

APPENDIX I

GENERAL INFORMATION ON PRESCRIBING IN CHILDREN

Many drugs used in children are used outside the recommendations of the Summary of Product Characteristic (Data Sheet) i.e. manufacturer's license. Prescribers must therefore take full responsibility for prescribing outside any licensed dosage, indication & age range.

- Calculating Paediatric Doses:

AGE	MEAN WEIGHT (KG)	MEAN HEIGHT (CM)	MEAN SURFACE AREA (M ²)	% OF ADULT DOSE
Newborn (full term)	3.5	50	0.23	12
1 month	4.2	55	0.26	14.5
3 months	5.6	59	0.32	18
6 months	7.7	67	0.40	22
1 year	10	76	0.47	25
3 years	15	94	0.62	33
5 years	18	108	0.73	40
7 years	23	120	0.88	50
10 years	30	143	1.10	60
12 years	39	148	1.25	75
14 years	50	160	1.50	80
Adult - female	56	163	1.60	100
Adult - male	68	173	1.80	100

Note: Estimated Surface Area (m²)
 = Squared Root [Height (cm) x (Weight (kg) /3600)]

NOTE: The figures above are from European statistics, it is recommended to use weight instead of age as a calculation basis for application in African patients. The figures relate to full term and not preterm (premature) infants who may need reduced dosage according to clinical condition.

Definitions of Age (as a guideline only):

Premature baby	Born before 37 weeks gestation
Term baby	Born at 37-42 weeks gestation
Neonate	First 4 weeks of life
Infant	Up to 1 year of age
Child	From 1-12 to 16 years of age

Drug Administration and Prescribing in Children:

- Parents must be warned to keep all medicines out of the reach of children.
- **STATE DOSAGE STRENGTH AND DOSE CLEARLY** to avoid over- or under-dosage. For example, paracetamol oral liquid may come in two strengths: 120mg/5ml or 250mg/5ml. Prescribing in volume (e.g. 5mls tds) can thus lead to paracetamol toxicity in young children.
- The parenteral route for children is the most reliable to obtain predictable blood levels. The painful intramuscular route should be avoided in children wherever possible.
- Parenteral doses must be prepared with care, with small volumes measured using graduated syringes or by dilution of injection. When reconstituting freeze-dried injections, the displacement value (i.e. volume of fluid displaced by powder) must be taken into account, especially if part vials are used, otherwise significant errors in the dose drawn up may result.
- The oral route is usually the easiest and most convenient, especially in long-term treatment. Dosage forms (e.g. liquid or tablet) appropriate for administration to different age ranges should be prescribed where possible.
- Oral syringes should be used with liquid oral preparations esp. for doses of less than 5mls.
- Do not mix medications with milk or other oral fluids unless otherwise directed, as there may be drug interactions, dosing errors or wastage if the child does not drink all the contents.
- Some liquid preparations contain sugar – to avoid dental decay teach the child to rinse orally with water after dosing, or wipe the child's mouth with a clean wet cloth.
- Some flexibility should be allowed in children for drugs with frequent dosing intervals (> q6h) to avoid waking them during the night. E.g. night-time dose may be given at parent's bedtime.

- **Choice of Inhaler Devices for Children:**

	1-2 years of age	3-5 years	> 5 years
MDI + Large volume spacer + mask	1 st Choice	2 nd Choice	-
MDI + Large volume spacer	2 nd Choice	1 st Choice	2 nd Choice
Dry Powder Inhaler (e.g. Turbohaler)	Inappropriate	Occasionally useful	1 st Choice

NOTE. Adapted from the British Thoracic Society Guidelines on Asthma Management (1997).

- **Adult Fingertip units (FTU) for topical corticosteroids used in children:**

- One FTU is equivalent to the amount of ointment expressed from a tube with a 5mm nozzle, applied from the distal crease to the tip, of the palm side of the index finger.

	Face & Neck	Arm & Hand	Leg & Foot	Trunk (Front)	Trunk (Back) inc. Buttocks
AGE	Number of FTUs				
3-6 mth	1	1	1.5	1	1.5
1-2 yrs	1.5	1.5	2	2	3
3-5 yrs	1.5	2	3	3	3.5
6-10 yrs	2	2.5	4.5	3.5	5

NOTE. Adapted from the University of Wales College of Medicine Dermatology Guidelines (1998).

APPENDIX II

GENERAL INFORMATION ON PRESCRIBING IN PREGNANCY & LACTATION

Extra care is required when prescribing during pregnancy and lactation because of the potentially harmful effects of drugs on the fetus in-utero and the breast-fed infant. While most attention has been focused on teratogenic effects of drugs in the early weeks of pregnancy when fetal tissues are forming, the growth and functional development of fetal organs can be affected by some drugs throughout the pregnancy, while drugs administered in late pregnancy and labour may have persisting adverse effects on the newborn infant. Although relatively few drugs have been shown beyond a doubt to be harmful, no drug is entirely safe and **as with all prescribing, risks and benefits must be balanced.**

On the other hand you will frequently be required to reassure pregnant patients prescribed essential medications and those who have inadvertently taken drugs without realising they were pregnant at the time. This reassurance would be given where appropriate bearing in mind that it is never possible to guarantee a normal outcome in any pregnancy.

The advisability of **breast-feeding** should be discussed in advance antenatally with patients who will have to continue to take necessary drugs after delivery. It is most important that breast-feeding should not be discouraged unless there is a very good reason.

It must be remembered that many drugs that may be taken by pregnant women are available without prescription (**‘over-the-counter’ drugs**), such as cough mixtures, analgesics and anti-diarrhoeal agents. Others such as **alcohol** and **cigarette smoking** may not be perceived as drugs by the patient. Pregnant and lactating patients should be warned (and indeed the general population) of these potential dangers.

POINTS TO NOTE:

- Prescribing for any woman in the **reproductive age group** should also take into account the possibility that she might be or become pregnant during the treatment.
- When a pregnancy is confirmed **existing medications** taken by the patient should be reviewed. Cessation of therapy, a dose reduction, or change of preparation might be available.
- Where drug therapy is essential, use wherever possible **well known preparations whose safety in pregnancy has been reasonably established** and reassure the patient about the use of these essential medications. Breast-feeding in this situation should be discussed in advance antenatally.
- **Avoid all non-essential drug prescribing** during pregnancy and educate the patient about the potential hazards of non-essential drug therapy including non-prescription drugs, excessive alcohol consumption, and cigarette smoking.
- Report **adverse drugs reactions** in pregnancy in and lactation.

APPENDIX III

GENERAL INFORMATION ON PRESCRIBING IN THE ELDERLY

The following notes are generally applicable to prescribing for the patient aged **over 75 years**:

- Nearly all drugs are finally excreted by the kidney. Renal function falls by 50% average by the age of 75 years.
- 20% of subjects over the age of 80 years have clinically detectable dementia and many others will have a decline in cerebral function.
- The elderly have increased sensitivity to drugs acting on the central nervous system. The reasons are not fully understood and do not clearly relate to changes stated in 2 above.
- Nearly all drugs were originally evaluated and dosage schedules established in young patients with normal renal and other metabolic functions.
- Most sick, elderly people are significantly dehydrated. Extracellular fluid volume depletion may result in higher tissue concentrations of drugs administered.
- Adverse reactions are increased in the elderly. The incidence is at least 10% at 65 years rising to 20% at 75 years and over.
- The likelihood of adverse reaction increases with the number of drugs prescribed. The main drug groups responsible for causing problems are cardiac drugs (e.g. digoxin, diuretics and antihypertensives) and cerebrally acting drugs (e.g. anti-Parkinsonism drugs, antidepressants, hypnotics, tranquillisers and psychotropic drugs).
- Presentation of illness is often atypical in the elderly subject.

It follows from the above that:

- Small doses at longer intervals should be used. It is common to start with about 50% of the adult dose for the elderly.
- Drugs with prolonged half-lives should be avoided e.g. nitrazepam.
- Simple regimens where possible no more than 4 drugs prescribed at any one time should be used. A drug with a less frequent dosing interval (e.g. twice daily dosing) is preferred.
- Drugs with cerebral & cardiac effects should be used with extreme care. Sedatives and hypnotics should be the last resort in management of noisy, confused and agitated patients.
- CLEAR EXPLANATIONS should be given, with full instructions on every prescription including repeat] so that proper labels with full directions can be given (avoid vague terms like “as directed”). Check that patient is able to swallow tablets comfortably and operate medical devices given (e.g. inhalers or child resistant containers). Large print labels may be necessary for those with poor eyesight. Advise on over-the-counter drugs and alcohol to avoid drug interactions.
- REPEATS AND DISPOSALS. Instruct patients what to do when drugs run out, and also how to dispose of any that are no longer necessary. Try to prescribe matching quantities.

SPECIFIC CLINICAL SITUATIONS

- ACUTE CONFUSION. FIRST SEEK THE CAUSE. Look for infection present in 80% of such cases, cardiac problems, uraemia, drug side effects, stroke etc. IF ALL ELSE FAILS, for the very confused, aggressive or agitated patient try Thioridazine in syrup or tablet form, starting at 5-10mg. It is better to adjust the dose of this drug upward to achieve the desired effect than to chop and change to other drugs. This is the phenothiazine best tolerated by the elderly with the least hypotensive effect.
- INSOMNIA. Hypnotics are indicated in a few cases for relief of insomnia due to grief or other severe emotional stress. More commonly prescribed for the peace of mind of relatives, night nurses or doctors.

- **OEDEMA.** There are multiple causes in the elderly and drugs are not always indicated. Many cases are associated with immobility and venous insufficiency, lymphatic obstruction etc. in which cases diuretics are potentially harmful and do not reduce the swelling. But remember that approximately 50% of elderly people admitted to hospital have cardiac failure and significant number of others has hypoalbuminaemia due to sundry causes.
- **HYPERTENSION.** Current opinion is that treatment for hypertension is indicated for elderly patients, certainly up to the age of 80 years and probably beyond, without which target organ damage may occur. Drugs of choice: a) Thiazide diuretics; b) Calcium channel blockers; and c) ACE inhibitors. Beta-blockers may cause confusion and precipitate heart failure in the elderly (cardiac reserve is markedly reduced by age alone).
- **HYPOTHYROIDISM.** The correct starting dose is thyroxine 25ug, increased at monthly intervals. A higher starting dose is like to precipitate symptoms of ischaemic heart disease.
- **DIZZINESS, GIDDINESS AND VERTIGO.** These symptoms demand full investigation and correction of the cause. Prochlorperazine (Stemetil) and related drugs are not appropriate for the elderly and may be positively harmful (may cause postural hypotension and falls).
- **DIABETES IN THE ELDERLY.** Often type II (non-insulin dependent), potentially serious and requires careful treatment (risk of death in a five-year period 4-5 times normal). Treatment:
 - 1) Diet – which may achieve reasonable control in 30% of cases;
 - 2) In combination with: - i) Insulin – prescribe long acting preparations with caution, as the elderly are known to be less likely to develop symptoms of hypoglycaemia until the situation is serious. ii) Oral agents – again long acting preparations should be used with great caution and some should be avoided altogether.
- **USE OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDs) IN THE ELDERLY.** It should be remembered as stated above that the sick elderly are often dehydrated and many are on diuretic therapy. Both may aggravate nephrotoxic effects of NSAIDs. GI side effects are common and may be dose related, so use smallest effective doses and monitor closely.
- **OSTEOPOROSIS.** The occurrence of a fracture implies further fractures are almost certain. Consider hormone replacement therapy, biphosphonates and calcium supplements.

Finally, it is vital in the elderly to review treatment regularly and frequently. Long-term follow up must be maintained.

APPENDIX IV

GENERAL INFORMATION ON PRESCRIBING IN TERMINAL ILLNESS

It is symptoms that cause a patient to consult his doctor and guide the doctor to a diagnosis. Symptom relief alone may thus be harmful. However, in the terminally ill, symptoms have lost any diagnostic value and symptom control in order to improve quality of life becomes the priority.

POINTS TO NOTE IN SYMPTOM CONTROL:

- Symptoms are not necessarily caused by the malignant process and are often caused by multiple factors. Adequate assessment of the cause or causes must precede treatment.
- The cause of the symptoms should be explained to the patient in simple terms and treatment options discussed both with the patient and relatives.
- Treatment is not necessarily confined to drugs.
- Prescribe drugs prophylactically for any persistent symptom.
- Never say “There is nothing more I can do”.
- Give all drugs orally wherever possible. Consider suppositories or transdermal systems or continuous subcutaneous infusion wherever possible rather than repeated injection.

Psychological aspects in the process of adjustment to terminal illness and death must be understood and addressed. An open attitude, attentiveness and reassurance that the patient will be kept as comfortable as possible are important in avoiding fear, loneliness, rejection, which can be worse than, and certainly contribute to, the more physical symptoms.

POINTS TO NOTE IN PAIN PREVENTION & RELIEF:

- Since analgesics are more effective in preventing development of pain than in relief of established pain, adequate dosing should be prescribed **REGULARLY** instead of just on a PRN (when needed) basis.

- *Non-opioid analgesics* such as **aspirin** or **paracetamol** given regularly often make the use of *opioids* unnecessary, but there should be no hesitation in prescribing opioids if required.
- In certain morphine-resistant pain alternative agents are available. **NSAIDs** may control bone and liver capsule pain and reduce inflammation.
- Nerve compression pain may be reduced by **corticosteroids** e.g. dexamethasone 8mg daily, which reduces oedema around the tumour.
- Dyaesthetic or stabbing pain caused by nerve irritation may be reduced by **amitriptyline 25-75mg at night**, or by **carbamazepine 200mg taken three times daily**.
- Muscle spasm pain may be relieved by muscle relaxants such as **diazepam 5-10mg daily**.

POINTS TO NOTE ON MORPHINE DOSING:

Morphine is well absorbed by mouth, producing peak blood levels in 1.5-2 hrs. It should be given at 4 hourly intervals regularly unless sustained release preparations are used which can be given 12 hourly. The appropriate dose is that which relieves pain but does not give toxic side effects.

To initiate:

- Administer 5-10mg morphine liquid q4h *prn*, increasing dose by 50% until pain control.
- Convert to sustain release (SR) morphine 12 hourly by adding up the TOTAL morphine dose in 24 hrs and dividing by 2,
e.g. Aqueous Morphine 10mg 4 hourly = Morphine Sulphate Tab Slow-Release (SR) 30mg every 12 hrs.
- Treat breakthrough pain with aqueous morphine on a '*prn*' (when needed) basis with 1/6th of the 24-hour requirement, increasing the dose of SR morphine if necessary.

Small doses of morphine may be effective in relieving *dyspnoea*. Morphine is best given by mouth by the clock; repeated injections are unpleasant. If oral route is not feasible, cont SC morphine infusion via syringe pump is very effective.

Major SIDE EFFECTS associated with morphine are:

- **20% Excessive sedation.** Normally wears off after a few days, ensure dose is not excessive.
- **30% Nausea and vomiting.** This is usually temporary, settling in a few days (if persistent another cause should be considered). Anti-emetics can help.
- **95% Constipation.** This is common & disturbing with opioid use and may be a major feature in terminal disease per se. Give laxative regularly when regular morphine is commenced.

OTHER SYMPTOMS CONTROL IN THE TERMINALLY ILL:

- **DIARRHOEA & COLIC.** Eliminate causes of impacted faeces or infection. Drugs of choice: Loperamide, codeine phosphate, and hyoscine butylbromide.
- **INTRACTABLE COUGH.** Moist inhalation, codeine linctus etc., assisted sputum clearance.
- **INSOMNIA.** Determine and treat cause where possible (e.g. pain or fear). Consider benzodiazepines e.g. diazepam or amitriptyline for sedation with antidepressant effect.
- **NAUSEA & VOMITING.** Determine and treat cause where possible (e.g. oral thrush or uraemia). If anti-emetics indicated give regularly, consider delivery route. Drugs of choice: metoclopramide (gastric stasis/gastritis); hyoscine (oesophageal obstruction/regurgitation); haloperidol or prochlorperazine (radiotherapy/drug side effects, metabolic causes); cyclizine (vestibular causes).
- **CONSTIPATION.** Dehydration and bed rest may contribute to this condition. Narcotics should be accompanied by a laxative routinely (a faecal softener and stimulant). Suppositories and enema may be useful. Treat threatened obstruction conservatively with faecal softeners and liquid diet.
- **EXCESSIVE RESPIRATORY SECRETION.** SC hyoscine hydrobromide may reduce respiratory secretion (death rattle) at 400-600ug q4-6h. Take care to avoid discomfort of dry mouth.

- DRY MOUTH. Advice good mouth care and ice cube/drinks for relief; consider nystatin or oral fluconazole for dry mouth associated with oral thrush. Consider drug side effects (e.g. opioids, antimuscarinics, antidepressants, antiemetics) and use alternatives if necessary where possible.
- TERMINAL RESTLESSNESS & CONFUSION. Exclude physical causes e.g. hypercalcaemia, pain, distended bladder or infection. If indicated, haloperidol or midazolam can be given. For rapid sedation rectal diazepam may be useful, followed by continuous infusion.