Trainees' Handbook

Department of Trauma & Orthopaedics

Pilgrim Hospital Boston

Handbook for FY, CT and ST1/ST2 doctors in Trauma and Orthopaedics

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“Read, Mark, Learn & Inwardly Digest…”
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2. ACKNOWLEDGEMENT

When I was working as a SHO to Mr A C Macey FRCS, Consultant Orthopaedic Surgeon, Sligo, Eire I was introduced to a trainee handbook. I contacted Mr. Macey a couple of months ago as I wished to write a handbook for my NHCDs. He kindly sent the original version. I have done the changes to suit our hospital. Much of this comes from the "Filofrax" manual put together by Mr John Barr MD FRCS, for the Royal Victoria Hospital, Belfast.

I think that this handbook will prove a useful guide for any Foundation Year one and two, Core Training, ST 1, 2 and 3 doctors in trauma and orthopaedics in UK and Eire.
3. **AIM**

The aim of this Handbook is to provide a portable aide memoire for doctors and other staff working in the department of trauma and orthopaedics.

**Handbook**

These can grow and change as the owner’s career and interests develop. It is hoped that the pocket book you have now will start as a Unit Handbook, develop into a reference and exam revision sourcebook and provide the framework for your own Unit Handbook in years to come.

Included in the Trauma/Orthopaedic sections you will find instructions on fracture management.

Your comments on the content and structure of this Handbook are welcomed.

**IF in DOUBT about anything, ASK !!**

If in DIFFICULTY re practical problems, especially procedures and operations, ASK !!
If something is proving difficult - a consult, an opinion, an operation - SEEK HELP, sooner rather than later.

**Objective:**
Expect a busy job at all levels.

**Assessment:**
One would be hard pressed to find a Unit where so much experience is so readily available - the hard work needed to cope with it...is not optional...

**Plan:**
What you make of the job is up to you, but as usual, the more you put into it, the more you get out of it.

For those unfamiliar with the gentle art of seeing themselves as others see them, obtain a copy of the Reference Proforma and try a self-assessment score. Six months later, repeat the exercise and compare the two...
4. PHILOSOPHY

The patient should feel better after each contact they have had with you. Look at the patient directly, smile, introduce yourself and your job and shake their hand. These basic courtesies can so easily be lost in the hospital hurly burly. If there has been a long delay - apologise briefly and defuse understandable irritation. It is probably not your fault, but it helps the patient cope with “the system”. Be positive - "always give hope", smile and take a personal interest for the brief time you spend with them.

The AO group motto "Movement is Life, Life is Movement" is worth remembering when encouraging patients to regain confidence and mobility.

Ensure that the results of tests are obtained speedily to allay anxiety and adopt a "DO IT NOW" approach to Certificates etc. These are a vital financial lifeline to many families and they need them stat. Read the synopsis of "The IBM WAY" and substitute "Patient" for "Customer"."Service, service, service and more service" took this company to the top. It will do the same for you.

When giving explanations etc adopt the KISS approach of MacDonalds (hamburgers!) - "Keep It Simple, Stupid"

When dealing with information given to you by others..."TRUST NOBODY"... check it for yourself, be it a diagnosis, job supposed to be done, theatre arrangement etc.

Recall Bunnell's story of the two stone masons laboriously shaping large granite masses into blocks. A man stopped to ask one what he was doing. The reply was a laconic, "I'm chipping away at this rock". When the next man was asked the same question he replied proudly "I'm building a cathedral...."

In summary, there are those people in life who will always tend to be miserable whatever their circumstances. You must decide if you wish to join them. And remember, any fool can be uncomfortable!
5. CONSIDERATIONS FOR NCHDs JOINING THE UNIT

What is On Offer - i.e. What do We Sell......?

A 7 Consultant Orthopaedic Unit.

Deals with both trauma and elective work.
3 clean air, self-contained Orthopaedic Theatres.
Experienced staff - nursing, plaster technicians, paramedical etc.

Specific interest areas –
Lower limb: Hip, knee and foot and ankle surgery
Upper limb: Shoulder, elbow and hand surgery

Radiology Dept. with state of the art CT and MRI scan. A dedicated team of musculoskeletal radiologists.

New Image Intensifier in Theatre, including laser for locking nails and video screening.

Nuclear Medicine Dept.

Well paid, reasonable hours/rota.

Specialist training / Core training / Foundation year doctors experience on offer:

Operative:-
Principles of closed treatment - often poorly understood....
Cast application - 3 point fixation etc
- Sarmiento principle / cast bracing

Basic surgical techniques - also often poorly understood. Read the book by the same name and do not expect to be given much operating to do if you do not understand what a square knot is...

Suturing
Operative approaches - see McCrea's book.

Operative Experience with a view to personal performing basic fracture fixations according to the AO principles. Do not expect to be "hands on" if you are unfamiliar with these and the pre-op planning that is needed.

Internal fixation - all sizes, including mini fragment
External fixation including distal radius
Leg lengthening
microsurgery
Fractured hips fixation - DHS / Hemiarthroplasties
Locking nails.
Soft tissue trauma, grafting etc
Hand trauma
Paediatric trauma
etc,

Wide range of elective work
- **Knee**: Soft tissue reconstruction including anterior cruciate ligament, Patello-femoral joint pathology, Unicompartment knee arthroplasty, TKR
- **Hip**: Total hip replacement, surface replacement, hip arthroscopy
- **Foot and ankle**: Forefoot and hindfoot work
- **Shoulder surgery**: all aspect including arthroscopic work
- **Elbow**
- **Wrist and hand surgery**

Wards experience
Communication
Talking to patients
Fundamentals of patient care.
Environment
Non operative treatment

Clinics
Communication
Look/Feel/Move/X-ray - please read Apley BEFORE you start...
Diagnostic skills - do not initiate treatment without first making a diagnosis e.g. "rheumatism", "lumbago" etc are NOT diagnoses.
Develop clear thought processes for dealing with the symptoms and signs that confront you. The S-O-A-P approach is very useful in this regard.

Treatment must be logical and effective. Non operative and operative option, based on a rational priority.

Relationships with paramedical staff. The Physiotherapists, Occupational Therapists, Radiographers and others are usually experienced and may have seen more of certain cases than you. Ask their advice and seek to develop a good working relationship based on mutual respect for each other's part in what is a team game.

**What do we expect - What do we Buy.......?**

Motivation
Enthusiasm
An Enquiring Mind and 1 research paper/ six months
Dedication
Detail -attention to
Punctuality
Civility
Compatibility
Sense of Humour
Ability to function under stress
Common Sense
Initiative
Communication
Know Limitations and when to ask for help
Skill improvements -
Increasing Knowledge throughout your 6 or 12 months
Tolerance of long hours
Ability to organise personal life and Unit needs such that conflicts do NOT occur.
Co-operation with colleagues and forward planning prevent problems
Postgraduate Teaching - Aims & Facilities

All - Audit
Outcomes

Interview techniques
Exam techniques

Man management
Delegation\Cognitive Skills

Orthopaedic Theory - Basic Biomechanics

Postgraduate Education and Training

Excellent general library with Medline CD-ROM

"Publish or Perish"

"Lecture or Leave"
6. **JOB DESCRIPTIONS**

Consultants - Consult...
Specialist registrar (SpR) - ..... 
FY1 /FY2 / CT doctors................

Do not expect to provide complete patient care within the confines of a strict 40 hour week. Clock watching is all too obvious and if that is your aim, get out of Orthopaedics at an early stage. FYs / CTs / and STs must be a step ahead of expected events and prepared for the unexpected. Mediocrity is not expected and will not be tolerated - average performers have an average chance of getting the next job...about 100 : 1 on current application : vacancy figures....

Responsibilities of FYs and CTs extend almost exclusively to ward work, especially pre and post operative care. Other areas include the Clinics, the Casualty department and assisting in theatre. Do the discharge summaries as soon as possible.

The ST's function is to oversee the above Ward work, provide an Orthopaedic service to Casualty and help run clinics and Theatre lists, particularly out of hours. He is also involved in the Postgraduate Teaching within the Unit and should be responsible for the efficient running and usage of the Library/Study room and the Monday teaching sessions.

**Practicalities**

Consultations, investigations and requests within the hospital
Consultations, investigations and requests outside the hospital
MRI Scans
Nerve Conduction Studies
Bone Scans
Gait analysis
7. **WARD WORK**

Ward activity includes a major round early in the week to confirm the schedule for that week. A major round at the end of the week to discharge patients and confirm the schedule for the week ahead.

1. Pre and Post Operative rounds by individuals and the Team
2. Routine daily rounds by the FYs and CTs.
3. Routine ST and FY /CT rounds as frequently as possible, particularly when the Consultant is off site.

Use the Problem Oriented Medical Record (POMR) format propounded by Laurence Weed. The original "S-O-A-P" has been modified to:

- **Problem**
- **Subjective**
- **Objective**
- **X-Ray**
- **Tests**
- **Assessment**
- **Plan**

Rapid, meaningful notes can be made on the wards and in the clinic using this format.

**The daily round, the common task...**

**Organising your day**
Start with the patient(s) that are most ill, wherever they are.

Complete a "Problem round" first thing in the morning, any time after the nurses Report concludes at 08:30. Check Fluids, bedside charts, blood tests etc.

Monitor the drug cardex and stop medication as soon as possible.

Medication on admission should be carefully charted using proper names. Include a stop date if possible. Chart prophylactic antibiotics start and stop on admission.

Handover at the end of the day, night, weekend, holiday period etc is vital and must be done in person.

This requires daily am and pm rounds with the nursing staff to ensure satisfactory progress of your patients. Out of hours, the On-call team must provide this level of care to the whole Unit. Handover/Takeover discussions must take place on ill patients etc.

Drugs and treatment regimes must be reviewed daily.
You are responsible for your own sharps.
8. ADMISSIONS

85% of all patients admitted undergo surgery. Pre, per and post Operative care will therefore form the bulk of your workload. It is essential to the smooth running of the Unit that the Wards and Theatre coordinate activity. This is a prime responsibility of the NCHD team. All patients must be clerked by a FY/CT (or ST) promptly and examined from head to toe.

On Admission, please ensure that previous notes and X-Rays are obtained.

Patients should NOT come up to the ward until their chart and X-Rays are complete.

History - to include the specific orthopaedic problem and relevant items about general condition. Take a DETAILED history, particularly noting the exact circumstances of accidents. Read Perkins article on this.

Use the standard approach:-

- Problem
- Presenting Complaint
- History of Presenting Complaint
- Past History
- Family History
- Social History
- Allergies
- Medication - specifically the pill/HRT
- Systems Review
- Examination
- X-Ray findings
- Investigations (results in RED opposite test ordered)
- Planned procedure
- Consent

Pay particular attention to problems that present an operative or anaesthetic risk e.g. skin/teeth, murmurs etc. STs must write a pre-op note in the chart of each patient pre-op summarising the problem, procedure, side, investigation list of all patients results etc and confirming that the consent is correct and understood.

Pathways are being developed. Use those existing for hip fractures.
9. TRAUMA MANAGEMENT

- The consultant is on call on a weekly basis. For smooth running of the trauma, there is a trauma co-ordinator.

- If the trauma co-ordinator is off, the registrar will have do all the work.

- **Trauma meeting:** Check with team about the timing of the trauma meeting (8.00/8.30 am). Everybody concerned will attend the meeting.

- It is the responsibility of the on call FY (night before) to produce the admission list and a master list of all patients under care of the consultant. The ST (middle grade) on call will supervise this work. 6 copies should be available.

- All the patients who are waiting to be operated should be kept fasted from midnight.

- The ST on call/ co-ordinator after consultation with the consultant (night before) should be ready with a tentative trauma list. After the meeting, a final order of the list will be decided. The co-ordinator will give the list to the secretary for typing and distributing. The co-ordinator also makes sure that all patients who are going to be operated are appropriately fasted, investigated, consented and are ready for the operation. If the co-ordinator is away, it is the responsibility of the registrar to make sure that all the patients are ready and list is done and well distributed. Any specific radiology or implant requirement should be put in the trauma list. Any specific requirement should be discussed with the trauma theatre in-charge nurse as well. A member of trauma theatre staff also attends the meeting.

- **Trauma admission:** The FY/ CT needs to discuss all the trauma admission with the ST, who should see the patient, make a plan and appropriately prepare him/her for theatre. The patient should be investigated and consented and be ready for the operation ASAP.

- **Fracture neck of femur:**

  Please read the national guideline and NHFD (National Hip Fracture Database). These patients have usually significant co-morbidities. Involve the anaesthetist and care of the elderly team if there is a need sooner rather than later. These patients need to be operated in the next available trauma list even if they are morbid. Make sure that they are well hydrated and try to optimise them for the next available theatre list.
10. **PRE-OPERATIVE ASSESSMENT**

We have a well established pre-assessment team for elective cases. Please liaise with them and learn the system. All elective patients are screened for MRSA.

11. **PERI-OPERATIVE CARE**

**PRE-OPERATIVE CARE**

Investigations to be selective. (Discuss and get a protocol with the pre-assessment and anaesthetic team). Blood tests are NOT indicated on healthy children.

Please give adequate clinical information on all request forms.

- **Haematology:** Hb%, FBC (ESR and CRP if indicated)
- **Biochemistry:** Cal. Phos. Alk Phos (acid phos if >50 yrs)
- **Blood transfusion:** Group and save serum (or cross-match if certain of need).
  - Check number of units needed
  - THR / TKR (usually group and save)
  - Revision = 4 units
- **Bacteriology:** Put T/W/A/ - Temp/Wound/Antibiotic on micro form as appropriate
- **X-Rays:** As indicated (CXR only if >45 years). Limbs in functional position - i.e. usually weight bearing. Think of pre-op planning? obliques, tomos, CTs etc needed
- **E.C.G.:** Only if over 40, unless cardiac problems

Skin marking of part for surgery to be performed by admission doctor, using indelible marker. Biro will NOT do. Check with ST and comply with MDU/MPS guidelines.

**Antibiotic Prophylaxis**

**Thrombo-embolic prophylaxis**

See complications section

Elective and planned Operation Lists to be printed by 12 noon on the previous day (by the secretaries). Title list TRAUMA or ELECTIVE and AM or PM. Advise theatre soonest of any special requirements e.g. equipment etc. Distribute before lunch.

Theatre Sister to be notified to any change in the list - preferably as soon as decision is
made.

Emergency operations to be written up on the list outside Theatre soonest and all relevant departments informed - X-Ray etc.

Access when locked

Per op care
Patient Positioning
Safety
Side
Tourniquet

PER OPERATIVE CARE - THEATRE

All the team should come to theatre as much as possible, both to work, learn and observe. If other teams are undertaking interesting cases, look on, whenever possible.

Assistants must be in theatre well before the scheduled anaesthetic start time to ensure a prompt operative start.

Ensure...X-rays displayed on PACS system, lights adjusted, positioning checked, side confirmed, antibiotics PRE tourniquet prn, camera prn , special equipment out and working etc BEFORE scrubbing.

Theatre scrubbing procedure to be observed (as detailed). Start as soon as the anaesthetist starts to ensure that skin painting begins promptly

Short operation note handwritten (Red Biro) in the case notes continuation sheet IMMEDIATELY after the operation, by the first assistant for immediate post op. guidance of ward staff. Detailed operation note is dictated for typing by operator (Dictaphone), to be typed by the secretary. In addition, dictate a BRIEF letter to the GP advising of the admission, operation and likely discharge date.

Clean air theate: Familiarise yourself with the routine for this BEFORE you assist for the first time.

POST OPERATIVE CARE

X-Rays : It is usually recorded in the pos op note.

Blood tests : prn, FBCs of little value in first 48 hrs

Daily head to toe examination of patients, observing for post op problems or the "Dangers of going to Bed".
12 GENERAL WARD CARE

Daily observation of patients should include some order such as the following:-

Brain : confusion, ? dehydration - try fluid.

Chest signs : injury ? fat embolism - check gases
: immobilisation - ? pulmonary embolism or
: hypostatic pneumonia.

Abdomen : ? constipation because of immobilisation - try fluids.

Bladder : retention\incontinence or UTI - avoid catheter if possible

Sacrum : skin sore - turn frequently

Thigh & Calf : muscle wasting - advise muscle exercises.

Calf & Skin : DVT

Heel : skin sore - sponge ring.

Neurological check lower limbs - brief check of motor power and sensation of feet.

Upper Limbs - after elbow fracture or forearm surgery, remember Compartment Syndrome

TPR

IN / OUT

DVT Prophylaxis

All joint replacement arthroplasty patients are given a prophylactic agent. If the patient starts oozing blood post-op, stop all the prophylactic agent. Continue with TED stocking, and calf exercises etc. Calf pump should be continued. Please stop Aspirin, Warfarin etc if possible. Discuss the case with the ST. Re start the medication only after consultation with the ST.

Read the NICE guideline
13. INFECTION CONTROL\ PATIENT ISOLATION

Common sense is useful...

All staff should be immunised against Hepatitis.
Consider HIV risk on ALL patients, not just the so-called "high risk" groups. AIDS is increasingly common in the heterosexual population. ~80% of drug addicts are HIV positive...

(a) Patients with overt infections (discharging urine, wound), are isolated.

(b) Patients medical equipment (blood pressure cuffs, stethoscopes etc. should be left in the isolation room at all times).

(c) On entry to isolation room wear plastic disposable apron and gloves provided.

(d) When leaving room remove apron and gloves and leave these in the isolation room disposal bag. Finally wash\dry hands.

5. Once outside, wash and dry hands again using disposable towels.

6. Visitors are of course to observe the same precautions.

DO NOT SIT ON THE BEDS
14. **ELDERLY PATIENTS WITH SIGNIFICANT CO-MORBIDITIES**

**Care of the elderly team input:** A care of the elderly consultant come and does ward round every week. If any patient needs an input from the care of the elderly team, please put the name in the register kept in the ward. If the team is not available contact the specialist registrar on call. Get a medical input.

**Rehabilitation and discharge plan:** As soon as these patients are admitted a discharge plan should be thought of whether they will be able to go back to their pre-injury accommodation or need to go for rehabilitation to a local cottage hospital. The SHO need to make sure that the patient is discussed for discharge plan in the multidisciplinary team as soon as the patient is medically well.

**Communication:** If the patient is not doing well inspite of all the medical input, please inform the next of kin and keep him/her in the loop.
15. THEATRE SURGICAL SCRUB PROCEDURES

Chlorhexadine soap is used for the initial washing of hands (and never used with Betadine as one counteracts the effect of the other when used simultaneously).

Betadine solution should be used, except in cases of allergy when hibiscrub or phisohex are acceptable.

SCRUB PROCEDURE DETAIL:
See in Theatre
16. POST OPERATIVE CARE - SPECIFIC ROUTINES

1. TOTAL HIP REPLACEMENT:
   1. Check the patient on a daily basis from tip to toe.
   2. Hb% 48 hours
   3. Check x-ray
   4. Mobilise as per protocol (usually full weight bearing)
   5. Wound check – if there is an ooze, stop DVT prophylactic agents
   6. DVT prophylaxis – Teds, Calf pump, chemical agent, mobilisation, calf exercises
   7. Conscious level, chest, urine output etc
   8. Prophylactic antibiotics – follow protocol
   9. Post-operative booklet to be given to the patient.
   10. Discharge when safe in walking and wound is dry.
   11. Removal of sutures – District nurse 2 weeks
   12. Follow-up 6 weeks and 6 months

   After discharge, any problem the patient is advised to ring either ward or the Arthroplasty nurse.

2. HEMIARTHROPLASTY (HASTING'S):

   Procedure as with THR.

3. TOTAL KNEE REPLACEMENT:
   1. Check the patient on a daily basis from tip to toe.
   2. Hb% 48 hours
   3. Check x-ray
   4. Mobilise as per protocol (usually full weight bearing)
   5. Wound check – if there is an ooze, stop DVT prophylactic agents
   6. DVT prophylaxis – Teds, Calf pump, chemical agent, mobilisation, calf exercises
   7. Conscious level, chest, urine output etc
   8. Prophylactic antibiotics – follow protocol
   9. Post-operative booklet to be given to the patient.
   10. Discharge when safe in walking and wound is dry.
   11. Removal of sutures – District nurse 2 weeks
   12. Follow-up 6 weeks and 6 months

   After discharge, any problem the patient is advised to ring either ward or the Arthroplasty nurse.

4. UNI-COMPARTMENT KNEE ARTHROPLASTY

   Same as total knee replacement
   Usually these patients recover early and discharged in a day or two.
5. ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

1. In the recovery
   a. Hinge knee brace (0° -90°)
   b. Cryo-cuff
2. Observe for compartment syndrome
3. Antibiotics (2 more doses)
4. ACL rehabilitation booklet to be give to the patient
5. Exercise programme, calf and knee exercises, breathing exercises
6. Thromboembolism prophylaxis
7. Mobilise full weight bearing from day one
8. Out patient physiotherapy to be arranged before discharge
9. Check x-ray and Hb%
10. Home next day when safe
11. Review
   a. specialist nurse clinic 2 weeks
   b. Consultant clinic six weeks

5. MENISCECTOMY / ARTHROSCOPY

Usually a day case
Mobilise and home when safe
Quads exercises (sheet given)
Reduce dressing 3 days (by the patient him/her self. Any problem the patient is advised to visit the practice nurse
Wound check by practice nurse 2 weeks
OPD review 6 to 8 weeks.

6. MENISCAL REPAIR, CARTILAGE LESION, REPAIR, MICROFRACTURE

Please look at the op note.
Non-weight bearing for 6 to 8 weeks
Exercise programme
Physiotherapy
Hinge knee brace

7. HIGH TIBIAL OSTEOTOMY: Full W.B. 6 weeks cast.

8. SHOULDER INJURIES: Triangular sling + ROM exercises.
9. ELBOW INJURIES: Collar\Cuff + ROM exercises.
10. Forearm cast loop at\proximal to fracture site (Collar + Cuff).
11. WRIST 'Colles' cast in palmar flexion\pronation\ulnar dev.'.
12. FINGER INJURIES: Align and go for function.
14. FEMORAL FRACTURE: Skin traction (Discuss with SpR).
15. TIBIAL FRACTURE: Open- see below
       Closed – POP slab
17. **COMPLICATIONS IN ORTHOPAEDIC PRACTICE**

Prevention / Prophylaxis

Infective Complications

Implants  Flucloxacillin and Gentamycin (please see the trust protocol).

For Joint Replacement patients, ensure:-

Urine culture and any swab results are checked including MRSA swabs

Open Fractures  Augmentin with or without Gentamycin (See BOA guideline)

Catheterisation - if indicated, give Gentmicin bolus 80mg IV, single dose, 15 mins previously

Teeth - See also JBJS

**Thrombo embolic Complications**

Ensure that the correct protocols for prophylaxis against DVT/PE are followed. Start as soon as the patient is admitted (and activity drops) as per protocol.

Enoxaparin or Rivaroxaban as per protocol
TED stockings
( Anti embolic stockings are dangerous if they do not fit properly)

Deep vein thrombosis and Pulmonary Embolism

Follow protocol
Discuss with the haematologist.

Complications - General

Look and examine each patient specifically from head to toe for:-

Confusion  anoxia / PE / Fat embolus / MI / septicaemia

Anaemia  (bleeding) / shock / metabolic problem

Chest problems  atelectasis / cardiac failure

Abdominal distension / renal and urinary tract function
DVT / distal and proximal

Mechanical problems - dislocation / fixation failure etc

Infection - wound / urinary / chest / skin

Recumbency - pressure areas / heels / sacrum / elbows

Per op complications must be discussed with the patient and/or relatives by the Consultant involved.

Post Trauma Complications

Complications which occur in a patient who has suffered a fracture or dislocation may be grouped in the following way:-

Acute / Chronic

(1) The complications of any tissue damage: These include
(a) internal and external haemorrhage, oligaemic shock etc.
(b) infection (in open injuries)
(c) electrolyte shifts, protein breakdown and other metabolic responses of trauma. N.B. Fat embolus / ARDS.

(2) The complications of prolonged recumbency: These include
(a) hypostatic pneumonia
(b) pressure sores
(c) deep venous thrombosis
(d) muscle wasting
(e) skeletal decalcification and formation of urinary tract calculi
(f) urinary tract infections, etc.

(3) The complications of anaesthesia and surgery: These include
(a) atelectasis and pneumonia
(b) blood loss leading to anaemia or shock with their secondary effects
(c) wound infection, mechanical failure of internal fixation devices, etc.

(4) The complications peculiar to fractures: These include
(e) disorders involving the rate and quality of union
(b) joint stiffness
(c) Sudeck's atrophy
(d) avascular necrosis
(e) myositis ossificans
(f) infections
(g) neurological, vascular and visceral complications.
Compartment syndromes

Intercurrent pathology - cholecystitis

**PATIENTS SHOULD BE ADVISED OF THE ABOVE AT LEAST THEY BE UNREASONABLY DISAPPOINTED BY THE END RESULT**

Expectations regarding OUTCOME are often unduly high...
18. DOCUMENTATION AND NOTE KEEPING

Your performance (and the worth of this Unit) will be largely judged on this crucial aspect of your work. Please read the RCSE notes on Clinical Records and the MPS/MDU guidelines. Detailed, accurate, legible notes are essential for both patient care and fire-proofing against legal actions. A thorough approach is needed on the wards, in theatre, in Casualty and in the Clinics.

NEVER abbreviate the side! Write LEFT or RIGHT out in full and DO NOT circle them. A Dutch surgeon was recently imprisoned for amputating the wrong leg - READ the MDU/MPS instructions on this vital topic and on the terminology for digits.

Discharge Summaries must be done on the day of discharge, by hand USING THE BLUE PROFORMA LETTER. This is a 3 part form:-

1. copy for the patient to take away
2. copy for the notes
3. copy for audit file

Write legibly and ensure that you press hard enough to register on all three copies. Detail must be adequate and all sections MUST be completed. There is no point in our designing and printing this simple, labour saving form if you do not complete it fully.

In some circumstances ancillary services, particularly Therapists, Social Workers and District Nurses may need to be notified about a discharge.

Inter-departmental referrals - use the Consultation request forms provided

Inter-hospital transfers - Consultant to Consultant only.

Deaths to be notified to GP and Consultants "stat".

CPR rehearsal at the start of each 6 months. Existing Registrar to arrange.
19. **DISCHARGE SUMMARY**

Fys, please do the discharge summary at the earliest possible opportunity. The hospital gets payment on this basis. Please do not leave the work for next day.

20. **CLINIC MANAGEMENT**

ST:
Please present yourself at the clinic 15 minutes before the clinic start time. X-ray cards to be signed in advance, prior to the clinic, please.

Aims of clinic

Review policy - visits / letters / DNAs

"Next Visit" instructions for action on arrival next time

Numbers

Letters

Tests / investigations

Action list - Register / Diary

Waiting lists

Interesting X-Ray file
21. PRACTICAL PRESCRIBING

Assess each patient's medication on admission. Occasionally regimes can be changed or reduced.

Assess the necessity of anything prescribed. Cost both in purchase price, nursing time and possible side effects should be uppermost in your mind.

N.B. Drugs acting on specific symptoms: Please always think of seeking the advice of specialists in such departments, e.g. Neurological, Gastroenterological situations. Consider telephoning adjacent departments and asking their advice on current therapy.

DRUG INTERACTIONS:

(a) Antibiotics: Aminoglycoside (Gentamicin) interacts with Cephalosporins and Frusemide leading to Nephrotoxicity and Ototoxicity.

(b) Anticoagulants: Warfarin interacts with non-steroidal and anti-inflammatory drugs, B.T.Z.\Naprosyn with resulting haemorrhage, Warfarin also interacts with barbiturates leading to loss of anti-coagulant effect.

(c) Allergic reactions: In emergencies such as angioneurotic oedema or acute anaphylaxis - use (with care) adrenalin or intravenous cortico steroids, otherwise use anti-histamines.

ANALGESICS:

Pain Management Policy.... Please read the RCSEng report on this topic. Pain associated with Trauma or Post Op. is greatly feared by most patients. There is considerable room for improvement in this area.

Trauma cases MUST be given adequate analgesia, preferably I.V., on arrival in Casualty, BEFORE temporary splintage is applied. Only after both these steps have been effected and effective should they be sent for X-Rays.

Excessive pain after splintage is a danger sign. Re-examine the patient, particularly for a compartment syndrome.

Tight plasters and bandages (particularly crepe) must be split "down to, but not including the skin..."
TREATMENT
(a) Peripheral Analgesics - use simple well tried Aspirin, Paracetamol, Brufen.

(b) Centrally acting - use Morphia or preferably Cyclomorph.

(c) Dihydrocodeine (DF 118) is very suitable and non-addictive. (Pethedine is a weaker drug than Morphia, has a greater risk of drug dependence).

Consider sub-lingual routes, local anaesthetic, TENS etc. No patient should wake up from operation in pain, or be left in pain e.g. post fracture. Ensure adequate pain relief BEFORE splinting limbs and obtaining X-Rays. (see the RCSEng publication "Postoperative Pain", in the Orthopaedic Library).

ANTIBIOTICS:

Do not start antibiotics without either sensitivities or specimens sent for same. Commit your best guess as to the organism to the chart and check the result. Justify parenteral administration and avoid prolonged courses.

If in doubt, ask Consultant Microbiologist.

(a) Penicillins are bactericidal and useful against Grampositive cocci - Cloxacillin good by injecting, Flucloxacillin good by mouth, both active against resistant staphylococci.

Ampicillin and Amoxycillin are useful in respiratory infection, but are not active against the resistant staphlococci.

(b) Cephalosporins - bactericidal against gram positive and gram negative organisms. Use Cephradine (basic Cephaloradine can cause kidney damage especially when used in combination with Frusemide).

(c) Aminoglycosides - Gentamicin is particularly active against gram negative organisms, but needs to be monitored, so don't use without instructions.

(d) Fucidic Acid (Fucidin) - active against Penicillin resistant, staphylococci well concentrated in bone.

1. Every effort must be made to limit the incidence of OSTEOMYELITIS.

2. Naturally Bacteriological sensitivity tests are vital.

3. Staphylococcus aureus - usually Penicillin resistant is the commonest cause of Osteomyelitis
4. Dual antibiotic therapy is wise to limit the risk of development of resistant organisms. 
   Orally - Use Flucloxacillin and Erythromycin or, Cephradine and Fucidin.

22. AUDIT AND RESEARCH

You need to be involved in at least one audit / research project during your job of 4 to 6 months. There are plenty of clinical materials to work on. Discuss with your consultant during your first week of work.
23. **TRAUMA - Need to Know injuries**

**Adult**
- Hip #s
- Wrist #s
- Humeral #s
- Supracondylar #s
- Femoral #s
- Tibial #s
- Sprains
- Subluxations
- Dislocations

**Paediatric**
- Supracondylar fracture
- Greenstick fracture
- Non-accidental injury

24. **ELECTIVE ORTHOPAEDICS - Need to Know Diagnoses**

**Adult**
- Osteoporosis
- Osteoarthritis
- Rheumatoid Arthritis
- Ankylosing Spondylitis
- Backache - Orth info

**Paediatric**
- Limping child
- Septic arthritis
25. TELEPHONE, BLEEP, FAX NOS, EMAIL ADDRESSES AND WEBSITES YOU NEED TO KNOW

Ward

OT

OPD

Human resources

Secretary

Accident and Emergency

Radiology including CT, Isotope scan and MRI scan

Laboratory

Microbiology
25. FILOFRAX

This section is based on Mr John Barr’s FILOFRAX, RVH, Belfast. Circa 1990, with thanks and acknowledgement.

DICTATION OF FRACTURE NOTES:

All notes in the fracture clinic are dictated and typed into the patient’s chart. Please speak clearly into the dictaphone and ensure that the note has been recorded. When dictating remember to give your name, the patient’s name, hospital number and date. Please remember that many fracture cases eventually become the basis for legal arguments and your note will often be the only record of events. Therefore a clear concise note is invaluable. The following basic framework is a useful guide to note making.

1) The CIRCUMSTANCES of injury
2) The MECHANISM of injury
3) POSITIVE CLINICAL FINDINGS (and relevant negative findings)
4) X-Ray appearances
5) TREATMENT prescribed
6) FOLLOW-UP arrangements

ANAESTHESIA/SEDATION FOR REDUCTIONS:

Prior to fracture reduction it is the duty of the doctor to ensure that the consent form has been correctly completed by either the patient or his relatives.

This is frequently a matter of personal preference. A full GA gives complete anaesthesia and good relaxation for difficult reductions. There is generally an anaesthetist on call for emergencies at all times (consult the monthly anaesthetic rota). At all other times, contact the first on call anaesthetic SHO. If a rota is not available contact switchboard.

It is often much quicker to use a combination of an opiate analgesic and Benzodiazepine to sedate the patient. If the later combination is used it is imperative that:
- The drugs are given slowly and titrated to achieve the desired effect.
  (remember that very small doses are required in the elderly)
- The patient should have ECG monitoring throughout.
- Full resuscitation facilities must be immediately available.
- The patient is kept under observation until fully recovered.
- The patient is accompanied home.

Local block eg. ring blocks are a useful method of pain relief and may provide adequate analgesia to carry out simple reductions.

ANALGESIA:

All too often we underestimate the pain that a patient suffers from a fracture or
dislocation. Use your discretion to provide adequate analgesia at all times. (try and imagine how you would react with a similar injury!)

Remember to give general advice ie. elevation of painful wrists and ankles as simple measures are often effective in providing pain relief.

PLASTERS:

Basically of two types - Gypsona (POP) and Resin (deltalite, scotchcast plus etc.)

These are expertly applied by the plaster technicians/ nursing staff. Patients are given a short instruction card re the do's and don'ts of plaster care.

All patients with a plaster on a fresh fracture are reviewed the next day to rule out any problems eg.

- if too tight the plaster may be split, then completed or replaced at a later date.
- if rubbing at an edge the plaster can be eased back or further padding inserted.
- if the patient complains of pain underneath the plaster, the plaster can be 'windowed' in the appropriate area or removed completely.

NEVER IGNORE PERSISTENT PAIN UNDERNEATH A PLASTER
Think of compartment syndrome

OUTLYERS:

Often there will be patients in wards other than the designated fracture wards. A list of all such patients is kept on the wall in the staff office as a constant reminder. A note should be written in the patient's chart and the Sister or Nurse in charge informed of the patients progress and any intended changes in treatment or of imminent discharge.

Certain outlying patients (eg. those in ICU) will need to be seen more frequently - this is done at the discretion of the registrar or consultant in charge of the particular case.
ALL TRAUMA CASES

Follow ATLS protocol (Do the ATLS course as soon as possible, if you have not done one)

THE UPPER LIMB

FRACTURED CLAVICLE

Reduction is usually unnecessary unless marked deformity (consider ORIF). Triangular sling for approximately three weeks is usually sufficient. Finger, wrist and elbow mobilisation should be encouraged early. Gentle mobilisation of the shoulder is encouraged early.

Some highly comminuted and segmental fracture might need open reduction and internal fixation (get a senior opinion).

ACROMIOCLAVICULAR SUBLUXATION/DISLOCATION

Diagnosis is usually clinically obvious. If in doubt get an X-ray with the arm dependant. Triangular sling for three weeks, then commence mobilisation. Internal fixation is rarely considered (although if patient is very concerned re deformity, get a senior opinion).

FRACTURED SCAPULA

Often a result of direct trauma therefore exclude damage to underlying structures eg. fractured ribs or pneumothorax. Triangular sling until pain settles. Might need CT scan.

ANTERIOR DISLOCATION OF SHOULDER

A pre reduction X-ray is mandatory to exclude an associated fracture. The patient should have a full clinical neurovascular assessment of the upper limb before and after reduction. Dislocation may be associated with fracture of the greater tuberosity or surgical neck of the humerus. Neither is a contraindication to attempts at closed reduction although the Registrar on call should be informed before going ahead.

Reduce as soon as possible under general anaesthesia or sedation as this is the only method of truly relieving the discomfort (Take help from anaesthetist). Kocher or Hippocratic methods of reduction rarely fail! Beware the Kocher method of reduction in patients with osteoporotic bone as a simple dislocation may be converted to a fracture dislocation with excessive force.
In a young patient the immobilisation is as follows; Triangular sling under clothing 1 week then a sling outside clothing 3 weeks. A collar and cuff may then be worn for a further 2 weeks the main aim being to prevent external rotation thereby allowing the capsule to heal.

In the elderly immobilisation for 2-3 weeks in a polysling, then early gentle mobilisation, again warn re external rotation.

A patient with 2 or more dislocations of the ipsilateral shoulder should be referred to a consultant clinic re further management.

In recurrent dislocations prolonged immobilisation is probably ineffective, therefore a collar and cuff or triangular sling is required only until the discomfort settles. These cases need to be referred to shoulder clinic.

POSTERIOR DISLOCATION OF THE SHOULDER

This is relatively rare and the diagnosis is often made clinically in association with a high index of suspicion. The arm is held in medial rotation and there is a fullness on the posterior aspect of the shoulder joint. Clinically the arm will not externally rotate beyond the neutral position. May be missed on AP X-Ray (look for light-bulb sign) therefore a lateral or preferably an axillary view is essential. Reduction is effected by longitudinal traction, external rotation and abduction. Triangular sling for three weeks, alternatively a polysling may be more comfortable. There is a possibility of reverse Bankart’s lesion.

FRACTURED NECK OF HUMERUS

Usually in the elderly. Check for axillary nerve function. Collar and cuff three weeks, again a poly sling may be more comfortable during the first few days - weeks. Check X-Rays often show subluxation of the humeral head. This is due to capsular haematoma. If there is concern about possible dislocation an axial view will confirm alignment.

Commence mobilisation after three weeks. Review at 4 weeks - if very stiff may require physiotherapy. If there is an associated dislocation, it may require an open reduction. The registrar should therefore be informed.
FRACTURED SHAFT OF HUMERUS

Check radial nerve function
A Bohler U protective cast may be applied if the fracture is undisplaced. Alternatively, with a displaced fracture, a hanging cast should be applied.
After a few weeks this may be replaced with a humeral brace.
X-ray weekly to ensure that alignment is maintained and that fracture is uniting. If any problems discuss with the registrar as these fractures may require internal fixation.
Commence mobilisation at 3 - 4 weeks depending on the clinical and radiological degree of healing.

SUPRACONDYLAR FRACTURE OF HUMERUS

Children: Inform the registrar on call
Check radial pulse and median nerve function.
If minimal displacement with little swelling treat in collar and cuff or above elbow POP slab. If displaced it is essential that all are discussed with the registrar on call as early reduction and percutaneous wiring may be indicated.
If treated as an outpatient the child should be reviewed regularly to ensure that a varus deformity is not developing.

Adults: Usually require admission and possible internal fixation, therefore inform the Registrar. A triangular sling or collar and cuff +/- a backslab is adequate first aid.

DISLOCATED ELBOW

Pre-reduction X-rays and neurovascular assessment are mandatory (exclude fracture).
The dislocation is usually posterolateral and results from a fall on the palm of the hand while the elbow is partially flexed.
Reduce under GA or sedation. Failure to reduce often implies an associated fracture with a loose body in the joint.
It is often valuable to screen under image intensification to confirm a stable reduction.
Collar and cuff three weeks with the elbow flexed. A backslab may be applied for the first 1-2 weeks for the patient's comfort.
May commence gentle mobilisation at about 2 weeks.

FRACTURED RADIAL HEAD

Due to a fall on the outstretched hand.
Wide spectrum of injury exists.
If no displacement treat in a collar and cuff for three weeks.
If comminuted and displaced patient should be admitted and the registrar informed as the patient may require open reduction and fixation or excision of the radial head. The other option is radial head replacement.
Warn patients of the severity of this injury as it often has a prolonged convalescence.

FRACTURED OLECRANON

Undisplaced fracture will need above elbow back slab.
The majority of displaced fractures require internal fixation with tension band wiring.
Some cases might need open reduction and internal fixation with plates.

FRACTURED RADIUS AND ULNA

All X-rays of radius and ulna should include the elbow and wrist joint.
The vast majority will require open reduction and internal fixation (in adults).
Correct any marked deformity under sedation and apply long arm backslab or split long arm POP.
Observe neurovascular status. Admit and inform the Registrar on call.
Keep forearm elevated in a pillow case.

Single forearm fractures: Exclude a Monteggia or Galeazzi fracture by X-raying the elbow and wrist joint. Again internal fixation is usually required.
In a single undisplaced fracture of the radius or ulna it may be possible to treat in a Long (or sometimes a short) arm POP. These patients should be reviewed weekly for the first four weeks with X-Rays to confirm that reduction is maintained.

FRACTURED DISTAL RADIUS

If undisplaced short arm POP
Review day 1 for POP check
Review day 10 for check X Ray
Remove POP at 5 weeks and commence mobilisation.
Review at 7 weeks: if good ROM - discharge
If poor ROM - refer to physiotherapy

In young patients with very comminuted fractures of the distal radius discuss with a senior colleague the most appropriate treatment ie. POP, percutaneous wires or external fixation.

COLLES FRACTURE:

All but the minimally displaced require reduction. The technique of reduction will be taught in the department. Hold in moulded SAPOP with wrist flexed and ulnar deviation. If there has been gross displacement and there is associated swelling the POP should be split.
Check X-Ray after reduction or if there is any doubt that a satisfactory reduction has been obtained - before the patient recovers from the anaesthetic.
Review day 1 for POP check : if swollen with paraesthesia split the POP and review day 5 for completion of POP.
Encourage movement of joints not immobilised by POP ie. fingers, elbow and shoulder. Review day 10 for check X-Ray: if position unsatisfactory - re-reduce (check with registrar if uncertain). Review at 5 weeks for removal of POP and explain wrist mobilisation exercises ie. flexion / extension; pronation / supination. Review at 7 weeks and proceed as above.

Be alert for late complications e.g.
- Carpal tunnel compression
- Sudeck's osteodystrophy
- Rupture of Extensor Pollicis Longus
- Subluxation of inferior radio-ulnar joint.

SMITH'S FRACTURE

Reduce under general anaesthetic and immobilise in LAPOP with the forearm supinated and in radial deviation. Review Day 1 for POP Day 10 for check X-Ray. Review 4 weeks to cut down POP to short arm and at 6 weeks for removal of cast and instruction re mobilisation then 8 weeks for discharge or referral to physio.

FRACTURED SCAPHOID

The classical sign is tenderness in the anatomical snuffbox. If X-Ray confirms a fractured waist of scaphoid (undisplaced) treat for 8 weeks in a short arm POP. If displaced admit and inform the Registrar as open reduction may be required eg. may be a trans-scaphoid perilunate dislocation. Fractured tubercle of scaphoid only requires 3-4 weeks in POP. Clinically but not radiologically fractured scaphoid: immobilise in short arm POP. Review at 3 weeks and repeat X-Rays with MACRO views. If still tender but X-Ray negative order a MRI scan. After removal from POP at 8 weeks check for clinical and radiological union. If clinically healed commence mobilisation and review in two weeks with a view to discharge. If there is no evidence of union at this stage replace POP for a further 4 weeks then re-X-Ray. If there is still no union, arrange a CT scan and refer to hand team for further assessment.

DISLOCATION OF THE CARPALS

Usually a perilunate dislocation, but may be a dislocation of the lunate or a trans-scaphoid perilunate dislocation. The Registrar on call should be informed and arrangements made for closed /? open reduction in the main theatre as soon as possible.
FRACTURED METACARPALS

Second - fourth metacarpals are well splinted by adjacent bones and soft tissues. Reduction is rarely required and a metacarpal plaster for three weeks will be sufficient. Remember to advise the patient that there will be some knuckle recession and possibly some thickening on the dorsum of the hand.

Base of first metacarpal: if not extending into the joint then a scaphoid type POP with the thumb extended.
Check X-Ray at day 10
Remove POP at 4 weeks

Neck of fifth metacarpal: ("Boxer's fracture")
Reduction is usually unnecessary unless angulation is greater than 30 degrees.
Check for malrotation.
A simple crepe bandage or dorsal strapping for three weeks is usually sufficient. If no malrotation and good ROM at 3 weeks discharge.

Multiple metacarpal fractures may require internal fixation - discuss with the registrar. There will also be considerable soft tissue damage - the patient should be admitted and the hand elevated in an inverted pillowcase.

BENNETT'S FRACTURE

Base of first metacarpal extending into the joint:
Reduce under GA / sedation and mould well over the base of the thumb. Check X-Ray to confirm reduction.
If unsatisfactory may require internal fixation.

If satisfactory check X-Ray at 10 days
Remove POP at 4 weeks and commence mobilisation.
Review at 6 weeks for discharge.

PHALANGEAL FRACTURES AND DISLOCATIONS

Be very careful with these injuries as poor initial management leads to poor eventual results.
Generally they require accurate reduction and correction of any malrotation.
They should be splinted on the dorsal surface with a 'zimmer' splint with the MCP joints flexed and IP joints extended. Occasionally neighbour strapping (or 'buddy' splintage) will be adequate.

Discuss intra articular phalangeal fractures and any others which you may be uncertain of with the Registrar.
Intra-articular or unstable fractures may require internal fixation.
A check X-Ray should always be taken to confirm reduction.
Review weekly and remove splintage at 3 weeks.
Review again at 5 weeks to confirm good ROM - if poor refer to physio or OT.

MALLET DEFORMITIES

Due to a rupture of the extensor tendon from its insertion to the distal phalanx, if there is a small fragment of bone avulsed with the tendon there is a good prognosis for healing.
Treat in mallet splint for 6 weeks if there is a bony injury and eight weeks if there is a soft tissue injury.
Teach the patient to change of strapping weekly although under no circumstances must the DIP joint be flexed.
THE LOWER LIMB

FRACTURED PELVIS

A wide ranging severity of injury exists.

Minor / stable e.g. isolated fracture of the pubic ramus. Usually in the elderly patient. Admit for bed rest and simple analgesia (admitted under care of the elderly if this is the isolated injury). Exclude an associated fractured neck of femur.

Major / unstable. There may be associated pelvic soft tissue injury, i.e. bladder, urethra, rectum etc.

Follow ATLS protocol. These patients require immediate resuscitation with IV fluids, analgesia and careful assessment prior to ward admission. Blood should be taken for FBP, Grouping and cross matching and electrolytes.

FRACTURED ACETABULUM

Again a wide variety exists. Admit all for bedrest and analgesia. Those which are undisplaced may be treated conservatively although may require Hamilton Russel with either skeletal or skin traction. Those which are comminuted and displaced will require further assessment with Judet views and a CAT scan prior to a decision regarding open reduction and internal fixation. The Judet views are rarely required as an emergency and should be carefully planned. The patient should be accompanied to the X Ray department by the Registrar or Senior Registrar, traction dismantled and the patient transferred to the X Ray table, after the administration of suitable analgesia. Views should be checked as they are processed to ensure that the necessary information is obtained. The importance of good radiographs in the planning of an operative procedure cannot be overemphasised.

FRACTURED NECK OF FEMUR

Admit all.
If clinically suspect but not obvious admit for further investigation i.e. MRI scan or further radiograph in a few days.

A&E department - give adequate analgesia

Remember that a fractured neck of femur in a relatively young patient (less than 65) is an orthopaedic emergency. The patient should be fasted and the registrar on call informed. All other patients will be seen and assessed by the unit registrar for the next available list. If an elderly patient is to be fasted overnight ensure that IV fluids have been erected.

TRAUMATIC DISLOCATION OF HIP
This is a most serious injury and may be associated with other long bone and pelvic fractures. Record the integrity of the sciatic nerve pre-reduction. It is frequently the result of major trauma in a previously young / fit individual, although can be the result of relatively minor trauma. Closed reduction under a general anaesthetic must be carried out AS SOON AS POSSIBLE. The registrar on call must be contacted as this injury occasionally requires open reduction. After reduction the patient is kept in traction for a variable period of time. Post reduction radiographs must be carefully scrutinised to exclude pelvic fracture or an avulsed fragment of the femoral head within the joint. If there is any doubt Judet views or a CAT scan will clarify this.

DISLOCATION OF A TOTAL HIP REPLACEMENT

Associated with variable degrees of trauma. Usually clinically obvious as the leg is shortened and internally rotated.
If within 2-3 hours of dislocation then it may be possible to reduce under sedation bearing in mind that failed reduction may delay suitability for a GA even further. Dislocations of more than 3 hours duration are often best re-located under GA.

TECHNIQUE OF REDUCTION - With the patient on a firm surface, flex the hip and knee to 90 degrees. Get an assistant to stabilise the pelvis firmly with a hand placed on each iliac crest. Stand with a foot either side of the patients dislocated hip and pull steadily upwards with the leg slightly ADDUCTED. Re-location is accompanied by a satisfying "clunk".
I would advocate that an AP radiograph of hip is taken before the patient leaves the Operating theatre. Following reduction the patient is placed in skin traction with the leg ABDUCTED. The following working day it is usual to inform the consultant (or his secretary) under whose care the THR was performed.

FRACTURED SHAFT OF FEMUR

The following are essential prior to ward admission.
ANALGESIA (either IV or with femoral nerve block)
IMMOBILISATION - in Thomas' splint
INTRAVENOUS FLUIDS
BASELINE BLOOD GASES
Check the neurovascular status.
If possible the Thomas' splint should be applied in the A&E department using skin traction.
The patent should have check radiographs following application of the splint.
If it is thought that there may be a delay of more than a few days prior to operative treatment it is advisable to put in a pin for skeletal traction at an early stage. This can often be performed under local anaesthetic in combination with sedation.

FRACTURED UPPER THIRD OF FEMUR
Most of these fractures require internal fixation. For initial assessment see fractured shaft
of femur.
A high tibial pin should be inserted and Hamilton-Russell traction erected if there is a delay in operative treatment.

SUPRACONDYLAR FRACTURE OF FEMUR
Discuss with the registrar on call as many of these fractures are suitable for internal fixation. If unsuitable treat in skeletal traction with a Thomas' splint and a Pearson knee flexion iron.
Check X-Ray and admit.

FRACTURED PATELLA
Undisplaced - The majority require a POP cylinder for 6 weeks.
- Patient will need crutches for a few days, but once comfortable the patient can walk.
Displaced and/or comminuted - admit and inform the Registrar on-call as these require exploration and internal fixation or excision.

DISLOCATED PATELLA
Reduce under sedation or GA. Get "skyline view" of patella to exclude an osteochondral fracture.
For 1st dislocation apply POP cylinder 6 weeks.
If a recurrent dislocation bring back to a consultant clinic.

KNEE INJURIES
These are extremely common and beyond the scope of this summary.
It is imperative that an accurate history is taken, particularly as to the mechanism of injury, and secondly the time of injury in relation to the onset of swelling. In general, swelling less than 6 hours implies an haemarthrosis, greater than 6 hours implies an effusion.
Aspiration of an haemarthrosis using an aseptic technique will frequently give the patient considerable pain relief.
Each patient with a proven haemarthrosis should be considered for the next available theatre list with a view to 'EXAMINATION UNDER ANAESTHETIC' and arthroscopy. All should have AP and Lateral views (and if necessary a "tunnel view"). If no major injury is suspected
- a Robert Jones bandage should be applied.
- static quads exercises should be taught
- patient instructed in the use of crutches
- NSAIDS prescribed
- Review day 5
If there is any clinical instability the Registrar on call should be contacted re further management.
Refer any patient with knee injury to Mr D Raj’s fracture / knee clinic on Tuesday pm.

FRACTURED TIBIAL CONDYLES / PLATEAU

Before embarking on a course of treatment discuss with the registrar.
Undisplaced - POP cylinder or Cast brace for 6 weeks.

- remain non weight bearing on crutches.
- X-Ray 2 weekly
- cast off at 6 weeks and commence physio
- partial weight bearing for further 4 weeks.

An alternative form of treatment is to pass percutaneous screws in theatre using image intensification to check screw position and to ensure that reduction has been maintained. this facilitates early movement of the knee post operatively.

Displaced - admit and fast with a view to open reduction and internal fixation on the next available list.

FRACTURED FIBULA

Often due to direct violence.
Check and record lateral popliteal nerve function.
Crepe bandage or wool and crepe for 3-4 weeks is usually sufficient.
Occasionally SLPOP may be required for pain relief.

FRACTURED TIBIA

All should be admitted for at least 24 hours observation after injury.
Undisplaced - Upper 2/3 - long leg POP
- Lower 1/3 - Patellar tendon bearing cast providing adequate observations are kept on distal circulation and sensation it is unnecessary to split the plaster. Follow up at consultant clinic - patient should be safe on crutches prior to discharge.

- review and X-ray weekly for 1 month.
- if POP becomes loose change
- heel can be applied at 4-6 weeks
- patient will require a total of 3-4 months in POP

Displaced - Reduction under GA with full muscle relaxation is necessary.
- at nights or weekends the Registrar on call should be informed as he / she may wish to be present at the reduction.
- Patient should be warned prior to reduction that if the fracture is unstable and a
satisfactory reduction has not been achieved or cannot be maintained it is probable that internal fixation by intramedullary nailing may be required.

- before patient is woken from GA an X-Ray should be taken to confirm reduction (Image intensifier is unsatisfactory as it has a limited field of view).

- if continuing with treatment in cast those patients with a satisfactory closed reduction should be X Rayed on a regular basis (every 5-10 days) to ensure that reduction has been maintained. If not they will require fixation.

PLASTERS ON MANIPULATED TIBIAL FRACTURES SHOULD BE SPLIT. (complete Day 5-7)
Post reduction observe neurovascular status.

Compound - book theatre and inform the registrar on admission as these fractures must be thoroughly cleaned, debrided and stabilised in theatre. If there is major tissue loss it is contact the plastic surgeons as they may wish to do a primary soft tissue procedure.

RUPTURED ACHILLES TENDON
The patient classically describes a sensation of having been kicked on the back of the heel or leg. Inform the registrar on call. Majority are treated surgically on the next available list. Within 48 hours of injury it is possible to treat conservatively in an equinus plaster.

Review day 1 for plaster check.
Review at 3 weeks for change of cast to about 45° of planter flexion.
Review at 6 weeks for change of cast to about 15 - 20° of planter flexion.
Remove cast at 9 weeks and commence gentle physiotherapy. At this stage the patient should have a heel raise of approximately 1-2cms.
If there is any doubt about the clinical diagnosis an ultrasound scan of the achilles tendon is a helpful investigation.

FRACTURED ANKLE

Ensure that good quality AP and Mortise views of the ankle have been taken.
Undisplaced fractures and those in patients greater than 60 are usually treated in POP. The majority require 6-8 weeks in POP. If very swollen a backslab should be applied for 3-5 days and the patient instructed to rest at home with the foot and ankle elevated above waist height.
X Rays should be taken at 1,2 and 4 weeks to confirm that reduction is maintained.
After removal of POP apply double tubigrip and commence graduated weight bearing.
Encourage ankle movement.

Displaced ankle fractures should be reduced as soon as possible to relieve pressure on the over-lying skin. If it is clinically obvious the fracture should be reduced before the patient is sent for an X-Ray.
Each displaced fracture should be discussed with a senior colleague as early internal fixation may be the treatment of choice.
If initial treatment in POP is decided on - the POP should be moulded and split and the
patient admitted for high elevation of the ankle.

Compound ankle fractures require thorough cleansing in theatre. The Registrar should be informed, antibiotics given and theatre arranged.
FRACTURED TALUS

Chip fracture
- In an intra-articular fracture tomograms may be necessary to assess the size of fragment.
- If undisplaced POP 6 weeks and re X-Ray to confirm re-attachment.
- If displaced and intra-articular an arthrotomy may be necessary to remove the loose body.

Fractured neck (undisplaced)
- Split POP until swelling subsides.
- Equinus POP 6 weeks.

Fractured neck (displaced)
- Inform the registrar on call and fast for next theatre list as may require open reduction and internal fixation.

Fracture dislocation
- urgent open reduction and internal fixation are required.

FRACTURED CALCANEUS

Admit for high elevation and application of ice packs.
If the fracture has resulted from a fall from a height it is essential to exclude a simultaneous spinal injury (usually lumbar) by clinical and radiological examination, and to record the findings.

FRACTURED METATARSALS

First metatarsal - moulded POP with heel 3-4 weeks

Second - fifth metatarsal
- treat symptomatically in double tubigrip.
The patient may require crutches for the first two weeks.
If pain is a major problem treat in POP.

Base of fifth metatarsal
- although it is acceptable to treat in tubigrip a short leg POP for 3-4 weeks provides excellent pain relief.

Multiple fractures
- admit for elevation prior to application of a well moulded POP.
- observe the skin regularly as there is associated soft tissue injury.
- beware of associated tarsal and tarsometatarsal dislocations.

PHALANGES
Reduction is usually unnecessary, but if required this can be carried out under local ring block. Immobilise with neighbour strapping for 2-3 weeks or in the case of the hallux - a well padded zimmer splint on the plantar aspect of the toe.

SPINAL FRACTURES

- The main concern is not with the spine itself, but with the closely related neurological elements.
- If you suspect or know for definite that you are expecting a spinal injury inform the registrar.
- If clinically suspected as a spinal injury the patient must be treated as such until otherwise proven.
- From admission to hospital, a doctor should remain with the patient at all times, supervising and coordinating any movement for examination, X-Rays etc. until the patient is safely in bed and admitted to the ward.
- A full explanation of what is happening must be given to the patient and regularly updated prior to each move or investigation. Remember that they will, quite understandably, be very anxious and afraid.

Small amounts of intravenous sedation may help to relieve anxiety.

- A spinal injury must be excluded in any multiply injured patient. Examination of the back and X-Rays of the cervical spine are therefore essential.

TYPES OF INJURY

Stable with intact neurology
Stable with neurological deficit
Unstable with intact neurology
Unstable with neurological deficit

Any combination of the above injuries may occur. In unstable fractures it is imperative that in a neurologically intact patient no deficit occurs. In the unstable patient with neurological deficit great care must be taken to see that no further deterioration occurs.

LEVEL OF INJURY

May occur anywhere from the atlas to the coccyx. Although cervical and lumbar injuries would appear to be the most common.

MECHANISM OF INJURY
May occur in the following ways:
FLEXION +/- ROTATION
EXTENSION +/- ROTATION
COMPRESSION

A detailed history from the patient usually will indicate the mechanism of injury. (Remember that a compression injury may be associated with calcaneal fractures)

AETIOLOGY
The majority of spinal fractures will be due to TRAUMA.
If there has been minimal trauma consider the possibility of a PATHOLOGICAL FRACTURE. This may be due to:
OSTEOPOROSIS
PRIMARY MALIGNANCY eg. Multiple Myeloma
METASTATIC DISEASE - Lung
- Kidney
- Thyroid
- Breast
- Prostate

MANAGEMENT
On admission to Accident and Emergency a suspected spinal injury should be nursed flat on his/her back.
If cervical spine then the head must remain in a neutral position with a firm collar and sandbags laid either side of the neck to prevent rotation. If the patient is to be transferred to another centre the forehead should be secured to the trolley by tape.
In the dorsal or lumbar spine no specific external support is required.
The AIRWAY MUST BE MAINTAINED AT ALL TIMES - suction must always be at hand and if the patient requires turning this should be coordinated by the supervising doctor.

HISTORY: Special attention should be paid to the following points:
1) the circumstances of the accident and the mechanism of injury.
2) presence of and location of pain in relation to the spine.
3) subjective sensation of weakness at any time since the accident.
4) subjective sensation of paraesthesia.

EXAMINATION: (Use ASIA examination sheet)

ASIA = American Spinal Injury Association

The patient must have a full examination to exclude any co-existing injury eg. head, chest, abdomen, pelvic and limb.
Specific examination of the neurological system is then carried out.
Develop your own technique of examination and adhere rigidly to it, by doing this there is less likelihood of things being missed.
Inspect the back looking for any tell tale bruising, abrasions or lacerations. The patient
must be rolled as a log i.e in one piece to allow inspection of the back.

Palpate the cervical, dorsal and lumbar spine looking for localised tenderness or a palpable gap suggesting disruption of the interspinous ligament.
I find it useful to start distally with my examination and to work proximally, assessing the following.

POWER of muscle groups, graded on a scale of 1-5, where 1=no movement and 5= full power.

SENSATION to light touch and pin prick. Paying particular attention to the perianal and perineal sensation.

REFLEXES both tendon and primitive reflexes.

TONE may be either normal, flaccid or spastic.

Your initial findings should be recorded clearly (a diagram is very useful) as this is a baseline assessment and any recovery or deterioration will be measured with reference to this.

INVESTIGATION: Good X Rays are essential. At least two views i.e. an AP and Lateral are necessary. Again the patient should be accompanied to the X Ray department and each X-Ray inspected after it has been processed. If the views are unsatisfactory they must be repeated.

The cervico-thoracic junction is often difficult to visualise particularly in a short fat individual. In this case it is necessary to apply traction to the arms as the X-Ray is taken, alternatively a 'ballet dancer' view may help.

In suspected facetal dislocations oblique views of the spine give additional valuable information.

A patient with neurological signs and/or symptoms but no radiological evidence of injury must have CONTROLLED FLEXION AND EXTENSION views of the cervical spine to exclude instability.

A patient with a proven spinal injury must have a chest X-Ray prior to ward admission. Remember that these patients are nursed flat and have a tendency to develop respiratory problems.

CT Scanning gives excellent pictures of the spine and provides additional information regarding possible soft tissue damage. They are not done routinely but at the discretion of the senior registrar or the Consultant in charge of the case. This procedure may be combined with a myelogram.
TREATMENT (STABLE): All require admission and observation prior to discharge at the discretion of the consultant. In the case of a stable cervical spine injury a firm collar for 2-3 weeks is effective, this can be changed to a softer collar after this time. In stable fractures of the dorsolumbar spine bed rest is the mainstay of treatment, (remember to exclude any underlying pathology). Some form of external support will be required when mobilisation commences.

TREATMENT (UNSTABLE): Must be discussed with a senior colleague. A decision will be made by the senior registrar and consultant regarding the necessity of urgent operative intervention.

Fast and take blood for haemoglobin, U&E and group & hold as the patient may need a General Anaesthetic.

The patient can be transferred to a fracture bed using a 'scoop stretcher' again this must be supervised and in the case of a cervical spine injury the doctor must have control of the head at all times.

In the RVH make sure that the patient is placed in the bed with his/her head at the foot of the bed. This is because only the foot of the bed can be elevated to provide the necessary countertraction.

For unstable cervical injuries 'Tongs' are usually applied in the fracture clinic reduction theatre. Various types exist although the ones most frequently used in RVH fracture clinic are 'Stratford Tongs'. They are applied using light sedation and Local Anaesthetic. Once the tongs have been applied 5-7 lbs of traction is attached and a further X Ray taken.

CATHETERISATION: if this necessary as in the case of a paraplegic or quadriplegic patient, it must be performed using strict aseptic technique. This is because the flaccid bladder is very susceptible to infection and treatment is difficult.

IV FLUIDS: the paraplegic and quadriplegic should maintain a good urinary output. This is because of the above risk of infection and secondly mobilised calcium can lead to stone formation in the genito-urinary tract. Until the patient is capable of maintaining an adequate amount by mouth an intake of approximately 4-5 litres per day should be aimed at in the presence of good renal function.

BOA (British Orthopaedic Association) has published “THE INITIAL CARE AND TRANSFER OF PATIENTS WITH SPINAL CORD INJURIES” Please go through this and follow the protocol.
BOA and NICE guidelines

3. Hip fracture in the older person 2008
4. Metastatic_bone_disease (1) BOA 2001
5. Open fracture lower limb BOA BAPRS 2009
6. Osteoporosis primary prevention NICE 2010
7. Osteoporosis_Disease_Management_2009 BOA
8. Pelvic and acetabular fracture management BOA 2009
9. Severly_injured_2 BOA 2001
10. TKR_patient_advice_BOA 2007
11. Venous thromboembolism_ reducing the risk NICE 2010