at the angles of the mouth. In addition, the deficiency may also cause diarrhoea and skin changes.

The skin eruptions are associated with an itching and burning sensation, which become worse on exposure to sun. Later the skin becomes thick, pigmented and rough and assumes a brown-black colour.

Severe vitamin B complex deficiency causes marked weakness, difficulty in walking, mental changes and swelling of the body. Death may occur due to heart failure.

Administration of vitamin B complex promptly corrects the deficiency, relieves the symptoms and reverses the changes caused by it. It also prevents such changes in patients who are undernourished and are likely to develop them.

When should it be used?

1. It is used to treat vitamin B complex deficiency.
2. It is also used to prevent vitamin B complex deficiency.

How is it supplied and given to patients?

Vitamin B complex is supplied as tablets or syrup for oral use.

Vitamin B complex tablet for preventing deficiency usually contains thiamine 1 – 2 mg, riboflavin 1 – 2 mg, nicotinamide 15 – 20 mg and pyridoxine 1 – 2 mg. One tablet or an equivalent amount of syrup is given daily. If this is not available, 8 – 10 yeast tablets are given per day.

In case deficiency develops, larger doses are required. Refer such patients to a doctor.

What are its side effects?

In the doses mentioned above, vitamin B complex does not produce any side effects.

What precautions should be taken?

1. Protect the tablets or syrup from sunlight and store in a cool place.
2. Large doses of the vitamins do not act as tonics and such an intake is wasteful. Encourage people to obtain their daily requirements from diet.

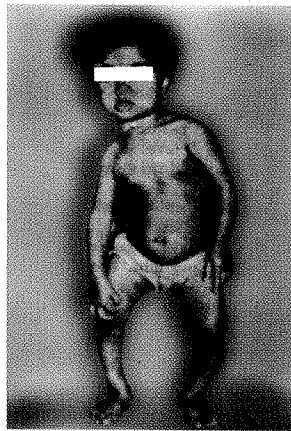


Vitamin D

How does it help?

Vitamin D is naturally produced in the body from a substance present in the human skin following exposure to sunlight. It is also present in fish liver. Deficiency of vitamin D produces rickets in children. Children become lethargic; do not take interest in play, and would prefer to sit idle. Older children may complain of muscle pain. Owing to vitamin D deficiency, bones are not properly formed and may get easily deformed. In children with deficiency of vitamin D the legs are curved and the knees may touch each other (Knock Knee). The front portion of the skull may get enlarged giving rise to hanging forehead (Frontal Bossing). In severe cases, the child may develop convulsions. Administration of vitamin D cures rickets and promotes normal growth of the bones.

A rickety child with curved legs



Rickets

Deficiency of vitamin D in elderly persons causes muscle and bone pain. Patients complain of muscle cramps and decreased muscle strength. Bones become fragile and may fracture.

When should it be used?

1. To prevent and treat rickets in children.
2. During pregnancy.

Anaemia

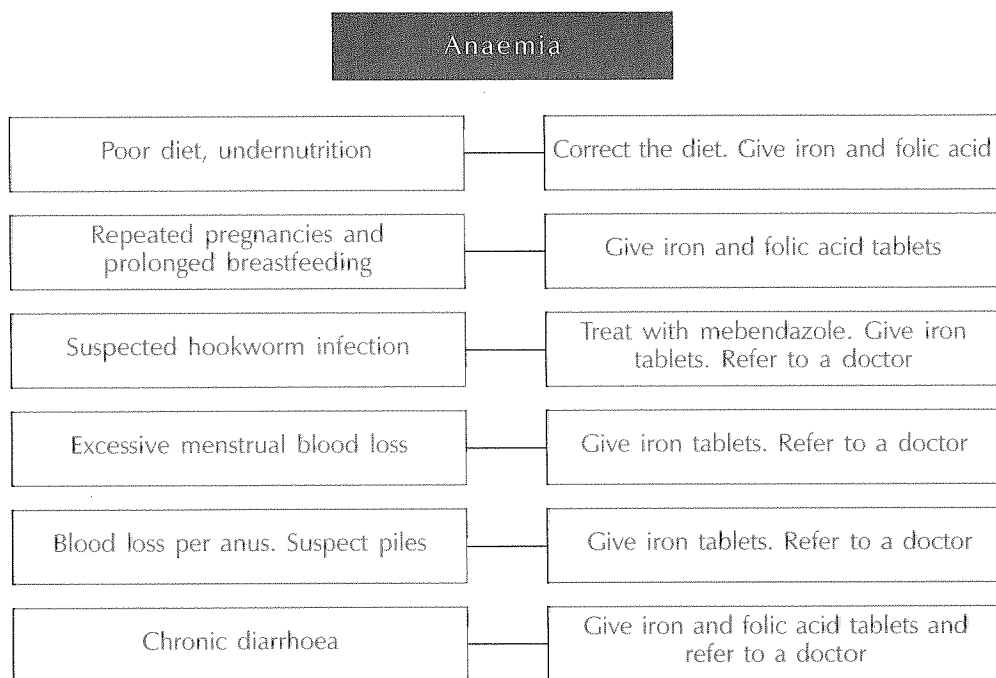
Anaemia is caused by the deficiency of haemoglobin, which is a red colour pigment of blood. Haemoglobin carries oxygen to various parts of the body. Blood formation is affected if the diet is deficient in proteins, iron, folic acid or vitamin B12. Anaemia is also due to excessive or prolonged blood loss. Women lose blood during menstruation every month. In some women, blood loss is heavy. Repeated pregnancies also deplete the body stores of iron and folic acid, leading to anaemia. Other important causes of blood loss are bleeding piles, ulcers in the gut and hookworms which suck blood from the intestines. Chronic diarrhoeas can also cause anaemia. The commonest cause of anaemia is the deficiency of iron with or without deficiency of folic acid.

Patients with anaemia complain of tiredness and weakness and show a lack of desire to work. Nails and tongue look pale. Severe anaemia produces general pallor and swelling of feet.

General guidelines

- (1) Suspect anaemia as the cause of tiredness and vague ill health, especially in women of child-bearing age.
- (2) Take history in detail. Repeated pregnancies, heavy menstrual blood loss, blood loss per rectum as in piles, chronic diarrhoea and habit of going to fields without using shoes (hookworm disease), will give a clue to the cause of anaemia.
- (3) Enquire about food intake and eating habits. Advise the patient to eat more green, leafy vegetables, beans and peas. Meat, fish and chicken also have high iron content but these are more expensive.
- (4) Give iron and folic acid tablets to women during pregnancy to prevent anaemia.
- (5) Give iron tablets to any person who has lost blood as a result of an injury or accident, in order to allow the patient to compensate for the loss of blood.
- (6) Remember that it is better to prevent anaemia by using iron in a patient who is likely to develop anaemia because of the causes mentioned above than to treat it later, when developed.

How to treat?



When to refer to a doctor?

- (1) All patients with severe anaemia.
- (2) Anaemia associated with other illnesses such as prolonged low grade fever, cough, enlarged glands in the neck or elsewhere in the body, and chronic diarrhoea.
- (3) Anaemia that does not respond to iron with or without folic acid even after one month of treatment.
- (4) Anaemia with known causes of bleeding such as piles and heavy menstruation.

What precautions should be taken?

- (1) Instruct the patient to take iron tablets after food; iron tablet sometimes produces stomach upset.
- (2) Inform the patient that the stools could be black during iron therapy.
- (3) Reduce the dose if iron produces stomachache, diarrhoea or constipation.
- (4) Remember that the response to iron therapy is gradual and it takes weeks or months for blood to become normal. Continue iron tablets for six months.
- (5) If the patient cannot tolerate oral iron at all, refer to a doctor.
- (6) Keep iron tablets out of the reach of children. They may swallow the tablets as candies causing adverse reactions including death.

Breathlessness

Breathlessness or shortness of breath, on exertion or at rest, is a manifestation of many forms of lung and heart diseases. The patient has to make an effort to breath even for the usual level of physical activity.

Acute breathlessness due to lung disease can be caused by foreign body in the respiratory tract, acute lung infections, such as pneumonia or an attack of asthma. It could be a terminal event in a serious disease in which the brain centre fails. Acute breathlessness also occurs due to sudden failure of heart.

Long-standing (chronic) breathlessness is due to chronic lung disease, asthma, severe anaemia or chronic heart disease.

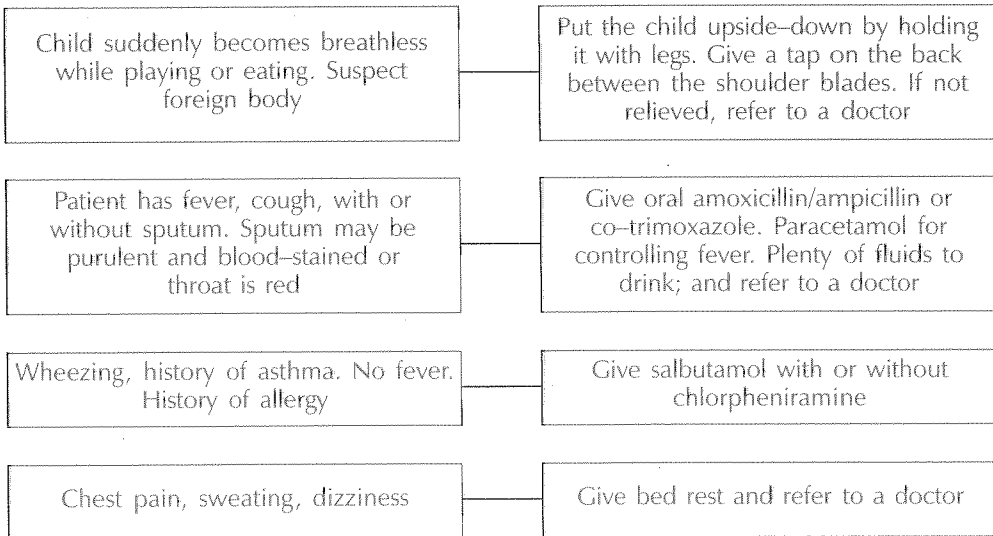
General guidelines

- (1) Ask about the patient's history to decide whether it is of short duration (acute) or long-standing (chronic). Always think first of a foreign body in the respiratory tract in case of an otherwise healthy child who suddenly becomes breathless, and refer to a doctor urgently.
- (2) Breathlessness associated with fever and cough, with or without sputum, indicates lung or throat infection. In children, rapid breathing (more than 50 per minute) is considered a sign of acute respiratory infection and an indication to administer a drug.
- (3) Ask about the history of high blood pressure or take blood pressure. Patients who have high blood pressure can suddenly develop breathlessness due to malfunctioning of heart (heart failure). Refer to a doctor.
- (4) If a patient above the age of forty suddenly develops breathlessness, pain in the chest, becomes pale and cold, feels giddy or perspires and vomits or develops pain in the left shoulder which is transmitted on the inner side of left arm, he is probably suffering from a heart attack. Refer him immediately to a doctor.
- (5) Breathlessness due to asthma or an attack of allergy is associated with wheezing and difficulty in breathing indicated by retraction of neck muscles.

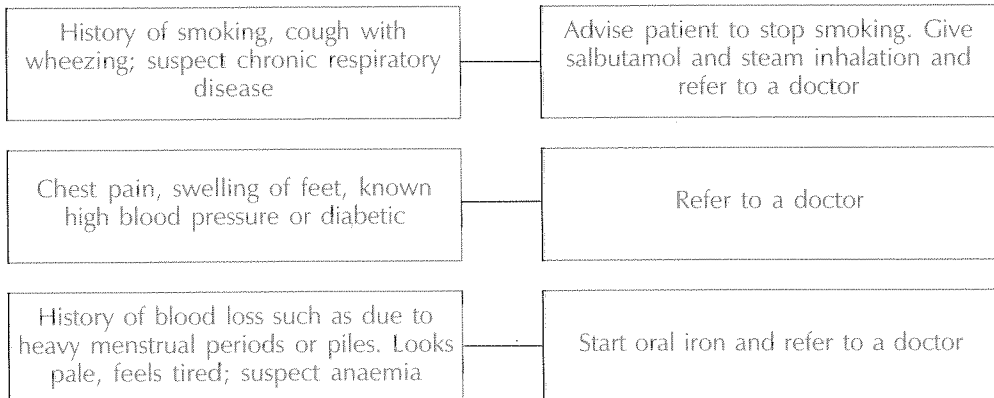
- (6) Breathlessness due to chronic heart disease becomes worse on exertion or in a lying-down position. Patients feel more comfortable on assuming a sitting or upright posture. These patients also have swelling of their feet and prominent neck veins.
- (7) Prolonged breathlessness produces loss of body water. Further, people who have difficulty in breathing may avoid drinking water. Hence, adequate fluid intake must be ensured.

How to treat?

Acute breathlessness



Chronic breathlessness



When to refer to a doctor?

- (1) If the foreign body does not come out.
- (2) Patients with suspected acute or chronic heart disease, as mentioned above.
- (3) Breathlessness associated with pain in chest.
- (4) If acute asthmatic attack is not relieved by treatment within 8 hours.
- (5) Chronic asthma and chronic lung disease where patients cough out large amounts of sputum.
- (6) Anaemia after starting iron treatment.

What precautions should be taken?

- (1) Give half the adult dose of salbutamol in old persons for asthma with heart disease and refer to a doctor.
- (2) Advise patient to drink plenty of liquid.
- (3) Advise restricted use of salt (less than normal) in a patient with breathlessness who has high blood pressure or heart disease. If the patient is obese (overweight), advise reduction of weight by restricting fatty or oily food and exercise.

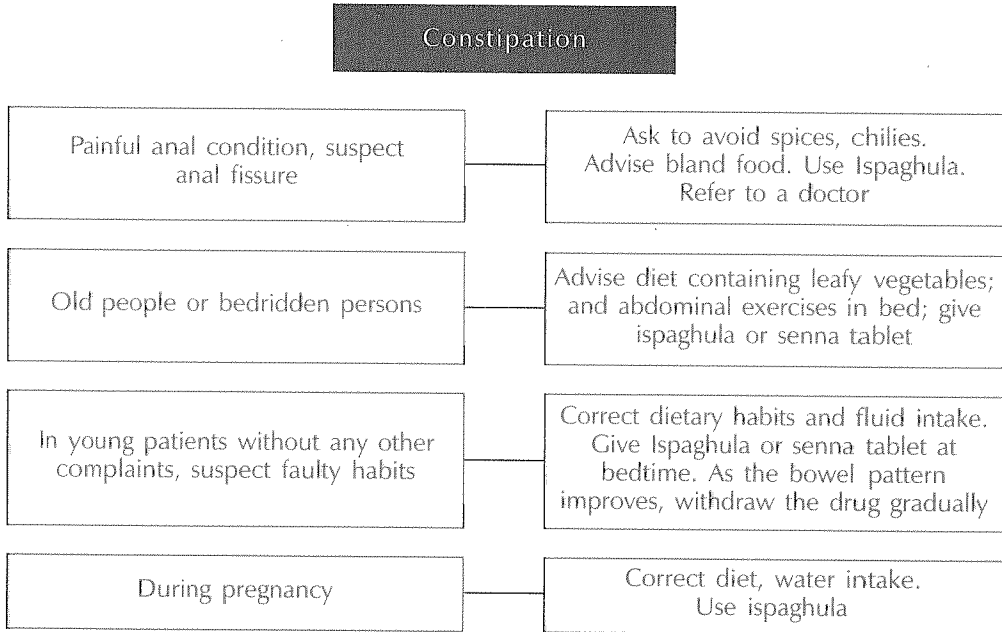
Constipation

A patient who complains of constipation passes dry and hard stools less frequently than once a day. It may be acute, developing suddenly or long-standing (chronic). Acute constipation may be part of a more serious illness such as acute bowel obstruction. In that case, the patient has abdominal pain, vomiting and distension (bloating) and cannot pass even wind (flatus). Such cases should be referred to a doctor immediately. Constipation may also occur following an attack of diarrhoea or the day after taking a purgative; this needs no treatment. Long-standing constipation may be due to: (a) faulty bowel habits – habitually not attending to the nature's call in time, (b) due to faulty diet that is low in roughage, fibre or water content, (c) lack of exercise, (d) painful lesions in the anal region such as cracking of skin near anal region (anal fissure), and (e) diseases of the bowel. Constipation is common in old people and during pregnancy because of difficulty in using abdominal muscles during evacuation. Constipation in children is due to faulty dietary habits; correction of these relieves constipation.

General guidelines

- (1) Do not give a purgative to a patient with acute, suddenly developed constipation. Refer her/him to a doctor.
- (2) Remember that many patients with normal stools and normal frequency of defecation imagine that they are constipated. They need reassurance and not drug treatment.
- (3) Take detailed history of a patient who complains of chronic constipation and have a look at the stool to check whether it is really scanty, hard and with or without slimy material. Pain in the anal region suggests anal fissure.
- (4) Enquire about food habits, intake of leafy vegetables, bran and other fibre-containing foods, water intake, exercise and regularity of bowel habits. Correction of these is far more important than any drug.
- (5) In all normal subjects with chronic constipation, attempts should be made at bowel training. Advise the patient to spare time every morning regularly to visit the toilet. Ask her/him to drink plenty of water, especially in summer, and to eat leafy vegetables and foods containing vegetable fibres. Patients should also be encouraged to take physical exercise, such as walk for $\frac{1}{2}$ to 1 hour daily, and abdominal exercises.

How to treat?



When to refer to a doctor?

- (1) Acute constipation, especially when the patient is vomiting, has not passed even wind and appears ill, suspect gut obstruction. Refer immediately to a doctor.
- (2) Chronic constipation that does not respond to treatment within 4 weeks.
- (3) Recent unexplained constipation (not acute) in an elderly person whose bowel habits were always regular.
- (4) Patient who has persistent pain in abdomen or blood in stools or experiences pain during evacuation.
- (5) Persistent constipation in children.

What precautions should be taken?

- (1) Do not use purgative frequently to treat constipation as it may form a habit.
- (2) Do not use purgatives to treat constipation associated with fever and following heart attack. A suppository or simple enema should be preferred.
- (3) Do not use senna to treat constipation during pregnancy, give ispaghula.

5

Cough

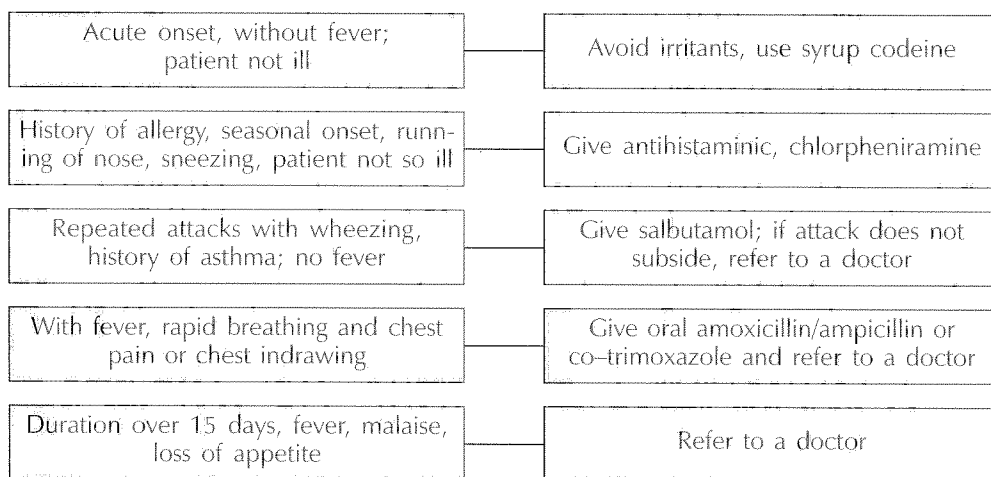
Most types of cough do not require drug treatment. Basically, cough cleans the windpipe by throwing out irritating material which may reach it from outside or is produced locally. This is necessary for preventing mechanical obstruction to breathing. Therefore, cough is a friend and not a foe. The common respiratory irritants are: fumes, cigarette or bidi smoke, smoke from a chulah, dust particles, pollens from flowers, and germs. Some of these also give rise to allergy and cough. The commonest causes of transient cough are common cold and influenza.

General guidelines

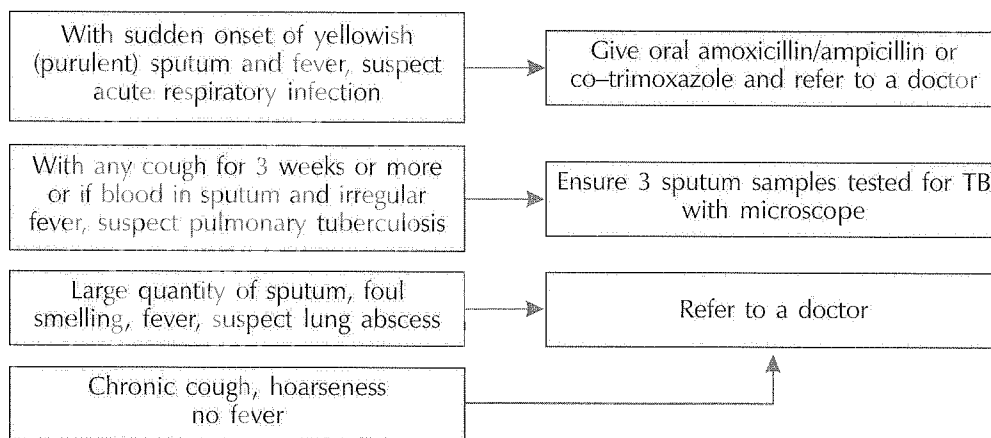
- (1) Avoid respiratory tract irritants such as smoke, chemical vapours and dust .
- (2) Avoid cold and dry air. A warm room with a humid atmosphere is beneficial.
- (3) Simple steam inhalation and warm drinks bring relief.
- (4) Patients should take good amount of fluids.
- (5) In case of cough with plenty of sputum, encourage the patient to cough voluntarily from time to time.
- (6) Remember that saliva is the best natural soothing agent for an inflamed throat and it can easily be increased by keeping a sugar candy or lemon drop in the mouth.

How to treat?

Dry cough without sputum



Productive cough with sputum



When to refer to a doctor?

- (1) Any cough that does not respond to therapy within 7 days.
- (2) Cases of productive cough referred to above and children with whooping cough.
- (3) If the patient looks ill, has difficulty in breathing, or is blue (cyanosed).
- (4) Persistent cough over two weeks' duration.

What precautions should be taken?

- (1) Salbutamol may produce palpitation. Give half the adult dose in patients with known heart disease or high blood pressure and refer to a doctor.
- (2) Chlorpheniramine, if used excessively, produces sleepiness and drying of respiratory secretions.
- (3) Do not use antibiotics (amoxicillin/ampicillin) or sulphadimidine or co-trimoxazole in patients with cough due to common cold or influenza. In such cases, cough is self-limiting and the drugs have no action against the organisms causing the disease.
- (4) Do not use fluoroquinolones (ofloxacin, ciprofloxacin) for cough. These medicines may partially treat tuberculosis (TB), and, the diagnosis of TB may be missed. Also these are not the best antibiotics for germs which commonly cause lung infections.



Diarrhoea

Diarrhoea is a condition where loose or watery stools are passed three or more times per day. The stool may contain blood and sticky material. Acute diarrhoea is due to: (a) intestinal infection, (b) infection elsewhere in the body (especially in children), and (c) eating food which is spoiled or contaminated with a toxin or an irritant material. Frequent attacks of diarrhoea contribute to malnutrition. Malnourished children are liable to get infection frequently. Thus a vicious circle of malnutrition and infection is created.

General guidelines

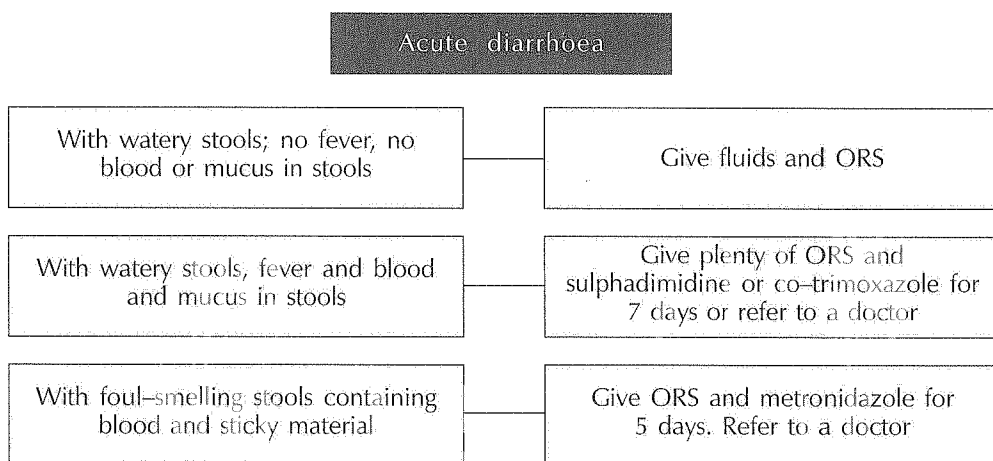
- (1) Enquire about the food eaten in the last 24 hours, especially stale fish or meat and milk products.
- (2) Acute diarrhoea produces dehydration (loss of salt and water from the body); therefore, the most important treatment for any acute diarrhoea is to replace the salt and water lost. In early stages, diarrhoea can be treated at home by giving fluids such as rice water, soup, buttermilk, tender coconut water, weak tea, and lime juice with added sugar and salt. In breastfed babies, give breast milk more often. If the child is not breastfed, the amount of milk feeds is increased and given diluted with equal amount of water. Watch for signs of dehydration (see section on ORS). Dehydration can be recognized by the following symptoms and signs: (a) some dehydration : dry mouth; thirst; sunken eye; rapid pulse; rapid deep breathing; scanty and dark urine; patient is restless or irritable; abdominal skin, when pinched, retracts slowly, and (b) severe: rapid and weak pulse, cold limbs, deeply sunken eyes and very dry mouth, bluish pale skin, fast breathing and, finally, unconsciousness; abdominal skin, when pinched, retracts very slowly (inelastic). No urine is passed for 6 hours. All patients of dehydration should be given oral rehydration solution (ORS) and severe cases should be referred to a doctor immediately (see section on ORS).
- (3) Fever and pain in abdomen suggest an infective cause such as bacillary dysentery.
- (4) Stools are of large volume and watery in cholera or viral diarrhoeas. They are of small to moderate volume and contain blackish blood and mucus in bacterial

dysentery. Stool is foul smelling, sticky and contain mucus and blackish blood in dysentery caused by an intestinal protozoa called amoeba.

- (5) If there is associated griping pain in the abdomen, give atropine sulphate tablet.
- (6) Drugs, such as codeine or opium, reduce the volume of stools but can make the patient more ill. Do not use them. Do not use any other drugs to reduce stool volume or frequency.
- (7) Antibiotics are not effective in treating majority of diarrhoeas. They are used only in cholera and bacillary dysentery.

Children accustomed to taking solid foods, and adults should be given easily digestible food such as boiled rice, chicken soup, boiled vegetables, eggs, fish or cooked meat and fruits like ripe bananas, tomatoes or pineapples; some fat and oil may be given. Spicy food should be avoided. Food should be offered to children 5–6 times a day. Further, the child should be given one extra feed per day for a week after the diarrhoea stops.

How to treat?



When to refer to a doctor?

- (1) Acute diarrhoea with severe dehydration (see section on ORS).
- (2) Acute diarrhoea (more than 10 liquid stools per day) not controlled within 24 – 48 hours.
- (3) Acute diarrhoea with severe vomiting.

In all the above patients, ORS must be started and continued on way to the primary health centre.

- (4) All persistent (chronic) diarrhoeas.

How is ORS supplied and given to patients?

- (1) ORS should be given even when there is vomiting. If a child vomits, wait for 10 minutes, then give a small amount of ORS by spoon.
- (2) Note the urine output. Enough ORS should be given so that the patient continues to pass plenty of urine.

Table 7: *ORS requirements in case of diarrhoea*
(Please also see Table 19.3 and 19.4, page 38)

Patients state	Age	Dose of ORS
No dehydration	Less than 2 years	- ¼-½ cup (50-100 ml) of fluid after each loose stool (2 glass per day)
	2-10 years	- 1 glass after each loose stool (4 glass per day)
	Above 10	- As much as the patient wants
Some dehydration	Less than 4 months	- ¼ glass in the first 4 hours
	4-11 months	- 2 glass in the first 4 hours
	12-23 months	- 3 glass in the first 4 hours
	2-4 years	- 4½ glass in the first 4 hours
	5-14 years	- 6 glass in the first 4 hours
	Above 14 years	- 12 glass in the first 4 hours
After rehydration	Less than 4 months stool	- ¼-½ cup (50-100 ml) after each loose stool
	4 months - 2 years stool	- ½-1 cup (100-200 ml) after each loose stool
	2-10 years	- 1-2 glass after each loose stool
	Above 10 years	- As much as the patient wants

NB: Breast feeding should continue between drinks of ORS Solution in breast fed children

Ear Problems

Pain in the ear (earache) may be due to wax in the ear or due to infection.

Wax is a normal secretion and provides protection to the ear drum and should be removed only if it disturbs hearing. Wax can be softened by using sodium bicarbonate ear drops containing 5 g of sodium bicarbonate and 30 ml of glycerine in 100 ml of water. Another simple remedy is to use coconut oil or olive oil for softening the wax.

Do not use the drops or oil if there is a discharge from the ear or if the patient is known to have perforation of the ear drum. Refer her/him to a doctor.

Pain in the ear may be due to a small boil in the external ear. If pulling the ear gently causes pain, suspect an infection of the canal or tube going into the ear. The infection may be visible if the ear canal is examined in good sunlight or with the help of a torch, pulling the ear gently and observing the canal. Tetracycline 1% ear drops can be applied locally to treat the infection. Pain can be relieved by giving aspirin or paracetamol with or without codeine. Refer the patient to a doctor.

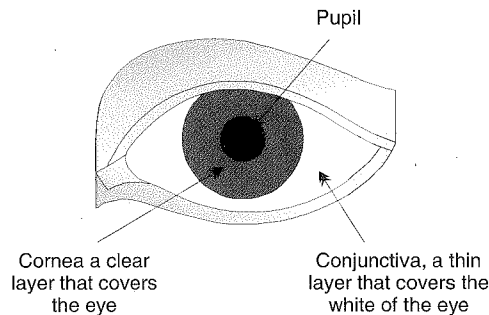
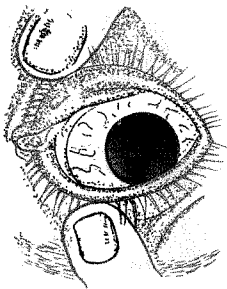
Inner ear infection (otitis media) is common in children. It often begins during an attack of common cold or stuffy nose or diseases such as measles. There may be fever. The child becomes restless and cries continuously because of pain and does not allow touching of the ear. In such cases, start oral co-trimoxazole and give paracetamol to relieve pain and refer the child to a doctor. If such an infection is not treated in time, perforation of the ear drum may occur.

All patients with chronic ear discharge, i.e., for more than 14 days, should be referred to a doctor.

Eye Problems

The eye is vulnerable to any external insult. Four common eye conditions are: (1) foreign body, (2) allergy, (3) infection, and (4) vitamin A deficiency. If these are not treated promptly, the damage done may have an effect on vision. Hence treatment of these conditions must be undertaken promptly.

Turning the eye lid up



(1) Foreign Body

This could be a small insect or a piece of grit or a loose eyelash. Tell the patient not to rub the affected eye. If possible, make the patient blink the eyelids, with the eye under clean water. If this is not effective, make her/him sit in good light. Wash your hands with soap and water and try to remove the foreign body gently by flushing the eye with clean water. For foreign body under the upper eyelid, turn the eyelid up and identify the foreign body and then remove it gently with moistened and twisted cotton wool or a clean piece of cloth. In case the foreign body is in the lower lid, gently draw the lower lid down and out and identify the particle and remove it with a moistened wisp of cotton. Magnifying glass is useful for identifying and localizing the foreign body. After removal, tetracycline eye ointment should be applied and the eye bandaged. If the foreign body cannot be easily wiped away or is embedded, do not try to remove it. In that case, cover the eye with a light bandage and refer the patient to a doctor.

Black or bruised eyelids (ecchymosis) does not need treatment if vision is not affected. Refer the patient to a doctor for any concomittant injury to eye.

(2) Eye allergy

Allergic conditions of the eye are due to various substances in the surroundings such as dust particles, smoke, chemicals and pollens from flowers. They produce chronic redness of eyes and itching without discharge. In the countryside, they are common during the flowering and harvesting seasons. They are treated with zinc sulphate 0.2% eye drops, 2–3 drops thrice daily, for 7–10 days. If there is no relief, the patient should be referred to a doctor.

(3) Inflammation and infection

Acute infections of the eye occur due to bacteria or viruses. Eyes become red and there is often pain and foreign body sensation (sore eyes). This is an inflammation of the covering of the eye (conjunctivitis) with marked redness, mild pain and secretory discharge which may contain pus. Patients feel uncomfortable in bright light and prefer to keep away. There is difficulty in opening the eyelids, particularly in the morning, owing to a sticky discharge.

Trachoma is a chronic infectious type of conjunctivitis. It is a major cause of blindness in many developing countries. Unlike acute conjunctivitis, it develops gradually over many months. In its early stage, it causes a slight swelling of the eyelids and running of the eyes due to increased secretion. The patient complains of foreign body in the eye (gritty feeling). The upper lid is usually the worst affected. This stage persists for many months. If untreated, abnormal fine blood vessels develop spreading from the periphery to the central region of the eye. The surface becomes granular. The eyelashes are inturned. This stage may last for six months or more. If untreated, scars may form leading to opacity and blindness.

Trachoma is an endemic disease and is associated with low socioeconomic and unsanitary conditions. The disease spreads through flies. Reduction of household crowding, identification and control of the breeding sites of eye-seeking flies, and improvement of personal hygiene should be actively encouraged.

How to treat infections?

- (1) Boil a glass of water with a pinch of salt and allow it to cool. Wash your hands with soap and water and wipe the eyes gently with clean cotton dipped in this water. Each time use a separate cotton swab.
- (2) Clean the lids. Pull down the lower lid and put tetracycline 1% eye ointment 4–5 times a day. Chloramphenicol eye ointment and eye drops can also be used for the same purpose if tetracycline eye ointment is not available. The patient or her/his relative should be instructed on how to clean the eyelids and apply the ointment at home.

- (3) Follow up the patient carefully. If, after 3 days of tetracycline treatment, there is no improvement, the patient should be referred to a doctor. If there is improvement, continue the medication for 7–10 days.
- (4) Lid inflammations, such as sty, should be treated by the application of warm compresses and tetracycline eye ointment 3–4 times a day for 3 days. People who get repeated sties or sore eyes should be referred to a doctor.
- (5) Sometimes newborn babies, within a few days after birth, suffer from red eyes with the swelling of lids and discharge. To prevent this, put tetracycline eye ointment in both eyes only once or instil 1 to 2 drops of silver nitrate 1% eye drops soon after birth, immediately after cleaning the eyes with boiled cool water.
- (6) If a person has a chronic eye complaint, such as trachoma mentioned above, refer her/him to a doctor for confirmation. Trachoma is curable if treated in the early stages. Tetracycline 1% eye ointment is applied 3 times a day for six weeks. In the early stages, only eye drops or ointment, if used adequately, would suffice. In the long run, local treatment with ointment has to be carried out by the affected person herself/himself and, therefore, the patient or her/his relative should be given detailed instructions regarding the application of ointment. In places where trachoma is endemic, for mass anti-trachoma treatment, tetracycline 1% ointment is applied to both eyes twice daily for 5 days every month for six months.

How to prevent the spread of sore eyes (conjunctivitis)?

- (1) Advise the patient with sore eyes to minimize physical contact with other people.
- (2) He/she should use a separate handkerchief or towel and wash it separately after use.
- (3) People with sore eyes should be advised not to bathe in canals or pond water used by others.
- (4) A child suffering from sore eyes (conjunctivitis) should not attend school during the attack.
- (5) Do not delay treatment.

(4) Vitamin A deficiency

This is one of the major causes of blindness in developing countries. Patient complains of difficulty in seeing in the dark (night blindness). Eyes become dry and sometimes white foamy spots (Bitot's spots) can be seen on the white surface of the eye ball. Later on, there are ulcers and destruction of the eyes leading to blindness.

For prevention and treatment of vitamin A deficiency, refer to section on Vitamin A.

Fever is often a symptom of an infectious disease and may be a valuable guide to know the severity of the disease. Mild cases need no immediate treatment with drugs.

General guidelines

- (1) If a patient gets sudden fever in a place where malaria is known to occur, take a blood smear for examination for malarial parasites.
- (2) Advise rest in bed as long as there is fever.
- (3) Give plenty of fluids, such as potable water (preferably boiled and cooled), vegetable soup, buttermilk, milk, weak tea or coffee, coconut water or lime juice with sugar and salt.
- (4) Meals should be light. Avoid food that is spicy, pungent or excessively oily. Do not starve the patient.
- (5) If the patient is uncomfortable because of fever, bodyache or headache, give aspirin or paracetamol three times a day. (see chapter on aspirin for precautions in children)
- (6) If the armpit temperature is more than 39.5°C or if the patient is delirious because of high fever, give sponge with tepid water. Remove all clothes except underwear. Sponge the entire body, part by part, with water at room temperature (not very cold). Do not dry the skin. The water will evaporate and cool the body. Do sponging till body temperature comes down to 39.0°C .
- (7) In case of fever associated with sore throat and pain, advise repeated gargling with warm water containing common salt (one teaspoonful of salt to a glass of warm water).

How to treat?

Fever of sudden onset

With headache, bodyache, running nose, sneezing as in common cold or influenza	Give aspirin or paracetamol. Aspirin should be avoided in children. Also give chlorpheniramine
With marked rigors, and temperature coming on periodically; fever comes down by itself with profuse sweating	Use chloroquine; if no improvement in three days, refer to a doctor
With cough and sputum, if the patient looks ill, complains of pain in throat	Give oral amoxicillin/ampicillin or co-trimoxazole or sulphadimidine, refer if no response in three days
With signs of sepsis such as an abscess or swelling and redness of skin	Give amoxicillin/ampicillin or co-trimoxazole and refer to a doctor
With frequency of urination and burning or pain while urinating or pain in loin	Start amoxicillin/ampicillin or co-trimoxazole and refer to a doctor
In a child with sore throat and cough	Give paracetamol and oral amoxicillin/ampicillin or co-trimoxazole. Refer if no relief in three days
In children with rash, or joint pains	Give paracetamol and refer to a doctor

When to refer to a doctor?

- (1) Fever of acute onset which does not respond to treatment within 3 days.
- (2) If the patient is ill, too weak to eat and drink, or is dehydrated.
- (3) If the patient talks incoherently, does not recognize people, is drowsy or unconscious, or has convulsions.
- (4) If the patient complains of marked headache and has attacks of vomiting or stiffness of neck.
- (5) All fevers with a duration of more than 7 days or occurring intermittently. Remember that tuberculosis commonly presents as an irregular fever.
- (6) If a child has fever, cough, rapid breathing and chest indrawing, give oral amoxicillin/ampicillin or co-trimoxazole and refer to a doctor immediately.
- (7) If a child has fever and rash on the body, refer to a doctor.

What precautions should be taken?

- (1) When aspirin is used, it must be given with plenty of water and after food.
- (2) Before giving sulphonamide (sulphadimidine), co-trimoxazole or amoxicillin/ampicillin enquire whether the patient has ever had a reaction, such as skin rash, itching, or joint pain following such drugs. In such cases, avoid the offending drug.
- (3) Watch the patient for any reactions following sulphonamide, co-trimoxazole or amoxicillin/ampicillin. Stop the drug if signs, such as rash, itching or urticaria, occur.
- (4) Ensure adequate food, water intake and urine output.
- (5) Do not give purgatives such as castor oil or epsom salt. If the patient is constipated, advise glycerine suppository in children or simple enema in adults.



HIV / AIDS

What is AIDS ?

AIDS (Acquired Immuno Deficiency Syndrome) is caused by a virus called HIV (Human immuno-deficiency virus). The virus can enter the body through sexual intercourse, blood transfusion, needles and syringes and from mother to child.

HIV is not spread through social contact, kissing, sharing clothes, toilets or swimming pools. A person with HIV after acquiring the infection can remain for 7-10 years, without any signs or symptoms. A person with HIV should not be discriminated or isolated from the community.

There is currently no cure for HIV but it can be easily prevented. Abstinence, having mutually faithful monogamous partner, use of condoms in situations of risk, ensuring that blood is tested for HIV and use of sterilized injecting equipment are good ways of preventing the transmission of HIV from one person to another.

General Information

- (1) AIDS is serious public health problem in South-East Asia Region.
- (2) Most people infected with HIV are in the age of 15-45, i.e. the most economically productive group.
- (3) The modes of transmission of HIV and Sexually Transmitted Infections are the same.
- (4) The infection is most likely to occur in people who have multiple sex partners or inject drugs.
- (5) A person with HIV can lead a normal productive life for many years and must be encouraged to do so.
- (6) Women are more vulnerable to HIV than men.
- (7) TB is the most common opportunistic infection among people with AIDS.

- (4) Watch for side-effects of the drugs prescribed. DDS produces loss of appetite, nausea and vomiting. It may also give rise to allergic rash. Rarely, it causes jaundice, ulcers in the mouth and anaemia. Patients with anaemia would look pale and complain of weakness and tiredness. Rifampicin may also cause loss of appetite. In addition, it may give rise to fever and jaundice but this is very rare with the doses used in the treatment of leprosy. Clofazimine sometimes changes the colour of the skin to reddish brown. Observe the patient regularly. If you notice any side-effects, refer the patient to a doctor.

How to prevent the spread of leprosy?

- (1) If you observe any individual with specific changes mentioned above on her/his face, or if you find a hypopigmented patch on the body associated with diminished sensation to pinprick, refer the patient to a doctor for examination.
- (2) All members of the family in contact with the leprosy patient should be examined.
- (3) Educate people that leprosy is curable and that they should seek early advice if they notice any hypopigmented patch on their bodies.
- (4) Remember that treatment for leprosy has to be carried out without default for many months to obtain complete cure. This should be emphasized to the patient as well as the dangers of inadequate or no treatment. Make sure that the patient gets her/his supply of drugs regularly.

Malaria

Malaria is a disease caused by the bite of an infected female *Anopheles* mosquito. During the mosquito bite, the parasite causing malaria is introduced into human body. The typical feature of malaria is repeated attacks of high fever with chills and rigor followed by intervals when the body temperature is normal. Sometimes in the initial stages the patient may complain of headache, muscle pain, joint pain, abdominal discomfort and fatigue, before fever develops.

With repeated attacks of malaria, deficiency of blood (anaemia) occurs, and on examination, there is enlargement of spleen. These patients may be given chloroquine to control malaria. For cure of malaria, primaquine is also given after treatment with chloroquine. However, in malarious regions (endemic zone) primaquine serves no useful purpose. Because with frequent mosquito bites recurrence of malaria will occur. If the fever of malaria is not controlled by chloroquine, the parasite has developed resistance to chloroquine and the patient should be referred to a doctor.

In some severe forms of malaria, apart from high fever, the patient may develop abnormal behaviour and may get fits (convulsions) and become unconscious. These cases also should be immediately referred to a doctor or to a referral hospital.

How to treat?

Drugs commonly prescribed for malaria are:

- Chloroquine
- Primaquine
- Pyrimethamine+sulphadoxine
- Quinine
- Mefloquine
- Artemisinin derivatives

What precautions should be taken?

- (1) If possible, blood smear of the patient should be sent to a laboratory for diagnosis of malaria.
- (2) When chloroquine is used, it must be given with plenty of water, after food and not on empty stomach. If chloroquine syrup is not available for children, the tablet should be crushed and given with honey or thick syrup.
- (3) Watch for side effects of drugs prescribed. Chloroquine may cause nausea, vomiting and diarrhoea, mild headache and skin allergy/rash.

Primaquine may cause breakdown of red blood cells in some enzyme deficient individuals. In these cases red or dark coloured urine may be passed. In such cases therapy should be stopped and patient immediately referred to a doctor.
- (4) If the patient of malaria does not respond to chloroquine therapy probably the parasite is resistant to chloroquine and the patient should be referred to a doctor.
- (5) Chloroquine should be avoided or not given, if the patient is suffering from concomitant liver disease, or has nausea, vomiting or also is suffering from disease of blood or brain.
- (6) In patients of malaria not responding to chloroquine, before giving pyrimethamine+sulphadoxine combination, history of sensitivity/allergy to sulphonamide should be obtained. In patients allergic to sulphonamide this combination should not be given.
- (7) If the patient with high fever and chills, becomes delirious, develops abnormal behaviour or stiff neck, the patient should be immediately referred to a doctor.

When to refer to a doctor?

- (1) Any fever with rigor not responding to chloroquine therapy within 3 days.
- (2) Patient on chloroquine therapy, if starts passing dark coloured urine.
- (3) Patient with high fever and rigor, develops abnormal behaviour or becomes semiconscious or unconscious or develops rigidity of neck.

Pain

Pain can be: (1) headache, bodyache or backache with or without fever; (2) due to local infection such as a boil; (3) rheumatic, or (4) due to disease of an organ (eye, ear, tooth, heart, lung, stomach, intestine, bladder, uterus, testes etc.). Rheumatic pain is the term used to describe pain coming from muscles and joints. Always look for the cause of pain. Relief from pain can be obtained by using drugs which may not cure the underlying disease.

General guidelines

- (1) Patients who complain of pain in the chest or have painful and swollen joints should be advised rest.
- (2) If the pain is localized, giving the part rest will be helpful.
- (3) Local heat (hotwater bag or hotwater bottle) gives relief from pain due to local infection, such as boils or abscess. In order to prevent a burn while applying heat, place a piece of cloth between the bottle and the skin.
- (4) Acute abdominal pain accompanied by vomiting and stiffness (hardness) of the abdominal muscles must be referred to a doctor immediately.
- (5) In all other abdominal pains, advise the patient to avoid spicy food.
- (6) Sometimes a patient suffering from pain neglects his diet; in such cases, ensure adequate food and water intake. Do not starve the patient.

Generalized pain

Headache or bodyache, with or without, fever	Use paracetamol or aspirin; in severe pain, combine with codeine (no aspirin in children. Refer to section on aspirin)
Pain due to injury	Use aspirin; in severe pain, combine with codeine
Earache	Aspirin; if severe, combine with codeine. Examine the external ear in good light. If boil is present, start oral amoxicillin/ampicillin
Upper abdominal pain relieved by food	Treat with magnesium hydroxide suspension
Colicky pain in the abdomen, occurring in attacks, abdominal muscle not stiff	Give atropine sulphate and refer to a doctor
Abdominal pain, diarrhoea or constipation	Give atropine sulphate; treat diarrhoea or constipation
Pain just before or during menstruation	Give aspirin or paracetamol
Pain and burning during urination	Give plenty of fluids and refer to a doctor
Frequent urination with pain, in females	Give plenty of fluids and refer to a doctor

Rheumatic pain

Joint pains and or backache	Give aspirin; apply local heat, refer to a doctor
-----------------------------	---

When to refer to a doctor?

- (1) Acute chest pain, particularly in elderly people, should be referred immediately.
- (2) Acute abdominal pain, when accompanied by vomiting and stiffness (hardening) of abdominal wall, should be referred immediately.
- (3) Pain due to severe injuries (fracture or open wounds).
- (4) Eye pain and ear pain.
- (5) Pain persisting for more than three days.
- (6) Headache associated with vomiting, paralysis, mental change, high blood pressure or change in consciousness.
- (7) Any severe pain with restlessness.

What precautions should be taken?

- (1) Do not use aspirin to treat abdominal pain.
- (2) Do not use aspirin to treat pain associated with abdominal symptoms such as nausea and vomiting .
- (3) Do not repeat codeine frequently as it may produce constipation.
- (4) Avoid atropine in patients older than 60 years of age as it may produce:
 - eye problems leading to severe headache and blurring of vision. This could be due to increase in pressure in eye ball or due to precipitation of acute attack of glaucoma.
 - urinary problems resulting in retention of urine in patients with enlarged prostate.
- (5) Avoid aspirin in children below 3 years of age suffering from chickenpox or influenza because of risk of developing Reye's Syndrome (see section on aspirin).
- (6) Refer the patient with abscess for surgery.

Pediculosis

What is it?

Lice is a parasite living on human skin, among the hair and on the clothes. The females lay eggs on hair; growth of hair brings the empty shells into view after the eggs have been hatched. Lice infestation is usually acquired through close contact with unclean persons, fellow classmates from schools, shared clothing, bedding or combs. It gives rise to itching. Secondary infection may occur following scratching.

When a person complains of itching in the head, look for the shiny grayish eggs on the hair. Also enquire about the contacts and examine the hair of family members.

How to treat?

- (1) For body lice – apply cream containing 1% gamma benzene hexachloride (lindane) (about 30 gm cream for an adult) to the whole body (from the neck down) and keep it for 8 – 12 hours. Then advise bath.
- (2) For head lice – lotion or shampoo containing 1% gamma benzene hexachloride (lindane) is applied to the hair, allowed to dry and followed by bath after 8 hours. A single application is enough. In cases of heavy infestation, scratching leads to secondary infection of the skin with pus formation. In such cases, it is advisable to cut the hair short and clean the skin with cotton swab dipped in hot water. The area is dried and then chlorhexidine ointment is applied.
- (3) Treat all contacts, particularly family members, simultaneously.
- (4) To destroy lice and eggs in clothes, dip them in boiling water. Keep the bedding in direct midday sun for several days.

What precautions should be taken?

- (1) Avoid contact of drugs with eyes.
- (2) Wash hands after application.
- (3) Do not use gamma benzene hexachloride repeatedly in children.
- (4) Keep the drugs at a safe place, away from children. If swallowed, they can produce serious toxicity.

Poisoning

Poisoning may be due to the swallowing of poisonous substances either accidentally or intentionally. Poisoning can occur in children from the consumption of berries from plants which are poisonous. Acute poisoning may also occur due to the ingestion of contaminated food. In all cases of poisoning, the poison, such as the chemicals, tablets or containers, should be saved, if available, for the doctor to examine. The vomit should also be preserved for identifying the poison.

How to treat poisoning?

- (1) If the patient is conscious, observe her/him carefully. Do not induce vomiting if you suspect the poison to be corrosive (strong acid or alkali) or a petroleum product. With a corrosive poison such as strong acid and alkali, the lips and the mouth may show grayish white stains.

If poisoning is not due to corrosive agents or petroleum products, make her/him vomit by tickling the back of the throat. If this does not work, give her/him plenty of water containing 4 tablespoonful of common salt to each tumbler of water. Vomiting will not help if the patient presents too late – more than four hours after the ingestion of poison.

- (2) Following vomiting, dilute any poison left in the stomach by asking the patient to drink milk. Alternatively, one can use charcoal powder. It is available as charcoal powder (activated) and is particularly useful for preventing the absorption of poisons which are toxic in small amounts. Charcoal should not be used in patients with poisoning due to an acid or alkali. It is prepared by dissolving 4 tablespoonful of powder in about 400 ml (2 glassful) of water and half a glass is given to drink every 15 minutes. It is quite safe. If charcoal is not available, powder of burnt bread can be used.
- (3) If the patient is unconscious, put her/him in a position lying on one side (preferably left side) with head tilted slightly backwards so that choking due to falling back of the tongue is prevented. This position will also allow secretions to drain from the mouth. If the patient has stopped breathing, he/she would need artificial respiration.

Refer all cases of poisoning to a doctor, along with samples of residual poisons, vomit and containers.

Sexually Transmitted Infections

Sexually transmitted Infections (STIs) are primarily spread through sexual contact. There are many STIs; the most common are Gonorrhoea, Syphilis and Trichomoniasis. Some of the common symptoms of STI are urethral and vaginal discharge, genital ulcers, scrotal swelling and lower abdominal pain. The presence of STI can cause infertility, pregnancy wastage, cancers etc.

Women could have STIs without any symptoms. It has been proven that the presence of STIs increases the risk of transmission of HIV by eight to ten times. Most STIs can be cured. HIV cannot be cured currently.

General Guidelines

- (1) Suspect STIs when women complain of white discharge, chronic back pain, itching in vagina etc. or men complain of itching around penis, discharge or ulcers in reproductive organs.
- (2) Refer Patient to a doctor immediately if you are not trained on management of STIs or follow syndromic guideline flow chart for treating patient.
- (3) Take a detailed sexual history. If patient admits having multiple sexual partners or has had sex with a person with multiple sexual partners, suspect a STI and probe for symptoms.
- (4) Do not be negative towards the patient and make the patient feel uncomfortable about his/her sexual behaviour or preference.
- (5) Provide privacy for patient while asking questions or undertaking a physical examination. Keep any information provided to you by the patient confidential.
- (6) Educate the patient on how the STIs were acquired.
- (7) Advise the patient about condom use and provide condoms.

- (8) If STIs is established ask patient to bring sexual partners for treatment and follow up if possible.
- (9) Advise patient on risk of multi-partner sex and promote safer sex practices such as use of condoms or non-penetrative sexual practices such as caressing, massaging any part of the body, etc.
- (10) Provide sources of additional information on HIV/AIDS/STI including counseling services to the patient.

How to treat?

Drugs commonly used for treatment of STIs are:

- Acyclovir
- Benzathine Pencillin (by intra-muscular injection)
- Ciprofloxacin
- Doxycycline
- Erythromycin
- Metronidazole
- Nystatin (intra-vaginally)

Check national guidelines for latest regime and flow chart for drug(s) of choice and dosage.

What precautions should be taken?

- (1) Use gloves while undertaking a physical examination.
- (2) Ensure that other known sexual partners are also treated.
- (3) Always use sterilized equipment where warranted. Follow universal precautions.

How to prevent the spread of STIs?

- (1) Sex with a single uninfected partner.
- (2) Condoms must be used when having sex with multiple partners.
- (3) Treatment of STIs must be taken at the earliest. Condoms must be used during treatment.
- (4) All sexual partners of patient must also be treated.
- (5) Never share needles. Only sterilized syringes and needles should be used.
- (6) Screen blood for STIs before transfusion.

Snakebites and Insect Stings

Snakebites

Although there are many types of snakes, only a few of them are poisonous.

How to distinguish between poisonous and non-poisonous snakes?

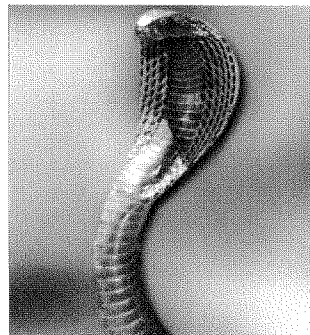
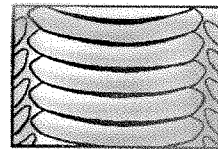
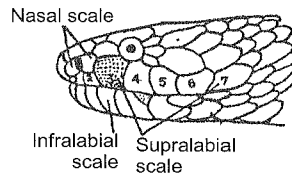
If a killed snake is brought in together with the victim, turn the snake on its back and observe ventral plates, then the head and the body.

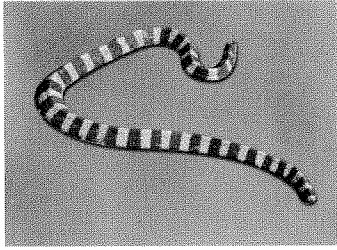
Poisonous snakes

(1) Elapid snakes – e.g., cobra and krait. The characteristics are:

- The head is about the same width as the body, the neck not being distinguishable;
- The pupils are circular;
- The ventral plates completely extend across the belly, and
- The dorsal line of the scales is hexagonal.

A cobra is usually 5 – 15 feet long, brown/dark brown/golden yellow in colour. When

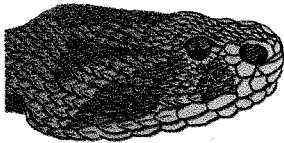




aroused, it raises its head and spreads it as a 'hood', which has on its dorsal side a specific pattern.

← The common krait usually measures 4 – 5 feet, and is shiny steel blue in colour with rows of white stripes across the body.

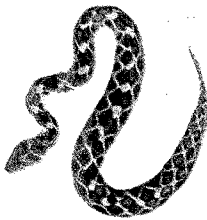
(2) Viperine snakes e.g., Russell's viper, saw-scaled viper, pit viper. The characteristics are:



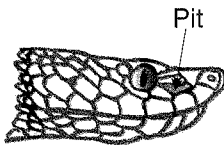
- The head is broad and pear-shaped (triangular) – with a distinct neck.
- The head is covered entirely by small scales of the size of those covering the body.
- Ventral plates completely cover the body and pupils are vertical.

Russell's viper is brown/amber in colour, has an angular snout and large fangs. It has a characteristic pattern of triple rows of oval spots running along the entire length of the body.

Saw-scaled viper

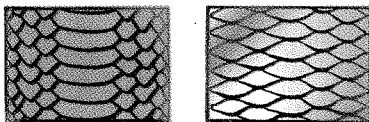


← The saw-scaled viper is smaller in length – 1 to 2 feet – brown/grayish brown in colour and has a triangular head with a typical white arrow mark. It has a characteristic diamond-shaped pattern on the back extending from head to tail.



← The pit viper is distinguishable by a pit between the eye and the nostril.

Non-poisonous snakes



← (1) The ventral plates do not extend right across the entire belly. Instead, the belly is covered with small scales or the last row of small scales which cover the back are visible on the underside of the snake.

(2) There are no fangs (two large grooved or tubular teeth) fixed to the upper jaw. Instead there are several rows of small teeth.

(3) The tail is markedly compressed.

Symptoms and signs of snake bite

Vipers	Cobra and Krait
Toxin acts on blood.	Toxin acts on nerves.
Intense and persistent local pain with oozing of blood from punctures.	Local burning, stinging pain but negligible blood oozing.
Marked local swelling.	Local swelling may be present.
Local sloughing occurs.	No local sloughing.
There is nausea, vomiting and characteristic bleeding from nose, gums and in urine. Patient may collapse due to loss of blood. Blood does not clot easily.	There is drooping of eye-lids. Patient feels giddy, weak; limbs get paralysed. Breathing becomes difficult and death occurs due to failure of respiration.

If the snake is found to be non-poisonous, no treatment except local treatment is necessary. Reassure the patient.

How to treat?

The following first-aid treatment should be carried out in all suspected cases immediately without wasting time. If the person is suspected to have been bitten by a snake, immediate arrangements should be made to send her/him to a PHC for treatment with anti-snake venom serum. This is the only life-saving measure available. No other remedy is known to substitute the antivenom serum.

- (1) Give assurance to the patient. Remember that fear of death may cause shock.
- (2) Apply a light tourniquet (not tight) with a strip of cloth, handkerchief, a cord or a rubber band to the thigh in the case of a bite on the leg and to the arm in the case of a bite on the hand. The purpose of the tourniquet is to compress the tissues above the bite and delay the venom getting into the general circulation during transit to PHC.
- (3) Avoid movements of the bitten part. It should be immobilized by means of a splint. Movement of the bitten part hastens absorption of the venom in spite of the tourniquet.

Scorpion stings

The scorpion has a sting on its tail which it uses for defence. The venom is injected into the victim with the sting. It usually produces local pain which can be severe

How to treat allergic reactions?

Allergic reactions of the skin are characterized by rash which may be fine, raised papules or thick, raised spots or patches that look like bee stings, and produce itching. Such reactions could be due to eating food to which a person is allergic or coming in contact with material which the person cannot tolerate. The rash may come and go and reappear when the patient comes in contact with the same material or eats the food to which he/she is allergic. Hence attempts should be made to find out the cause. If detected, the cause(s) should be avoided by the patient. Apply calamine lotion locally and, if the itching is severe, give an antihistaminic drug, chlorpheniramine. In cases of severe reaction which is accompanied by difficulty in breathing, fall in blood pressure, vomiting, giddiness, etc., refer the patient to a doctor immediately.

How to treat boils?

Boils are caused because of infection of the hair roots. They are warm, raised, painful and may show a small whitish area in the centre. The skin around it may be swollen. Sometimes, multiple boils may occur giving rise to fever.

- (1) Foment the boil with hot water several times a day.
- (2) Usually, small boils will break open by themselves. Continue applying hot compresses and allow the pus to drain. Apply gentian violet or chlorhexidine ointment or povidone iodine ointment. If the patient also has fever, give amoxicillin/ampicillin or co-trimoxazole tablets.

How to treat scabies?

See section on Benzyl Benzoate or Lindane.

How to treat fungus infection (ringworm)?

See section on Ringworm Ointment.

Tooth Problems

Toothache is a common complaint both in children and adults.

Many persons, particularly in developing countries, have poor oral hygiene. Breath smells foul; the gums are swollen due to formation of pus; and bleed easily (Pyorrhoea). Tooth decay and a cavity is formed (caries). When food particles or cold water gets into the cavity, patient complains of severe pain. Sometimes pus forms at the root of the tooth and there is swelling of the gum.

General guidelines on oral hygiene

- (1) Teeth and gums must be kept healthy for chewing of food. This can be done by brushing teeth after every meal and once before retiring to bed at night.
- (2) Use any brand of tooth paste for brushing or for gentle massage of gums. The paste or powder should not be gritty.
- (3) Advise patient not to take very sweet foods. Parents should be advised not to give a child with caries of teeth, too much candies, chocolates or sweets. In any case, advise brushing and thorough rinsing of mouth with water after eating.
- (4) A substance called fluoride can reduce caries, particularly if there is less quantity of this chemical in water. But excess fluoride is harmful.
- (5) If tooth paste or powder is not available, advise brushing with a mixture of salt and baking soda in equal proportion (1:1) or with green stick of neem (margosa) tree.
- (6) Advise people to take plenty of fruits, leafy vegetables, lentils, and milk. Good diet keeps teeth and gums healthy.

How to treat dental problems?

- (1) Toothache due to cavity: Cleaning the cavity with lukewarm water containing salt (two teaspoonsful in a litre of water) and apply a cotton swab dipped in clove oil.
- (2) Give a tablet of aspirin or paracetamol. It can be repeated after 3 – 4 hours. If pain is more severe give a tablet of codeine with aspirin.
- (3) All patients of dental caries should be referred to a dentist. Dentist may be able to fill the cavity and save the tooth from further decay.
- (4) If the toothache is due to swelling of the gum and root abscess, ask the patient to gargle with warm salt water; give a tablet of aspirin and amoxicillin/ampicillin or co-trimoxazole and refer the patient to a dentist.
- (5) Disease of the gums is due to poor oral hygiene. It is best treated by regular and proper cleaning of the mouth, gargling with chlorhexidine mouth wash (refer to section on Chlorhexidine). Rarely patients who take drugs for epilepsy may complain of spongy gums and bleeding. Enquire about this and refer the patient to a doctor.
- (6) Many people from some countries in South–East Asia have the habit of eating betel leaf mixed with areca nut, lime and tobacco called pan. This habit may lead to development of cancer of the mouth. Advise patient to stop eating pan.

Tuberculosis

What is tuberculosis (TB)?

Tuberculosis is a disease caused by a type of bacteria. It affects many parts of the body such as lungs, intestine, kidney, brain and bone. Lung tuberculosis is the commonest. A patient suffering from tuberculosis has loss of appetite, feeling of tiredness, loss of weight, chronic cough and irregular low fever. The cough may be dry or associated with sputum which may be blood-stained. In some patients, glands in the neck become enlarged. A person with low-grade fever associated with chronic cough and loss of weight should be suspected of suffering from tuberculosis. All such cases should be referred to a doctor.

How to treat?

Tuberculosis can be cured. Directly Observed Treatment, Short-course (DOTS) is the most effective way to ensure cure. In the initial, intensive phase of treatment, every dose of medicines which includes rifampicin should be directly observed. Medicines may be taken either daily or thrice weekly, according to the national policy of each country. Daily and thrice weekly treatment are equally effective. Direct observation of treatment should be done by a person who is trained by and accountable to the health system, and who is accessible and acceptable to the patient. Ensure that the patient is treated respectfully and confidentially.

Drugs which are commonly prescribed for tuberculosis are

- Streptomycin given by injection
 - Isoniazid tablets
 - Rifampicin capsules
 - Thiacetazone + Isoniazid tablets
 - Ethambutol tablets
 - Pyrazinamide tablets
- } given orally

What precautions should be taken?

- (1) Multiple drugs are given for treating tuberculosis. Make sure that the patient, under direct observation, has understood how to take these drugs and that he/she takes them regularly as prescribed by the doctor, without defaulting. This is very essential for curing the disease, and rendering the patient non-infectious to others.
- (2) Keep a record of body temperature and body weight. The body weight will increase gradually and the temperature will settle down within a few weeks. The cough will also decrease and ultimately stop within 4 – 6 weeks.
- (3) If you notice any of the following, stop the drugs and refer the patient to the doctor immediately:
 - Yellowish discolouration of the skin and eyeballs (jaundice)
 - Blurred vision in a patient taking ethambutol
 - Easy bruising in a patient on rifampicin
 - Dizziness or hearing loss in a patient taking streptomycin
 - Itching and skin rash in a patient on thiacetazone

Thiacetazone should never be used for patients with risk of HIV infection.

- (4) Watch for side effects of the drugs prescribed. All the drugs can give rise to allergic rash. Enquire about any disturbances of hearing or giddiness. This can be caused by streptomycin. Isoniazid sometimes causes tingling and numbness in limbs, muscle weakness and jaundice, which may turn the eyes and urine yellow. Rifampicin may cause loss of appetite, irregular fever in patients whose fever has earlier settled down, and jaundice. Inform the patient on rifampicin therapy that her/his urine and sputum may become orange red in colour. This does not cause any harm. Ethambutol sometimes produces disturbances of vision; enquire about it. Thiacetazone may give rise to skin rash, joint pain, ulcers in the mouth and jaundice. Pyrazinamide may cause loss of appetite, nausea and vomiting, pain in the joints and sometimes injury to the liver (jaundice). Observe the patient regularly and, if you notice any such effects, refer him to a doctor.
- (5) Advise the patient about nutrition. Ensure that the patient visits the doctor for medical and/or sputum examination and instructions regarding further drug therapy. Drug therapy for tuberculosis has to be given for six to nine months.

How to prevent spread of tuberculosis?

- (1) Remember that tuberculosis can be completely cured if drug treatment is carried out as prescribed properly and for the desired period. Make sure that the patient takes the medicine as prescribed. Inadequate or interrupted treatment results in the development of drug-resistant bacteria. Such cases then do not respond to drug therapy.

- (2) At any time during treatment, if a patient becomes acutely ill or coughs out blood, refer her/him to a doctor.
- (3) Tuberculosis spreads through coughing. Hence the patient should be instructed to cover her/his mouth with a handkerchief while coughing.
- (4) People should be warned against the danger of spitting anywhere.
- (5) Undernutrition and overcrowding promote the spread of tuberculosis.
- (6) Educate people about the preventive aspect of this disease, emphasizing that if they seek early advice, the disease can be cured completely.
- (7) Ensure BCG vaccination in children.
- (8) AIDS is sometimes associated with tuberculosis. Consider offering voluntary confidential HIV testing to TB patients. Refer the patient to a National AIDS Programme.

Vomiting

Vomiting results from the ingestion of a nauseating or irritating material, spoiled food, inflammation of stomach or gut, or high fever. Pregnancy, travel sickness, half headache (migraine) and vertigo (a sensation of reeling) are other common causes of vomiting. Vomiting is also associated with serious illnesses, such as painful fracture, heart attack, acute abdominal pain, brain disease and head injury or closed abdominal injuries with internal organ damage. Persistent vomiting may be due to stomach ulcer or obstruction in the gut.

When vomiting is due to the ingestion of spoiled food or irritating substances, it helps to throw out the irritating material and hence is beneficial. However, excessive vomiting causes loss of salt and water and exhausts the patient. Vomiting over a long period of time prevents eating and thus results in starvation.

The vomited material may be watery or slimy; it may contain partly digested food or blood, or it may be dark green or brown and foul smelling.

General guidelines

- (1) Look at the vomitus, if available. If not, ask the patient what it contains – especially, inquire about blood and smell. Find out how long the vomiting has been present.
- (2) Find out if the patient has high fever, severe headache, diarrhoea, chest pain, abdominal pain or any injury.
- (3) Ask the patient if he/she has passed a stool and whether he/she has passed gas (flatus). If not, the patient should be referred to a doctor immediately.
- (4) If vomiting has started suddenly after ingestion of food, suspect food poisoning. Others who ate the same food may also vomit.
- (5) If vomiting occurs in a young woman with missed period (menstruation), particularly in the morning, think of pregnancy as a cause.
- (6) A patient who is vomiting should not eat solid food. He/she is advised to take sips of ice-cold water, cold weak tea, lime juice or rehydration fluid. If diarrhoea is present, give plenty of rehydration fluids (ORS).
- (7) Preserve the vomitus, if available, for examination by a doctor.

How to treat?

Acute vomiting

Vomiting during travelling only (motion sickness)	Advise travel after light meal and not on an empty stomach. Pinch of powdered ginger root may help in milder cases. Those who are known to suffer from such vomiting should get medication from a doctor
Vomiting due to pregnancy	Advise plenty of fluids. Reassure the patient that it is self-limiting
Injuries, sprains, fractures	Give the injured part rest. Use paracetamol with or without codeine to relieve pain. Refer to a doctor
Vomiting due to eating spoilt, irritating food	No food. Only sips of cold water or rehydration fluid. It is self-limiting
Vomiting with diarrhoea	See section on Diarrhoea
With high fever	See section on Fever
With half headache. History of similar attacks. Suspect migraine	Rest in bed. Give aspirin. Plenty of fluids, tea or coffee. Refer to a doctor
With abdominal pain, distension. Vomitus may have foul smell. Suspect obstruction	Refer immediately to a doctor
Chest pain, perspiration. Suspect heart attack	Refer immediately to a doctor

When to refer to a doctor?

- (1) If vomiting is accompanied by acute abdominal pain, severe chest pain, severe headache, high fever, convulsions, or dehydration.
- (2) If the vomitus contains blood.

- (3) If the vomitus is dark coloured and foul smelling.
- (4) If the vomiting is not controlled within 24 hours and the patient looks ill.
- (5) Persistent vomiting in a pregnant woman.
- (6) All patients with a history of repeated attacks of vomiting of long duration.

What precautions should be taken?

- (1) Look for dehydration (see section on Oral Rehydration Salts) in all patients who are vomiting.
- (2) Watch urine output. Decrease in urine output suggests a need for increased fluid intake.

Wounds, Burns and Shock

Wounds

A wound is a break in the skin occurring due to injury. Such a break may cause bleeding which must be attended to immediately. It may cause local pain and swelling. It may get infected due to the entry of bacteria. Such infection, if untreated, can spread. Wounds are sometimes associated with fractures of bones.

How to treat?

Bleeding

Bleeding from wounds can be stopped by keeping local pressure with thumb and fingers or a clean cloth, cotton or gauze for a few minutes. Raising the part may help further. If bleeding is severe and continuous, immediately apply a tourniquet with a rubber band or a piece of cloth or a piece of string a little above the wound. Always use a sterile gauze for dressing. Press the dressing upon the wound. Cover it with a thick cotton pad and bandage it firmly, covering the entire wound and the adjoining area. Release the tourniquet if applied. If blood still oozes out of the bandage, do not remove the bandage but add more pads. In case of excessive bleeding, apply the tourniquet again and refer to a doctor. The tourniquet should be loosened every ten minutes for one minute while applying pressure on the pads by hand before being seen by a doctor.

Bleeding from a tooth socket can be arrested by putting a small piece of sterile gauze firmly on the socket and asking the patient to bite hard on the pad for 10 minutes.

If the bleeding is from inside the ear, do not put anything in the ear. Do not plug the wound. Cover the whole of the ear with a bandage and refer to a doctor.

To arrest bleeding from the nose:

- (1) Ask the patient to close the nostril firmly by pinching the nose with thumb and finger for 10 minutes and breathe through the mouth.

Appendix
Recommended standard drug treatment schedules
for common ailments

S.N.	Indication	Drug	Dose		Times daily	No. of days	Total amount for course of treatment	
			Tablet	Syrup (Teaspoon- tab)				
1.	Anaemia	Ferrous sulphate						
		Adult	1		3	90	270 tabs	
		Pregnant women	1		1	360	360 tabs	
		Child -						
		Upto 1 yr	$\frac{1}{4}$		2	90	45 tabs	
		1-5 yr	$\frac{1}{2}$		2	90	90 tabs	
6-12 yr	1		2	90	180 tabs			
2.	Constipation	Senna						
		Tablet 7.5 mg						
		Adult	2		1		2 tabs	
		Child	1	1		1 tab		
3.	Cough (dry)	Codeine Syrup						
		10 mg/5ml (teaspoon)						
		Adult		1	3	4	60 ml	
		Child - 1-5 yr		$\frac{1}{2}$	3	4	15 ml	
		6-12 yr		$\frac{1}{2}$	3	4	30 ml	
4.	Common Cold	Paracetamol						
		Tablet 500 mg						
		Syrup 125mg/5ml (Teaspoon)						
		Adult (Tablet)	1		4	3	12 tabs	
		Child - (Syrup)						
		2-6 mths		$\frac{1}{2}$ - $\frac{1}{2}$	4	3	20-40 ml	
		7-1 yr		$\frac{1}{2}$ - 1	4	3	30-60 ml	
1-6 yr		1 - 2	4	3	60-120 ml			
		6-12 yr (Tablet)	$\frac{1}{2}$ - 1	4	3	6-12 tabs		
5.	Diarrhoea	ORS Packets			Refer to section on GRS			
6.	Dysentery a) Amoebic	Metronidazole						
		Tablet 400 mg						
		Syrup 100 mg/5ml (teaspoon)						
		Adult (Tablet)	2		3	5	30 tabs	
		Child (Syrup)						
		1-2 yr		1	3	5	75 ml	
		2-3 yr		2	3	5	150 ml	
4-7 yr		3	3	5	225 ml			
		8-12 yr (Tablet)	1	3	5	15 tabs		

S.N.	Indication	Drug	Dose		Times daily	No. of days	Total amount for course of treatment
			Tablet	Syrup (Teaspoonful)			
b) Bacillary		Amoxicillin Capsule 250 mg. Syrup 125/5ml (Teaspoon)					
		Adult (Tablet)	2		3	7	42 tabs
		Child (Syrup) Less than 2 months		$\frac{1}{2}$	3	7	55 ml
		2 - 12 months		1	3	7	105 ml
		2-5 yrs		2	3	7	210 ml
7.	Earache, Toothache	Paracetamol Tablet 500 mg Syrup 125 mg/5ml (Teaspoon)					
		Adult (Tablet)	2		To be repeated after 4 hours if needed	2	4 tabs
		Child (Syrup) 2-6 mths		$\frac{1}{4}$ - $\frac{1}{2}$		2	20 ml
		$\frac{1}{2}$ - 1 yr		$\frac{1}{2}$ - 1		2	20 ml
		1 - 6yr		1 - 2		2	20 ml
		6 - 12 yr (Tablet)	$\frac{1}{2}$ - 1			2	4 tabs
8.	Eye infection	Tetracycline eye ointment 1%-5 g tube	Apply small amount		3	7	One Tube
9.	Fever	Paracetamol Tablet 500 mg Syrup 125 mg/5ml (Teaspoon)					
		Adult (Tablet)	1		4	3	12 tabs
		Child (Syrup) 2-6 months		$\frac{1}{4}$ - $\frac{1}{2}$	4	3	20-40 ml
		$\frac{1}{2}$ - 1 yr		$\frac{1}{2}$ - 1	4	3	30-60 ml
		1-6 yr		1-2	4	3	60-120 ml
		6-12 yr	$\frac{1}{2}$ -1		4	3	6-12 tabs
10.	Itching	Chlorpheniramine Tablet 4 mg Syrup 2 mg/ml (teaspoon)					
		Adult (Tablet)	1		3	4	12 tabs
		Child (Syrup) Upto 1 yr		$\frac{1}{2}$	2	4	20 ml
		1-5 yr		$\frac{1}{2}$	3	4	30 ml
		6-12 yr		1	3	4	60 ml

S.N.	Indication	Drug	Dose		Times daily	No. of days	Total amount for course of treatment
			Tablet	Syrup (Teaspoonful)			
11.	Malaria (fever with rigor)	Chloroquine Tablet – 150 mg Syrup – 50 mg/5ml (Teaspoon) Adult – (Tablet) 1st day 2nd day 3rd day Child – (syrup): – Refer to section on chloroquine	4 tabs at once; 2 tabs, 6 hrs later 2 2		1 1	1 1	10 tabs
12.	Pain (muscles and joints) Adults only	Aspirin 300 mg tablet	2 (not on empty stomach)		3	7	42 tabs
13.	Respiratory infection Pneumonia (ARI)	Co-trimoxazole tablet Adult tablet – 480 mg. Paediatric tablet – 120 mg	2		2	5	20 tabs
	Note: Children with Pneumonia should be referred to a doctor immediately after starting treatment	2 months – 1 yr 1–5 yr 6–12 yr	½ adult tablet (1½ Paediatric tablet) 1 adult tablet (3 Paediatric tablets) 1½ adult tablets		2 2 2	5 5 5	5 adult tabs (15 paediatric tabs) 10 adult tabs (30 paediatric tabs) 15 tabs
14.	Scabies	Benzyl benzoate lotion 25%	1 application				
15.	Worm Infestation	Mebendazole* tablet 100 mg	1		2	3	6 tabs

* Same for adult and children above 2 years.