ESSENTIAL PAIN MANAGEMENT

Workshop Manual

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A Workshop for Health Workers

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Disclaimer

We have done our best to provide accurate information regarding drug doses and other treatments, however this book may contain mistakes. In addition, treatment options vary from country to country. It is important that health workers double-check drug doses and use their clinical judgement when treating patients.

CONTENTS

INTRODUCTION

Pain affects all of us – young and old, rich and poor. Pain has many causes – cancer, injury, infection, surgery – and people experience pain in many different ways.

Pain is often a "hidden" problem and is often poorly treated. We do not always recognise that a person is in pain. There are also many barriers to the treatment of pain – e.g. people's attitudes, lack of health workers and lack of medicines.

Pain can often be improved with very simple treatments.

In some ways, pain is like a rat – something that causes a lot of suffering but is often hidden from view.

The letters R.A.T. can also be used to help us manage pain:

R = Recognize
A = Assess
T = Treat

The basic aims of this course are:

- **To improve understanding of pain**
- **To teach a simple framework for managing pain**
- **To reduce pain management barriers**

WHAT IS PAIN?

Think of a patient/friend/relative who had pain. How did the person describe the pain? How was it treated?

The International Association for the Study of Pain defines pain in the following way:

> **Pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage".**

This definition is quite complicated but some important points can be made:

- Pain is unpleasant and therefore, in general, people do not like having pain.
- Emotions (psychological aspects) are important.
- Pain is not always associated with visible tissue damage. In other words, a patient may be experiencing pain even if we cannot see an obvious cause for it.

Another simpler definition of pain is:

> **"Pain is what the person says hurts."**

WHY SHOULD WE TREAT PAIN?

CASE 1:
Mr T is a 29-year-old man with a fast growing mouth cancer that has spread to his bones. He has severe face pain. He is expected to die within 6 months and the surgeons do not want to operate. He is married with two children, aged 11 and 8.
Why should we treat his pain?

CASE 2:
Mrs G is a 54-year-old woman who has just had a laparotomy for bowel obstruction. You see her on the surgical ward soon after the operation. She appears to be in pain.
Why should we treat her pain?

Acute pain is a symptom of tissue injury. Untreated pain causes inflammatory changes in the body which may have harmful physical and psychological effects. In addition, poorly treated acute pain may progress to chronic pain.

There are benefits of effective pain management for both the patient, the patient's family, and society (hospital and wider community).

For the patient:

- Treating pain is the "humane" thing to do
  - — Less suffering
  - — Greater dignity (especially for patients dying with cancer pain)

- Fewer physical problems
  - — Improved sleep, better appetite
  - — Quicker recovery after injury or surgery
  - — Lower risk of pneumonia (e.g. after abdominal surgery)
  - — Lower risk of thrombosis if able to mobilise earlier

- Fewer psychological problems
  - — Less depression and anxiety

For the family:

- Able to function as part of the family

- Able to provide for the family

For society:

- Lower health costs
  - — Patients are discharged earlier
  - — Patients are less likely to be readmitted

- Patients are able to work and contribute to the community

CLASSIFICATION OF PAIN

Not all pain is the same.

It is important to classify the pain (make a pain diagnosis) because this helps us to choose the best treatment.

Pain can be classified in many ways, but it is helpful to classify pain using three main questions:

1. How long has the patient had pain?
2. What is the cause?
3. What is the pain mechanism?

1. Acute versus chronic pain (duration)

Pain can be acute (pain for less than 3 months) or chronic (pain for more than 3 months or persisting after an injury heals). Sometimes, a patient with chronic pain may experience additional acute pain (acute on chronic pain).

There is evidence that poorly treated acute pain is more likely to become chronic pain.

2. Cancer versus non-cancer pain (cause)

Cancer pain

- Examples include pelvic pain due to uterine cervical cancer, bone pain due to cancer spread to bones.
- Pain symptoms tend to get worse over time if untreated (i.e. progressive)
- Often cancer pain is chronic but the patient may get acute pain as well (e.g. pain due to a new fracture from bone metastases)

Non-cancer pain

- There are many different causes, including:
    - — Surgery or injury
    - — Degenerative disease (e.g. arthritis)
    - — Headache
    - — Childbirth

    - Nerve compression or injury (e.g. sciatica, "neuralgia")
    - No obvious cause ("psychological")
- Pain may be acute and last for a limited time or may become chronic.
- The cause may or may not be obvious.

3. Nociceptive versus neuropathic pain (mechanism)

Pain can also be classified by mechanism (the physiological or pathological way the pain is produced). There is currently much research in this area – understanding the exact cause of pain at the nerve level will help guide more specific treatments.

The pain can either be nociceptive, neuropathic or mixed (both nociceptive and neuropathic). Nociceptive and neuropathic pain are also discussed in the Physiology and Pathology section.

Nociceptive pain

- Commonest type of pain following tissue injury.
- Sometimes called "physiological" pain.
- Caused by stimulation of pain receptors in the tissues that have been injured.
- Patients describe pain as sharp, throbbing or aching, and it is usually well localised (the patient is able to point to exactly where the pain is).

Neuropathic pain

- Caused by damage to or abnormal function of the nervous system.
- Sometimes called "pathological" pain.
- Tissue injury may not be obvious.
- Effects of nerve damage:
    - Abnormal firing of nerves giving pain without a stimulus.
    - Increased number of pain signals from the spinal cord to the brain.
- Patients describe neuropathic pain as shooting or burning. They may also complain of numbness or pins and needles. The pain is often not well localised.

PHYSIOLOGY AND PATHOLOGY

Understanding pain physiology and pathology helps us to understand how to treat pain.

Normal pain physiology involves a number of steps between the site of injury and the brain – this is called the "pain pathway" *(Fig 1)*. The pain signal can be changed at many points along the pain pathway, e.g. by drugs or psychological factors. These changes affect the amount and type of pain we feel.

Pain pathology involves damage to or abnormality of the pain pathway. This can cause neuropathic pain.

Nociception and pain

Nociception is how pain signals get from the site of injury to the brain. Nociception can be altered by many factors – in the periphery, in the spinal cord and in the brain.

Nociception is not the same as pain perception (how we "feel" pain). Pain perception depends on many other factors, including:

- Beliefs / concerns about pain
- Psychological factors (e.g. anxiety, anger)
- Cultural expectations
- Other illnesses
- Coping strategies
- Social factors (e.g. family, work)

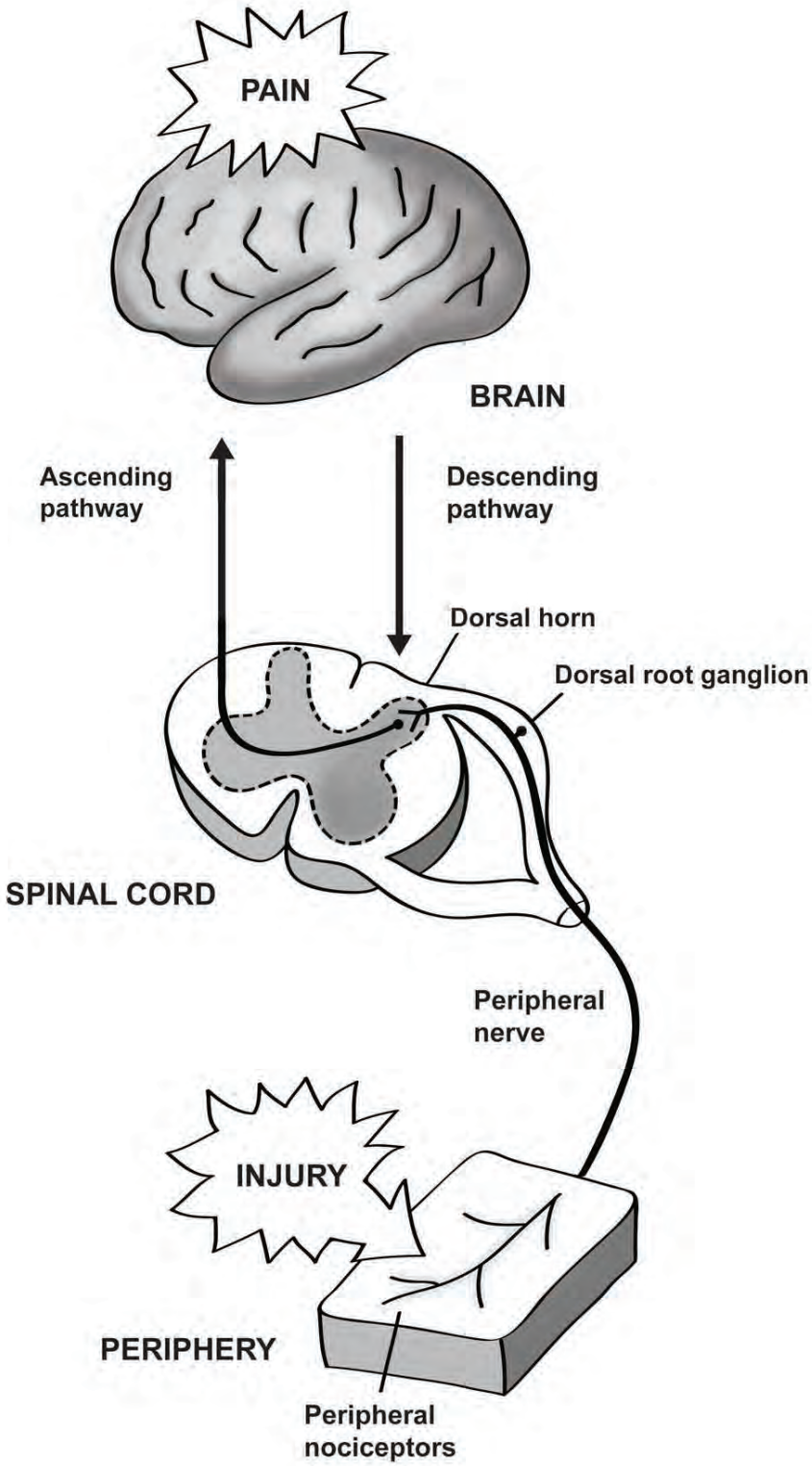


Fig 1: The pain pathway

The pain pathway

1. Periphery *(Fig 2 and 3)*

- Tissue injury causes release of chemicals, the "inflammatory soup" (e.g. hydrogen ions, prostaglandins).
- These substances stimulate pain nerves (nociceptors) called Aδ and C fibres.
- The body also responds to the damage by releasing inflammatory substances (e.g. substance P), which increase nociceptor stimulation.
- The pain signal travels along the Aδ and C fibres, through the dorsal root to the dorsal horn of the spinal cord.

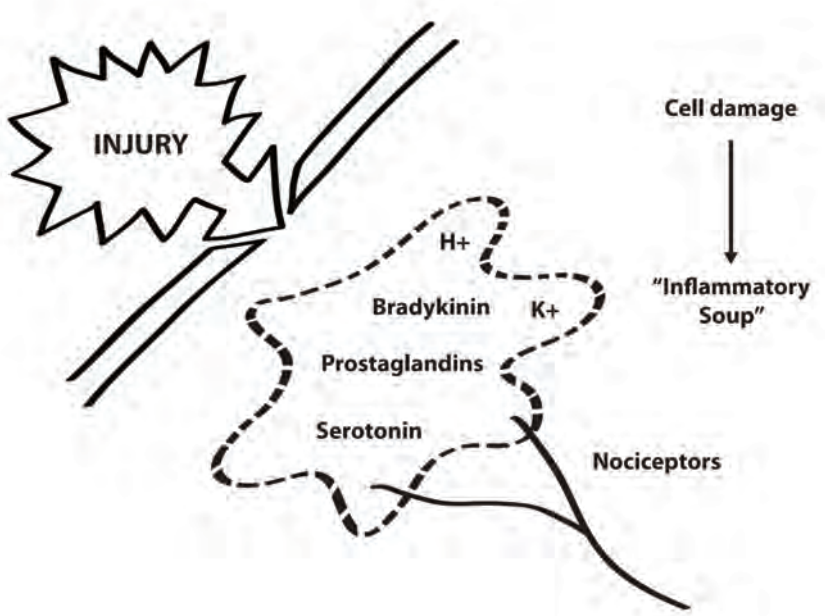


Fig 2: "Inflammatory soup" and stimulation of nociceptors

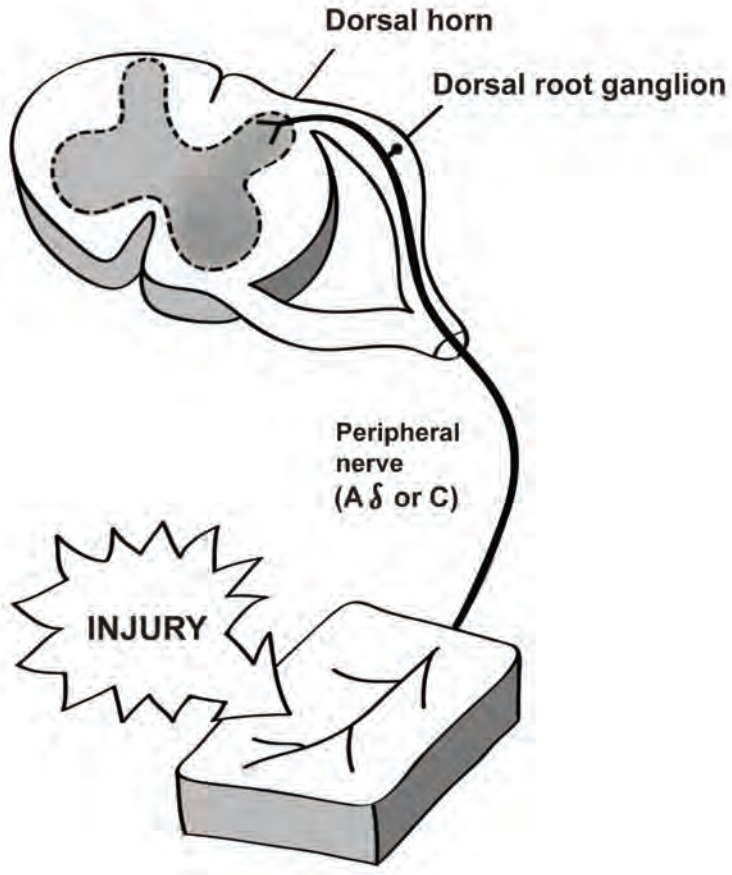


Fig 3: Transmission of pain signal from the periphery to the dorsal horn

2. Spinal cord *(Fig 4)*

- The dorsal horn of the spinal cord is the "first relay station". This is a vital area for two main reasons:
    - — The Aδ and C fibres connect (synapse) with "second order" pain nerves.
    - — There is input from other peripheral and spinal cord nerves – this may change the signal.
- The second order pain nerve crosses to the other side of the spinal cord and travels up the spinothalamic tract to the thalamus at the base of the brain.

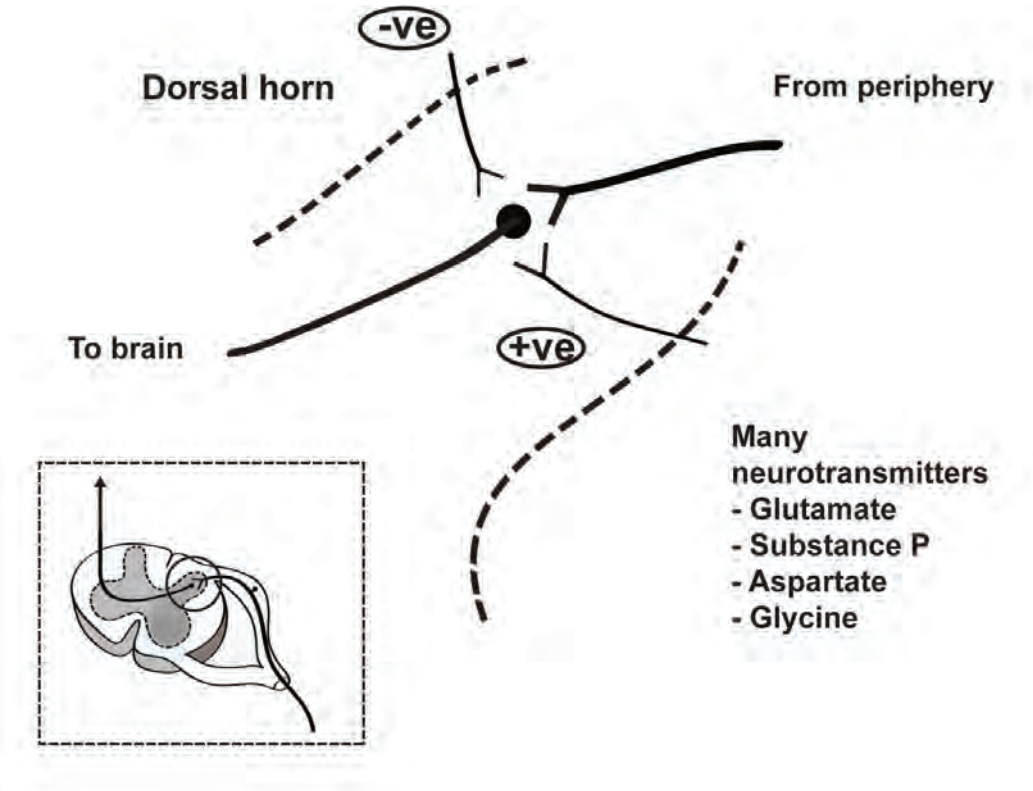


Fig 4: Dorsal horn connections

3. **Brain** *(Fig 5)*

- The thalamus is the "second relay station". There are many connections with other parts of the brain, including:

  — Cortex
  — Limbic system
  — Brainstem

- The cortex is the main area responsible for us being aware of the pain (i.e. pain perception).

- The limbic system is responsible for many of the emotions we feel when we experience pain (e.g. anxiety, fear).

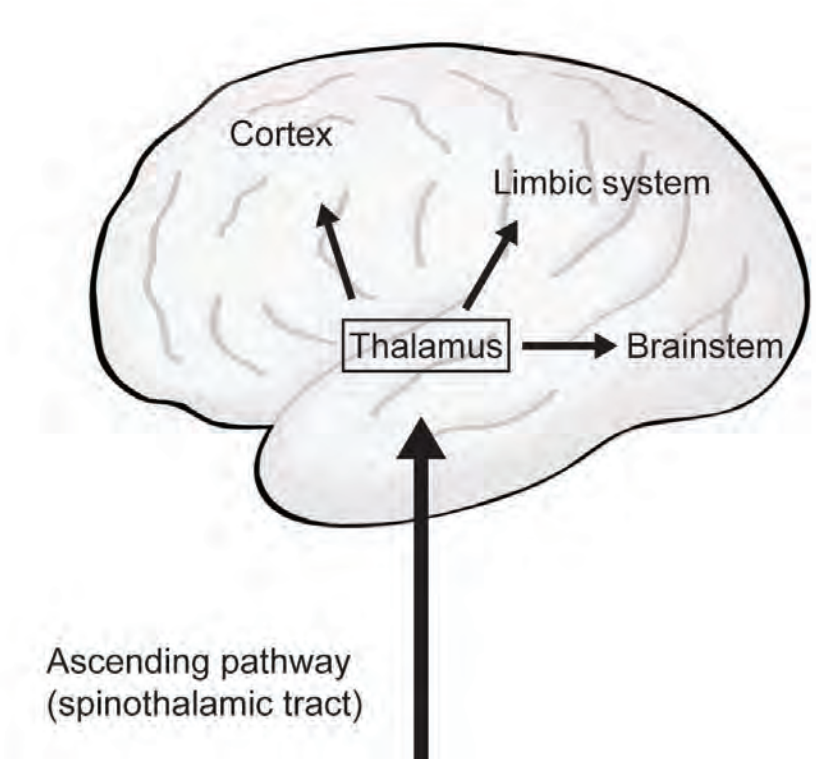


Fig 5: Brain connections

4. Modulation *(Fig 6)*

- The pain signals can be changed (modulated) in the spinal cord or the brain.
- In the dorsal horn of the spinal cord, peripheral pain nerves or spinal cord nerves can either increase (excite) or reduce (inhibit) pain.
- The descending pain pathway is a very important inhibitory pathway. It travels from the brainstem down the spinal cord to the dorsal horn where it inhibits pain signals from the periphery.

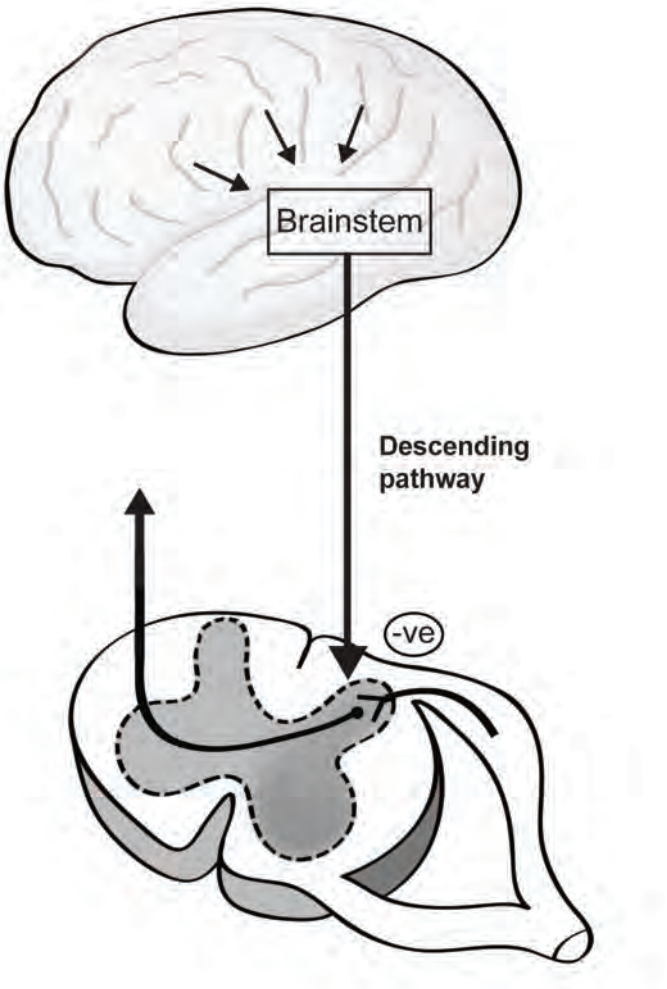


Fig 6: Descending pain modulation

What happens in neuropathic pain?

In neuropathic pain ("pathological pain"), there is damage to or abnormal function of the peripheral or central nervous system.

Examples:

- Nerve damage caused by:
  - — Trauma
  - — Cancer
  - — Amputation
  - — Diabetes
- Chronic pain following prolonged, poorly treated acute pain

Mechanisms:

- Peripheral nervous system
  - — Increased receptor numbers
  - — Abnormal firing of pain nerves
- Central nervous system
  - — Changes in chemical signalling at the dorsal horn
  - — "Rewiring" of nerve connections
  - — Loss of normal inhibitory nerve function
  - — The overall effect is called "central sensitisation".

Because of these changes, pain may occur spontaneously (no stimulus) or pain may result from stimuli that are normally non-painful (e.g. touch). Psychological changes (e.g. increased anxiety) will also contribute to the development of neuropathic pain.

PAIN TREATMENT

Because many factors contribute to the amount and type of pain we feel, it is often necessary to use a combination of treatments to manage an individual patient's pain.

Both non-drug and drug treatments are important.

What non-drug treatments are available where you work?

What pain drugs (analgesics) are available where you work? What doses and what preparations (e.g. injections, suppositories etc)?

Non-drug treatments

Both physical and psychological factors affect how we feel pain. Treatments include:

- Physical
  - — RICE (rest, ice, compression, elevation) of injuries
  - — Surgery (e.g. for treatment of abscess)
  - — Acupuncture, massage, physiotherapy

- Psychological
  - — Explanation
  - — Reassurance
  - — Counselling

A placebo treatment involves giving a patient a medicine that has no pharmacological effect (e.g. giving an injection of saline for pain). Because psychological factors are very important, the patient's pain may improve.

If the placebo treatment works, this does not mean the patient did not have pain in the first place or that the patient was lying!

Drug treatments

Medicines are often the mainstay of treatment. Different medicines work on different parts of the pain pathway and it is often important to use a combination of medicines. In addition, combining medicines may result in fewer side effects, e.g. prescribing regular paracetamol in addition to morphine allows the dose of morphine to be reduced, resulting in fewer morphine-related side effects.

Classification of pain drugs (analgesics)

Note: Refer to the appendices for individual drug information and doses.

1. Simple analgesics

- Paracetamol / acetaminophen (Pamol, Panadol, Tylenol)
- Non-steroidal anti-inflammatory medicines (NSAIMs)
  - Aspirin
  - Ibuprofen (Brufen, Nurofen)
  - Diclofenac (Voltaren)

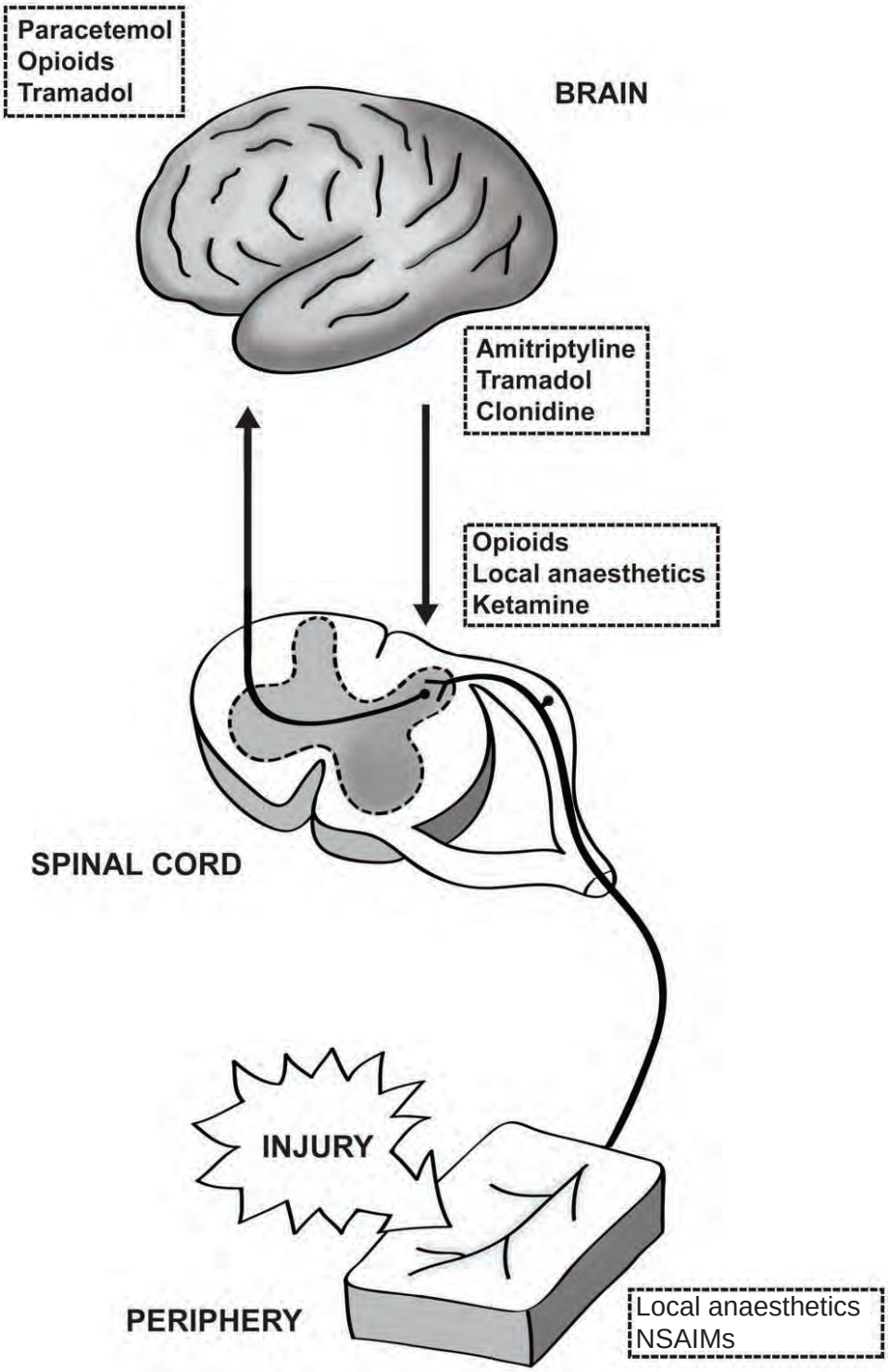
2. Opioid analgesics

- Mild opioid
  - Codeine
- Strong opioid
  - Morphine
  - Pethidine (Demerol)

3. Other analgesics

- Tricyclic antidepressants
  - Amitriptyline
- Anticonvulsants
  - Carbamazepine (Tegretol)
  - Sodium valproate (Epilim)
- Local anaesthetics
  - Lignocaine / lidocaine (Xylocaine)
  - Bupivacaine (Marcain)
- Others
  - Tramadol
  - Ketamine
  - Clonidine
  - Entonox (N_2O/O_2)

Where do analgesics work?



How do analgesics work?

Simple analgesics	
Paracetamol	Change prostaglandin levels in the brain
NSAIMs	Mainly work by changing prostaglandin levels in the periphery, thereby reducing inflammation
Opioid analgesics	
Codeine	Acts on opioid receptors in the brain and spinal cord
Morphine, pethidine	Act on opioid receptors in the brain and spinal cord
Other analgesics	
Amitriptyline	Increases descending inhibitory signals in the spinal cord
Anticonvulsants	“Membrane stabilisers”, probably work by reducing abnormal firing of pain nerves
Local anaesthetics	Temporarily block signalling in pain nerves in periphery (e.g. infiltration or nerve block) or spinal cord (e.g. spinal block)
Tramadol	Acts weakly on opioid receptors, also increases descending inhibitory signals in the spinal cord
Ketamine	Blocks NMDA receptors in the brain and spinal cord (especially in dorsal horn)
Clonidine	Increases descending inhibitory signals in the spinal cord

Drug effectiveness

The effectiveness of an individual analgesic drug depends on the type of pain.

The WHO Analgesic Ladder (Appendix 4) was designed mainly for treatment of cancer pain, i.e. progressive pain requiring increasing medication. This stepwise approach does not work well for acute severe pain requiring immediate strong opioids (e.g. morphine).

The ladder also does not work well for chronic non-cancer pain or neuropathic pain. In these situations, morphine is usually unhelpful. Amitriptyline and membrane stabilising drugs are much more likely to be effective.

Table 1 shows the usefulness of some analgesic drugs for treating different types of pain.

	Acute nociceptive mild	Acute nociceptive severe	Acute neuropathic	Chronic non-cancer	Chronic cancer
Paracetamol	+++	++ (in combination)	+	+	+
NSAIMs	++	++		±	± (e.g. bone pain)
Codeine	++	+			±
Morphine		+++	++	-	+++
Amitriptyline	-	-	++	++	++ (e.g. neuropathic pain)
Carbamazepine	-	-	++	+	+ (e.g. neuropathic pain)

Table 1: Analgesic usefulness

- \- Not usually useful
- ± Occasionally useful
- \+ Useful, mildly effective
- ++ Useful, moderately effective
- +++ Useful, highly effective

BARRIERS TO PAIN TREATMENT

Frequently, pain is not treated as well as it could be. Why does this happen?

What are the barriers where you work?

Possible barriers:

- **Patient factors**

  — Patients may expect to have pain
  — Patients may not seek help
  — Patients may see complaining about pain as a weakness

- **Drugs**

  — Supply may be unreliable
  — Appropriate drugs missing from the hospital formulary
  — Appropriate preparations not available (e.g. fast release oral morphine)

- **Health workers**

  — Not enough workers
  — Workers too busy
  — Workers may not recognize pain
  — Workers may have inadequate knowledge about pain and its treatment
  — Workers may be unable to prescribe or give appropriate drugs

- **System issues**

  — No culture of pain assessment and management
  — No protocols
  — No forms for recording pain (e.g. on post-op obs charts or routine vital signs charts)

BASIC APPROACH TO PAIN MANAGEMENT

R = RECOGNIZE
A = ASSESS
T = TREAT

1. RECOGNIZE

We sometimes forget to ask whether the patient has pain and sometimes patients don't or can't tell us. If you don't look or ask, you don't find!

Does the patient have pain?

- Ask
- Look (frowning, moving easily or not, sweating?)

Do other people know the patient has pain?

- Other health workers
- Patient's family

2. ASSESS

To treat pain better, we need to think about the cause and type of pain. We may be able to better treat the injury that is causing the pain. We may also be able to choose better drugs to treat the pain itself.

- **HOW SEVERE IS THE PAIN?**

  - What is the pain score?
    - — At rest
    - — With movement

  - How is the pain affecting the patient?
    - — Can the patient move, cough?
    - — Can the patient work?

- **MAKE A PAIN DIAGNOSIS!**

  Is the pain acute or chronic?

  The cause of acute nociceptive pain may be very obvious but chronic pain may be more complicated. In chronic pain, psychological factors may be more important and the pain may have both nociceptive and neuropathic features.

  The pain may be acute on chronic (e.g. fracture in a patient with chronic cancer pain).

  Is the pain cancer pain or non-cancer pain?

  Does the patient's disease explain the pain?

  There may be an obvious cause of the pain that requires specific treatment. For example:
  - — Fracture needing splinting or surgery
  - — Infection needing cleaning and antibiotics

Is the pain nociceptive, neuropathic or mixed?

Neuropathic pain is more likely in some situations:
— Diabetes
— Nerve injury (including amputation)
— Chronic pain

Ask about specific symptoms:
— Burning or shooting pain
— Pins and needles, numbness
— Phantom limb pain

- **WHAT OTHER FACTORS ARE CONTRIBUTING TO THE PAIN?**

  - Physical factors (other illnesses)

  - Psychological and social factors
    — Anger, anxiety, depression
    — Lack of social supports

3. TREAT

Treatment can be divided into non-drug and drug treatments. Both types of treatment are important.

Many factors may be contributing to an individual patient's pain, so there is no set list of treatments. The exact treatments will depend on the individual patient, the type of injury or disease, the type of pain and other factors contributing to the pain.

- **NON-DRUG TREATMENTS**

  - Physical
    - Rest, ice, compression and elevation of injuries (RICE)
    - Surgery may be required
    - Nursing care
    - Acupuncture, massage, physiotherapy

  - Psychological
    - Explanation and reassurance
    - Input from social worker or pastor, if appropriate

- **DRUG TREATMENTS**

  - **Nociceptive pain**

    - The WHO Analgesic Ladder is helpful for mild to moderate pain.
    - Start with regular simple drugs (paracetamol ± NSAIM)
    - Add in codeine or morphine early if moderate to severe pain or simple drugs are inadequate
    - In severe pain, if possible, use small doses of morphine IV to control pain early.

  - **Neuropathic pain**

    - The WHO Analgesic Ladder may not work as well
    - Consider using a tricyclic antidepressant (amitriptyline) or anticonvulsant (carbamazepine) early.
    - Don't forget non-drug treatments

ASSESSMENT OF SEVERITY

It is important to assess the severity of the pain to help guide treatment.

Determine the pain score by using a number score or faces score. It is important to assess the pain score at rest and with movement (some patients will appear to have mild pain at rest but be unable to move because of severe pain).

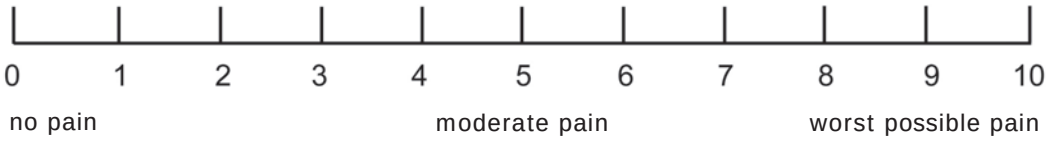
How is the pain affecting the patient? Examples:

- Post-laparotomy patient
  — Can the patient cough, get out of bed, walk?

- Chronic cancer patient
  — Can the patient look after himself / herself at home? Work?

Number score

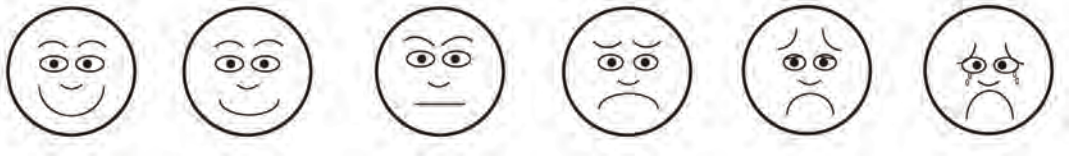
Ask the patient to show where their pain comes on the scale of 1-10



no pain moderate pain worst possible pain

Faces score

Ask the patient to point to the face which shows how bad their pain is



PAIN MANAGEMENT EXAMPLES

EXAMPLE 1:
32-year-old man with compound fractured hand

1. RECOGNIZE

- Pain easily recognized
- Obvious cause, patient likely to be distressed

2. ASSESS

- Pain may be moderate to severe
- Acute pain, musculoskeletal (non-cancer) cause
- Nociceptive mechanism, pain described as sharp, aching
- Possibility of neuropathic pain if nerve injury
- Other factors may be contributing to the pain (e.g. anxiety, infection if old injury)

3. TREAT

- **Non-drug treatments**
  - — Reduce inflammation (immobilisation, sling)
  - — Surgery will probably be necessary
  - — Prevention or treatment of infection

- **Drug treatments**
  - — Pain will be improved by simple drugs (e.g. paracetamol) but may need to add other drugs
  - — Regular paracetamol (1G four times daily)
  - — Consider adding codeine (30-60mg four-hourly)
  - — NSAIMs will reduce inflammation but may affect bone healing
  - — Morphine is effective and may be necessary if severe pain

Summary

Moderate to severe, acute pain due to injury, nociceptive mechanism

- **Treat the injury**
- **Regular simple analgesics**
- **Morphine if severe pain**

EXAMPLE 2:
8-year-old boy with probable appendicitis waiting for an operation.

1. RECOGNIZE

- Pain may be overlooked by health workers.
- Ask the patient!

2. ASSESS

- Pain may be moderate to severe
- Acute pain, non-cancer cause
- Nociceptive mechanism but pain may not be well localised in early appendicitis.
- Other factors may be contributing to the pain (e.g. fear, anxiety)

3. TREAT

- **Non-drug treatments**
  - Early surgery if possible
  - Reassurance
  - Support from family

- **Drug treatments**
  - Drugs may not be well absorbed if given PO
  - Pain will be improved by simple drugs (e.g. paracetamol 15 mg/kg PO or PR 4-hourly)
  - Will probably need to add other drugs (e.g. codeine 0.5 mg/kg)
  - For severe pain, an IV should be inserted and morphine given IV (0.02 mg/kg 10-minutely, e.g. 0.5 mg IV 10-minutely for a 25kg boy)

Summary

Moderate to severe, acute nociceptive pain

- **Surgery needed**
- **Regular simple analgesics**
- **Morphine if severe pain, given IV if possible**

EXAMPLE 3:
24-year-old woman with a 2 year history of severe headache. Doctors told her 6 months ago that there is "nothing wrong inside her head".

1. RECOGNIZE

- Patient may not show outward signs of pain
- Other people may think that she doesn't have pain
- Ask the patient!
  "Pain is what the patient says hurts."

2. ASSESS

- Pain may be severe despite outward appearances
- Chronic pain, non-cancer cause
- There will probably be no obvious underlying disease. It is important to rule out increased intracranial pressure as a cause (e.g. due to brain tumour). Features of increased intracranial pressure include early morning headache, nausea and vomiting, reduced level of consciousness, and papilloedema on eye examination.
- The pain may be difficult to localise and may have neuropathic features (e.g. burning, pins and needles)
- Psychological and social factors may be contributing to the pain. It is important to ask about these.

3. TREAT

- **Non-drug treatments**
  - — Reassurance that the pain is not due to anything life-threatening
  - — Acupuncture and massage may be helpful
  - — Psychological or social support are likely to be the mainstays of treatment.
    - Work issues
    - Family issues

- **Drug treatments**
  - — Regular paracetamol and NSAIM may be helpful
  - — In general, opiods are not helpful
  - — Consider amitriptyline if features of neuropathic pain (especially if poor sleep)

Summary

Moderate to severe, chronic headache (non-cancer) pain, neuropathic mechanism

- **Assessment may be difficult**
- **Non-drug treatments are important**
- **Regular simple analgesics may help**
- **Opioids not helpful**
- **Amitriptyline may be helpful**

EXAMPLE 4:
12-year-old girl with burns to chest and abdomen.
She needs dressing changes every 2-3 days.

1. RECOGNIZE

- Patient may not appear to be in pain between dressing changes.
- She may be very fearful of the dressing changes.
- Staff on a burns ward will usually recognize that the patient has pain.

2. ASSESS

- Pain may be moderate to severe, especially when old dressings removed.
- Acute pain, non-cancer cause
- Usually nociceptive mechanism but may have some neuropathic features if the burns have caused nerve damage.
- Psychological factors (e.g. fear and anxiety) will be contributing to the pain.
- Physical factors (e.g. infection of burns) may also be contributing.

3. TREAT

- **Non-drug treatments**
  - Reassurance ("we can help the pain", "your burns are healing well")
  - Support from family, distraction
  - Patient may be able to remove own dressings
  - Surgery may be required

- **Drug treatments**
  - Fast release oral morphine 30 minutes before dressing change (0.3 mg/kg, e.g. 9 mg for a 30-kg girl)
  - Oral ketamine may be useful for very painful dressing changes (up to 5 mg/kg given 30 minutes before)
  - Entonox is sometimes helpful
  - Regular oral paracetamol and morphine if there is pain between dressing changes
  - Low dose amitriptyline (e.g. 5-10 mg at night) may be helpful if severe burn

Summary

Moderate to severe, acute burn (non-cancer) pain, usually nociceptive

- **Fear and anxiety about dressing changes**
- **Reassurance and other non-drug treatments are important**
- **Oral morphine is the best drug treatment**
- **Regular paracetamol and oral morphine if there is pain between dressing changes**

EXAMPLE 5:
51-year-old man with 2 year history of lower back pain. Sometimes radiates down his right leg. Fell recently and now having problems walking.

1. RECOGNIZE

- Patient may not show outward signs of pain
- Other people may think that the patient is avoiding work.
- Ask the patient about his symptoms!

2. ASSESS

- Pain may be moderate to severe
- Chronic pain, musculoskeletal (non-cancer) cause
- There may have been a recent new injury causing acute on chronic pain.
- The pain may be difficult to localise and have both nociceptive and neuropathic features (e.g. burning, pins and needles)
- Multiple factors may be contributing to the pain
  - — Physical
  - — Psychological and social

3. TREAT

- **Non-drug treatments**
  - — Rest is often not helpful in chronic back pain
  - — Occasionally, there may be an acute on chronic problem that needs surgical treatment, (e.g. prolapsed disc)
  - — Acupuncture, massage and physiotherapy may be helpful.
  - — Psychological or social support
    - Work issues
    - Family issues

- **Drug treatments**
  - — Regular paracetamol and NSAIM may be helpful, especially if acute on chronic pain.
  - — In general, morphine is not helpful for chronic back pain. Occasionally, morphine may need to be added for more severe nociceptive pain.
  - — Consider amitriptyline if features of neuropathic pain (especially if poor sleep)

Summary

Moderate to severe, acute on chronic non-cancer pain, mixed neuropathic and nociceptive mechanisms

- **Assessment may be difficult**
- **Non-drug treatments are important**
- **Regular simple analgesics**
- **Morphine usually not helpful (unless severe nociceptive pain)**
- **Amitriptyline may be helpful**

EXAMPLE 6:
55-year-old woman with metastatic breast cancer. Large tumour of left breast with spread to spine causing severe pain.

1. RECOGNIZE

- Patient may have pain in both her breast and back.
- New severe back pain may not be recognized.
- Ask the patient about her pain symptoms!

2. ASSESS

- Assessment may be difficult because of two types of pain
- Both breast pain and back pain may be severe.
- Chronic cancer pain getting worse over time, acute musculoskeletal pain caused by spinal metastases (e.g. collapse of vertebra with nerve compression)
- The pain may have both nociceptive and neuropathic features. Neuropathic symptoms may be present especially if nerve compression – burning, pins and needles
- Multiple factors may be contributing to the pain
  - Physical
  - Psychological and social

3. TREAT

- **Non-drug treatments**
  - Treatment of breast tumour
    - Nursing care, possibly surgery, treatment of infection
  - Psychological or social support
  - Other treatments?

- **Drug treatments**
  - Regular simple analgesics + opioid.
  - If possible, control acute severe pain with IV morphine
  - Convert to regular oral morphine when pain controlled
  - Consider amitriptyline if features of neuropathic pain (especially if poor sleep)

Summary

Severe, acute on chronic pain. Mixed cause – chronic cancer pain and acute musculoskeletal pain. Nociceptive and neuropathic mechanisms.

- **Assessment may be difficult**
- **Non-drug treatments are important**
- **Regular simple analgesics**
- **Control acute severe pain with IV morphine, then change to regular oral morphine**
- **Amitriptyline may be helpful**

CASE DISCUSSIONS

CASE 1:
A 22-year-old man fell off a truck and has a fractured right femur. There are no other obvious injuries. He says the pain in his thigh is very bad.
How would you manage his pain?

CASE 2:
A 44-year-old woman with known cervical cancer is admitted to hospital because she can't look after herself at home.
How would you manage her from a pain point of view?

CASE 3:
A 5-year-old girl has advanced bone cancer that has spread from her leg to her spine. She cries most of the time and is frightened of injections.
What would you do?

CASE 4:
A 49-year-old man with longstanding diabetes has to have a below knee amputation for gangrene. You see him four weeks later and he complains of leg pain.
How would you manage him?

DISCUSSION TOPICS

TOPIC 1:
Treatment of pain is not as important as public health measures like immunisation and clean water. **True or false?**

TOPIC 2:
Respiratory depression is a common dangerous side effect of morphine. **True or false?**

TOPIC 3:
Pain and suffering make a person stronger. **True or false?**

TOPIC 4:
Newly born babies have an immature nervous system and do not feel pain. **True or false?**

APPENDICES

Appendix 1: WHO Essential Medicines List

The following table is based on the WHO Model List, 16th edition (updated). Medicines useful for managing pain can be found in a variety of sections of the list (e.g. anticonvulsants, medicines used in mood disorders).

For the full list, see:
http://www.who.int/medicines/publications/essentialmedicines/en/

Analgesics, Antipyretics, Non-Steroidal Anti-Inflammatory Medicines (NSAIMs) (section 2)	
Non-opioids and NSAIMs (section 2.1)	
Acetylsalacylic acid (aspirin)	**Suppository:** 50 mg to 150 mg **Tablet:** 100 mg to 500 mg
Ibuprofen (>3 months)	**Tablet:** 200 mg; 400 mg
Paracetamol	**Oral liquid:** 125 mg per 5ml **Suppository:** 100 mg **Tablet:** 100 mg to 500 mg
Opioid Analgesics (section 2.2)	
Codeine	**Tablet:** 15 mg (phosphate); 30 mg (phosphate)
Morphine	**Injection:** 10 mg (morphine hydrochloride or morphine sulfate) in 1 ml ampoule **Oral liquid:** 10 mg (morphine hydrochloride or morphine sulfate) per 5 ml **Tablet:** 10 mg (morphine sulfate) **Tablet (prolonged release):** 10 mg; 30 mg; 60 mg (morphine sulfate)
Anticonvulsants, Antiepileptics (section 5)	
Carbamazepine	**Oral liquid:** 100 mg per 5 ml **Tablet (chewable):** 100 mg; 200 mg **Tablet (scored):** 100 mg; 200 mg

Valproic acid (sodium valproate)	**Oral liquid:** 200 mg/5 ml **Tablet (crushable):** 100 mg **Tablet (enteric-coated):** 200 mg; 500 mg (sodium valproate)
Medicines Used in Mood Disorders (section 24)	
Amitriptyline	**Tablet:** 25 mg (hydrochloride)
Other Drugs	
General Anaesthetics (section 1.1)	
Ketamine	**Injection:** 50 mg (as hydrochloride) per ml in 10 ml vial
Nitrous oxide	**Inhalation**
Local Anaesthetics (section 1.2)	
Bupivacaine	**Injection:** 0.25%; 0.5% (hydrochloride) in vial
Lidocaine (lignocaine)	**Injection:** 1%; 2% (hydrochloride) in vial
Lidocaine + epinephrine (lignocaine + adrenaline)	**Injection:** 1%; 2% (hydrochloride) + epinephrine 1:200 000 in vial
Antiemetic Medicines (section 17.2)	
Dexamethasone	**Injection:** 4 mg/ml in 1-ml ampoule **Oral liquid:** 0.5 mg/5 ml; 2 mg per ml **Solid oral dosage form:** 0.5 mg; 0.75 mg; 1.5 mg; 4 mg
Metoclopramide (not in neonates)	**Injection:** 5 mg (hydrochloride)/ml in 2-ml ampoule **Tablet:** 10 mg (hydrochloride)
Ondansetron (>1 month)	**Injection:** 2 mg base/ml in 2-ml ampoule (as hydrochloride) **Oral liquid:** 4 mg base/5 ml **Solid oral dosage form:** Eq 4 mg base; Eq 8 mg base; Eq 24 mg base.

Appendix 2: Medicine Formulary for Adults

Note: Exact formulations (e.g. tablet size) may vary.
Exact morphine doses will depend on the individual patient.

Abbreviations:

- IM = intramuscular, IV = intravenous, PO = oral, PR = rectal, SC = subcutaneous
- OD = once daily, BD = twice daily, TDS = three times daily, QDS = four times daily

1. Simple Analgesics

Drug	Uses	Problems	Adult dose
Paracetamol / acetaminophen (Pamol, Panadol, Tylenol)	Generally very safe. Good for mild pain but can be useful for most nociceptive pain. Usually need to add other medications for moderate to severe pain. Also used to lower body temperature in fever.	Not all patients are able to take oral liquids or tablets. Can cause liver damage in overdose.	Usually given PO but can be given PR PO or PR: 1 G (two 500 mg tablets) QDS Maximum dose: 4 G per 24 hours
Aspirin	Can be used with paracetamol Good for nociceptive pain	Not all patients are able to take oral tablets. Side effects: Gastro-intestinal problems, e.g. gastritis Kidney damage Fluid retention Increased risk of bleeding	PO: 600 mg (two 300 mg tablets) 4-6 hourly Maximum dose: 3.6 G per 24 hours
Diclofenac (Voltaren, Voltarol)	As for aspirin	As for aspirin, but can be given IM or PR	PO: 25-50 mg TDS PR: 100 mg OD IM: 75 mg BD Maximum dose: 150 mg per 24 hours

Ibuprofen (Brufen, Nurofen)	As for aspirin	As for aspirin	PO: 400 mg QDS
Naproxen (Naprosyn)	As for aspirin	As for aspirin	PO: 500 mg BD

2. Opioid Analgesics

Drug	Uses	Problems	Adult dose
Codeine	Generally very safe Often added to paracetamol and/or NSAIM for moderate pain.	Not all patients are able to take oral liquids or tablets. Similar side effects to other opioid drugs: Constipation Respiratory depression in high dose Myths about addiction Different patients require different doses (variable dose requirement)	Usually given PO but sometimes given IM PO or IM: 30-60 mg 4-hourly
Morphine	Generally very safe Often added to paracetamol and/or NSAIM for moderate to severe pain Oral morphine very useful for cancer pain Available as either fast release tablets or syrup, or slow release tablets	Similar problems to other opioid drugs: Constipation Respiratory depression in high dose Nausea and vomiting Myths about addiction Oral dose is not the same as the injected dose	Can be given PO, IV, IM or SC Different patients require different doses Oral dose is 2-3 times the injected dose PO (fast): 10-30 mg 4-hourly (e.g. for controlling cancer pain) PO (slow): BD dosing (may need high doses for cancer pain) IV: 2.5-10 mg (e.g. during surgery or recovery) IM or SC: 5-10 mg 4-hourly

Pethidine (Demerol)	Generally very safe Often added to paracetamol and/or NSAIM for moderate to severe pain	As for morphine Seizures caused by metabolite (norpethidine) if high dose given for more than 48 hours	Usually not given PO IV or IM dose about 10 times morphine dose IV: 25-50 mg (e.g. during surgery or recovery) IM or SC: 50-100 mg 4-hourly
Oxycodone (Oxynorm, Oxycontin)	As for morphine Can be used for cancer pain Available as fast release (Oxynorm) or slow release (Oxycontin)	As for morphine Not widely available	PO (fast): Oxynorm 5-10 mg 4-hourly PO (slow): Oxycontin 10 mg BD, increased as needed.

3. Other Analgesics (in alphabetical order)

Drug	Uses	Problems	Adult dose
Amitriptyline	Useful in neuropathic pain Also used to treat depression and improve sleep	Sedation Postural hypotension (low blood pressure) Cholinergic side effects: Dry mouth Urinary retention Constipation	PO: Usually 25 mg at night "Start low, go slow", especially in elderly patients (e.g. start at 10 mg, increase every 2-3 days as tolerated)
Carbamazepine (Tegretol)	Anticonvulsant ("membrane stabiliser") Useful in neuropathic pain	Sedation Confusion in high dose	PO: 100-200 mg BD, increased to 200-400 mg QDS as tolerated "Start low, go slow", especially in elderly patients
Clonidine	May be useful if pain difficult to treat	Not widely available Sedation Hypotension	IV: 15-30 mcg 15-minutely up to 1-2 mcg/kg PO: 2 mcg/kg

Ketamine	May be useful in pain not responding to opioids (nociceptive or neuropathic) Also used as a general anaesthetic	Sedation (only need small dose for pain relief) Dreams, delirium, hallucinations	IV: 5-10 mg for severe acute pain SC infusion: 100 mg over 24 hours for 3 days, can be increased to 300 mg, then 500 mg per 24 hours
Sodium valproate (Epilim)	Anticonvulsant ("membrane stabiliser") Useful in neuropathic pain	Gastro-intestinal side effects, sedation	PO: 200 mg 8-12-hourly
Tramadol (Tramal)	Can be used with paracetamol and/or opioids for nociceptive pain Sometimes helpful for neuropathic pain Causes less respiratory depression and constipation than morphine	Not widely available Nausea and vomiting	PO or IV: 50-100 mg QDS

Appendix 3: Paediatric Medicine Doses

Note: Exact formulations (e.g. tablet size) may vary.
Exact morphine doses will depend on the individual patient.

Abbreviations:

- IM = intramuscular, IV = intravenous, PO = oral, PR = rectal, SC = subcutaneous
- OD = once daily, BD = twice daily, TDS = three times daily, QDS = four times daily

1. Simple Analgesics

Paracetamol / acetaminophen	PO or PR: 15 mg/kg 4-hourly Maximum dose: 90 mg/kg per 24 hours
Aspirin	PO: 15 mg/kg 4-6 hourly Not for children under 10 years old
Diclofenac	PO or PR: 1 mg/kg BD or TDS
Ibuprofen	PO: 5 mg/kg QDS
Indomethacin	PO: 0.5-1 mg/kg TDS
Naproxen	PO: 5-10 mg/kg BD or TDS Not for children under 2 years old

2. Opioid Analgesics

Codeine	PO: 0.5-1 mg/kg 4-hourly
Morphine – fast	IV: 0.02 mg/kg 10-minutely (e.g. after surgery) IM or SC: 0.1-0.2 mg/kg 3-4-hourly PO (fast release): 0.2-0.4 mg/kg 3-4-hourly (e.g. for controlling cancer pain)
Morphine – slow	PO (slow release): Start with 0.6 mg/kg BD, increase every 48 hours as required
Pethidine / meperidine	IV: 0.5 mg/kg 10-minutely (e.g. after surgery) IM: 1mg/kg 3-4-hourly
Oxycodone	IV, SC or PO (fast): 0.1 mg/kg 4-hourly PO (slow): 0.2-0.5 mg/kg BD

3. Other Analgesics

Amitriptyline	PO: 0.5 mg/kg at night
Carbamazepine	PO: 2 mg/kg BD to TDS
Clonidine	PO: 2.5 mcg/kg as a pre-med for painful procedures
Sodium valproate	PO: 5 mg/kg BD to TDS
Tramadol	PO or IV: 1-2 mg/kg QDS

Appendix 4: WHO Analgesic Ladder

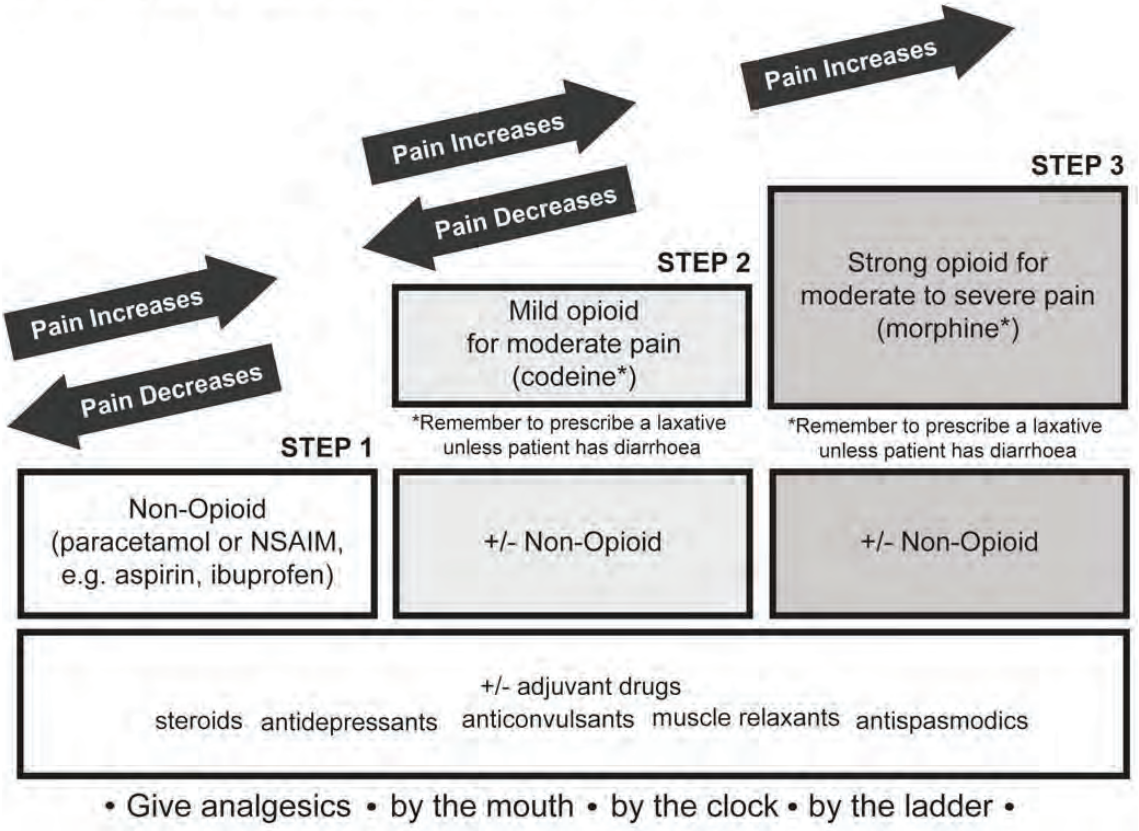
This "ladder" was developed by the WHO to mainly guide treatment of cancer pain. It may not work well for some other types of pain, e.g. neuropathic pain.

In cancer pain, the correct dose of morphine for an individual is the dose that relieves that patient's pain.

Medicines should be given:

1. By mouth – so that medicines can be taken at home.
2. By the clock – medicines are given regularly so that pain does not come back before the next dose.
3. By the ladder – gradually giving bigger doses and stronger medicines until the patient is pain-free.
4. For the individual – there is no standard dose of morphine. The correct dose is the dose that relieves the patient's pain.
5. With attention to detail – includes working out the best times to give medicines and treating side effects (e.g. giving a laxative to treat constipation).

The Analgesic Ladder for Pain Control



Appendix 5: Using Morphine for Cancer Pain

The most important drug for managing cancer pain is morphine. Acute severe pain may need to be controlled with morphine injections but this should be changed to oral morphine as soon as the pain is under control.

The oral morphine dose is 2-3 times the injected dose.

Steps for controlling pain with morphine:

1. Control severe pain quickly with injections or fast release oral morphine. Give 4-hourly as needed.

2. Work out morphine requirement per 24 hours.
   e.g.: Patient needing 10 mg IM morphine every 4 hours
   IM morphine requirement per day = 6 x 10 mg = 60 mg
   Equivalent oral morphine dose is 2-3 times (120-180 mg)

3. Halve the total daily oral dose and give as slow release morphine twice daily.
   e.g.: Total daily oral dose = 120-180 mg
   Start with slow release morphine 60 mg PO BD
   Increase to 90 mg PO BD as needed

4. Continue to give extra fast release morphine 4-hourly if needed for "breakthrough pain". If frequent extra doses are needed, work out total daily dose and increase slow morphine dose.

NOTES