ESSENTIAL PAIN MANAGEMENT

EPM Lite Manual

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A Workshop for Health Workers and Students

1st Edition
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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

In many ways, using RAT to manage pain is like using ABC to manage a trauma patient. The EPM course teaches a **system** for managing pain of all types, using the RAT approach.

The basic aims of this course are:

- **To improve understanding of pain**
- **To teach the RAT approach to pain management**

WHAT IS PAIN?

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 people do not like having pain.
- Pain can influence a person's feelings, thoughts and emotions.
- 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."**

QUESTIONS

1. From a biological point of view, why is it beneficial for pain to be unpleasant?
2. Give an example of pain where there is no obvious tissue damage.
3. Pain can influence emotions, but can emotions influence pain?

WHY SHOULD WE TREAT PAIN?

GROUP DISCUSSION:

Think of a patient / friend / relative who had pain (or use your pre-prepared case).
How did the person describe the pain?
What were the benefits of treating his/her pain?

CASE DISCUSSIONS:
Why should we treat pain in the following patients?

1. 55-year-old woman with breast cancer that has spread to her spine. She has severe chest wall and low back pain and is expected to die within a few weeks.

2. 40-year-old man who has just had a laparotomy for bowel obstruction. He is unable to get out of bed because of 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 by causing changes in the nervous system.

There are benefits of effective pain management for 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
  - — Earlier mobilization, faster recovery after injury or surgery
  - — Fewer medical complications (e.g. heart attack, pneumonia, deep vein thrombosis)

- 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

QUESTIONS

1. Can the experience of pain make a person stronger in the long term?
2. What are the benefits of treating chronic low back pain in a 45-year-old man?
3. Is it necessary to treat pain in newborn babies?

CLASSIFICATION OF PAIN

Not all pain is the same.

It is important to classify pain because this helps us to choose the best treatment.

Pain can be classified in many ways, but it can be done simply by using three main questions:

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

1. Acute versus chronic pain (duration)

Pain can be acute (pain for less than 3 months) or chronic (pain lasting for more than 3 months or lasting after normal healing). 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)
    - — Childbirth
    - — Nerve compression or injury (e.g. sciatica, "neuralgia”)

- 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 (neural mechanism)

Pain can also be classified by neural 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).
- **Examples:** Pain due to a fracture, appendicitis, burn.

Neuropathic pain

- Caused by damage to or abnormal function of the nervous system.
- Sometimes called pathological pain.
- Abnormal processing of pain signals in the spinal cord and brain.
- Patients often describe pain as shooting or burning, and may also complain of numbness or pins and needles. The pain is often not well localised.
- **Examples:** Post-amputation pain, diabetic pain, sciatica.

QUESTIONS

1. How can you tell when a patient's pain has gone from acute to chronic?
2. Give some examples of chronic, non-cancer, nociceptive pain.
3. Give some examples of neuropathic pain.

EXTRA FOR EXPERTS
Classification by Neural Mechanism

There is no universally agreed way to classify pain by neural mechanism. We use a simplified classification (nociceptive versus neuropathic) because this allows us to easily assess the patient and choose the right treatment.

Broadly speaking, pain can be either physiological (protective) or pathological (non-protective). The following gives a more detailed classification by neural mechanism.

Physiological pain
- Nociceptive
- Inflammatory

Pathological pain
- Neuropathic
- Dysfunctional

Nociceptive pain acts as an early-warning protective system in response to damaging or noxious stimuli.

Inflammatory pain is also protective. Inflammation results in increased sensory sensitivity after injury (lower intensity stimuli cause pain). This discourages physical contact and movement and promotes recovery.

Neuropathic pain results from damage to the peripheral or central nervous system. It can be thought of as a "hardware problem". It is not protective.

Dysfunctional pain is also not protective and can be thought of as a "software problem". There is no damage to the nervous system.

Based on Woolf CJ. What is this thing called pain? J Clin Invest 2010;120(11):3742-4)

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 nociceptive pathway *(Fig 1)*. The pain signal can be changed (modulated) at many points along the nociceptive pathway and this affects the severity and nature of the pain we feel.

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

Nociception and pain

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)

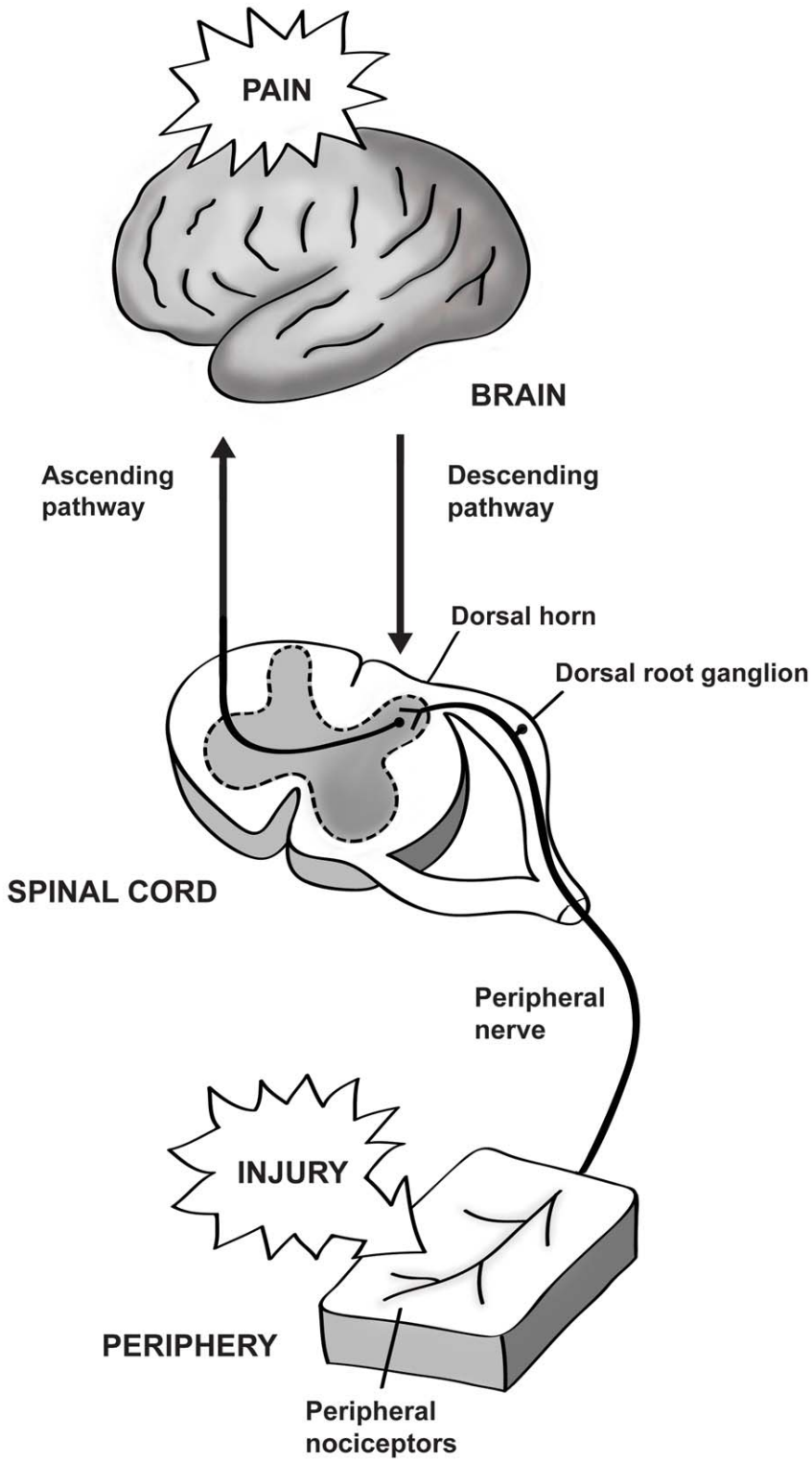


Fig 1: The nociceptive pathway

The nociceptive pathway

1. Periphery *(Fig 2 and 3)*

- Pain receptors (nociceptors) are activated by intense thermal (heat or cold), mechanical (pressure) or chemical stimuli.

- This results in activation of pain nerves called Aδ and C fibres.

- Tissue injury causes release of chemicals – the "inflammatory soup" (e.g. hydrogen ions, prostaglandins, substance P). The chemicals increase / amplify the pain signal and this process is called peripheral sensitization.

- The pain signal travels along the Aδ and C fibres, through the dorsal root to the dorsal horn of the spinal cord.

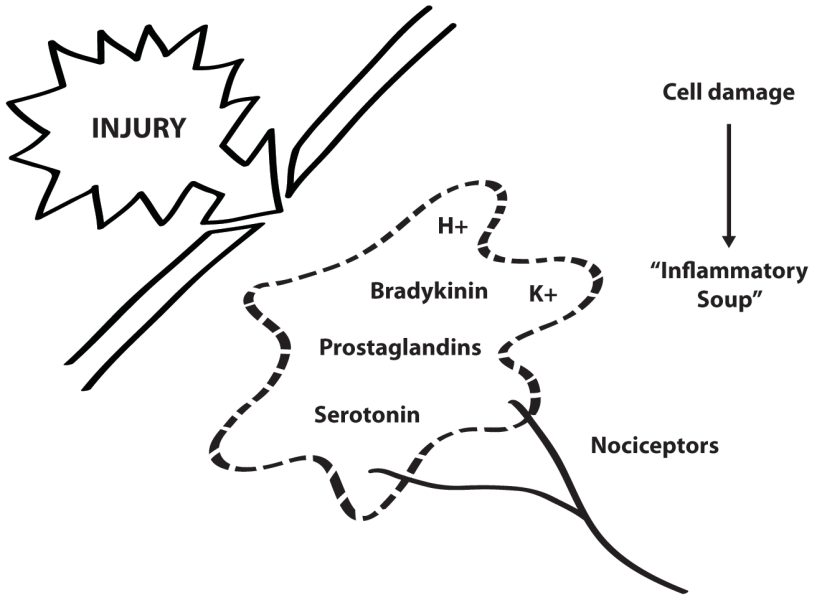


Fig 2: "Inflammatory soup" and stimulation of nociceptors

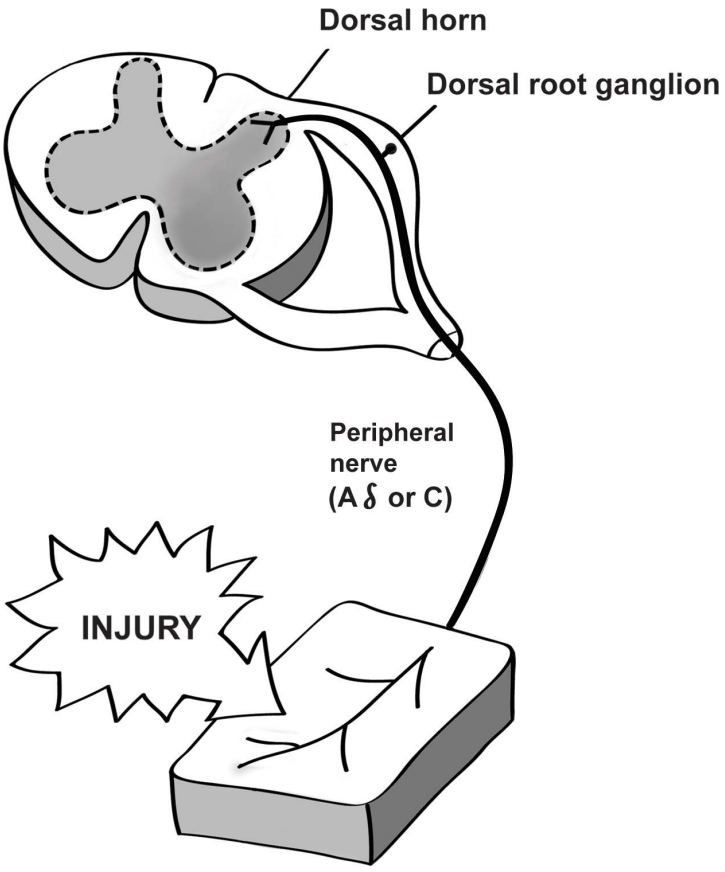


Fig 3: Transmission of pain signal from the periphery to the dorsal horn

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 that can modulate the pain 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.

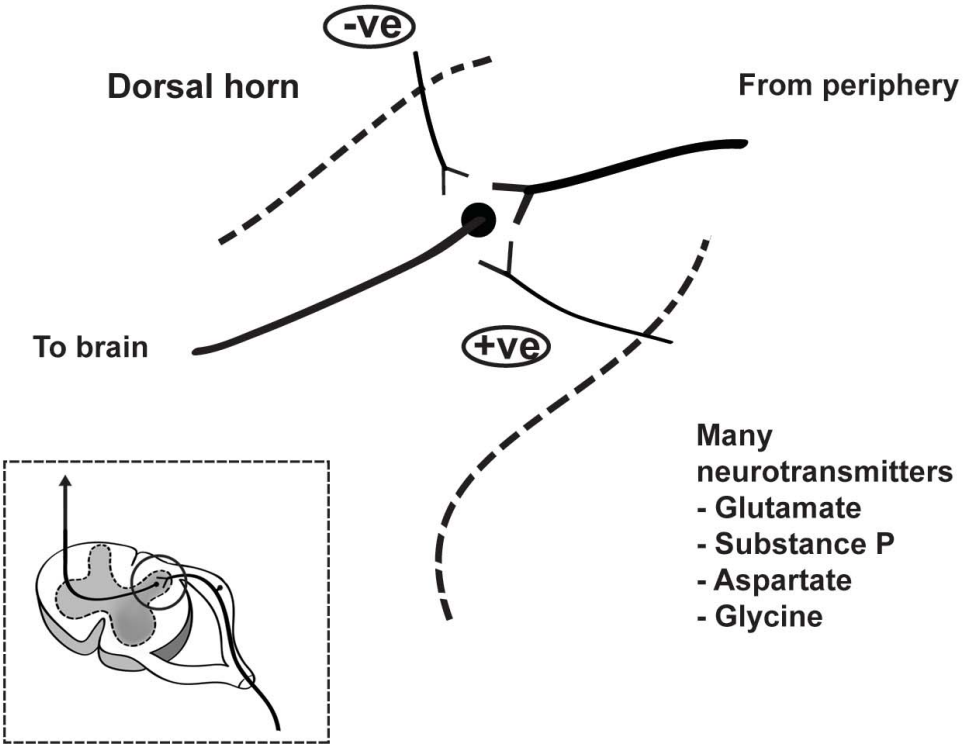


Fig 4: Dorsal horn connections

3. Brain *(Fig 5)*

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

    — Sensory cortex
    — Limbic system
    — Brainstem

- The sensory 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).

- The brainstem plays an important role in reflex responses to pain and coordination of pain modulation.

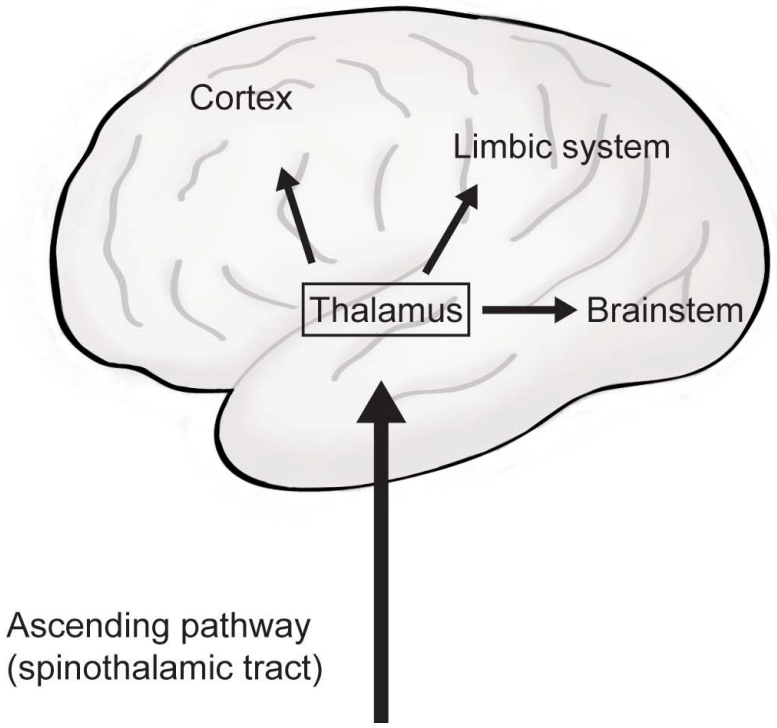


Fig 5: Brain connections

4. Modulation *(Fig 6)*

- 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.

- A major descending inhibitory pathway travels from the brainstem down the spinal cord to the dorsal horn where it inhibits pain signals from the periphery.

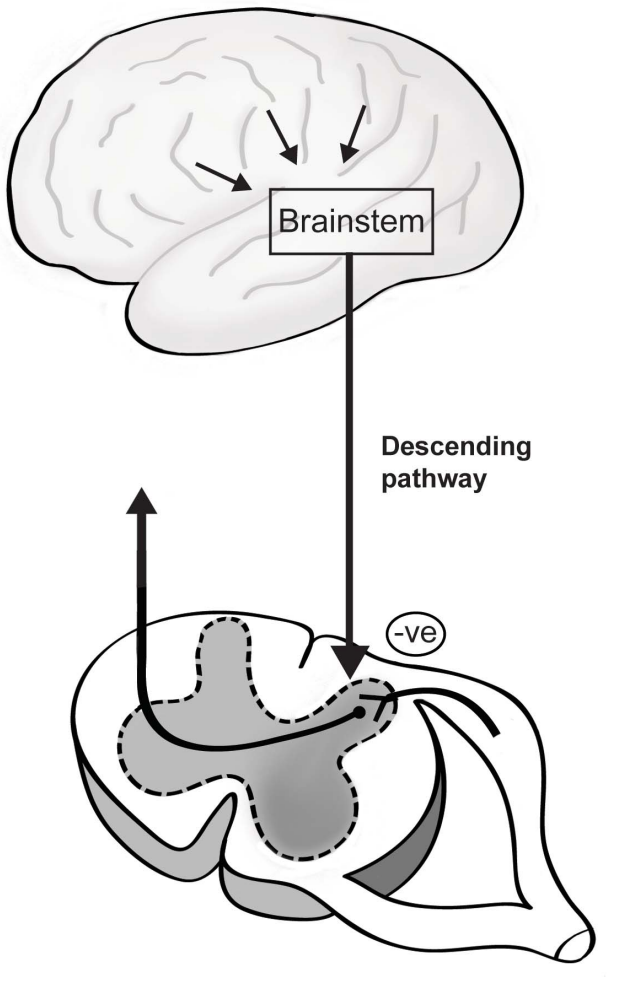


Fig 6: Descending pain modulation

Pain pathology

In pathological pain, there is abnormal processing of pain signals by the nervous system. There may or may not be damage to the peripheral or central nervous system. This type of pain does not have a protective function.

Pain may occur spontaneously (no stimulus) or pain may result from stimuli that are normally non-painful (e.g. light touch). Psychological changes (e.g. increased anxiety) may also contribute to the experience of pathological pain.

Mechanisms:

There may be anatomical or chemical changes in the peripheral and central nervous system. Examples include:

- Abnormal nerve tissue, e.g. stump neuroma after amputation
- Abnormal firing of pain nerves
- Changes in chemical signaling at the dorsal horn
- "Rewiring" of nerve connections in the dorsal horn
- Loss of normal inhibitory function

Examples:

- **Damage to nervous system (neuropathic pain)**
    - Nerve trauma, amputation
    - Diabetic neuropathy
    - Invasive cancer (e.g. uterine cancer invading the lumbosacral plexus)

- **No damage to nervous system (dysfunctional pain)**
    - Fibromyalgia
    - Tension type headache
    - Chronic pain following prolonged, poorly treated acute pain.

In clinical practice, neuropathic and dysfunctional pain can be difficult to distinguish. When using the RAT approach, we use the term "neuropathic" to describe both types of pathological pain.

QUESTIONS

1. Give an example of a person experiencing nociception without pain and someone experiencing pain without nociception.
2. How quickly do nociceptors transmit information compared with other sensory nerves?
3. Nausea and vomiting are sometimes associated with pain. What is the mechanism for this?
4. What is central sensitization? How does it occur?

EXTRA FOR EXPERTS
Pain Terms

Allodynia
Pain due to a stimulus that does not normally cause pain (e.g. light touch).

Analgesia
Absence of pain in response to a stimulus that normally causes pain.

Dysaesthesia
An unpleasant abnormal sensation.

Hyperalgesia
Increased pain in response to a stimulus that normally causes pain.

Peripheral sensitization
Increased sensitivity (excitability) of peripheral nociceptors.

Central sensitization
Increased sensitivity (excitability) of nerves within the central nervous system. Normal inputs begin to produce abnormal responses, e.g. spread of pain sensitivity beyond an area of tissue damage.

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?

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

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 drainage of abscess, removal of inflamed appendix)
    - — 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 that 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 nociceptive 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)

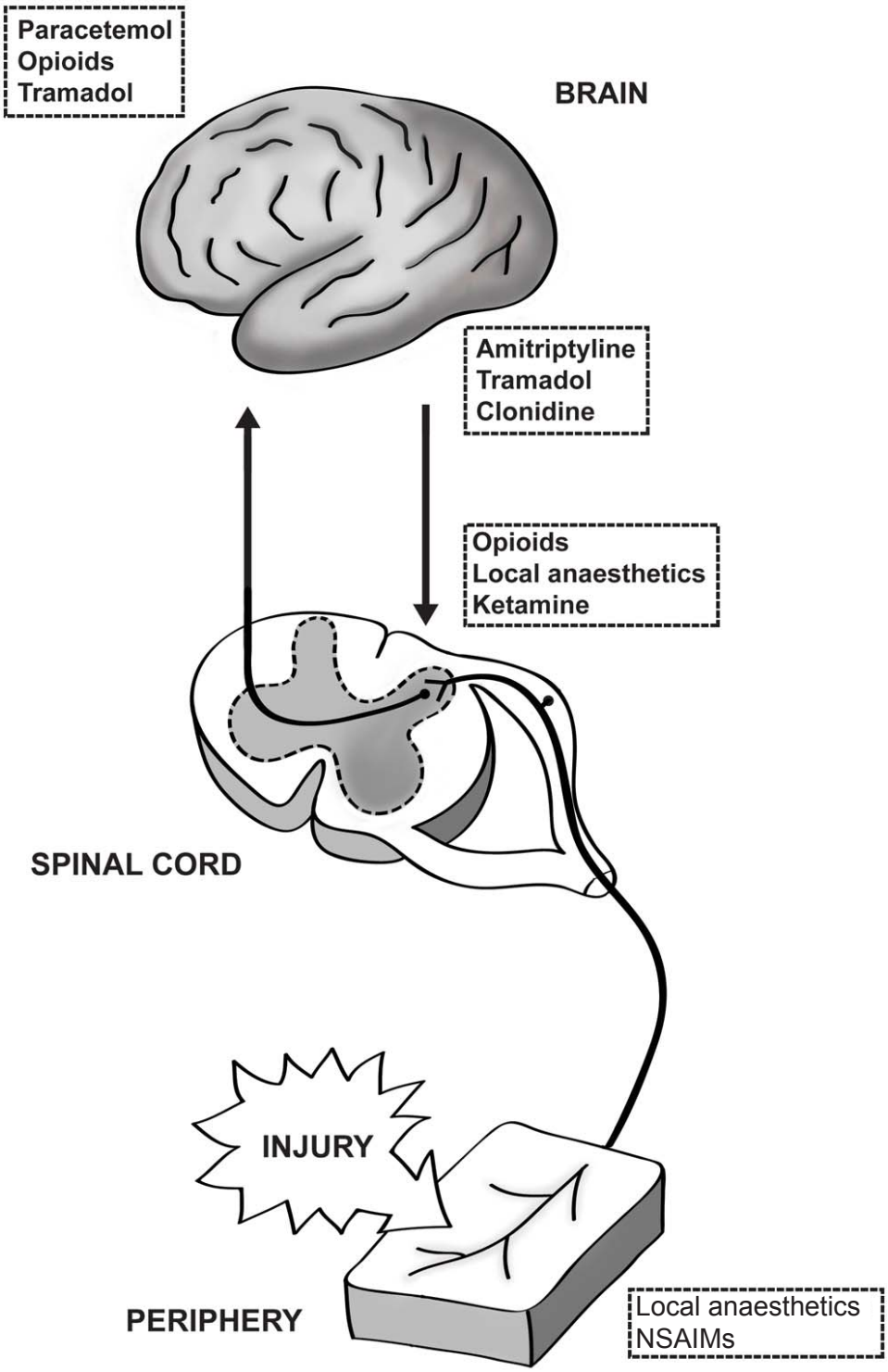
2. Opioid analgesics

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

3. Other analgesics

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

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	
Tricyclic antidepressants	Increase 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		+++	++	-	+++
Tricyclic antidepressants	-	-	++	++	++ (e.g. neuropathic pain)
Anticonvulsants	-	-	++	+	+ (e.g. neuropathic pain)

Table 1: Analgesic usefulness

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

QUESTIONS

1. How does a placebo medication reduce a person's pain?
2. How does acupuncture work?
3. What is the best drug for severe, acute, nociceptive pain?
4. Why are membrane stabilising drugs effective for some types of neuropathic pain?

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 live?

Possible barriers:

- **Patient factors**
  - — Cultural factors or beliefs
    - Patients may expect to have pain
    - Patients may see complaining about pain as a weakness
  - — Fears about addiction or side effects
  - — Communication problems (e.g. babies, intellectual impairment, language difficulties)

- **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**

  — Pain management seen as a low priority
  — 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)

QUESTIONS

1. What are the most important barriers where you live or work?
2. How do pain behaviours vary between different ethnic groups?
3. Why is pain management often seen as a low priority?

RAT 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 for pain behaviours (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?

- **WHAT TYPE OF PAIN IS IT?**

  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

- **ARE THERE OTHER FACTORS?**

  - 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

QUESTIONS

1. What are the three components of "Assess"?
2. Are non-drug treatments more effective in acute or chronic pain?
3. Do NSAIMs have a role in chronic pain management?

ASSESSMENT OF SEVERITY

Pain assessment is the "fifth vital sign" (along with temperature, pulse rate, blood pressure and respiratory rate). 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).

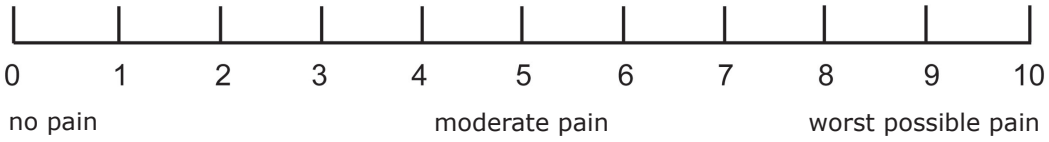
How is the pain affecting the patient? Examples:

- 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?

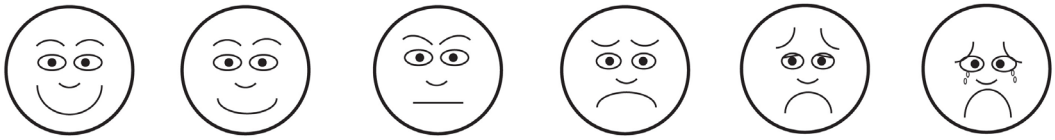
Number score

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



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 following an accident at work.

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:
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**

EXAMPLE 3:
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 nociceptive and neuropathic 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 4:
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, opioids 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**

GROUP 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 60-year-old man has just had a laparotomy for bowel obstruction. He is now lying very still in bed and appears to be in severe pain. **How would you manage him?**

CASE 4:
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 5:
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?

CASE 6:
A 9-year-old boy with probable appendicitis is waiting for an operation.
How would you manage him from a pain point of view?

APPENDICES

Appendix 1: 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

Gabapentin	Anticonvulsant ("membrane stabiliser") Useful in neuropathic pain	Sedation	PO: 100 mg TDS, increased to 300 mg TDS as tolerated
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 2: 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 3: WHO Analgesic Ladder

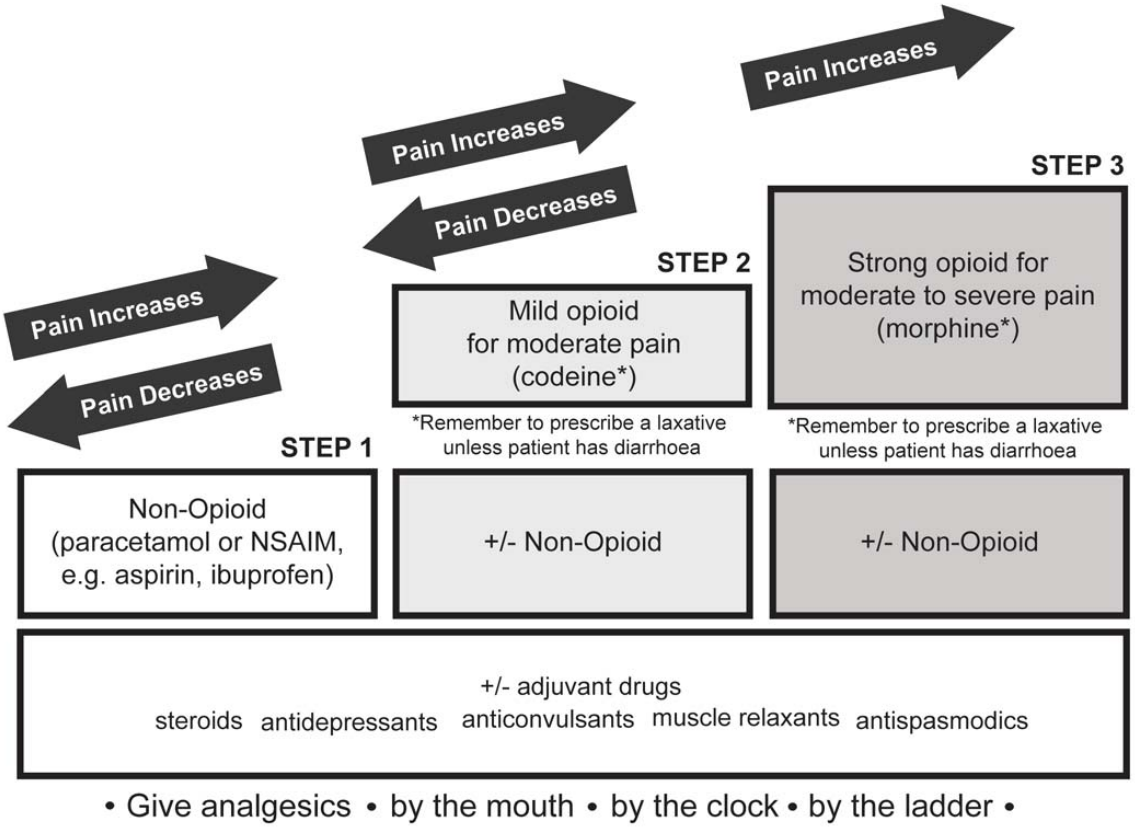
This "ladder" was developed by the WHO to mainly guide treatment of cancer pain. It may not work well for some other types of pain, e.g. neuropathic pain.

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 4: 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.

Appendix 5: WHO Essential Medicines List

In many low- and middle-income countries, there is very limited availability of analgesic medicines. The WHO Essential Medicines List provides a minimum standard for supply of medicines. 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 6: Answers to Chapter Questions

What is Pain?

1. **From a biological point of view, why is it beneficial for pain to be unpleasant?**
   Nociceptive pain has a protective function. It acts as an early warning system, e.g. withdrawal of hand from a flame to prevent further injury. After injury, pain discourages contact and movement and promotes recovery.

2. **Give an example of pain where there is no obvious tissue damage.**
   Tension type headache, non-specific low back pain, fibromyalgia.

3. **Pain can influence emotions, but can emotions influence pain?**
   Yes, e.g. increased anxiety will increase a patient's perception of pain. Conversely, reduced anxiety will reduce pain.

Why Should We Treat Pain?

1. **Can the experience of pain make a person stronger in the long term?**
   Not usually. Unrecognized and untreated pain is generally not desirable because it can have negative physical and psychological consequences.

2. **What are the benefits of treating chronic low back pain in a 45-year-old man?**
   For the patient: Relief of suffering, improved function, fewer psychological problems.
   For his family: More engaged in family life, able to work and maintain income.
   For society: Productive member of society, fewer ongoing health costs.

3. **Is it necessary to treat pain in newborn babies?**
   Yes, babies still experience pain. It is therefore humane to treat pain. Benefits include reduced stress response, improved feeding, reduced parental anxiety.

Classification of Pain

1. **How can you tell when a patient's pain has gone from acute to chronic?**
   The pain has lasted for more than three months or the pain has lasted after normal healing.

2. **Give some examples of chronic, non-cancer, nociceptive pain.**
   Arthritis, non-united fracture, chronic toothache, non-healing skin ulcer. These conditions may also have some features of pathological pain.

3. **Give some examples of neuropathic pain.**
   Painful diabetic neuropathy, phantom limb pain, post-shingles pain, sciatica, chronic tension type headache, fibromyalgia.

Physiology and Pathology

1. **Give an example of a person experiencing nociception without pain and someone experiencing pain without nociception.**
   Nociception without pain: General anaesthesia, psychological states overriding pain perception (e.g. religious trance)/
   Pain without nociception: Pathological pain with abnormal sensory processing.

2. **How quickly do nociceptors transmit information compared with other sensory nerves?**
   Slower than other sensory nerves. Conduction velocity of C fibres is 0.5-2 m/s, Aδ fibres 3-30 m/s, Aß fibres 30-75 m/s, Aα fibres 80-120 m/s

3. **Nausea and vomiting are sometimes associated with pain. What is the mechanism for this?**
   There are connections from pain pathways in the brainstem, limbic system and cortex to the vomiting centre (area postrema) in the medulla. The vomiting centre coordinates the act of vomiting.

4. **What is central sensitization? How does it occur?**
   Pathological pain state where there is increased sensitivity or excitability of nerves within the central nervous system. Pain

can occur spontaneously (no peripheral input) or normally non-painful stimuli can become painful.

Pain Treatment

1. **How does a placebo medicine reduce a person's pain?**
   If the person believes that the medicine will be effective, modulatory pathways will be activated and these will inhibit the pain signal and therefore reduce the persons' perception of pain.

2. **How does acupuncture work?**
   The exact answer is unknown but acupuncture may work by causing release of endogenous opioids (endorphins) or by stimulating Aß fibres resulting in inhibition of the pain signal in the dorsal horn.

3. **What is the best drug for severe, acute, nociceptive pain?**
   Morphine

4. **Why are membrane stabilizing drugs effective for some types of neuropathic pain?**
   They reduce sensitivity and/or spontaneous activity in damaged pain nerves.

Barriers to Pain Treatment

1. **What are the most important barriers where you live or work?**
   This will vary depending on resources and cultural factors. Common barriers are a lack of awareness or lack of knowledge about pain management, absence of protocols, inadequate staffing. In many poorer countries, lack of drugs is a major problem.

2. **How do pain behaviours vary between different ethnic groups?**
   Some ethnic groups tend to be more demonstrative about pain (e.g. screaming or yelling); other groups are less likely to complain of pain. It is important to use the RAT approach – don't assume a quiet patient does not have pain, and don't

assume a noisy patient is over-reacting. Pain is what the patient says hurts!

3. **Why is pain management often seen as a low priority?**
   Lack of knowledge is probably the most important reason. Patients don't expect to receive good pain management, health workers don't understand the importance of recognizing, assessing and treating pain.

RAT Approach to Pain Management

1. **What are the three components of "Assess"?**
   - How severe is the pain?
   - What type of pain is it? (Acute or chronic? Cancer or non-cancer? Nociceptive or neuropathic?)
   - Are there other factors?

2. **Are non-drug treatments more effective in acute or chronic pain?**
   Non-drug treatments are important in both acute and chronic pain. In some types of chronic pain, non-drug treatments have a much bigger role than drug treatments, e.g. psychological therapy in chronic non-cancer pain.

3. **Do NSAIMs have a role in chronic pain management?**
   Yes, but only if there is an inflammatory component. They should be prescribed at the lowest effective dose and for the shortest time to minimise the risk of side effects.

Appendix 7: More Information

EPM webpage

- www.essentialpainmanagement.org
- Information about EPM, manual and slide downloads

Faculty of Pain Medicine, ANZCA

- www.fpm.anzca.edu.au/resources/ books-and-publications
- Download "Acute Pain Mangagement: Scientific Evidence" and other publications.

International Association for the Study of Pain

- www.iasp-pain.org
- Download "Guide to Pain Management in Low Resource Settings"

NOTES