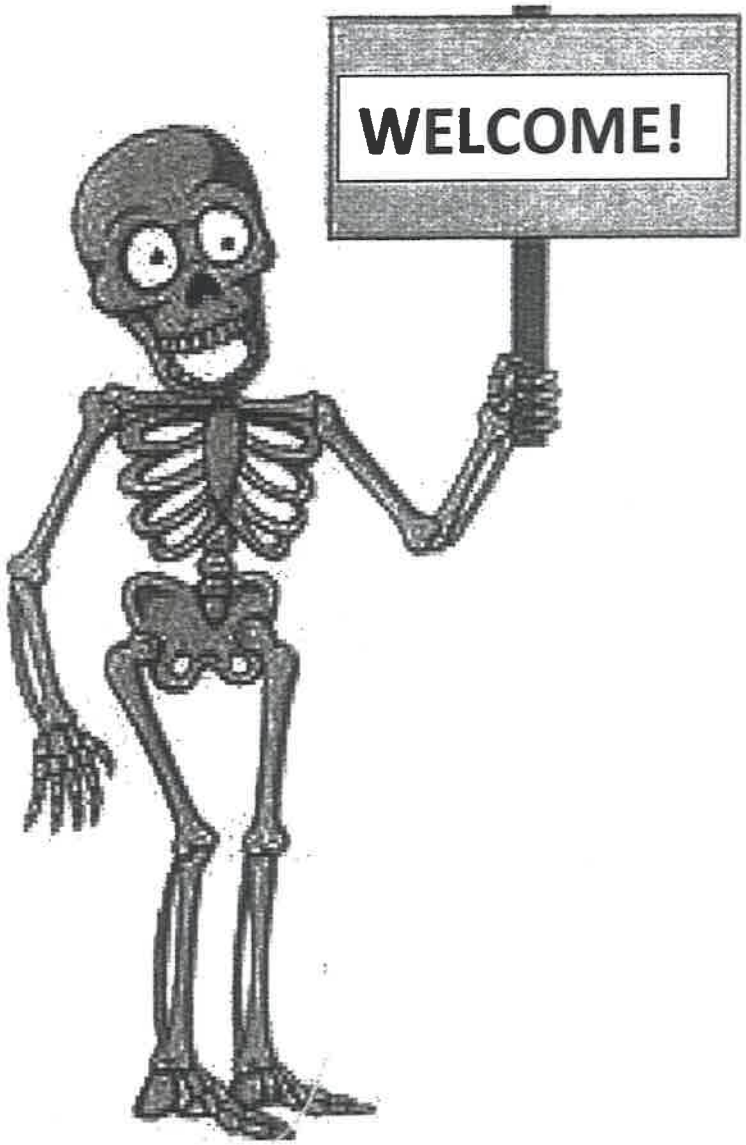


To Orthopaedics

Student

Assessor

Supervisors

A very warm welcome from all the team on the orthopaedic unit! We hope that you enjoy your stay with us.

We know that the beginning of a new placement can be a very daunting experience and so we are all here to help you to settle in and hopefully have a happy, interesting and beneficial experience.

There are many members of the multidisciplinary team (MDT), working in our area who have a wealth of knowledge and experience, who are here to support and help you to progress through this placement. If you have any questions, queries or problems (anything at all) during your stay – do not be afraid to ask.

We are a team and as our student, you are part of our team. We respect students' supernumerary status, however, as in any area, it is true that the more that you put into an experience, the more you gain from it. An interest and willingness to learn is all that we ask.

This booklet is a brief introduction to our area. We hope that you enjoy your stay with us.

Ward Information:

Telephone number Ward 14: 01772 522424

Telephone number Ward 16: 01772 522966

Telephone number MTW: 01772 521491

Shift Patterns:

Early shift	0700-1500hr
Late shift	1330-21.30hr
Night shift	2100-0730hr

Longer hours must be approved by the ward manager in your area.

Sickness/Absence:
If you are sick or absent from placement you must phone the ward and inform the nurse in charge prior to the beginning of your shift.
You must also inform Placement Learning Unit either by telephone or e-mail. (E-mail is preferred then they have written evidence of your sickness/absence.)
Placement absence reporting: punit@uclan.ac.uk
Where students expect to be absent for more than 3 days, students should contact their academic advisors for support and advice to be given in a timely manner.
Any absence should be recorded as such on the online timesheet and signed as being an accurate representation by allocated practice supervisors/assessors.
If you have diarrhoea or vomiting you must be clear of this/these for 48 hours before resuming placement.

Introduction to the Orthopaedic Unit

Ward 14 and Ward 16 are 24 bedded wards set out over 5 bays and 4 side rooms. Bay 1, in both areas, is often utilised as a higher observation area for patients who are high risk of falls.
Both wards are acute trauma orthopaedic admission wards, receiving admissions 24 hours a day mainly from A&E, fracture clinic, urgent care, GP referrals and other wards if orthopaedic needs indicate this. However, we do not exclusively nurse orthopaedic patients: dependent on bed pressures we can also nurse patients from other specialities, including medical, surgical, neurology, urology and vascular.
Major Trauma Ward is a 10 bedded area that deals with patients who have multiple traumas, not just injuries that are orthopaedic in nature.

Ward 14 and Ward 16 are CLiP areas. (Collaborative learning in Practice).
The CLiP® model originated in Amsterdam in 2013 and was brought to the UK by the University of East Anglia (UEA) in 2014. It has been running in Norfolk and Great Yarmouth Hospitals and was introduced into Lancashire Teaching Hospitals approximately 3 years ago.
CLiP is based on a method of 'coaching'. The focus is on developing students' confidence, competence and performance through enhanced mentoring skills, thereby promoting critical thinking and skill acquisition.
A main aspect of this approach is that students are expected to take responsibility for their learning. Coaching encourages the student to identify their own learning needs and to work out how they might achieve them. Coaches tease out answers through probing questions, rather than just telling; coaches help students learn rather than teaching them. Coaches help a student unlock their own potential to maximise their own performance. When a student defines their own leaning, they are more likely to be motivated to work, take responsibility and be committed to achieve their goals. The student is responsible for their learning choices. The coach is responsible for the quality of the learning experience.

Mentoring/Teaching	Coaching
Answers questions	Asks questions
Steps in and provides care	Steps back and allows the student to learn by providing care
Is watched by the student	Watches the student
Directs the student learning	The student demonstrates what they've learnt (usually self-directed) to the coach.
Shows the student how	Is shown how by the student
Allocates work to the student	Is allocated work by the student
Talks	Listens
Does the same work as before, but with a student	Works differently, while coaching the student
Identifies individual learning opportunities in the ward environment	Uses the whole ward as a complete learning environment

Who's Who in Orthopaedics

Matron	Emma Kevill
Senior Nursing Staff Ward 14	Ward Manager Pauline Smithson Sister Carla Dixon Charge Nurse Ryan Soothill
Senior Nursing Staff Ward 16	Ward Manager Fiona Jones Sister Nicole Blacklaws Charge Nurse Adriano de Pina Acting Sister Giulia Zamunaro
Senior Nursing Staff Major Trauma Ward	Ward Manager Joanne Cross Sister Natasha Pickup Sister Sharon Yates Sister Lisa Womack Sister Laura Moorby Sister Lisa Reid
Advanced Nurse Practitioner	Dawn Parkinson
Trauma Co-ordinators	Debbie Salthouse Gemma Benson
Trauma Practitioners	Yvonne Marsh Kieran Goods Sarah Hearle Emma Day
Clinical Nurse Educator	Jane Killingback

Consultants

Upper Limb	Mr PJ Hughes Mr DRM Redfern Mr Baumann
Lower Limb	Mr GJ McLauchlan Mr Kumar Mr Helm Mr Canty Mr R Boden Mr Chitre Miss Cross
Lower Limb Chorley	Prof. W Raut Mr Al Hassan
Trauma	Mr Mannion
Spinal	Mr Khatri Mr Baker Mr Austin Mr Bourne
Foot and Ankle, Paediatrics	Mr A McEvoy
Hand	Mr Woodruff
Orthogeriatrician	Dr Japanwala

Orthopaedic Abbreviations

#	Fracture
#NOF	Fracture neck of femur (usually preceded by R or L to denote the side)
#SOF	Fracture shaft of femur
Hemi or HA	Hemi-arthroplasty
DHS	Dynamic Hip screw
CHS	Cannulated Hip Screw
THR	Total Hip Replacement
TKR	Total knee replacement
IM nail	Intramedullary nail
ORIF	Open reduction internal fixation
Ex-fix	External fixation
MUA	Manipulation under anaesthetic
EUA	Examination under anaesthetic
POP	Plaster of Paris
AE	Above elbow
BE	Below elbow
AK	Above knee
BK	Below knee
Tib & fib	Tibia and fibula
I&D	Incision and drainage
BE	Below elbow
GA	General anaesthetic
LA	Local anaesthetic
FWB	Fully Weight Bear
PWB	Partial weight bear
TTWB	Touch Toe Weight Bear
NWB	Non-Weight Bear
ROM	Range of movements
OPA	Outpatient Appointment
FU	Follow up
ROC	Removal of Clips
ROS	Removal of sutures
CSM	Colour, sensation, movement
RICE	Rest, Ice, Compression, Elevation
S/B	Seen by
CPM	Continuous Passive Movement
C+C	Collar and cuff
BAS	Broad arm sling
HAS	High arm sling
DIPJ	Distal interphalangeal joint
MC	Metacarpal
MCPJ	Metacarpophalangeal joint
MT	Metatarsal
MTPJ	Metatarsophalangeal joint
PIPJ	Proximal interphalangeal joint
TTO'S	To take out (drugs)
NBM	Nil by mouth
CXR	Check xray

Please familiarise yourself with the following conditions:

Deep Vein Thrombosis (DVT)

Fat embolism

Compartment syndrome

Osteomyelitis

Osteoporosis

Avascular Necrosis

Osteoarthritis

Ischaemic contracture

Sudecks dystrophy

Myositis ossificans

Orthopaedic Word Search

O	T	D	N	C	O	N	T	R	A	C	T	I	L	I	T	Y	V	B	S
S	B	I	S	D	D	F	G	J	K	L	W	E	E	R	T	R	U	I	O
T	F	A	W	Q	A	D	D	U	C	T	I	O	N	D	H	H	S	Z	X
E	M	P	E	Y	C	V	B	N	A	L	A	D	F	G	E	H	F	T	G
O	K	H	D	F	G	T	Y	U	I	Q	D	O	P	B	P	R	T	S	A
C	E	Y	T	I	P	A	E	D	V	G	J	L	Z	I	X	C	B	M	R
L	U	S	R	E	W	R	G	B	O	T	I	O	P	B	E	S	D	B	T
A	V	I	C	X	U	U	R	F	N	N	T	E	Y	B	N	O	I	T	I
S	R	S	E	T	B	O	N	E	Y	F	R	A	U	V	E	R	K	L	C
T	W	R	C	E	T	U	Y	I	S	T	E	O	B	L	A	S	T	B	U
S	M	A	W	Q	A	V	B	N	M	R	T	Y	U	I	O	S	D	F	L
T	R	F	R	A	C	B	U	R	S	I	T	I	S	U	R	E	P	B	A
F	L	I	M	B	N	O	D	A	B	D	C	U	T	O	N	D	A	R	T
A	D	D	U	C	T	N	O	U	B	O	B	E	N	Q	R	T	Y	U	I
B	U	R	A	D	S	F	E	N	C	S	D	F	G	H	J	K	A	K	O
C	O	N	D	I	S	L	O	C	A	T	I	O	N	H	J	K	L	M	N
O	M	N	D	R	E	E	T	I	O	N	I	B	U	D	S	A	Y	N	G
N	T	U	I	O	D	F	G	H	J	K	L	O	D	E	N	S	S	O	P
B	U	R	S	A	I	T	U	S	V	B	Z	M	N	R	F	G	I	K	O
Q	W	E	R	T	Y	U	I	O	P	L	K	K	Y	P	H	O	S	I	S

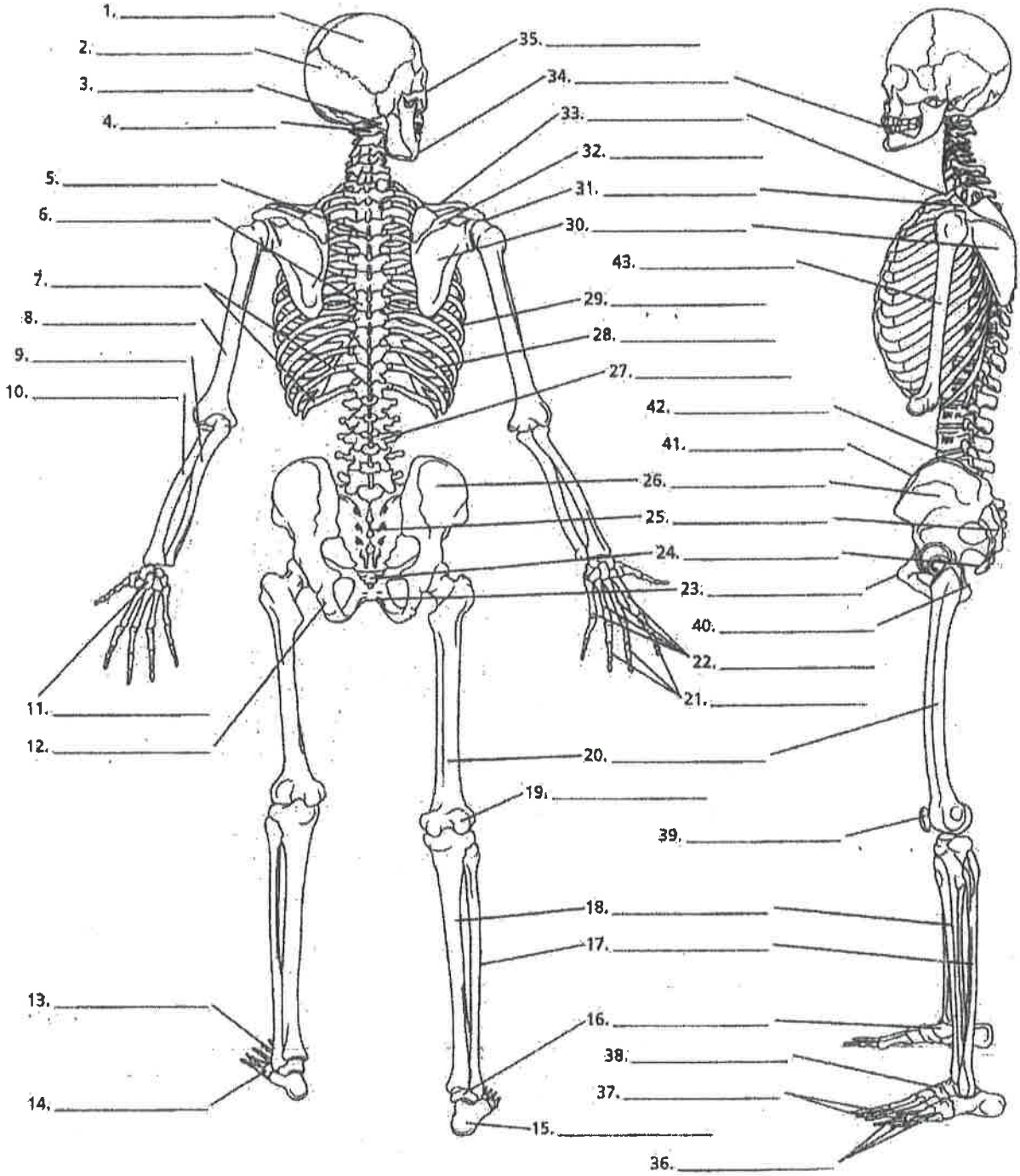
Find the answers to these questions in the grid.

- Movement away from the body is
- Movement towards the body is
- The point of union of any two bones
- Fluid filled sac or space
- Inflammation is irritation of a bursa sac
- Ability of a muscle to become short and thick
- Shaft of a long bone.
- Displacement of a limb from its original position
- Ends of long bones
- Broken bone
- Increased curvature of the thoracic spine
- Young Bone forming cell
- Cell absorbs bone tissue
- Loss of muscle function
- Viscus fluid of a joint or similar cavity

Label the skeleton

Skeletal System—posterior view

Skeletal System—lateral view



The skeleton

The human skeletal system performs many vital functions necessary for a human being to live and move. It supports muscles, it facilitates movement, and it protects our internal organs from outside damage. It is also the location of blood cell production and calcium storage.

The adult human skeletal system is made up of 206 bones. Each of these bones has a different purpose and is a different size and shape. Babies are born with approximately 300 bones. These bones fuse and grow together to create the number we end up with as fully grown adults. The individual bones can grow as well, which is how we reach our final, adult height.

Living bones are made up of several layers. The first is the periosteum, a thin, dense membrane of nerves and blood vessels that delivers sustenance to the bones. The second layer is compact bone: the hard, smooth material we all recognize. Inside this layer is cancellous bone, a spongy substance that contains the most interior bone layer: the marrow. Bone marrow is a thick, gel-like substance that produces blood cells.

The median age for the end of bone growth is 25 years. Bones and cartilage begin as soft and malleable and harden over the year. At this age, the growing stops, and the bones are as big as they will ever get.

Calcium is vital to bone development and maintenance. When a child's bones are growing and switching from cartilage to bone (or simply growing into other, bigger bones), they need calcium for nourishment and strength. Even as an adult, it is important to keep calcium in your diet, especially when women enter menopause when bones begin to weaken.

The largest bone in the body is the femur, otherwise known as the thigh bone. The smallest bones are in the middle ear -- these tiny bones help you to hear, so they pack a lot of punch for such small components. Both types of bones are completely different in size and shape, but they are equally important to our bodies as a whole.

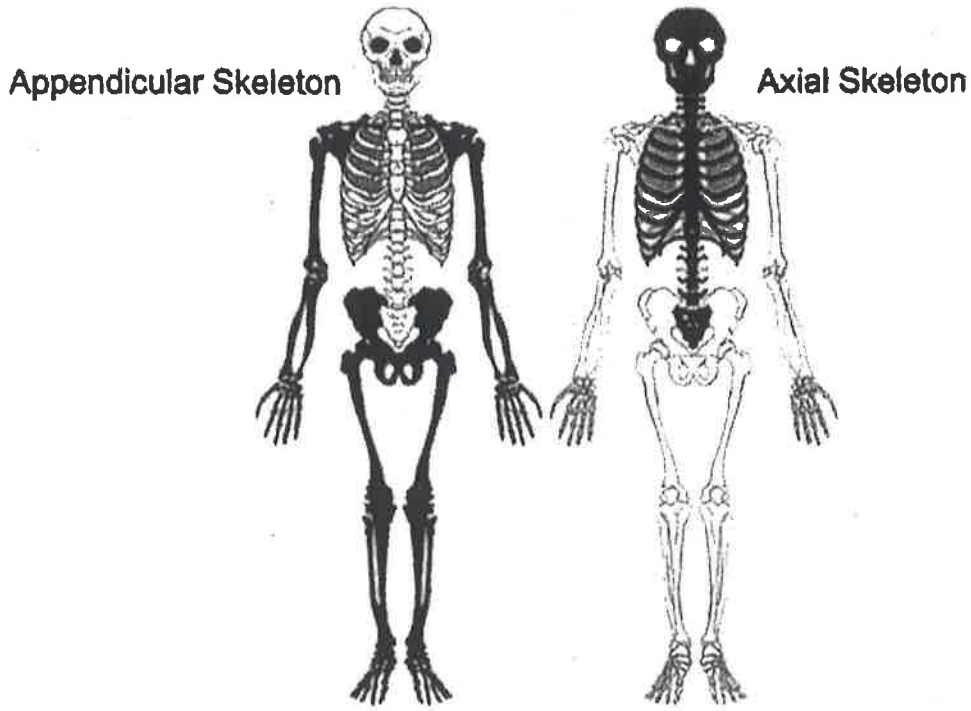
The spine is one of the most important parts of the human skeletal system. It allows you to move, and twist, and walk, and holds your body upright. It protects a large bundle of nerves called the spinal cord, which acts as an information superhighway between your brain and the rest of your body. 33 different interlocking bones make up the spine, each of which carries out a different function. These vertebrae help you do everything from hold your head up to pick up heavy things without falling over.

We may all be created equal in some ways, but this isn't technically true when it comes to our skeletal system. The female skeletal system includes a flatter, larger, more rounded pelvis bone to enable giving birth. A male's pelvis is smaller and is at a more acute angle to his body. Most of the differences between the male and female skeletal system are related to reproduction, as men and woman are biologically designed to take on different roles in this process.

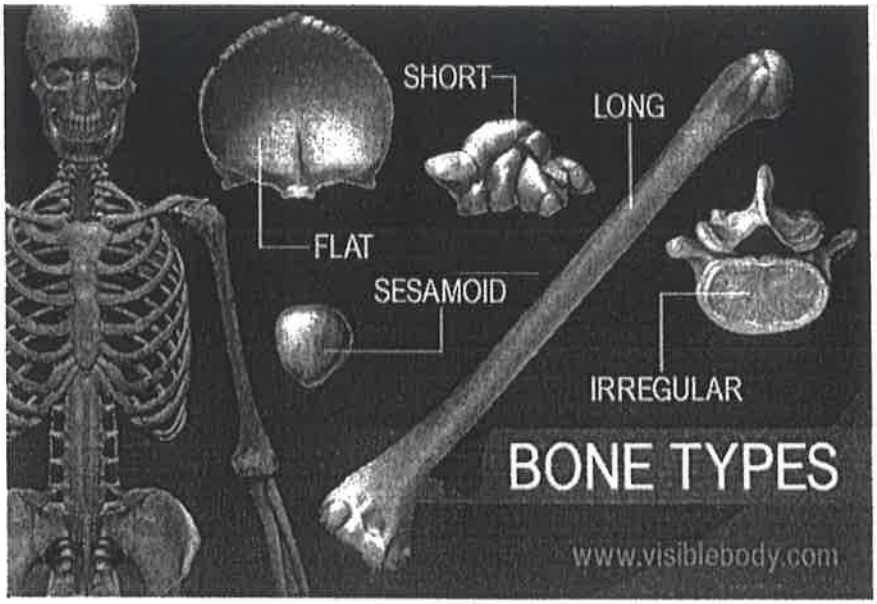
Teeth are not defined as bone, but they are still an integral part of the skeletal system. In fact, they are stronger than bones: experts now know the dentin and enamel that make up our teeth are the most durable substances in our bodies. This is why many of the skeletons of people who lived thousands of years ago still have the teeth attached when much of the rest of the body is gone.

The skeleton

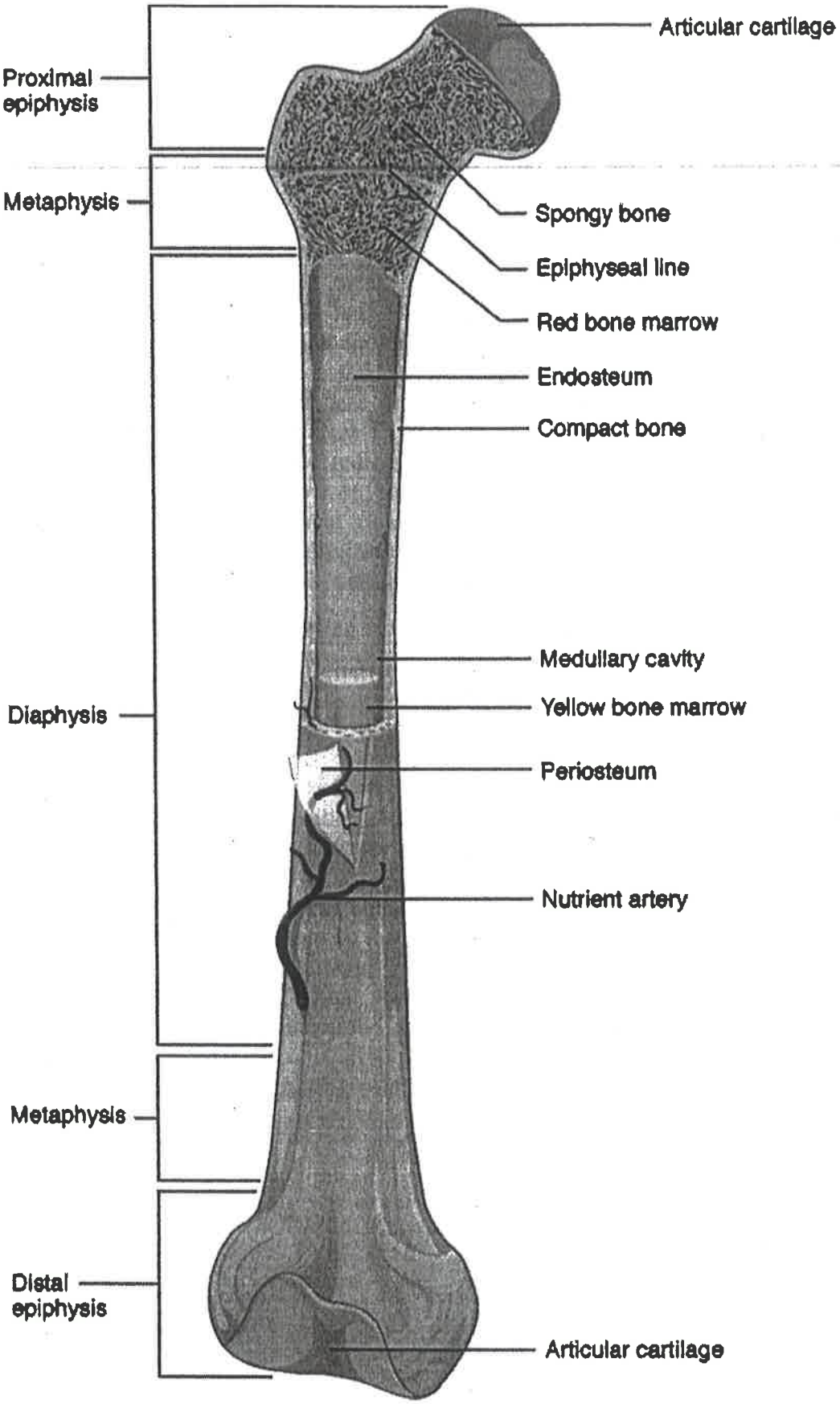
Bones Are Grouped into the Axial Skeleton and the Appendicular Skeleton:
Axial skeleton - bones of the skull, vertebral column, sternum and ribs.
Appendicular skeleton- bones of the upper and lower limbs, clavicles, scapulae and pelvis.



Bones of the human skeletal system are categorized by their shape and function into five types. The femur is an example of a long bone. The frontal bone is a flat bone. The patella, also called the knee cap, is a sesamoid bone. Carpals (in the hand) and tarsals (in the feet) are examples of short bones.



Anatomy of a Long Bone


Articular cartilage
Proximal epiphysis
Metaphysis
Spongy bone
Epiphyseal line
Red bone marrow
Endosteum
Compact bone
Medullary cavity
Diaphysis
Yellow bone marrow
Periosteum
Nutrient artery
Metaphysis
Distal epiphysis
Articular cartilage

Orthopaedics

Orthopaedics is derived from the ancient Greek words orthos meaning straight or correct and paidon meaning child. Nicholas Andry first coined the word in 1741. The practice of orthopaedics was initially developed with attention to correcting and preventing deformities in children, however the correction of spinal and bone deformities in all stages of life eventually became the cornerstone of orthopaedic practice.

Orthopaedics is the medical specialty that focuses on injuries and diseases of your body's musculoskeletal system. This complex system, which includes your bones, joints, ligaments, tendons, muscles, and nerves, allows you to move, work, and be active.

Musculoskeletal conditions comprise more than 150 diagnoses that affect the locomotor system; that is, muscles, bones, joints and associated tissues such as tendons and ligaments, as listed in the International Classification of Diseases. They range from those that arise suddenly and are short-lived, such as fractures, sprains and strains, to lifelong conditions associated with ongoing pain and disability.

Musculoskeletal conditions are typically characterised by pain (often persistent) and limitations in mobility, dexterity and functional ability, reducing people's ability to work and participate in social roles with associated impacts on mental wellbeing, and at a broader level impacts on the prosperity of communities. The most common and disabling musculoskeletal conditions are osteoarthritis, back and neck pain, fractures associated with bone fragility, injuries and systemic inflammatory conditions such as rheumatoid arthritis.

Musculoskeletal conditions include conditions that affect:

- joints, such as osteoarthritis, rheumatoid arthritis, psoriatic arthritis, gout, ankylosing spondylitis;
- bones, such as osteoporosis, osteopenia and associated fragility fractures, traumatic fractures;
- muscles, such as sarcopenia;
- the spine, such as back and neck pain;
- multiple body areas or systems, such as regional and widespread pain disorders and inflammatory diseases such as connective tissue diseases and vasculitis that have musculoskeletal manifestations, for example systemic lupus erythematosus.

Musculoskeletal conditions are prevalent across the life-course and most commonly affect people from adolescence through to older age. The prevalence and impact of musculoskeletal conditions is predicted to rise as the global population ages and the prevalence of risk factors for noncommunicable diseases increases, particularly in low- and middle-income settings. Musculoskeletal conditions occur commonly with other noncommunicable diseases in multimorbidity health states.

(https://www.who.int/newsroom/factsheets/detail/musculoskeletal-conditions).

Fractures

Fractures are broken bones. They are among the most common orthopaedic problems.
A fracture is a break in the continuity of the bone. There are several different types/classifications of fractures.
The average person in this country can expect to sustain two fractures over the course of their lifetime.
A fracture is diagnosed by the history of the event and by the physical examination of the injury site.
X-rays are used to confirm a diagnosis, but they can be misleading. Sometimes a fracture may not show on x-ray until there are signs of union.
Fractures happen because an area of bone is not able to support the energy placed on it. Therefore, there are two critical factors in determining why a fracture occurs:

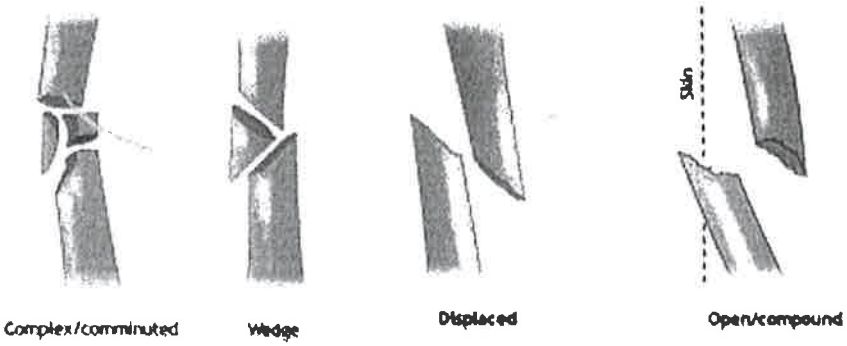
- The energy of the event
- The strength of the bone

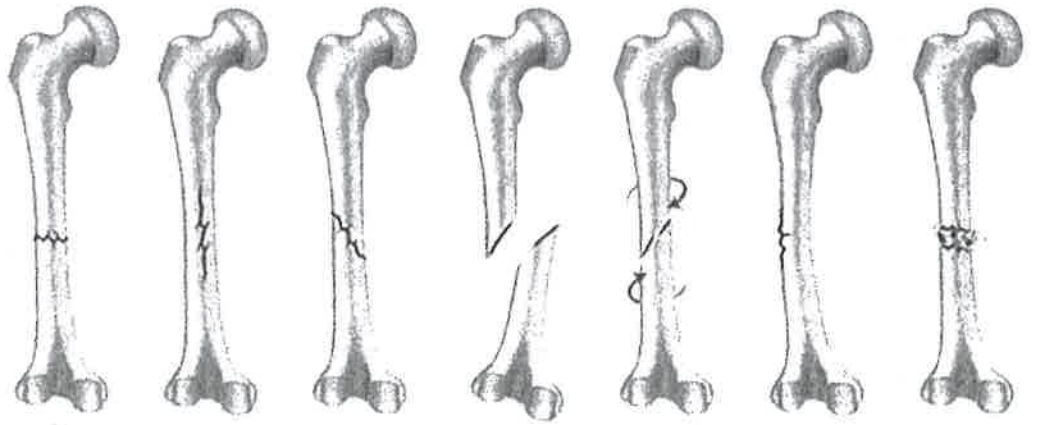
Signs and symptoms:

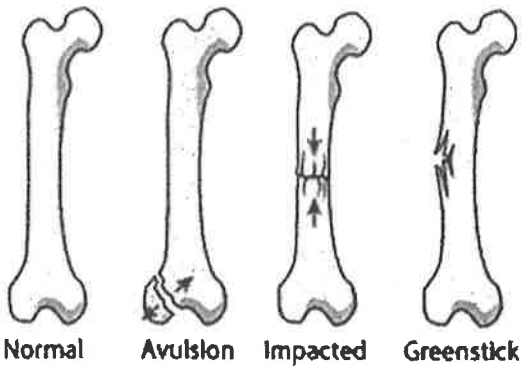
- History of injury (not always)
- Pain swelling
- Deformity
- Loss of function
- Abnormal mobility
- Crepitus

Aims of Fracture Treatment:
Restore optimum function of the injured limb
Obtain and maintain reduction of the fracture
Encourage union (restoration of normal bone structure) of the fracture
Prevent complications
Provide adequate pain relief
Rehabilitation of the patient.

Classification of fractures



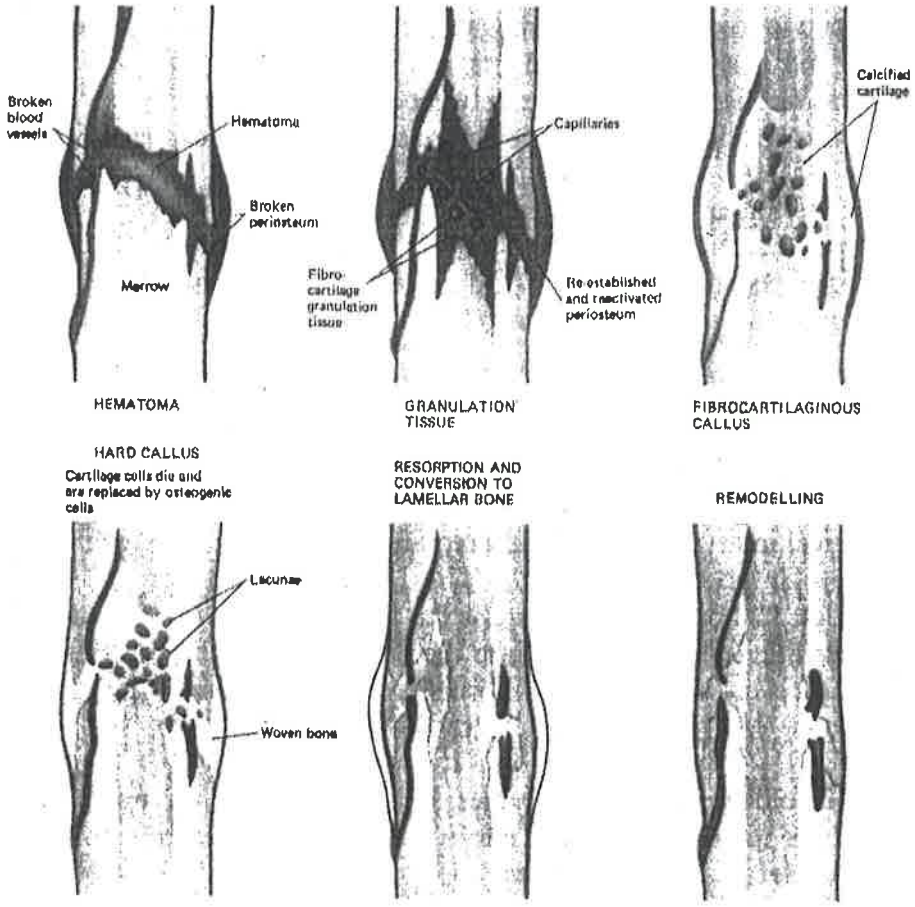




Bone healing

There are five stages a fractured bone goes through in order to repair itself:

1. Haematoma formation
    - After any fracture, bleeding occurs from the ends of the bone and from the surrounding tissues
    - The vessels that are torn at the time of fracture lead to the formation of a fracture haematoma.
2. Cell proliferation
    - Within 8 hours of the fracture occurring, an acute inflammation reaction occurs, with proliferation of cells under the periosteum and within the breached medullary canal
    - The bone fragment ends are surrounded by cellular tissues that bridge the fracture
    - The haematoma is reabsorbed and fine new capillaries grow in the area.
3. Callus formation
    - The proliferating cells are potentially chondrogenic and osteogenic in nature.
    - Under the right circumstances, the cell population changes to osteoblasts and osteoclasts.
    - The dead bone is mopped up and woven bone appears in the fracture callus.
4. Consolidation
    - The woven bone is replaced by lamellar bone and the fracture is solidly united.
5. Remodelling
    - New bone is remodelled to resemble the original normal structure.



Complications of fractures

The risk of complications varies with the particular fracture, its site, circumstances and complexity, with the quality of management, with patient-specific risk factors such as age and comorbidities, and with post-fracture activities such as air travel and immobility.

Some common complications are discussed below:

- Pain
- Shock
- Mal-union
- Delayed union
- Non-union
- Fat embolism
- Nerve injury
- Vascular injury
- Infection
- Compartment syndrome

Pain

Pain is a major symptom of a fracture and as such demands special consideration. The patient requires adequate levels of pain relief, usually by oral, injection or inhalation method. If the patient is in pain, it will make them less able to co-operate and comprehend the information given and therefore treatment can be more difficult.

Shock

All fractures bleed. You should anticipate greater blood loss from the major bones, especially if the fracture is compound. Femoral and pelvic fractures haemorrhage severely, thus making it more likely that the patient will be in shock. Blood loss from a closed fracture shaft of femur can be between 1000-1500ml. Blood loss from a closed tibial fracture can be between 500-1000ml.

It is important that all vital signs are checked and recorded regularly and intravenous fluids are prescribed and given.

Adequate reduction and splintage of the fracture will reduce blood loss.

Mal-Union

This is when a fracture unites in an unacceptable position. Correct reduction and positioning of the fracture within the splint/cast will significantly reduce the risk of mal-union.

Delayed union

Delayed union occurs when a fracture takes longer than expected to heal. Adequate splintage can reduce the risk of delayed union.

Non-Union

Fractures that show no signs of uniting after twice the expected healing time are generally classed as non-union fractures. As a result, surgical intervention is usually required.

Fat Embolism

A possible complication during the first 72 hours post fracture is the formation of a fat embolism. It is caused when a fractured bone leaks microglobules of fat into the blood stream. Usually this does not cause the patient any problems however, if an embolism forms it can obstruct blood flow to the brain, liver kidneys, or lungs.

Nerve Injury

Because nerves are usually located in close proximity to bones, it is possible for the nerve to be damaged when a fracture occurs. It is important for the nerve supply to be checked on initial examination of the fracture and at regular intervals afterwards. Loss of movement, numbness, and pins and needles are all signs of possible nerve damage and should be investigated immediately.

Vascular injury

Veins and arteries are also located in close proximity to bones and can be damaged by a fractured bone. The vascular supply should be checked on initial examination of the fracture and at regular intervals afterwards. Any vascular compromise is an emergency and the patient's doctor needs to be informed immediately.

Infection

Closed fractures are not likely to become infected. Compound fractures are highly likely to become infected. They need to be cleaned well and covered with antiseptic dressings. IV antibiotics are often prescribed to counteract infection. If infection spreads to the fractured bone, it will be extremely difficult to eradicate and may lead to non-union.

Compartment Syndrome

Acute compartment syndrome occurs when a muscle is injured, usually as a result of trauma. Arm and lower leg muscles are particularly affected.

Muscles are encased within a tough outer layer called a fascia that helps to protect the muscle. When a muscle is injured, it bleeds and swells and the fascia has to stretch to accommodate this. Acute compartment syndrome occurs when the muscle fascia is beginning to be stretched to its maximum capacity and it starts to tourniquet the muscle. The tourniquet effect will put pressure on nerves, veins and arteries. The muscle will be starved of oxygenated blood, leading the muscle to die and the limb will suffer permanent paralysis.

Signs and Symptoms; **5 P's:**

Pain
Pallor (pale skin tone)
Paresthesia (numbness feeling)
Pulselessness (faint pulse)
Paralysis (weakness with movements).

A patient suffering from acute compartment syndrome will be in extreme pain and will probably feel that their limb is being "strangled", sensation to the limb will probably diminish, movement, especially extension, will significantly increase pain. It may only be during advanced stages of acute compartment syndrome that reduced perfusion is noted and pulses begin to weaken or become unpalpable.

It is possible for an external source such as a tight cast or bandage to cause compartment syndrome. If symptoms are present, the cast/bandage should be split or removed, exposing the skin and releasing any external pressure.

Acute compartment syndrome is a medical emergency and the patient's doctor should be informed immediately if it is suspected. The patient will probably require a surgical incision to the fascia to release the pressure on the muscle (fasciotomy).

FRACTURED NECK OF FEMUR

There is an e-learning package on the Trust's e-learning website which is very informative and all students are encouraged to complete this.
(https://elearning.lthtr.nhs.uk/course/view.php?id=306)

About 70–75,000 hip fractures (proximal femoral fractures) occur annually in the UK. Hip fracture is the commonest reason for admission to an orthopaedic ward, and is usually a 'fragility' fracture caused by a fall affecting an older person with osteoporosis or osteopaenia (a lesser degree of bone reduction and weakness due to the same process as in osteoporosis). The average age of a person with hip fracture is 77 years. The annual cost of medical and social care for all the hip fracture cases in the UK amounts to about £2 billion. Mortality is high – about 10% of people with a hip fracture die within 1 month, and about one third within 12 months. However, fewer than half of deaths are attributable to the fracture. This reflects the high prevalence of comorbidity in people with hip fractures; often the combination of fall and fracture brings to light underlying ill health. This presents major challenges for anaesthetic, surgical, postoperative and rehabilitative care. (NICE, Hip fracture final scope, July 2009).

Classification of Hip Fractures

Hip fractures are described as occurring in one of three sites; clinically they are impossible to tell apart and have no relevance to the initial treatment, they are only relevant to the operative management and to the likely outcome. Any hip fracture can be undisplaced, grossly displaced or impacted (Garden classification; see diagram below). Injury to the nerves and blood vessels is extremely rare.

Subcapital Fracture

Intracapsulsar fractures which lie within the hip joint.

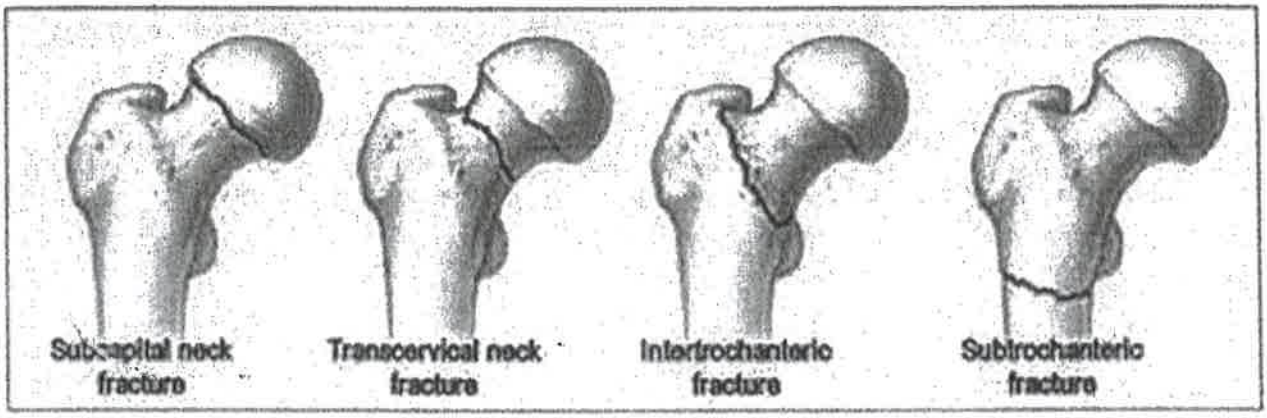
Transcervical Fracture

The fracture site is usually about halfway down the neck. Like the subcapital fracture, if this is displaced, the head of the femur is likely to lose its blood supply and crumble later. For this reason, the majority of these fractures are treated by replacement of the femoral head by a metal implant, rather than trying to put back a fracture which will not heal and then collapse.

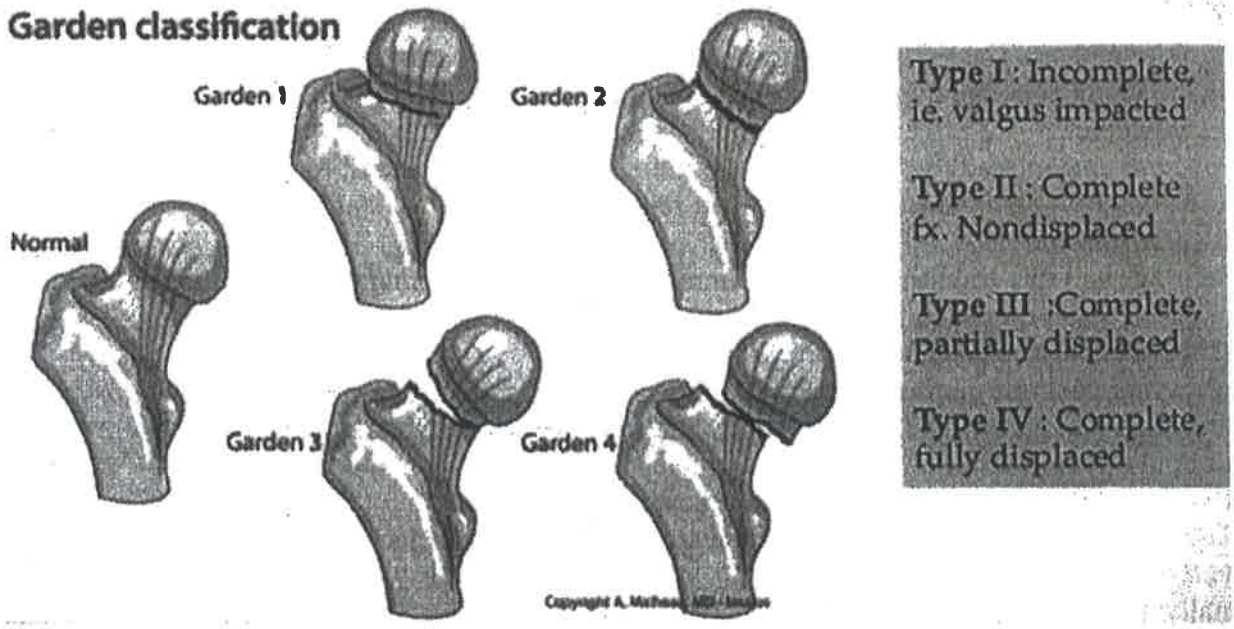
Intertrochanteric (or Per trochanteric) Fracture

The fracture line runs diagonally between the two trochanters. Per trochanteric fractures separate one or both trochanters from the femur. The area has an excellent blood supply and fractures are unlikely to affect the viability of the head. They are usually treated by internal fixation, often with very good results.

Classification of Hip Factures



Garden Classification



The Clinical Picture

History:

Minor stumble or fall with a twisting element in an elderly person, can also be caused as a part of more serious multiple trauma. If no clear history can be obtained then consult next of kin or GP. Full examination of the patient is required.

Symptoms

- Pain in the groin area
- Worse on movement
- Unable to weight-bear. (some patients can weight bear especially if the fracture is impacted.)

Signs

- May be minimal
- Pain on movement
- Pain on gentle rotation
- Tenderness over the upper thigh, just below the groin.

Deformity

- Shortening of the effected leg
- External rotation of the affected leg

Treatment

Full initial examination is very important, as there may be an underlying cause as to why the patient has fallen. The medical staff complete this.

- Bloods should be taken (FBC, U&E's, Anti-coagulation, group and save)
- ECG performed
- X-ray performed to confirm the fracture.

Pain Management

Assessment and evaluation of analgesia is essential.
The use of analgesia in the elderly requires care and as a consequence there is a tendency to under prescribe and under administer analgesia (Novy & Genge Jagmin 1997). This is demonstrated in Closs et al's study (1993) study where older people having undergone hip surgery reported considerable post-operative pain but only a small proportion of the prescribed analgesia had been given.
One of the greatest difficulties in pain management is pain assessment of the cognitively impaired or confused older patient. The nurse needs to be aware of the non- verbal signs of discomfort such as change in breathing patterns, fidgeting and non-specific noise making.

Fluid Management

Elderly patients may already be dehydrated before admission; it is therefore essential that they be treated accordingly. There is a fluid management regime for the medical staff to follow.

Surgical Intervention

Due to their age and this condition not being immediately life threatening, patients with hip fractures are in danger of being cancelled for theatre on more than one occasion.
Patients should ideally be taken to theatre within 24 hours.
The surgical interventions performed are;

- Dynamic Hip Screw (DHS), for intertrochanteric (or per trochanteric) fractures
- Cannulated Hip Screw (CHS), for intertrochanteric (or per trochanteric) fractures
- Hemiarthroplasty (Hemi or HA), for intracapsular fractures
- Total Hip Replacement (THR), for intracapsular fractures in selective patients.

Conservative Treatment

Occasionally a decision is made to delay surgery or treat conservatively, this can either be due to the patient's condition or the fracture they have sustained, I.e. greater trochanter fracture, which can be treated with bed rest, mobilisation as pain allows and analgesia.

Regular reviews by the Medical staff, pre and post operatively

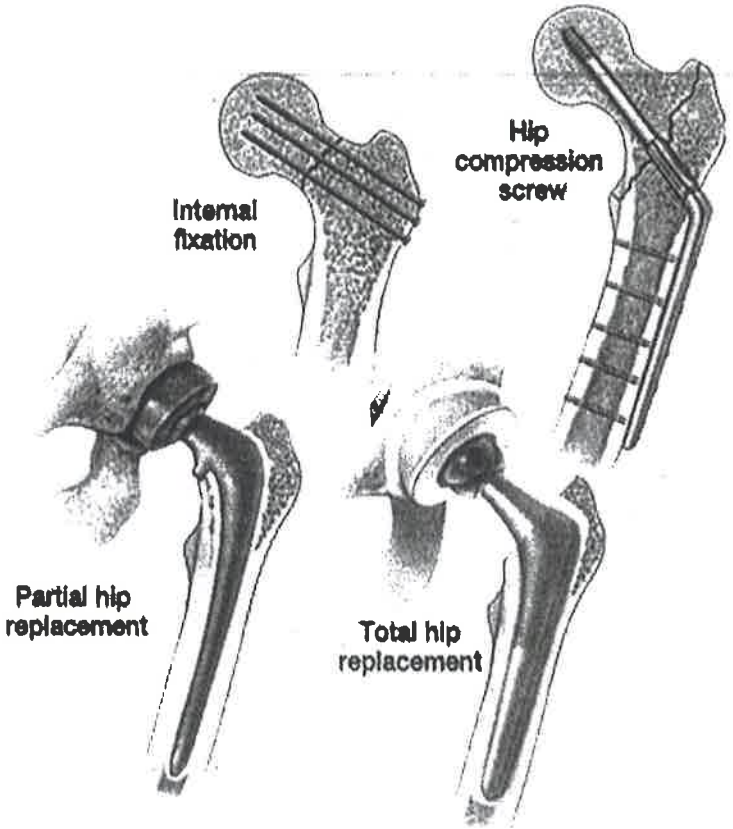
This is essential as these patients are at risk of developing complications and their condition can deteriorate very quickly.

Nursing Care

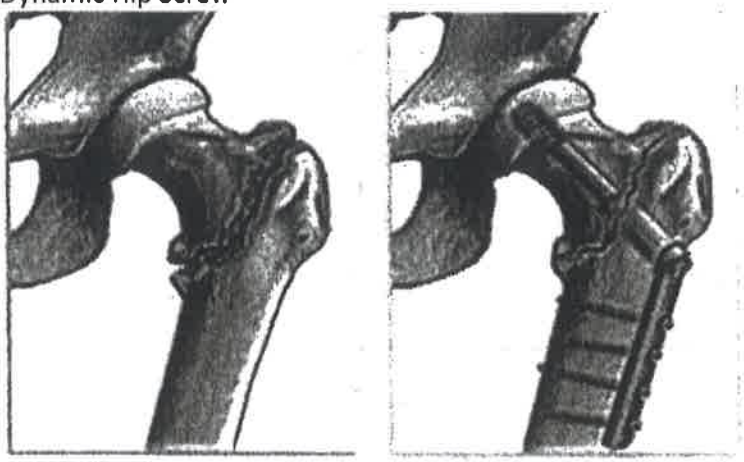
These patients will be on enforced bedrest until they have been to theatre therefore all activities of daily living will be affected.
Main areas for concern are:

- Pain- assessment and evaluation
- Nutrition- at risk of becoming dehydrated and malnourished therefore essential to assess and evaluate
- Mobility/care of skin- bedrest pressure area care, once attended theatre to increase mobility and regain independence.
- Elimination- assessment and evaluation
- Cognitive state- again assessment and evaluation, acute confusion may be reversible need to find out the cause, i.e. dehydration, medication, nutritional imbalance, constipation, pain, anxiety, unfamiliar surroundings.

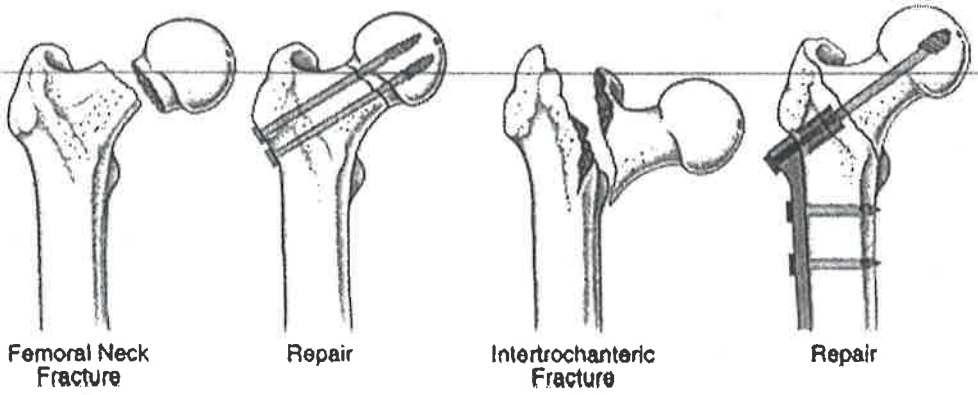
Types of hip fixation

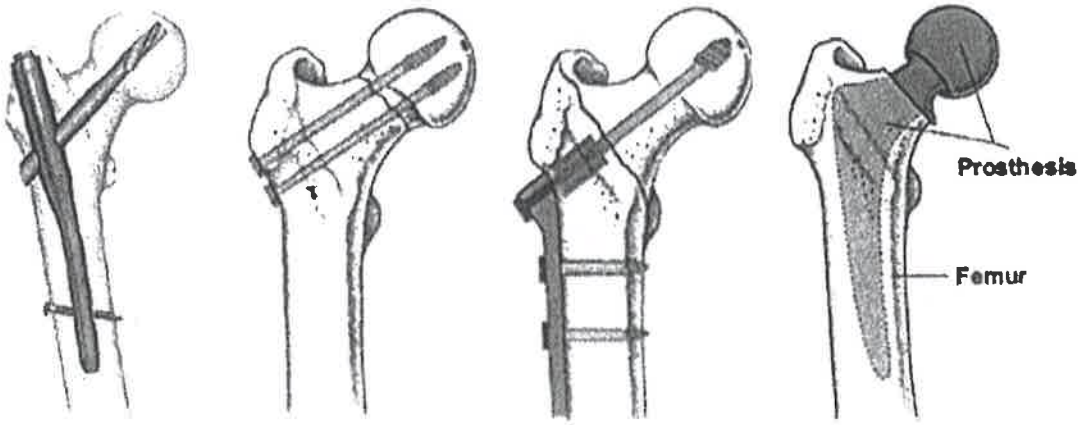


Dynamic Hip Screw



Types of hip fixation





Pictures of trochanteric nail, sliding hip screw, and cannulated screws courtesy of AO Principles of Fracture Management, 2nd Expanded Edition, 2007. Copyright AO Publishing Davos, Switzerland.

FRACTURED SHAFT OF FEMUR

Femoral shaft fractures in young people are frequently due to some type of high-energy collision. The most common cause of femoral shaft fracture is a motor vehicle or motorcycle crash. Being hit by a car while walking is another common cause, as are falls from heights and gunshot wounds.

A lower-force incident, such as a fall from standing, may cause a femoral shaft fracture in an older person who has weaker bones.

Symptoms

A femoral shaft fracture usually causes immediate, severe pain.

- An obvious deformity of the thigh/leg (an unusual angle, twisting, or shortening of the leg)
- Breaks in the skin
- Bruises
- Bony pieces that may be pushing on the skin

Diagnosis:

Confirm fracture with Xray.

Computerized tomography (CT) scans. If the doctor still needs more information after reviewing x-rays, a CT scan may be ordered. A CT scan shows a cross-sectional image of the limb. It can provide the doctor with valuable information about the severity of the fracture. For example, sometimes the fracture lines can be very thin and hard to see on an x-ray. A CT scan can help the doctor see the lines more clearly.

Treatment:

Nonsurgical Treatment

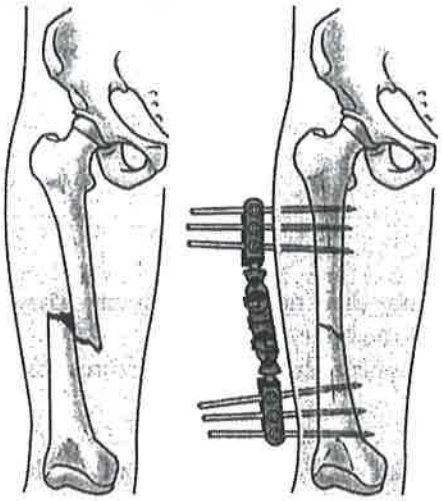
Long leg cast, indicated for patients with nondisplaced femoral shaft fractures that have multiple medical comorbidities.

Surgical Treatment

Timing of surgery. Most femur fractures are fixed within 24 to 48 hours. On occasion, fixation will be delayed until other life-threatening injuries or unstable medical conditions are stabilized. To reduce the risk of infection, open fractures are treated with antibiotics as soon as the patient arrives at the hospital. The open wound, tissues, and bone will be cleaned during surgery.

For the time between initial emergency care and surgery, the doctor may place the fractured leg either in a long-leg splint (usually a Thomas Splint) or in traction. This is to keep the broken bones as aligned as possible and to maintain the length of the leg.

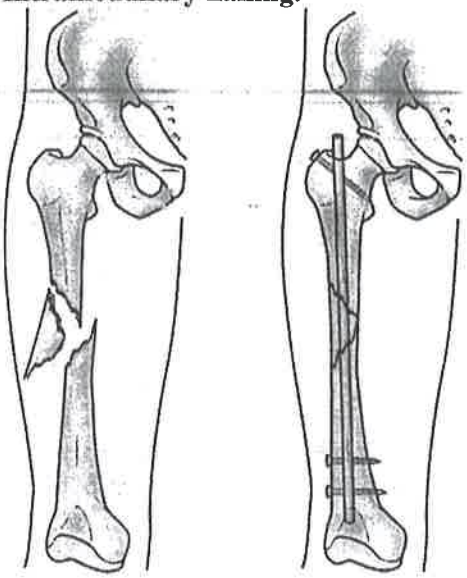
External fixation.



In this type of operation, metal pins or screws are placed into the bone above and below the fracture site. The pins and screws are attached to a bar outside the skin. This device is a stabilizing frame that holds the bones in the proper position.

External fixation is usually a temporary treatment for femur fractures. Because they are easily applied, external fixators are often put on when a patient has multiple injuries and is not yet ready for a longer surgery to fix the fracture. An external fixator provides good, temporary stability until the patient is healthy enough for the final surgery. In some cases, an external fixator is left on until the femur is fully healed, but this is not common.

Intramedullary nailing.

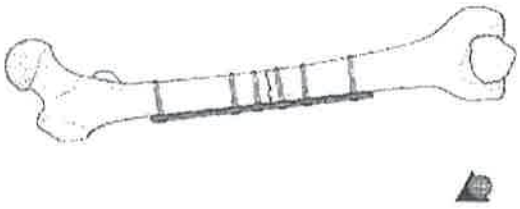


(IM nail). Currently, the method most surgeons use for treating femoral shaft fractures is intramedullary nailing. During this procedure, a specially designed metal rod is inserted into the canal of the femur. The rod passes across the fracture to keep it in position.

An intramedullary nail can be inserted into the canal either at the hip or the knee. Screws are placed above and below the fracture to hold the leg in correct alignment while the bone heals.

Intramedullary nails are usually made of titanium. They come in various lengths and diameters to fit most femur bones.

Plates and screws.



During this operation, the bone fragments are first repositioned (reduced) into their normal alignment. They are held together with screws and metal plates attached to the outer surface of the bone.

Plates and screws are often used when intramedullary nailing may not be possible, such as for fractures that extend into either the hip or knee joints.

Recovery

Most femoral shaft fractures take 3 to 6 months to completely heal. Some take even longer, especially if the fracture was open or broken into several pieces or if the patient uses tobacco products.

Pain Management

Pain after an injury or surgery is a natural part of the healing process. Adequate analgesia is essential to reduce pain, which can help patients recover faster.

Weightbearing

Many doctors encourage leg motion early on in the recovery period. It is very important to follow the doctor's instructions and ascertain the patients weightbearing status on the injured leg to avoid problems.

In some cases, doctors will allow patients to put as much weight as possible on the leg right after surgery. However, the patient may not be able to put full weight on the leg until the fracture has started to heal.

Physical Therapy

Because a patient will most likely lose muscle strength in the injured area, exercises during the healing process are important. Physical therapy will help to restore normal muscle strength, joint motion, and flexibility. It can also help manage pain after surgery.

A physical therapist will begin teaching specific exercises immediately after surgery. The therapist will also help the patient learn how to use crutches or a walker.

Complications

Femoral shaft fractures can cause further injury and complications.

The ends of broken bones are often sharp and can cut or tear surrounding blood vessels or nerves, though this is very rare.

Acute compartment syndrome may develop.

Open fractures expose the bone to the outside environment. Even with good surgical cleaning of the bone and muscle, the bone can become infected. Bone infection is difficult to treat and often requires multiple surgeries and long-term antibiotics.

Occasionally, the ligaments around the knee can be injured during a femoral shaft fracture.

Complications from Surgery

In addition to the risks of surgery in general, such as blood loss or problems related to anaesthesia, complications of surgery may include:

Infection

Injury to nerves and blood vessels

Blood clots

Fat embolism (bone marrow enters the blood stream and can travel to the lungs; this can also happen from the fracture itself without surgery)

Malalignment or the inability to correctly position the broken bone fragments

Delayed union or non-union (when the fracture heals slower than usual or not at all)

Hardware irritation (sometimes the end of the nail or the screw can irritate the overlying muscles and tendons)

FRACTURES OF TIBIA AND FIBULA

The tibia is the most commonly fractured long bone in the body. A tibial shaft fracture occurs along the length of the bone, below the knee and above the ankle. In many tibia fractures, the smaller bone in the lower leg (fibula) is broken as well. In a fracture of the ankle there may be fracture of the talus bone also.

Causes:

Tibial shaft fractures are often caused by some type of high-energy collision, such as a motor vehicle or motorcycle crash. In cases like these, the bone can be broken into several pieces (comminuted fracture).

Sports injuries, such as a fall while skiing or a collision with another player during soccer, are lower-energy injuries that can cause tibial shaft fractures. These fractures are typically caused by a twisting force and result in an oblique or spiral fracture.

Fractured ankles affect all ages and occur in 184 per 100000 people per year. During the last 30-40 years, doctors have noticed an increase in the number and severity of fractured ankles, due in part to an active, older population.

Symptoms:

A tibial fracture usually causes immediate, severe pain. Other symptoms may include:

- Inability to walk or bear weight on the leg
- Bone "tenting" over the skin at the fracture site or bone protruding through a break in the skin
- Occasional loss of feeling in the foot
- An obvious deformity of the tibia/leg (an unusual angle, twisting, or shortening of the leg)
- Bruises
- Swelling
- Redness
- Tender and warm to touch
- Instability (some patients may retain a degree of stability if the fibula is not broken or if the fracture is incomplete)

Diagnosis

The most common way to evaluate a fracture is with x-rays, which provide clear images of bones. X-rays are also useful for identifying the involvement of the knee or ankle joints and the presence of a fibula fracture.

If the doctor still needs more information after reviewing x-rays, a CT scan may be ordered. A CT scan shows a cross-sectional image of the limb. It can provide the doctor with valuable information about the severity of the fracture. For example, sometimes the fracture lines can be very thin and hard to see on an x-ray. A CT scan can help the doctor see the lines more clearly.

Initial Treatment:

Initially in the emergency department, tibial fractures are often reduced under conscious sedation, and below knee backslabs are applied to maintain the alignment of the bone. They need RICE.

- Rest
- Ice
- Circulation checks
- Elevation

If the fracture is open or a dislocation and is unable to be reduced, the patient is taken to theatre as soon as possible.

Nonsurgical Treatment

Nonsurgical treatment may be recommended for patients who:

- Are poor candidates for surgery due to their overall health problems
- Are less active, so are better able to tolerate small degrees of angulation or differences in leg length
- Have closed fractures with minimal movement of the fracture ends

Most injuries cause some swelling for the first few weeks. A backslab splint may be applied to provide comfort and support. Unlike a full cast, a backslab splint allows for swelling to subside. Once the swelling goes down, the consultant will consider a range of treatment options.

Casting and bracing.

The doctor may immobilize the fracture in a cast for initial healing. After several weeks, the cast can be replaced with a functional brace made of plastic and fasteners. The brace will provide protection and support until healing is complete. The brace can be taken off for hygiene purposes and for physical therapy.

Surgical Treatment

Surgery may be recommended for certain types of fractures, including:

- Open fractures with wounds that need monitoring
- Fractures that have not healed with nonsurgical treatment
- Fractures with many bone fragments and a large degree of displacement

Surgery is normally referred to as ORIF- Open Reduction Internal Fixation. With this surgery a patient usually remains non weightbearing for 6 weeks to allow the bone to unite and to avoid displacing the metal work.

Intramedullary nailing. Currently, the method most surgeons use for treating tibia fractures is intramedullary nailing. During this procedure, a specially designed metal rod is inserted into the canal of the tibia. The rod passes across the fracture to keep it in position.

The intramedullary nail is screwed to the bone at both ends. This keeps the nail and the bone in proper position during healing.

Plates and screws. During this operation, the bone fragments are first repositioned (reduced) into their normal alignment. They are held together with screws and metal plates attached to the outer surface of the bone.

Plates and screws are often used when intramedullary nailing may not be possible, such as for fractures that extend into either the knee or ankle joints.

External fixation. In this type of operation, metal pins or screws are placed into the bone above and below the fracture site. The pins and screws are attached to a bar outside the skin. This device is a stabilizing frame that holds the bones in the proper position so they can heal.

Recovery:

Most tibial shaft fractures take 4 to 6 months to heal completely. Some take even longer, especially if the fracture was open or broken into several pieces or if the patients uses tobacco products.

Pain Management

Pain after an injury or surgery is a natural part of the healing process. Adequate analgesia helps the patient recover faster.

Analgesics include paracetamol, nonsteroidal anti-inflammatory drugs (NSAIDs), gabapentinoids (normally recommended by the Pain Team for treating nerve pain), muscle relaxants, opioids, and topical pain medications.

Weightbearing

Many doctors encourage leg motion early in the recovery period. It is very important to follow the doctor's instructions concerning the weightbearing status of a patient. The weightbearing status of a patient is initially found in the patients post operative notes and then in the patients case notes (now on computer).

In some cases, doctors will allow patients to put as much as weight as possible on the leg right after surgery. However, a patient may not be able to put full weight on their leg until the fracture has started to heal.

When a patient begins walking, they need a physiotherapy assessment to determine the mobility aids best suited to the patient usually crutches or a walker for support.

Physical Therapy

Because a patient will likely lose muscle strength in the injured area, exercises during the healing process are important. Physical therapy will help to restore normal muscle strength, joint motion, and flexibility. It can also help the patient manage pain after surgery.

Complications

Complications from Tibial Shaft Fractures

Tibial shaft fractures can cause further injury and complications, including the following:

- The ends of broken bones are often sharp and can cut or tear surrounding muscles, nerves, or blood vessels.
- Acute compartment syndrome may develop. This is a painful condition that occurs when pressure within the muscles builds to dangerous levels. This pressure can decrease blood flow, which prevents nourishment and oxygen from reaching nerve and muscle cells. Unless the pressure is relieved quickly, permanent disability may result. This is a surgical emergency. During the procedure, your surgeon makes incisions in your skin and the muscle coverings to relieve pressure.
- Open fractures expose the bone to the outside environment. Even with good surgical cleaning of the bone and muscle, the bone can become infected. Bone infection is difficult to treat and often requires multiple surgeries and long-term antibiotics.

Complications from Surgery

In addition to the risks of surgery in general, such as blood loss and problems related to anesthesia, complications of surgery may include:

- Infection
- Injury to nerves and blood vessels
- Blood clots (these may also occur without surgery)
- Malalignment or the inability to correctly position the broken fragments
- Delayed union or nonunion (when the fracture heals slower than usual or not at all)
- Angulation (with treatment by external fixation)

FRACTURES OF THE HUMERUS

The humerus is the long bone of the upper arm. It extends from the shoulder to the elbow, where it joins with the ulna and radius bones of the forearm. A humerus fracture refers to any break in this bone.

The pain from a humerus fracture often extends to either the shoulder or elbow, depending on where the break is, and recovery may last several weeks.

There are three types of humerus fracture, depending on the location of the break:

- **Proximal.** A proximal humerus fracture is a break in the upper part of the humerus near the shoulder.
- **Mid-shaft.** A mid-shaft humerus fracture is a break in the middle of the humerus.
- **Distal.** Distal humerus fractures occur near the elbow. This type is usually part of a more complex elbow injury and sometimes involves loose bone fragments.

Causes:

Any hard blow or injury to the arm can result in a humerus fracture, but some are more likely to cause certain types. For example, breaking your fall with an outstretched arm can often cause mid-shaft and proximal humerus fractures. A high-impact collision, such as a car accident or football tackle, is more likely to cause a distal humerus fracture.

Humerus fractures can also be pathological fractures, which happen as the result of a condition that weakens your bones. This leaves the bones more vulnerable to breaks from everyday activities that wouldn't usually cause any injuries.

Things that can cause pathological humerus fractures include:

- osteoporosis
- bone cancer
- bone cysts or tumours
- bone infection

Treatment:

Treating a humerus fracture depends on several factors, including the type of fracture and whether there are any loose bone fragments. To determine the best treatment, the doctor will order an X-ray and examine the arm.

In many cases, proximal and mid-shaft humerus fractures don't require surgery because the broken ends usually stay close together. This makes it easier for the humerus to heal on its own. However, the patient will still need to wear a sling, brace, or splint to keep the arm from moving and stabilize the shoulder, if needed. Occasionally, surgery is required with either plates, screws, rods, or sometimes replacement of the shoulder joint with use of a prosthesis.

Distal fractures and more severe proximal or mid-shaft fractures usually require surgery. There are two main approaches that your surgeon may use:

- **Pins and screws.** If the fracture is open, surgery will be required to clean up the broken ends and pins and screws and plates may be used to hold the broken ends of the humerus in place.
- **Bone grafting.** If some of the bone has been lost or severely crushed, the surgeon may take a piece of bone from another area of the body or a donor and add it to the humerus. In some cases, doctors can even use an artificial material to create a new piece of bone.

Regardless of whether or not surgery is needed, the doctor will probably suggest following up with physical therapy. This will help the patient learn exercises and movements that can be done to help strengthen the arm muscles and regain range of motion.

Healing times vary greatly depending on the type of fracture. Non-surgical or conservative management of fractures, a sling/collar and cuff would be worn by the patient for two to six weeks. Proximal fractures generally require the least amount of time, while distal fractures need the most.

If a surgical repair is performed, the patient may need to wear a cast, sling, splint, or brace for several weeks. During this period, the patient may be discharged and follow up would be in Fracture Clinic.

For severe fractures, X-rays every few weeks for a couple of months may be required. Most patients are able to return to their usual activity level within a few months. Sometimes, physical therapy or occupational therapy is necessary to regain lost motion of the joints.

Most humerus fractures eventually heal without causing any long-term health problems.

Fractures of the radius and ulna

Your forearm is made up of two bones, the radius and ulna. In most cases of adult forearm fractures, both bones are broken.

Fractures of the forearm can occur near the wrist at the farthest (distal) end of the bone, in the middle of the forearm, or near the elbow at the top (proximal) end of the bone.

Forearm bones can break in several ways. The bone can crack just slightly, or can break into many pieces. The broken pieces of bone may line up straight or may be far out of place.

In some cases, the bone will break in such a way that bone fragments stick out through the skin or a wound penetrates down to the broken bone.

Anatomy

If you hold your arms at your side with your palms facing up, the ulna is the bone closest to your body and the radius is closest to your thumb. The ulna is larger at the elbow — it forms the "point" of your elbow — and the radius is larger at the wrist.

The primary motion of the forearm is rotation: the ability to turn our palms up or down. The ulna stays still while the radius rotates around it. This is the motion used to turn a screwdriver or twist in a light bulb. Forearm fractures can affect your ability to rotate your arm, as well as bend and straighten the wrist and elbow.

Because of the strong force required to break the radius or ulna in the middle of the bone, it is more common for adults to break both bones during a forearm injury. When only one bone in the forearm is broken, it is typically the ulna — usually as a result of a direct blow to the outside of your arm when you have it raised in self-defence.

Cause

The most common causes of forearm fractures include:

- Direct blow
- Fall on an outstretched arm, often during sports or from a height
- Automobile/motorcycle accidents

Symptoms

A broken forearm usually causes immediate pain. Because both bones are usually involved, forearm fractures often cause an obvious deformity — the forearm may appear bent and shorter than the other arm. The patient will most likely present supporting the injured arm with your other hand.

Additional symptoms include:

- Swelling
- Bruising (not as common as in other broken bones)
- Inability to rotate arm
- Numbness or weakness in the fingers or wrist (rare)

Doctor Examination

The doctor will:

- Examine the skin to see if there are any cuts from the injury. Bone fragments can break through the skin and create lacerations. This leads to an increased risk for infection.
- Palpate (feel) all around the arm to determine if there are any other areas of tenderness. This can indicate other broken bones or injuries.
- Check the pulse at the wrist to be sure that good blood flow is getting through your forearm to the hand.

- Check to see if the patient can move their fingers and wrist, and can feel things with their fingers. Sometimes, nerves may be injured at the same time that the bone is broken, which can result in hand and wrist weakness and numbness.
- The doctor may examine the shoulder, upper arm, elbow, wrist, and hand, even if the patient only complains of arm pain.

X-rays confirm diagnosis.

Treatment

Most cases of adult forearm fractures require surgery to make sure the bones are stabilized and lined up for successful healing.

Immediate Treatment

In the emergency room, the doctor may try to temporarily realign the bones, depending upon how far out of place the pieces are. "Reduction" is the technical term for this process in which the doctor moves the pieces into place. This is not a surgical procedure. Pain will be controlled with medication. Afterward, the doctor will apply a backslab the forearm and provide a sling to keep the arm in position and supported. Unlike a full cast, a backslab allows swelling to reduce.

It is very important to control the movement of a broken bone. Moving a broken bone can cause additional damage to the bone, nearby blood vessels, and nerves or other tissues surrounding the bone.

Additional immediate treatment may include applying ice to help reduce swelling.

Nonsurgical Treatment

If only one bone is broken and it is not out of place, it may be possible to treat it with a cast or brace. The doctor will closely monitor the healing of the fracture, and have the patient return to the clinic for x-rays frequently. If the fracture shifts in position, the patient may require surgery to put the bones back together.

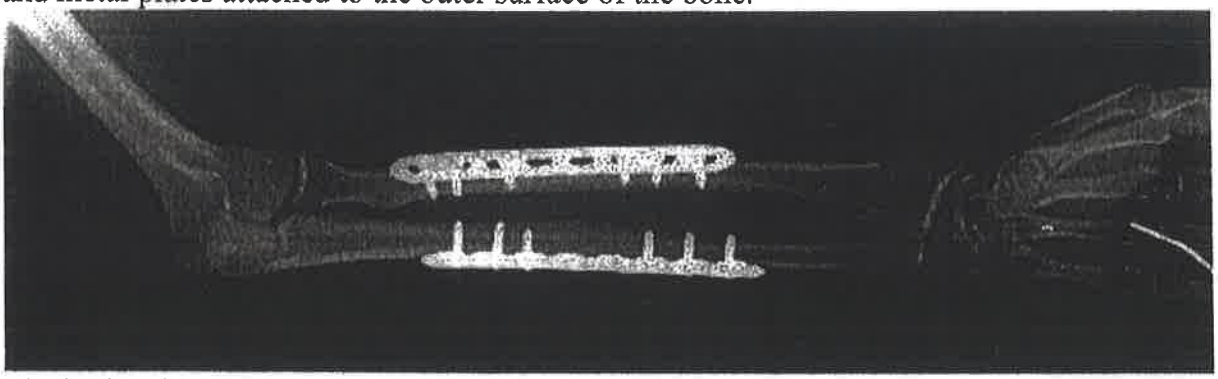
Surgical Treatment

When both forearm bones are broken, or if the bones have punctured the skin (open fracture), surgery is usually required.

Because of the increased risk for infection, open fractures are usually scheduled for surgery immediately. Patients are typically given antibiotics intravenously in the emergency room (usually continued on the ward), and may receive a tetanus shot. During surgery, the cuts from the injury will be thoroughly cleaned out. The broken bones are typically fixed during the same surgery.

If the skin around the fracture has not been broken, the doctor may recommend waiting until swelling has gone down before having surgery. Keeping the arm immobilized and elevated for several days will decrease swelling. It also gives skin that has been stretched a chance to recover.

Open reduction and internal fixation (ORIF) with plates and screws. This is the most common type of surgical repair for forearm fractures. During this type of procedure, the bone fragments are first repositioned (reduced) into their normal alignment. They are held together with special screws and metal plates attached to the outer surface of the bone.



The broken bones of the forearm are held in position by plates and screws while they heal.

Open reduction and internal fixation with rods. During this procedure, a specially designed metal rod is inserted through the marrow space in the centre of the bone.

External fixation. If the skin and bone are severely damaged, using plates and screws and large incisions may injure the skin further. This may result in infection. In this case, the patient may be treated with an external fixator. In this type of operation, metal pins or screws are placed into the bone above and below the fracture site. The pins and screws are attached to a bar outside the skin. This device is a stabilizing frame that holds the bones in the proper position so they can heal.

Complications

Complications from Forearm Fractures

Forearm fractures can cause further injury and complications.

- The ends of broken bones are often sharp and can cut or tear surrounding blood vessels or nerves.
- Excessive bleeding and swelling right after the injury may lead to acute compartment syndrome, a condition in which the swelling cuts off blood supply to the hand and forearm. It typically occurs within 24 to 48 hours of the injury and causes severe pain when moving the fingers. Compartment syndrome can result in loss of sensation and function, and requires emergency surgery once it is diagnosed. In such cases, the skin and muscle coverings are opened and left open to relieve pressure and allow blood to return.
- Open fractures expose the bone to the outside environment. Even with good surgical cleaning of the bone and muscle, the bone can become infected. Bone infection is difficult to treat and often requires multiple surgeries and long-term antibiotics.

Complications from Surgery

There are risks associated with all surgery. The doctor recommends surgery, he or she thinks that the possible benefits of surgery outweigh the risks.

- Infection. There is a risk of infection with any surgery, whether it is for a forearm fracture or another purpose.
- Damage to nerves and blood vessels. There is a minor risk of injury to nerves and blood vessels around the forearm. Although some temporary numbness is common right after injury, if the patient experiences persistent numbness or tingling in your fingers, the doctor must be informed
- Synostosis. Another rare complication is healing between the two bones of the forearm with a bridge of bone known as synostosis. This can decrease the rotation of the bones and prevent full movement.
- Non-union. Surgery does not guarantee healing of the fracture. A fracture may pull apart, or the screws, plates, or rods may shift or break. This can occur for a variety of reasons, including:
    - The patient does not follow directions after surgery.
    - The patient has other health issues that slow healing. Some diseases, like diabetes, slow healing. Smoking or using other tobacco products also slow healing.
    - If the fracture was associated with a cut in the skin (an open fracture), healing is often slower.
    - Infections can also slow or prevent healing.

If the fracture fails to heal, further surgery may be needed.

Recovery

Bones have a remarkable capacity to heal. Forearm bones typically take 3 to 6 months to fully heal. The more severe the injury, however, the longer recovery may be.

Pain Management

Pain after an injury or surgery is a natural part of the healing process.
Medications are often prescribed for short-term pain relief after surgery or an injury. Many types of medicines are available to help manage pain, including opioids, non-steroidal anti-inflammatory drugs (NSAIDs), and local anaesthetics. The doctor may use a combination of these medications to improve pain relief, as well as minimize the need for opioids.

Rehabilitation

Nonsurgical treatment. Rehabilitation typically begins after a few weeks of keeping the arm still by using a cast or brace. In many cases, a physical therapist will help with rehabilitation, beginning with gentle exercises to increase range of motion (ROM), and gradually adding exercises to strengthen the arm.
Surgical treatment. Depending on the complexity of the fracture and the stability of the repair, a cast or brace may be necessary for 2 to 6 weeks after surgery. Motion exercises for the forearm, elbow, and wrist usually begin shortly after surgery. This early motion is important to prevent stiffness.

Outcome

Some stiffness after healing is common, but this does not usually affect the overall function of the arm.
The consultant will advise the patient on when they may return to work and sports activities. This varies depending on the fracture pattern and the type and stability of the repair.
If a patient has surgery, the plates and screws are usually left in place forever, they are not removed unless a complication requires their removal.

OTHER FRACTURES:

It is a lengthy process to include all fractures in this booklet, so we have mainly listed the most common fractures that you may see on the orthopaedic unit.
The wards have a resource folder for students, please ask where this is kept in your area.
Information on fractures not mentioned in this handout may be found there or you could look up the information online.
If you are not sure of a patient's injuries please ask a member of nursing staff.

The Trust has an excellent e-learning website:
https://elearning.lthtr.nhs.uk
Students should learn how to access the website (usually by using Trust email log-in and password).
The following courses can be completed and may be beneficial to your time on the orthopaedic unit. (Certificates can be printed off for your portfolio on completion):
Cauda Equina
Fractured Neck of femur (NOF)
Look after your back
Lumbar and Cervical Spinal Surgery.
These courses can be found by selecting "Courses" and then selecting "Orthopaedics & Rheumatology" from the list.
It recommended that all students complete the "Look after your back" course.
If you have difficulty logging in to the website please contact the IT department during working hours for assistance.

General Information

Welcome to Lancashire Teaching Hospitals NHS Trust:

The inpatient pain service is an inpatient service, providing day to day specialist advice regarding pain management.

The team currently consists of five clinical nurse specialists and two consultant anaesthetists. The hospital inpatient clinical guidelines are available on the intranet. We recommend you familiarise yourselves with these and visit our web page.

A member of the inpatient pain team reviews patients with epidural analgesia or continuous nerve infusion analgesia or complicated PCA cases at least once daily. The review consists of an in depth, complex, holistic assessment, identifying individual patients requirements with regard to acute pain, through verbal, non verbal, traditional observations and the use of appropriate tools. Any patient presenting with moderate to severe pain which is difficult to manage, can be referred to the inpatient pain team, please adhere to our inpatient pain referral criteria (on our web site) prior to referral. Referrals can be made via QuadraMed or by bleeping 2436 .
Patients will be seen Monday- Friday 0800-1700 .

Out of Hours:
Out of hours pain management service is provided by the on-call anaesthetic team. Should you require help or advice please contact bleep 3333 for the on-call anaesthetist

Patient Selection:
For routine surgery the decision to use patient controlled analgesia (PCA), continuous nerve infusion or epidural should, where possible be made during the pre-operative assessment conducted by the anaesthetist. The decision and explanation regarding analgesic technique should be documented in the patients notes. Communication is very important and any pertinent issues should be discussed with the anaesthetist and nursing staff. This is particularly important as it ensures a cohesive approach when the patient receives information or asks questions.

The nursing staff on each ward are encouraged to discuss post-operative pain relief with patients, including pain assessment. There are information leaflets available on the wards and intranet which explains PCA and epidurals in simple terms to the patients.

The following information is a summary and a guide on how we manage post-operative and trauma pain here at Preston and Chorley Hospital. If you have any queries regarding advice or training please do not hesitate to contact us.

Patient Controlled Analgesia (PCA)
(Alaris PCAM)

PCA allows patients to control the amount of analgesia they receive by self administration of a small amount of analgesia, usually morphine or oxycodone. PCA must be prescribed on the patients prescription chart, EPMA .

Indications for use

- Moderate to severe post-operative pain
- Trauma pain
- Acute pain but patient is nil orally e.g. pancreatitis
- Acute pain that requires large amounts of iv opioids

Patients must be able to understand how to use the PCA and co-operate with its application.

We do not use background infusions on the PCA's

There is a designated giving set (PCA administration line with antisiphon valve and anti reflux) for use with the PCA device.

The PCA devices have 7 pre-programmed protocols available. Staff must ensure that the correct program is selected against a valid prescription.

The most common dose for PCA is:

Morphine or Oxycodone	
Concentration	1mg/ml
PCA dose	1mg
Lockout interval	5 minutes

The PCA should only be used on a dedicated peripheral intravenous cannula (minimum 20G); in critical care unit PCA's may be given via the central venous lines .

Intravenous opioid infusion

Only to be used on critical care or in theatres for continuous opioid requirement .

Epidural Analgesia (QCORE Sapphire)

These are often used for analgesia in major surgery and may be kept in place for up to 3-5 days providing adverse effects do not exist. If the patient's condition justifies continuation of the epidural for longer than 5 days, this must be done after discussion with the inpatient pain team.

NOTE all epidural giving sets have yellow tubing for ease of identification and to reduce the risk of IV connection.

Dose and range:

The standard rate range for epidural is: 1-15mls/hr (lumbar) and 1-10 ml/hr (thoracic)

The bag consists of a pre-filled solution containing one of the following:

0.125% Bupivacaine
0.125% Bupivacaine with Fentanyl 2mcgs/ml (0.0002%)

Epidurals and motor block

Local anaesthetic may cause reduced motor power in lumbar epidurals or alternatively, reduced motor block and sensation may be a sign of an adverse effect from the epidural and must be escalated. Specific epidural observations should be recorded on the epidural daily management chart.

Epidurals and hypotension

Blood pressure may fall with the sympathetic nerve blockade. 80% of the preoperative BP is usually acceptable provided the patient is well hydrated and has a good urine output. Severe hypotension will occur with hypovolaemia due to lack of compensatory vaso-contraction. This can be avoided by replacing losses promptly and monitoring urine output . Any adverse observations need to be escalated to the nurse in charge and the patient reviewed

Epidural management and anticoagulation

Senior surgical staff and anaesthetists will omit preoperative dose of LMWH where possible epidural insertion is likely. LMWH should be prescribed at 6pm to **allow removal during daytime hours.** LMWH should be given 4 hours post epidural removal.

NOTE In the case of patients requiring or receiving oral antiplatelet drugs such as clopidogrel or warfarin pre operatively these must not be restarted until the epidural catheter has been removed. If full anticoagulation is required whilst an epidural is in situ the parent team will need to liaise with the anaesthetist concerned or the inpatient pain team.

Avoid additional systemic opioids when patients are receiving either PCA or epidural analgesia - unless discussed with inpatient pain team or anaesthetist.

Continuous Nerve Infusions

Local anaesthetic (LA) infusions can be an effective method of pain relief by delivering a LA solution to the area of peripheral nerves using an indwelling catheter. Additional bolus doses may be used. Such infusions have the potential to be an effective part of a multimodal analgesic regime after surgery or trauma and reduce opioid consumption.

Paravertebral catheter infusions

- Post operative pain relief for thoracotomy or other upper GI surgery
- Post operative pain relief for other procedures e.g. nephrectomy, open cholecystectomy, breast surgery
- After thoracic trauma, e.g. multiple rib fractures, flail chest

Peripheral nerve catheter infusions

- Continuous interscalene/supraclavicular brachial plexus block
- Continuous femoral nerve block
- Continuous fascia iliaca block
- Continuous sciatic nerve block (e.g. popliteal)
- Rectus sheath catheter infusion (e.g. abdominal surgery)

Wound infusions may also be used to deliver LA to the wound .

Oral opioids

Use oral route whenever possible and if absorbing oral fluids.

For mild to moderate pain: dihydrocodeine 30mg QDS prescribed regularly and 30mg prn (caution in the elderly).

If not effective or for ***severe pain*** consider oral morphine 5-10mg 2-4 hourly prn or oxycodone liquid IR 2.5mg-5mg 4 hourly prn (reduce dose in elderly and renal impairment)

NB: slow release preparations are not usually used for immediate post operative pain or other acute pain situations.

Opioid side effects

Respiratory depression and sedation: may occur with any opioid analgesic technique. Airway and ventilation support may be required. Respiratory rate ≤ 8/min. Sedation score 2.

Naloxone: may be used to reverse sedation and respiratory depression:

Dilute a 400mcg ampoule up to 8mls with normal saline and titrate 2mls at a time. Larger doses will reverse all analgesia. A continuous infusion may be required as naloxone has a shorter half life than morphine. Contact on-call anaesthetist for advice.

Note : 50mcg –100mcg of Naloxone may be used to reverse opioids induced urine retention

Nausea and vomiting: can be caused by opioids - follow post operative nausea and vomiting guideline

Constipation: usually occurs with all systemic opioids. Use laxatives when appropriate.

Non steroidal anti inflammatory drugs (NSAIDS) including paracetamol

Patients with post operative pain could receive a NSAID if appropriate and no contraindications for 5-7 days in addition to their opioid, PCA , epidural or nerve infusion analgesia .

NSAIDS : either

- Oral ibuprofen 400mg TDS and paracetamol 1g QDS

or

- Oral naproxen 500mg BD and paracetamol 1g QDS

Contraindications for NSAID's:

- Recent or significant upper GI bleeding (ulcers), caution with steroids
- Aspirin sensitive asthma
- Severe congestive heart failure
- Dehydration, hypovolaemia or renal failure
- Coagulation disorders (heparin thrombo-prophylaxis is safe)
- Bone replacement or limb lengthening surgery

PPI's should be prescribed if required .

NOTE oral and IV paracetamol dose needs to be reduced in patients weighing less than 50kg .

ACUTE PAIN

Lancashire Teaching Hospitals Trust

A Guide For Nurses / Trainees

Inpatient Pain Team

Clinical Nurse Specialists:	Team contact no.
Gill Nixon	BLEEP: 2436
Ruth Palliser	OFFICE : 2436
Kate Sutherland	
Ivan Haskell	
Caroline Nuttall	

Lead Clinical Nurse Specialist
Lynne Clarke 07753 136796

Consultant Anaesthetists:
Dr Emma Baird - Clinical Lead
Dr Shiva Tripathi - CD

Senior Surgical Pharmacist:
Jenny Whatton BLEEP: 2486

On-call Anaesthetist BLEEP: 3333
Available for acute pain advice out of hours

January 2020

Epidural Daily Management Record

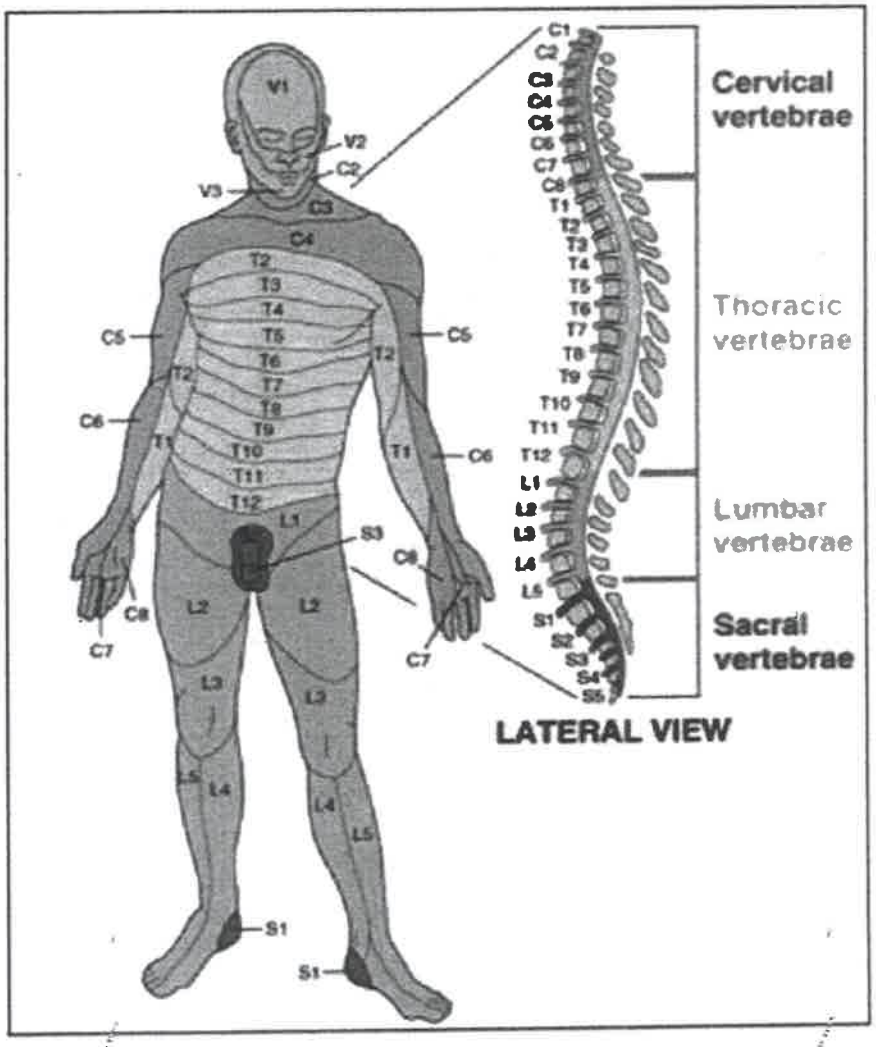
version 3.0 G Nixon

Record 4 hourly: Patients name:_____ Hospital no:_____

Date	Time	Rate of infusion (ml/hr)	Block less than T4 (Y/N)		Bromage Score		Pressure areas checked	Site and dressing dry and intact	Epidural line intact	Initial
			L	R	L	R	Y/N	Y/N	Y/N	

Record on generic vital signs chart:
Minimum observations: every 15 mins for 1st hour, then hourly for 12 hours then 4 hourly
Record: RR, Pulse, BP, oxygen sats, temperature, NEWS, pain, sedation and nausea score, urine output

Dermatomes of the Human Body



Acute Pain Team: bleep /ext 2436 @ Preston
Bleep 4701 ext 5781 CDH
IN AN EMERGENCY OUT OF HOURS CONTACT THE ON CALL ANAESTHETIST BLEEP 3333

Lancashire Teaching Hospitals NHS
NHS Foundation Trust

Patients name: _____ Hospital no: _____

Bromage Score	Criteria	Degree of block	Action
1	Free movement of legs and feet	Nil (0%)	No action, continue observations
2	Just able to flex knees with free movement of feet	Partial (33%)	Reduce rate by 2 ml and continue observations
3	Unable to flex knees, but with free movement of feet	Almost complete (66%)	Stop epidural. Assess leg strength every 30 minutes up to a maximum of 4 hours. If leg strength does not improve in this time seek urgent review by surgical team. If pain score more than 1 during this time the patient may require a PCA. When bromage score is 2 or less restart epidural at 2 ml less than the previous rate.
4	Unable to move legs or feet	Complete (100%)	Stop epidural Carry out actions as above. If after 4 hours leg strength does not improve seek urgent review by surgical team. Patient will need MRI scan. Inform pain team or 2nd on call anaesthetist out of hours. If pain score more than 1, patient may need PCA.

Bromage Score to be recorded 4 hourly whilst epidural in situ and to be recorded at 2 hours post removal of epidural

Test to make sure the sensory block is not above T4

You do not need to determine the actual level of block. You are testing to make sure the patient has normal sensation above T4 (nipple level).This means that the block is less than T4. This must be assessed right and left sides.

Apply a cold stimulus e.g. a steret to the patient's chest, just below the level of the nipple. The patient should be able to feel the coldness of the steret i.e. there is no block at this level.

On partially blocked areas the steret will feel slightly cold.

On blocked areas the patient will only be able to feel the touch of the steret and not the cold sensation. If the patient has numbness above T4 follow the advice below and contact the pain team or the on call anaesthetist.

If patient complains o umb chest above T4 and/or pins and needles down arms:

- Switch off epidural
- Sit patient upright if possible
- Give oxygen at 15litres via non-rebreathe mask
- Check observations (blood pressure, heart rate, resp rate and sedation score)
- Call surgical team, pain team/on call anaesthetist

Removal of Catheter

Prior to removal check:

- Epidural has been stopped and left in situ for 4 hours
- Alternative analgesia has been px, given and is effective
- LMWH has not been given in the last 12 hours and clotting is normal

Following removal:

- Ensure that blue tip is present. Swab site and send tip if signs of infection (if blue tip not present or any signs of infection contact APS/on call Anaethetist immediately).
- Use normal saline to clean site if necessary
- Cover site with a transparent dressing and observe for signs of redness, swelling or pain 4 hourly for 48 hrs
- Advise patients to report any pain at the epidural site, or problems with movement or sensation in their legs following removal of epidural catheter.
- LMWH can be given 4 hours following removal.

Removal of catheter

Print & sign Date ☐ Time ☐

Motor Block Checked 2 Hours Following Removal of EPI Catheter

Print & sign Date ☐ Time ☐

Bromage Score **RIGHT LEG** ☐ **LEFT LEG** ☐

- If Bromage Score >1 contact APS/Anaethetist on call
- Pain Assessment to be continued after discontinuation of epidural

Epidural discharge leaflet given

☐ Yes ☐ No signature: _____

Please put this chart in the patients notes