The Orthopedic HO Guide

Compiled by Dr. Gerard Loh
2012

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The Orthopedic House Officer Guide

Dedicated to Dept of Orthopedics, Hospital Ampang

Special thanks
Mr Felix Loong, Ms Lynn Azura, Mr Manmohan Singh, Mr Jeffry Amit,

Dr Liong Meng Feng, Dr Khoo Saw Sian, Dr Ilyanna Zahudi, Dr Vikrama Devadass, Dr Mike Tan
Dr Raghbir Parmar, Dr Lai, Dr Firdaus, Dr Kamarul, Dr Ita

And to all my fellow colleagues, seniors, nursing staff and medical assistants!

Timetable
Mon – CLINIC + OT (Trauma List)
Tues – OT (elective)
Wed - CLINIC
Thurs- CME
Fri – OT (elective)
Sat – OT (locum)
Everyday = OT emergency and ED

Locations
Wards: 5A (male), 5C (female)
Clinic : Ground floor
ED : Ground floor opposite Radiology
OT : 3rd floor
Daycare: next to OT, 3rd floor
Pej. Pakar: 3rd floor
Blood bank: 2nd floor next to lifts
Pathology lab: 2nd floor, above Radiology

Your duties as an Orthopod
1. Documentation – Clerking, progress notes, post op review, clinic review, discharge summary
2. Orders – Radiology, pharmacy, laboratory tests, OT surgeries,
3. Writing – Referral letters, memo, medical certificate, discharge note, physiotherapy referral
4. Calls – referral, requesting for blood, posting case to anaesthesiologist,
5. Trace – Laboratory tests, radiology, culture and sensitivity, TDM
6. Procedures – dressing and bandaging, vacuum dressing, blood taking, septic workout, desloughing, casts and splinting, wound irrigation, assist in OT (tourniquet, skin traction, antibiotics prep, surgeries)
7. Monitor – Blood pressure, pulse, SpO2, Temperature, DXT, drugs chart, I/O chart, circulation chart

Contents:
1. Abbreviations
2. Documentation
3. In the ED
4. In the Ward
5. In the OT
6. Clinic/ Daycare duty
7. Pharmacy prescriptions
8. Appendix

May this compilation help you in your orthopaedics posting!

Compiled by
Dr Gerard Loh (CSMU, Ukraine)
Orthopedics posting Oct 2011 – Feb 2012

For more guides, visit www.myhow.wordpress.com
Abbreviations

c/o – complaints of
k/c/o – known case of
o/e – on examination
s/w – seen with s/b – seen by
s/t – spoken to
f/up – follow up
s/s – sliding scale
u/s – ultrasound
cm – coming morning
Stat – immediately
C & S – culture and sensitivity
CBD – catheterization of Bladder device
CRIB – complete rest in bed
RICE – Rest, Ice Compression, elevate
NBM – Nil by mouth
IVD – Intravenous drip
FBP – full blood picture
FBS – fasting blood sugar
FBC – full blood count
RP – Renal profile
GSH – Group screen Hold
GXM – Group cross match
INR – International normalized ratio
DXT – dextrose
NWB – non weight bearing
PWB – partial weight bearing
FWB – full weight bearing
CXR – chest xray
I/I or c-arm – mobile xray
DRNM – dual rhythm non murmur
NKDA – No known Drug allergies
NKMI – No known medical Illness
STI – soft tissue injury

OM – morning
ON - overnight
OD – once daily
BD - twice daily
TDS – 3 times daily
QID – four times daily
EOD – every other day
I/I – 1 Tab, once daily
II/II – 2 Tabs, twice daily
_/7 – days
_/12 – months
_/52 - weeks

ABSI – Ankle-Brachial Systolic Index
DFU – diabetic foot ulcer
DPA – Dorsalis Pedis Artery
PTA – Posterior Tibial Artery
OM – Osteomyelitis
ROM – range of movement
CTEVE: congenital talipes equinovarus
ATT- Anti tetanus toxoid
PTB – Pulmonary TB

Ortho Procedures

AKA – above knee amputation
BKA – below knee amputation
BKPOPO: below knee POP
AKPOPO: above knee POP
TBW – Tension band wiring
DHS- Dynamic Hip srew
TKR- Total knee replacement
ORIF- open reduction internal fixation
ROI – removal of implant
MUA – manipulation under anesthesia
ILN – Interlocking Nail
PFN – peripheral femoral nail

RA- Ray’s Amputation
SSG- Split skin grafting
WD – wound debridement

Anatomy

NOF – Neck of Femur
DIPJ : Distal Inter-Phalangeal Joint
PIPJ – Proximal Inter-phalangeal jt
MTB – metatarsal bone
FDP- flexor digitorum profundus

Discharge

TCA – To Come Again
WI – wound inspection
STO – Suture To Open
DOA – date of admission
DOD – date of discharge

MRO - multiple resistant organism
MRSA- Methicilin resistant Staph Aureus
**Orthopedics General Clerking**

*<Done for new or latest encounters in ED and admission review in ward>*

<table>
<thead>
<tr>
<th>Main complaint</th>
<th>S/w Dr Mike (Medical Officer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a/t/s:</td>
<td>age-race-sex eg: 62 yo Malay male</td>
</tr>
<tr>
<td>K/c/o:</td>
<td>Disease – Duration – medication – follow up</td>
</tr>
<tr>
<td></td>
<td>Eg: 1) HPT (2years), currently on T. Amlodipine 10mg OD, f/up KK Ampang</td>
</tr>
<tr>
<td></td>
<td>2) DM (2years), currently on T. Metformin 500mg BD, s/c Actrapid 6U tds, Insulatard 10U ON</td>
</tr>
</tbody>
</table>

**Dominance:** Right Handed

case refered from __ private GP

c/o: pain and swelling over right wrist

<table>
<thead>
<tr>
<th>Duration</th>
<th>4 hours</th>
</tr>
</thead>
</table>

**HOPI:**

short story about problem

Eg: **Alleged MVA** (MB vs Car) at Pandan Indah at 4pm today

Pt was pillion rider, helmet buckled, was hit by car frm left side

Fell on right side with left hand outstretched, sustained immediate pain over right wrist

-No LOC, no nausea or vomiting, no SOB, no ENT bleeding, no open wound, no head injuries, no other injuries

<table>
<thead>
<tr>
<th>Past Medical Hx:</th>
<th>NIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications:</td>
<td>NIL</td>
</tr>
<tr>
<td>Surgical Hx:</td>
<td>NIL</td>
</tr>
</tbody>
</table>

**Social Hx**

non smoker, social alcoholic,

works as a nurse,

lives with family in Cheras

**Systemic review**

**General:**

alert, conscious,

vital signs: BP, PR, T, SpO2...

**CVS:**

DRNM

**Chest:**

Lungs Clear

**Abdomen:**

soft, non-tender

**Musculoskeletal**

**Inspection:**

Swelling, tenderness, hematoma, abrasions...etc

**Power:** 5/5

**ROM of wrist joint limited due to pain, ROM of fingers full**

**Neuro and motor component (sensations)** of radial median and ulnar nerves intact

**Distal Pulses:** DPA/PTA (LL)/ Radial Ulnar (UL)

CRT < 2 sec

<table>
<thead>
<tr>
<th>Radiology:</th>
<th>x ray of __ right wrist joint: fracture of distal end of radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>management:</td>
<td>Plan...admit ward 5A...</td>
</tr>
</tbody>
</table>
Orthopedic Progress notes
<for AM/PM/Night/ Post Op / clinic review>

**AM review**
with Ms Lynn, Dr Khoo and Dr Liong

a/r/s: 60 yo Malay male
k/c/o: HPT (2years) currently on T.Amlodipine 10mg OD, f/up
KK Ampang

**Problem:** Closed Fracture of left femur...

**Progress:** latest condition, changes
comfortable in bed
pain tolerable
No active complains

**Medications:**
T. Amlodipine 10mg OD
T. PCM 1g QID

**o/e:**
Alert, conscious,
non tachypneic
hydration fair

Vitals: BP, T, PR, SpO2

**Plan:** for ILN on Tuesday under elective…etc

**Post Op review**
<copy findings and post operative plan from surgeon notes>

a/r/s: 60 yo Malay male
k/c/o: HPT (2years) currently on T.Amlodipine 10mg OD, f/up
KK Ampang

PO1Hr (duration) : ILN of left femur (Type of surgery)
PODx: Closed fracture of left femur

**Findings:** comminuted fracture of left femur

**Progress:**
comfortable in bed
pain tolerable
Bandage not soaked

**Medications:**
T. Amlodipine 10mg OD
T. PCM 1g QID

**o/e:**
Alert, conscious,
non tachypneic
hydration fair

Vitals: BP, T, PR, SpO2

**Plan:** CRIB for 6 hours, put abduction pillow…etc

**Clinic review**
s/w Mr Mannohan

a/r/s: 60 yo Malay male
k/c/o: HPT (2years) currently on T.Amlodipine 10mg OD, f/up
KK Ampang

PO 1/12: ILN of left femur
PODx: Closed fracture of left femur
(post trauma 1/12)

**Progress:**
ambulating with crutches
compliant to PWB
Pain tolerable

**o/e:**
alert, conscious
Examination of left LL:
no swelling,
Power…ROM…sensations….CRT

WI: suture clean, no pus discharge, no active bleeding….
XOA: bone healing, callus+

**Plan:**
latest plan….PWB with crutches..refer physio…
analgesics…
TCA 1/12 XOA in ortho clinic
TCA stat if pain, swelling…etc
MC till TCA (1/1/12 – 1/2/12) (V615623)
Discharging a patient

1. Record discharge advice → (ICD 10 Diagnosis + supporting diagnosis)
2. Order Medications
3. Fill in Discharge Note, Appointment card, STO/dressing form, physiotherapy form, OKU form etc.
4. Record Discharge summary

Discharge summary

**Diagnosis**: search for earlier recorded ICD-10 diagnosis

<table>
<thead>
<tr>
<th>Onset date</th>
<th>Stage</th>
<th>Diagnosis: Fracture of femur</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/12</td>
<td>Final</td>
<td></td>
</tr>
<tr>
<td><strong>Remarks</strong>: Closed fracture of mid shaft left femur</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**History**: 
DOA : 1/1/12  
DOD : 7/1/12  
60 yo malay male, NKMI

Presented to EDHA on 1/1/12 with c/o pain over left thigh. Was admitted to ward for ILN of left femur.

Operation was done successfully on 3/1/12.  
He was monitored in ward with antibiotics IV Zinacef 750mg for 3 doses.

Upon inspection of post op site, he was allowed discharge on 7/1/12 with C. Tramal 50mg tds….etc..

With TCA 2/52 in ortho clinic.

**Physical Examination**:  
On Admission: ____ examination of left thigh: swelling, ROM....  
On Discharge: ____ WI: clean, no pus discharge...

**Laboratory Investigations**: select latest FBC, RP, C & S..only important parameters!

<table>
<thead>
<tr>
<th>Full Blood count</th>
<th>1/1/12</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC</td>
<td>3.5</td>
</tr>
<tr>
<td>Hb</td>
<td>13.1</td>
</tr>
<tr>
<td>Hct</td>
<td>35</td>
</tr>
<tr>
<td>WCC</td>
<td>7.3</td>
</tr>
<tr>
<td>Plt</td>
<td>220</td>
</tr>
</tbody>
</table>

**Radiology** : Xray of left femur: fracture of mid shaft left femur  
**Imp**: closed fracture of mid shaft left femur

**Medications**: select earlier ordered medications

<table>
<thead>
<tr>
<th>Start date</th>
<th>End date</th>
<th>Medication</th>
<th>Dossage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/1/12</td>
<td>21/1/12</td>
<td>Tab. Paracetamol</td>
<td>1000mg, QID</td>
</tr>
</tbody>
</table>

**Procedures**  
Surgical : ORIF, ILN of left femur (3/1/12), PODX and findings…

**Management**  
Plan : TCA, analgesics, antibiotics, dressing, MC

checked by Dr ___ (M.O.)
Writing a referral letter

To: Doctor  
Designation: Medical Officer  
Referred to: KK Ampang

From: Dr Loh  
Designation: House Officer  
From: Orthopedics HA

Main complaint:
Dear Doctor,

Thank you for seeing this patient.
She is a 19 yo, Sabahan, NKMI
alleged MVA….etc

Diagnosis :  xray of...
impression:

Laboratory investigations: FBC, RP....

Medication: T PCM 1g....

Surgical procedures: type of operation...

Management : TCA 1/12 with XOa……..etc

Purpose of ref :  
This patient prefers to cont treatment at your hospital due to logistic reason.
Please kindly do the needful.

Thank You

Writing a Memo

Kepada: Klinik Kesihatan Ampang
Daripada: Jabatan Ortopedik, Hospital Ampang

Dear colleague, Date: 7/1/12

Name ___(IC no. - ###)

The above named patient was under our care for........ (diagnosis and procedures)
She also has underlying DM, for 2 years, previously on T.Metformin 500mg BD.....on follow up.......

During admission in our ward, her DXT was ranging from 6.0-14. She was given s/c Actrapid 6U tds ..(regime in hospital)

Please monitor her DXT in your health centre and kindly do the needful.

Thank You.

Signature and Stamp

Dressing/STO form
<for dressing and STO in KK>

Name: R:
IC no.: for daily dressing with NS and Bactigrass
R/N: AM00635621 STO D14 (20/1/12) at nearest KK
Date:

Diagnosis: Signature and stamp: ___________________
Hospital Ampang
Negeri Selangor
**Consent**  
* required for all surgeries and procedures

Keizinan Pembedahan

Hospital Ampang...
Saya… (A) Ng Yee Ong…..yang beralamat…..Taman Kosas, Ampang…..dengan ini memberi keizinan untuk

(1) menjalani pembedahan … Open Reduction Internal Fixation of left lower limb…. (no short form!)….  

Or

(2) meyerahkan jagaan saya……Ng Yee Li…  
untuk menjalani pembedahan….. Open Reduction Internal Fixation of left lower limb

….Pembedahan telah diterangkan oleh….. Dr…Liong Meng Feng (only Medical Officer may sign!)  

………………………………..  

Tarih:  
Tali persaudaraan: ………………...  
IC: ….650112-10-5687…

………………………………..  

MO stamp and sign

* (A) - If patient signing for self, fill in pt name and cont with (1)
  - If Caregiver signing, write caregiver name first and proceed to (2)
* HO may sign for CMR under sedation

**Physiotherapy Form**  
*carbon copy required*

<table>
<thead>
<tr>
<th>Name:</th>
<th>R/N: AM00007897</th>
<th>Ward: 5A/5C</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC:</td>
<td></td>
<td>Unit: Orthopedic</td>
</tr>
<tr>
<td>Diagnosis:</td>
<td>closed fracture R d/e radius</td>
<td></td>
</tr>
<tr>
<td>Xray:</td>
<td>R wrist joint</td>
<td></td>
</tr>
<tr>
<td>Physiotherapy instructions:</td>
<td>for ROM exercise of…..</td>
<td></td>
</tr>
<tr>
<td>Precautions:</td>
<td>PO ORIF</td>
<td></td>
</tr>
<tr>
<td>Doctor sign and stamp:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Physio: ROM exercises, muscle strengthening, TENS, chest physio, ambulation with crutches, transfer to wheelchair, wax therapy..
**IN THE WARD**

**Posting case to OT**
* prepare patient history, FBC, RP etc…to present
**Make sure 6 hours after last meal**
**Vitals stable**
1. Dial 0. Ask for anaesthesiologist on call
2. Present case to anest
   * Hello, I’m Dr____, __HO frm ward __. I would like to discuss my patient with you
   . My patient ____, AM____, with diagnosis____, planned for____surgery, on______
   <present case>
   Patient NBM for ___ hours (>6 hours).RP…, Hb…Vitals stable…CXR normal, ECG normal…
   Surgeon to perform is Dr.________
3. Once approved by anest, post case to GOT counter
   Hello GOT, I would like to post a case…Name, AM no. , Diagonosis, surgeon to perform

**Booking**
1. Order surgery- in ORDER, search for type of surgery
2. Schedule Time and date ➔ APPLY
3. Record Consent
4. OT transactions ➔ Booking Verification ➔ FINALIZE ➔ APPLY

**Ordering ultrasound**
Make sure you know your case
1. Call 0 and ask for MO on call for ultrasound…or go to radio reception
2. Present case to MO…
Questions:
Why need Ultrasound?
Did you do Xray? What is white cell count… Temperature…etc
Eg: To rule out Septic arthritis, Xray was done but inconclusive TRO septic arthritis..
3. If the MO approves, go to the white board in the ULTRASOUND room and write down patient’s name, case and appointment time
4. Order the ultrasound on eHIS
5. Make sure patient arrives 15 mins before appointment time!!

**Referring a case to another dept**
1. Dial 0 and ask for name of MO on call for tat dept. Ask operator to connect
2. Greet Dr.____ and introduce yourself : Name, HO of ___department, ward__
3. Propose to discuss patient : I would like to discuss and refer a patient to your dept
4. Give name and AM no., and present case, and what current management of said diseases
   a) a/r/s   b) k/c/o   c) c/o   d) Diagnosis   e) Investigations
5. Ask for recommendation : Can you please recommend a plan of management?
   Or ask for a review: Can you please come and review the patient in our ward…
6. Update Progress Notes : Spoken to Dr ______ , for team to review in ward later.

**PRESENTING A CASE**
1. Age, race, sex
2. presented with ____ (current problem)
3. “he/she also has (underlying diseases) “ OR “he/she is a known case of ___
4. our current plan is _____ (surgery) OR currently Post Op day…
5. Vitals (Afebrile, BP well controlled, DXT single digit..etc)
6. Attachments – IVD, CBD…
7. Medications : Antibiotics, analgesics..
8. CXR NAD, ECG NAD, lungs clear

Eg: 55 year old Malay lady, presented with Closed # distal end of left radius. She also has Hypertension and DM, currently under f/up KK Ampang. Our current plan is for ORIF, locking plate on Friday. She is currently afebrile, BP and DXT well controlled. currently on IVD 4 pints NS over 24 hrs she is on IV Zinacef , and tramal..
CXR no abnormalities detected, ECG sinus rhythm NAD, lungs clear awaiting anest team to review today.
**Calling blood bank for blood**
*prepare patient details before calling!!
* make sure GSH sent!!

1. Dial 0 for operator. Ask for MO on call for blood bank
2. Introduce yourself. (Hello good morning Dr___, I’m orthopaedic HO frm, ward 5A/C)
3. Patient details: I would like to request for 2pints PC for my patient: age, sex
4. K/c/o: relevant co-morbid
5. Diagnosis:
   Progress: eg: she is currently POD1…loss of 1 litre of blood intra op, clinically looking pale..
   repeated FBC latest Hb is..
6. Investigations: Hb, Hct, Blood type
7. Request: I would like to request for ___pints of ___, please...
8. Once approved, you will be given a CODE. Call Blood Bank and to complete your order.
9. **Documentation:** S/T Dr Dass MO oncall Blood bank, approved 2 pints of PC with code____
   Plan: to transfuse 2 pints immediately, FBC 6 hrs post tx

<table>
<thead>
<tr>
<th>Common questions</th>
<th>Good Answers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Why your patient needs transfusion?</td>
<td>*Hb was low, so we repeated FBC and Hb was</td>
</tr>
<tr>
<td>-RBC, Hb, HCT? Plt?</td>
<td>*clinically looking pale, tachycardia, BP drop...</td>
</tr>
<tr>
<td>-What surgery and when?</td>
<td>*To optimize patient’s condition for op tmr</td>
</tr>
<tr>
<td>-How many for transfusion now, how many reserved for op?</td>
<td>*Severe anemia or bleeding</td>
</tr>
<tr>
<td>How long transfusion per pint? * 4hours</td>
<td>* intra op bleeding</td>
</tr>
</tbody>
</table>

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**lecture by Dr Dass during Patho course**

**TYPES of Blood for transfusions**

a) **Packed cells**

relevant co-morbid = IHD, anemia, bleeding disorders, CKD, MVA polytrauma,
relevant Ix: Hb, Hct, (Hb < 8 = likely to get)
pints: 1 pint increases 1g Hb
**must transfuse within 4 hrs
***take FBC 6 hrs post transfusion

anemia- pulse pressure increases (>50 fn murmur)
Fe deff = hypochromic, microcytic, reactive thrombocytosis, red cell distribution rate (high=poikilocytosis)
Bleeding = normochromic, normocytic, RBC Hb drop
B12 = hyperchromic, macrocytic

b) **Platelets (types: 1) random (4 in 1), 2) Apheresis (individual)**

*taking aspirin? (causes Plt dysfn-half life 5 days) Uremia also
Plt levels: > 100 = impossible, 30-50 = if bleeding or minor procedure, 10-20 = with bleeding, <10 = definitely get
Available in 2 packs or 4 packs
**Must constantly shake to prevent clumping

c) **Fresh frozen plasma**

Ix: PT, APPT
Units : 15ml/kg
*Needs time to thaw, hence must inform earlier

d) **Cryoprecipitate**

Ind: DIVC = Liver failure, sepsis, polytrauma, HELLP syn, ABO imcomp, miscarriage, APML
Units: 1U/10kg
*needs time to thaw

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**Hypovolemic shock**

Grade 1 : 750ml loss = Crystalloids
Grade 2 : 1.5 L loss = Crystalloids + Colloids
Grade 3. 1.5-2L loss = crystalloids + colloids + blood
Grade 4 : >2L loss = BLOOD transfusion
**ABSI (Ankle Brachial Systolic Index)**

1. Apply cuff above ankle
2. Using Doppler, find the Dorsalis Pedis Artery or Post Tibial Artery
3. Start inflating cuff, wait till sound disappears
4. Deflate cuff, wait till sound reappears and take systolic reading

Formula: systolic LL/systolic UL  
Norm = 0.9-1.2  
< 0.9-0.8 = venous ulcers  
0.5-0.8 = mixed ulcers  
<0.5 = arterial ulcers  
>1.0-1.2 = venous ulcers  
>1.2 = atherosclerosis

**Septic Workout (if 2nd temperature spike)**  
Ix = FBC, ESR, Blood and Urine C & S, UFEME

**Check list Pre Op**  
1) Blood investigations – RP, FBC, GSH, (Co-Ag)  
3) Withhold Aspirin/heparin  
4) CXR/ECG  
5) Consent  
6) NBM >6 hours  
7) Vitals stable  
8) CBD

**Vacuum dressing**

1. Mark wound periphery with iodine  
2. Place sponge foam over wound

* Ensure done in aseptic conditions

* Connect to suction, check for leaks, maintain pressure at 20

* Wound inspection D 3
### Traction

**1) Skin (G) –**
- Weights = 5% BW
- Ind: Femur/tibia
- always apply just below fractured bone
Lateral traction (B,C) – Thompson splint
- usually used on UL

**A**
- Adjust required length (start BELOW # site)
**C**
- Check Symmetry of adhesive tape
**D**
- Protect ankle with padding, leave ample space
**E**
- Wrap with adhesive plaster
**F**
- Tie knot, setup bed for traction
**G**
- Apply weight (5% BW, no more than 5kg!)

**2) Skeletal**
- With Steinman pin
- weights = 10% BW

**A**, **B**, **C**
- sites of insertion
**D**
- Steinman pin, T- handle, stirrup
**E**
- Local block
**F, G**
- Pin inserted slowly, until striking bone
**H**
- drill/T-handle to advance pin until opposite side
**I**
- incision made at opposite side
**J**
- Pin advanced
**K**
- stirrup attached to pin,
**L**
- Apply weights (10% BW)

---

**TRACE C & S**

1. Type of microorganism – Gram +/-, rods, cocci,
2. Antibiotic sensitivity Sensitive / Resistant / Intermediate / MRO/ MRSA
DM control
1) Ortho Sliding scale – insulin is adjusted to DXT monitoring 4 hourly (usually before surgery for optimised DXT or to determine optimum dosage of insulin required to control DXT)
2) OHA – Oral hypoglycaemic agents
Metformin – reduces insulin resistance, Gliclazide (Diamicron) – stimulate insulin production

3) s/c Insulin
Types
Rapid acting (15mins) = Novorapid, (humalog lispro)
Short acting (peak 1-3hr, action 6-8hrs) = Actrapid, Humulin S
Intermediate (peak 4-12hr, action 24hrs)= Insulatard, Humulin I
Long Acting (action 24hrs) = Lantus, Levemir (peakless) / Monotard (peak 10hrs)

1) Twice daily premix (30mins b4 bfast & dinner): Mixtard = Actrapid + Insulatard (Ind: High after meals)
2) Multiple inj basal/bolus: Actrapid TDS + Insulatard ON
3) Once daily Intermediate (Insulatard ON) + OHA (ind: High ON-OM, norm day)
4) Once daily peakless: Lantus, Levemir

Hyperglycemia (DXT 22-55)
Signs: polyuria, polydipsia, polyphagia, headache, acetone breath
precomatose: insomnia, restless, clonic convulsions, Kusmaul respiration
2nd phase: inhibition, dizzy, no interest, LOC
Deep coma: ↓ muscle tone/reflexes, Brady, ↓ eyeball tone, pupils narrow, Kusmaul’s resp., motionless, face pink pallid, dry skin,
(Investigations: VBG - acidosis + UFEME - Ketones = DKA)
Treatment
s/c insulin

Hypoglycemia (DXT <3.5)
Signs: hunger, tremor, headache, dizzy, slow speech, disorientation, blur vision, irritability
Coma: ↑ muscle tone/reflexes, BP↑, convulsions, pupils dilated, eyeballs firm, pale
Treatment
1) mild: intake of carbohydrates
2) severe : DXT 50% 50 cc + maintenance D10% 1 pint and monitor DXT hourly,
   *off maintenance when DXT double digit

DKA
Pathogenesis: body fat broken down for energy → accumulation of fatty acid KETONE → DKA
Signs: vomiting, acetone breath, ↓ musc reflex, thirst, dehydration, tachypea, xerostomia DXT >20
Investigations: VBG deranged (acidosis), UFEME ketones (+++)
Treatment: rapid acting s/c Insulin and hydration therapy (4 pint NS), monitor vitals, NP if desaturation
Compartment syndrome

Signs: (6P’s)
1) **Pain** → (+) passive stretch test (tenderness)
2) **Pallor** + Poikilothermia (pale and cold limb)
3) **Paresthesia** [change in sensation] → numbness or tingling sensation
4) CRT >2sec and Pulselessness → absent distal pulses
5) **Paralysis** → unable to move limbs

*Watch out* = check signs
- movement, limb T, SpO2, sensation, passive stretch
- apply cryocuff/ice,

*impending compartment syndrome

compartment syndrome following TIBIA fractures are most common in closed frx (upto 20% of frx)

- **Clinical Presentation:**
  - symptoms may not appear for 24 hours after injury;
  - clinical signs include increased pain even after reduction and casting;
  - severe tenderness over the anterior compartment muscles rather than fracture site is an indication of compartment syndrome;
  - irreversible muscle damage may occur after 4-6 hours, after which time the pain of ischemic muscles may diminish or be absent;

- **Exam:**
  - **blood pressure:**
    - compartment syndrome is potentiated by hypotension;
  - **pain:**
    - extreme pain out of proportion to the injury,
    - pain on passive ROM of the fingers or toes (stretch pain of the involved compartment):
    - patient will usually hold injured part in a position of flexion to maximally relax the fascia and reduce pain;
  - **pulses:**
    - check extremity pulse (such as dorsalis pedis)
    - apply a pulse oximetry monitor to the great toe, and sequentially occlude the posterior tibial and dorsalis pedis pulses;
    - compare pulses to the opposite non injured side (to rule out vascular injury);
  - **pallor** of the extremity,
  - **paresthesias** (early loss of vibratory sensation);

- **anterior compartment:**
  - variable weakness of toe extension;
  - pain on passive toe flexion;
  - diminished sensation in the first web space;

- **posterior compartment:**
  - weakness of toe flexion and ankle inversion;
  - pain on passive toe extension (may refer to the back of the leg)
  - diminished sensation over the sole of the foot;
- **Management:**
  - **fasciotomy**
    - normally the lateral fasciotomy incision is made halfway between the tibia and fibula;
    - w/ a difficult fracture reduction, consider making the incision slightly closer to the tibia so that the fracture site can be palpated and bone holding clamps can be applied;

Compartment Syndrome with Fasciotomy Procedure

- if cast has been applied, it should be bivalved immediately;
The compartments

**Hand**

1. **Dorsal** = Spf Dorsal + Deep Dorsal
2. **Spf Volar**
3. **Deep Volar**
4. **Mobile wad**

**Forearm**

1. **Dorsal** = Spf Dorsal + Deep Dorsal
2. **Spf Volar**
3. **Deep Volar**
4. **Mobile wad**

**Arm**

1. **Anterior** = **biceps brachii**, **brachialis**, and **coracobrachialis**.
2. **Posterior** = **triceps brachii** and **anconeus**
### Thigh

1. Anterior
   - sartorius
   - quadriceps (rectus femoris, vastus lateralis, vastus intermedius, vastus medialis)

2. Medial
   - adductor longus
   - adductor brevis
   - adductor magnus

3. Posterior (Spf + deep)
   - biceps femoris
   - semitendinosus
   - semimembranosus

### Leg

**Anterior compartment**
- Tibialis anterior
- Extensor digitorum longus
- Extensor hallucis longus

**Lateral compartment**
- Peroneus Longus
- Peroneus brevis

**Posterior compartment**
- Tibialis posterior
- Flexor digitorum
- Flexor hallucis
- Plantaris
- Soleus
- Gastrocnemius
Fat Embolism
Etio: trauma to long bones / pelvis – large fat droplets enter circulation – deposition in pulmonary capillary beds

Gurd’s Criteria (Dx 1 Major + 4 minor)

**MAJOR CRITERIA**
- Petechial rash
- Respiratory Insufficiency
- Cerebral involvement

**MINOR CRITERIA**
- Tachycardia >120/min
- Fever > 39.4° C
- Retinal signs-fat or petechiae
- Jaundice
- Renal signs-anuria or oliguria

**LABORATORY FINDINGS**
- Sudden fall in Haemoglobin concentration
- Sudden thrombocytopenia
- High ESR
- Fat macroglobulinaemia

**Schonfeld’s Criteria**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petechiae</td>
<td>5</td>
</tr>
<tr>
<td>Alveolar infiltrated</td>
<td>4</td>
</tr>
<tr>
<td>Hypoxemia Pa O2 &lt;70 mmHg</td>
<td>3</td>
</tr>
<tr>
<td>Confusion</td>
<td>1</td>
</tr>
<tr>
<td>Fever &gt;38 degrees C</td>
<td>1</td>
</tr>
<tr>
<td>Heart rate &gt;120 beats per min</td>
<td>1</td>
</tr>
<tr>
<td>Resp rate &gt;30 breaths per min</td>
<td>9</td>
</tr>
</tbody>
</table>

Supportive treatment only
- Adequate oxygenation, cont pulse oxymetry
- IVD fluid therapy
- Heparin
* IV corticosteroids
**General Examination**

1. LOOK: swelling, deformities, wound, discoloration  
   (always compare with other limb)
2. FEEL: Ask pt to point exact location of pain, feel place of maximum tenderness, warmth = infection,
3. MOVE: Active + passive movement
4. Xray
5. Treat

**Upper Limbs**

Sensations:  
- Ulna = Little finger – ½ ring finger  
- radial = dorsal btwn thumb-index finger, post-medial forearm, Triceps  
- median = thumb- ½ ring finger  
- musculocutaneous = regimental badge

Motor components  
a) Ulna: abduction fingers, thumb to little finger  
b) Radial: wrist extension  
c) Median: thumb abduction

**Examination of UL**

- Swelling and tenderness over ____  
- ROM of wrist limited due to pain  
- rotational deformity  
- neuro and motor component of median, radial and ulnar nerve intact  
- Radial/ular artery palpable  
- CRT < 2sec
Lower Limbs

Sensations

Thighs: Lateral cutaneous (lat), Femoral (ant-knee-med leg), Obturator (med), Post Cut (post)

Leg: Sciatic (lat-post-dorsal), common peroneal (lat-ant-dorsal) Femoral (med)

Foot: Deep Peroneal (btwn big-2nd toe), Tibial (rest of toes), Sural (lat)

Plantar: Sural (lat), Lateral Plantar (lat), Medial plantar (med), saphenous(med), calcaneal (heel)

Motor components

a) Iliopsoas = flex thigh at hip against resistance (knee 90 degrees)
b) Quadriceps femoris (femoral) = extend leg against resistance (flex-straighten leg)
c) Adductors (obturator) = Adduct limb against resistance

Examination:
- Swelling and tenderness over ____
- Varus/valgus
- ROM of ankle/knee/ toes limited due to pain - ROM knee up to __ degrees
- able to dorsiflex/plantarflex
- other tests: SLRT, knee lig tests, meniscus tests,
- sensations intact
- DPA/PTA palpable
- CRT < 2 sec

Anterior drawer test (Top left). Place patient supine, flex the hip to 45 degrees and the knee to 90 degrees. Sit on the dorsum of the foot, wrap your hands around the hamstrings (ensuring that these muscles are relaxed), then pull and push the proximal part of the leg, testing the movement of the tibia on the femur. Do these maneuvers in three positions of tibial rotation: neutral, 30 degrees externally rotated, and 30 degrees internally rotated. A normal test result is no more than 6 mm to 8 mm of laxity.

Lachman test (Top right). Place patient supine on examining table, leg at the examiner’s side, slightly externally rotated and flexed (20 to 30 degrees). Stabilize the femur with one hand, and apply pressure to the back of the knee with the other hand with the thumb of the hand exerting pressure placed on the joint line. A positive test result is movement of the knee with a soft or mushy end point.

Pivot test (Bottom left). Fully extend the knee, rotate the foot internally. Apply a valgus stress while progressively flexing the knee, watching and feeling for translation of the tibia on the femur.

McMurray test (Bottom right). Flex the hip and knee maximally. Apply a valgus (abduction) force to the knee while externally rotating the foot and passively extending the knee. An audible or palpable snap during extension suggests a tear of the medial meniscus. For the lateral meniscus, apply a varus (adduction) stress during internal rotation of the foot and passive extension of the knee.
In the ED

Orientation
Zones – **Green**, **Yellow** (+observation), **Red** (critical/resuscitation)

**POP room** = applying casts, removal of ROP…etc
- **Bilik rawatan** can be used to clerk patients
- **Utiliti kotor** = metal bowl (for wound irrigation)
- **Fluids** = water for irrigation, NS, HM…-
- **Prep Room** = branula, swab, heparin, tongue depressor, orange stick, etc
- cupboard opposite prep room = documents- MC, cuti sakit, AOR, admission to ward, GSH,

* Referrals may come from Green, Yellow or Red zone
Collect patient sheet from Green zone consultation rooms and proceed to Bilik Rawatan , call patient and do a General clerking

Common ED cases
- Colle’s fracture
- clavicle fracture
- shoulder dislocation
- metacarpal fractures
- DFU
- Abscess
- Femur/Tibia fractures
- ankle fractures
- STI
Common Management

Clavicle fracture (usually conservative unless severely displaced)
- look for skin tenting, pierced skin, open wound
- TRO shoulder dislocation = ask pt to touch opposite ear, raise hand
  neuro: regimental badge, radius, median, ulnar
  xray: clavicle
Plan: Pt put on arm sling, encourage pendulum exercise, analgesics, TCA 1/12
Surgical: hook plate

Radius/ulna fracture
- Swelling, ROM, sensations, pulses, numbness, (w/o Wrist drop)
- conservative: CMR under sedation, AE/BE POP, check xray acceptable, POP advice, analgesics, TCA 2/52
- surgery: Admit ward, AE/BE back slab, analgesics, IVD, circulation chart, cryocuff, elevate UL/lateral traction
  For ORIF (plating with screws), MUA,

Most common: Colle’s fracture = fall with outstretched hand
b) metacarpal
- conservative: Buddy tape / Ulnar gutter, analgesics, TCA PRN
- surgical: admit ward, RICE, analgesics, For K-wiring

c) humerus
- conservative: collar and cuff/ back slab, analgesics, TCA 2/52
- surgery: admit ward, lateral traction, cryocuff, RICE
For K-wiring, ORIF plating

d) phalanges
   Exam: CRT, 2 point discrimination, sensations, ROM,
   rotational deformity
Common- dislocation, mallet finger, chip fracture, open fracture
Dislocation: CMR under LA at ED
Mallet finger: refashioning / zimmer splint
Chip fracture- zimmer splint

   conservative: zimmer splint, TCA 2/52
Surgery: K wiring, refashioning

Shoulder Dislocation
Xrays: shoulder joint, scapula Y view, axillary view

1) Anterior dislocation – head of humerus is in front of the glenoid cavity
   signs: patient holds arm in a “hand-shake” position

Anterior Dislocation

   Lightbulb sign – The head of the humerus in the same axis as the shaft
   producing a lightbulb shape
   Internal rotation of the humerus
   The ‘rim sign’ – Widening of the glenohumeral space
   The vacant glenoid sign – Where the anterior glenoid fossa looks empty
   The ‘trough’ sign – a vertical line made by the impression fracture of the
   anterior humeral head

Posterior Dislocation

   Management: Closed Reduction under sedation/MUA, TCA 1/12
   Traction + counter traction eg: Hippocrates method, kocher’s method
LOWER LIMBS

Plan:
a) Midshaft/distal third femur or tibia
- admit ward, skin traction, watchout for compartment, analgesics, keep NBM, IVD, surgery after d/w specialist
- surgery: admit ward, AK backslab, watch out compartment syndrome, keep NBM, IVD, circulation chart, analgesics, RICE for ILN, plating, Intramedullary nail

b) Neck of femur, inter trochanteric, sub trochanteric...
- admit ward, skin traction, circulation chart, RICE, analgesics
- for hemiarthroplasty - unipolar/bipolar/Austin moore prosthesis (elderly), DHS (young)

c) ankle
- Exam: swelling, dorsi/plantarflexion, sensations, distal pulses, CRT (Weber classification)
- admit ward, BK backslab, circulation chart, RICE, analgesics,
  – plating + K wiring

d) calcaneal
- conservative: Robert-jones bandage
  – calcaneal plate

e) patellar
- conservative: Robert jones bandage
  – Tension Band wiring

f) knee OA
conservative: 1) physiotherapy 3/12 + NSAIDs, analgesics (2) intra-articular injections (hyalgan, kenocort, shincort),
Surgical: Total Knee Replacement
ACL tear = Lachman, Pivot, Anterior drawer test  meniscus tear = Mcmurray test
**Spinal – compression#, burst #, wedge #, spondylolisthesis** (Xray, CT, MRI as indicated)
- tenderness (vertebral/paravertebral), ROM, SLRT (sciatica)
- full neurological screening test- reflex, dermatomes, myotomes
- PU/BO (PR tone exam) / bulbocavernous reflex = squeeze penis head/ clitoris (or tug CBD)
- stabilization by soft neck brace/ juwet’s brace / body cast

*Fractures involving only the anterior columns are considered stable, while fractures that involve the middle or all three columns are considered unstable.

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**Wedge compression #**
- **mechanism:** hyperflexion + axial loading
- **xray:** Lateral view decrease body distance
- **Mx:** stabilization, juwet’s brace/body cast

**Burst #**
- **Mechanism:** hyperflexion + axial loading (compression of the vertebra and intervertebral disk in such a fashion that the compressed disk adjacent to the affected vertebra herniates into the vertebral body. As a result, the vertebra fractures outward with retropulsion of bone fragment into the spinal canal and an increase in interpeduncular distance (distance between the pedicles)
- **Xray:** AP/ Lateral view increase interpeduncular distance
- **Mx:** surgical
Pelvis Fractures - common in MB trauma

**TILE classification**

**Type A** injuries, the sacroiliac complex is intact. The pelvic ring has a stable fracture that can be managed nonoperatively.

**Type B** injuries are caused by either external or internal rotational forces resulting in partial disruption of the posterior sacroiliac complex. These are often unstable.

**Type C** injuries are characterized by complete disruption of the posterior sacroiliac complex and are both rotationally and vertically unstable.

**Young classification**

- Grade I - Associated sacral compression on side of impact
- Grade II - Associated posterior iliac ("crescent") fracture on side of impact
- Grade III - Associated contralateral sacroiliac joint injury

**Open Book #**

This is often the result from a heavy impact to the groin (pubis), a common motorcycling accident injury. The left and right halves of the pelvis are separated at front and rear, the front opening more than the rear, i.e. like opening a book. Depending on the severity, this may require surgical reconstruction before rehabilitation.

**Examination of Hip**

19.5 Movement (a) Forcing one hip into full flexion will straighten out the lumbar spine; the other hip should still be capable of full extension in this position. (b) Now the position is reversed; the right hip is held in full flexion. (c) If the hip cannot straighten out completely, this is referred to as a fixed flexion deformity. (d) Testing for abduction. The pelvis is kept level by placing the opposite leg over the edge of the examination couch with that hip also in abduction (the examiner’s left hand checks the position of the anterior spine) before abducting the target hip. (e) Testing for adduction. (f-h) External and internal rotation are assessed (f) first with the hips in full extension and then (g-h) in 90° of flexion. (i) Testing for extension.
18.4 Sciatic stretch tests
(a) Straight-leg raising. The knee is kept absolutely straight while the leg is slowly lifted (or raised by the patient himself); note where the patient complains of tightness and pain in the buttock — this normally occurs around 80 or 90°.
(b) At that point a more acute stretch can be applied by passively dorsiflexing the foot — this may cause an added stab of pain. (c) The "bowstring sign" is a confirmatory test for sciatic tension. At the point where the patient experiences pain, relax the tension by bending the knee slightly; the pain should disappear. Then apply firm pressure behind the lateral hamstrings to tighten the common peroneal nerve (d); the pain recurs with renewed intensity.
**Diabetic Foot Ulcer**
- Diabetic Hx: Duration- F/up clinic- Insulin/OHA
- Hx of ulcer, trauma/insect bite, self prick?, dressing, fever
- size, pus/discharge on milking, foul smelling
- necrotic patch?, ROM, sensation, DPA/PTA
- Xray of foot (DFU-OM changes, gas shadow) also order CXR
- take Tissue/pus swab → trace C & S
- FBC=Leucocytosis,
- antibiotics IV unasyn stat

**MANAGEMENT**
*Admit ward
- DXT monitoring (BD/TDS/QID)- ABSI in ward
- if for op, keep NBM (last meal ___) with IVD 4-5 pints NS
- analgesics and antibiotics

- Antibiotics+bactigrass dressing → WD → Ray Amputation → BKA → AKA
- diabetic registry before discharge

4) Infected wound, gangrene, cellulitis
- swab C & S, mark level of cellulitis
- start antibiotics – Cloxa + C Pen and Analgesics
- keep NBM, IVD, Blood Ix
post op- dressing NS + Bactigrass

**Surgery:**
Abscess → I & D ,
carbuncle → sauerization,
cellulitis/infected wound → antibx or Wound debridement

**Wound debridement** = Excision of dead or unhealthy tissue (until healthy tissue with good blood supply)

**Incision and drainage** = incision is made and pus is drained out, wound is kept open after surgery (no suture required)
ED Procedures

- Wound Irrigation
- Toilet and suturing, refashioning
- Swab C & S
- splinting: Buddy tape, zimmer splint
- bandaging: Compression, bactigrass, +NS, Robert-jones
- arm sling
- CMR, POP, Back slab, volar slab

Wound irrigation
What to get: a wash basin, 3-5 bottles NS 0.9%, gauze, crepe bandage
1. Wash wound with copious amount of NS
2. apply wet gauze on wound
3. apply compression bandage or suture where indicated

Buddy tape ➔ metacarpal, metatarsal, phalanx fractures
Taping between the digital joints (toes or fingers) allows the normal adjacent finger to protect the collateral ligament of its injured neighbor. Webril should be placed between the digits to prevent maceration of the skin
1. Cut or fold gauze to appropriate size (to fit between toes/fingers)
2. Put Gauze between toes/fingers
3. Apply tape distally and proximally

Zimmer splint ➔ For phalanx fractures
1. get zimmer splint from POP room
2. Apply padded side on palmar side, with metal facing outwards
3. Tape proximal and distally

Robert Jones bandage
Wrap around limb: orthoban - crepe – orthoban - crepe

Arm sling ➔ clavicle fractures w/o shoulder dislocation
1. Get arm sling from POP room
2. Open up arm sling, fold into neat triangle
3. The Apex part is used to support the limb, the long ends used to tie over the neck
CMR and POP

CMR under sedation (prepare in 5cc syringe)
* request drugs from sister or staff nurse, return ampule to sister!

Sedation
1) Midazolam 1ml + 4ml H2O (1cc=1mg)
   Adults give 2.5cc (half ampule/2mins) Peds: 0.1mg/kg
   (antidote = flumazenil 0.02mg/kg) 1 amp
2) Pethidine 1ml + 4ml H2O (1cc=10mg)
   Adults give ½ dose 2.5cc over 2 mins Peds: 1mg/kg
   (antidote = naloxone: 0.01mg/kg) 1 amp
20kg = 1 cc
30kg = 1.5cc
40kg = 2cc
50kg = 2.5cc
max 2.5 cc in 2 minutes

Post POP xray
1. Radial height = 10-13mm
2. Radial tilt 11 (2-20)
3. Volar tilt 10 degrees
4. Radial Inclination = 21 -25 degrees

POP
1. prepare 5 layers ortho bun, + 13-15 layers plaster
2. prepare bucket of warm water
3. dip plaster in water until bubbles disappear
4. place with ortho bun contacting skin surface internally and the plaster on the external
5. smoothen the plaster and press on affected part to fix plaster
6. apply crepe bandage
7. Perform post POP Xray!!!

Back slab
1. Take plaster and measure length required (from below MCPJ to cubital fossa)
2. Place orthoban, slightly longer than plaster (for folding)
3. Start layering plaster (up to 15 layers)
4. Prepare a pail of water, fold and dip plaster in water, going in at angle of 45 degrees, until bubbles disappear
5. Remove from water and squeeze lightly excess water from plaster using 2 fingers
6. Place plaster on orthoban, smoothen the plaster and fold edges of orthoban on to the plaster (sandwich)
7. Place this sandwich with orthoban contacting skin
8. Smoothen the plaster to fit limb
9. Wrap with Crepe bandage starting from proximal end to distal.
10. Secure with tape and allow to dry

Volar slab
1. Position patient’s hand with wrist extended 45 degrees and fingers pointing at 90 degrees
2. Measure length from DIPJ to cubital fossa
3. Layer up to 15 layers of plaster and place on slight longer orthoban
4. Submerse in water at a 45 degree angle until bubbles disappear, squeeze and place on orthoban
5. Sandwich the plaster and orthoban
6. Place sandwich, hand first, making sure the angles are kept
7. Wrap with crepe bandage

POP (best to learn from the MA or senior housemen)
1. Start by bandaging with Orthoban, from distal to proximal, overlapping 1/3
2. Hold on to one end of plaster and Submerse whole roll of plaster in water, squeeze slightly
3. Start bandaging plaster over the orthoban from wrist to hand, then to proximal, overlapping 1/3
4. Smoothen the plaster and apply next roll. The wrist should be square shaped, and the proximal end spherical

POP advice
1. Do not wet, draw, spoil POP
2. Do not put long objects inside/scratch 3. TCA stat if pain/numbness/blue
The Back Slab

1. Get a roll of POP and measure the length required on limb
2. Get a roll of Orthoban, measure required length, making sure there is enough space around the earlier measured POP
3. Start layering the POP (13-15 layers)
4. Once the layers are achieved, fold

[Diagram showing the process of applying the back slab]

5. Place POP on orthoban as depicted, smoothen the POP (mould), and fold orthoban edges over

[Diagram showing the positioning and folding of the POP]

6. Place the back slab with orthoban contacting skin and POP facing outwards.
   Make sure the foot is positioned 90 degrees.
   Wrap leg with crepe bandage to keep back slab in place
   Allow time to dry

- Volar slab is similar but with hand position as below

[Diagram showing the Volar slab with hand position]

The Ulnar Gutter – a back slab applied over the radial aspect + 4-5th fingers (leaving ulnar aspect free hence the name)
In the OT

Surgery
Elective (planned)
Emergency
Trauma list

Common Surgical Procedures
Open Reduction Internal Fixation
Plating with screws, Interlocking plate
Tension Band Wiring
TKR- Total Knee replacement
AKA/BKA- Above/Below knee amputation
Wound debridement– wound debridement

Wound exploration
Fasciotomy (for compartment syndrome)
Intramedullar nail, gamma nail, ILN
Arthroplasty + wash out
K wiring

Before entering OT – contact OT sister for orientation
1) use the correct entrance
2) wear correct surgical attire
3) Learn technique of scrubbing
4) Learn technique of closed gloving
http://www.utmb.edu/surgery/clerks/ormanual.htm

Before Op
1) check-OT List, patient’s name, age, diagnosis and procedure
2) make sure orders done – surgery ordered, Antibiotics to OT, blood or GXM available, I-I ordered, MA present
3) Write details on the OT whiteboard
4) Open patient’s history (eHIS) and Xrays (on PACS system)
5) prepare antibiotics (if indicated)
6) call MO or specialist once patient is under anaesthesia

Your duties in the OT
1) Open patient’s history on eHis
2) Open xrays
3) Write operation details on whiteboard
4) Antibiotics preparation
5) Applying tourniquet, CBD
6) hold limbs, suction, retraction, wash wound, casting etc
7) write surgeon notes
8) order any specimens

Antibiotics prep in OT
1. Take 10cc of water in syringe, inject into bottle of antibiotics (powder)
2. Shake the bottle till well dissolved. Syringe out and label correctly.
3. Give in IV line ( do not inject IM!!!), usually given by anesthesiologist

CBF
1. Get a CBD set. Prepare correct catheter, lignocaine gel, syringe, 10cc water for inflation
2. Cleanse the penis with Clorexhixidine
3. Wear sterile gloves, with apron. Drape the are
4. Administer some lubricant into urethra with syringe (1-2ml)
5. Lubricate the end of the cathether. Pull down the foreskin. Hold the penis at 90 degrees.
6. Insert the catheter slowly until urine flows out.
7. Inflate with 10cc of water (see catheter for accurate volume of water) Tug to confirm insertion.
8. Retract foreskin !! (failure to do so may result in phimosis)
9. To remove catheter, syringe out the 10cc water and tug slowly till removed completely.

*in females, steps are similar except no need to administer lube into urethra
Sizes: Male = 16 -18 F Female = 14-16 F

12 Fr ● 26 Fr
14 Fr ● 28 Fr
16 Fr ● 30 Fr
18 Fr ● 32 Fr
20 Fr ● 34 Fr
22 Fr ● 36 Fr
24 Fr ● 38 Fr
26 Fr ● 40 Fr
Applying a tourniquet

1. Find the tourniquet inflating apparatus
2. Select cuff- Small with **green** string = upper limbs, large **brown** string = lower limbs
3. Wrap 3-5 layers orthoban around area. Always apply as proximal as possible.
4. Locate the connector plug (white). Make sure it is facing towards the patient’s body
5. Apply the cuff. Hold on to end strings, wrap the strap tightly.
6. Elevate the limb to empty veins.
7. Adjust the pressure
   - **250 for UL** (*Max duration for UL = 60mins*)
   - **350 for LL** (max = 120mins)
8. Press INFLATE
Local block

1. Ring block

Two dorsal and two palmar (or plantar) nerves supply fingers and toes. These can be blocked effectively for minor surgical procedures. A fine 25 G (orange) needle should be used; after preparation of the skin the needle is inserted dorsally at one side of the base of the finger (or toe) and advanced close to the surface of the bone until its tip lies close to the palmar (or plantar) surface. Then, while slowly withdrawing the needle, inject 2-3 ml 2% plain lignocaine. Before the needle is totally withdrawn, it should be deflected and advanced to the other side and a further 0.5-1 ml injected under the skin at the point where the needle is to be reinserted to block the digital nerves on the other side of the finger. The injection of anaesthetic must be done slowly because the distension of the tissue in this region is very painful.

A rubber tourniquet should be applied immediately around the finger once the block is working to prevent dispersal of the LA and rapid regression of analgesia.

2. Ankle block

An ankle block is essentially a block of the terminal branches of the sciatic nerve. It is useful to think of the ankle block as the block of

- two deep nerves
  1. posterior tibial and
  2. deep peroneal nerves

- three superficial nerves
  1. saphenous
  2. sural
  3. superficial peroneal

This concept is crucial for the success of the block, because the two deep nerves are anesthetized by injecting local anesthetic underneath the superficial fascia, whereas the three superficial nerves are anesthetized by a simple subcutaneous injection of local anesthetic.
Deep nerves
1. Deep peroneal block

The finger of the palpating hand is positioned in the groove just lateral to the extensor hallucis longus. The needle is inserted under the skin and advanced until stopped by the bone. At this point, the needle is withdrawn back 1-2 mm and 2-3 mL of local anesthetic is injected. A "fan" technique is recommended to increase the success rate.

Deep Peroneal Block

2. Post tibial block

Posterior tibial nerve is anesthetized by injecting local anesthetic just behind the medial malleolus. Facing the medial aspect of the foot, the needle is introduced in the groove behind the medial malleolus and advanced until contact with the bone is felt. At this point, the needle is withdrawn back 1-2 mm and 2-3 mL of local anesthetic is injected.
**Sph nerves**

1. **Sph peroneal nerves**
Superficial peroneal nerve is blocked by subcutaneous infiltration of local anesthetic over the lateral aspect of the foot.

2. **Sural nerve**

3. **Saphenous nerve**
Saphenous nerve is blocked by subcutaneous infiltration of local anesthetic over the medial aspect of the foot.
Clinic Duty

Clinic days: Monday & Wednesday (starting 8am)

Your duties in clinic
1. Review existing patients
2. Clerk new patients
3. Wound inspection at dressing room
4. Any procedures necessary

Forms you need to fill
1. Physiotherapy
2. wound inspection, dressing, ROP
3. XOA
4. Time slip, MC, school leave
5. light duty slip
6. Appointment slip
7. Admission to ward

Steps
1. Collect card from counter
2. Find patient under OUTPATIENT, Unassigned list
3. Review last progress notes
4. Review patient’s latest progress (scheme as shown in progress notes section)
5. Present case to MO or specialist for next plan
6. Documentation and pharmacy orders

Daycare Duty

Daycare OT (Tuesdays 8am) – for planned procedures under LA

Daycare Intra-articular injections (Thursday 2pm)
- Check daycare book at Ortho Clinic
- bring required injections to Daycare 3rd floor (eg: shincort/kenocort), take from clinic dressing room
- prepare consent
- when patients arrive, call MO in charge
- after injection, enter simple progress notes:

*Pt came for intraarticular injection
Consent signed by pt
Injection done, no allergic reaction after injection
Patient discharged with TCA 1/52 for next cycle

- prepare discharge advice (no need summary)

Morning Passover
Every morning, Passover is at ward 5C nursing bay. You will need to learn to use the software to load xrays. Housemen on ED duty will present cases encountered the day before in ED or referrals to the specialists.

What to present: Age, sex, dominance, diagnosis, history, relevant investigations, management, TCA

CME
- every Thursday after Grand ward round, seminar room, 3rd Floor, Pejabat Pakar
- All HO are required to present 2 major presentations and 2 minor (to MO).
**Antibiotics**

IV Zinacef (zinnat) 1.5g stat. TDS ; Tab 250/500 BD

IV Unasyn 1.5g tds ; Tab 375 BD [I: infected DFU]

IV C-Penicillin 2.4 miu QID (max 4 miu) Tab Pen V 250 QID [I: cellulitis/abscess]

IV Cloxacillin 1g (2g max) QID ; C Cloxa 250mg QID [I: cellulitis/abscess]

IV Flagyl (metronidazole) 500mg, Tab 200mg TDS [I: metal, rusty iron contact]

IV Gentamycin 160-240mg

IV Fortum (ceftazidime) 1g TDS

IV Sulperazone (cefoperazone + sulbactam) 1-2g BD

IV Rocephine 2g (ceftriaxone)

IV Vanco 500mg TDS, 750mg BD

IV Ciprofloxacin 100-200-400mg BD, Tab 250-500 TDS

IV Bactrim 480mg BD, 1tab tds

T. Augmentin 500mg BD

**Analgesics**

C. Tramal 50mg TDS (>39yo)

T / IM Voltaren 50mg TDS

LMS cream 30mg

T. PCM 1g QID

IM Pethidine 50mg tds 1-2/7

C. Celebrex 200mg BD

Arcoxia (Etoricoxib) 90-120mg OD

K+

Mist KCl 15ml,

T. slow K 1tab tds

hyperK ➔ Lytic cocktail

**PPI**

Omeprazole 10mg , Rabeprazole 10mg

**H2B**

Ranitidine 150mg BD

**Calcitonin**

Miacalcic 50-100 IU EOD

Calcium lactate 100mg

**Hematinics**

Vit. B Complex 1-2 tabs OD

Ferrous Fumarate 200mg 1-2 tabs OD

Folic Acid 5mg 1-2 tabs OD

Ascorbic Acid 100mg 1-2 tabs OD

**Anti HPT**

Amlodipine 5-10mg ,

Perindopril 10mg

Prazosin 1-2-4mg

Labetalol 100-200-300mg

Nifedipine 10mg

Hydrochlorothiazide 50mg BD

**Antidiarrheal**

Lomotil 1tab TDS

**Anticoag**

s/c clexane 40-60mg (LMW heparin)

Arixtra (fondaparinux) 90mg OD

**Antiemetic**

Maxolon 10mg

misc

Lorazepam 1.75mg ON

Ranitidine 50mg

* doses may vary, check with your superior before prescribing if unsure
<table>
<thead>
<tr>
<th>Normal range</th>
<th>Causes of elevation</th>
<th>Causes of decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium (Na): 135 – 145 mEq/L</td>
<td><strong>Hypernatremia:</strong> Excessive loss of water through GI system, lungs, or skin; fluid restriction, certain diuretics, hypertonic IV solutions, tube feeding; hypothalamic lesions, hyperaldosteronism, corticosteroid use, Cushing’s syndrome, diabetes insipidus</td>
<td><strong>Hyponatremia:</strong> Congestive heart failure, cirrhosis, nephrosis, excess fluid intake, syndrome of inappropriate antidiuretic hormone secretion (dilutional hyponatremia); sodium depletion, loss of body fluids without replacement, diuretic therapy, laxatives, nasogastric suctioning, hyperaldosteronism, cerebral salt-wasting disease</td>
</tr>
<tr>
<td>Potassium (K): 3.5 – 5.0 mEq/L</td>
<td><strong>Hyperkalemia:</strong> Aldosterone deficiency, sodium depletion, acidosis, trauma, hemolysis of red blood cells, potassium-sparing diuretics</td>
<td><strong>Hypokalemia:</strong> Lack of dietary intake of potassium, vomiting, nasogastric suctioning, potassium-depleting diuretics, aldosteronism, salt-wasting kidney disease, major GI surgery, diuretic therapy with inadequate potassium replacement</td>
</tr>
<tr>
<td>Calcium (Ca): 8.5 – 10.5 mg/dL</td>
<td><strong>Hypercalcemia:</strong> Excessive vitamin D, immobility, hyperparathyroidism, potassium-sparing diuretics, ACE inhibitors, malignancy of bone or blood</td>
<td><strong>Hypocalcemia:</strong> Hypoparathyroidism, malabsorption, insufficient or inactivated vitamin D or inadequate intake of calcium, hypoalbuminemia, diuretic therapy, diarrhea, acute pancreatitis, bone cancer, gastric surgery</td>
</tr>
<tr>
<td>Magnesium (Mg): 1.5 – 2.5 mg/dL</td>
<td><strong>Hypermagnesemia:</strong> Excessive use of magnesium-containing antacids and laxatives, untreated diabetic ketoacidosis, excessive magnesium infusions</td>
<td><strong>Hypomagnesemia:</strong> Malabsorption related to GI disease, excessive loss of GI fluids, acute alcoholism/cirrhosis, diuretic therapy, hyper- or hypothyroidism, pancreatitis, preeclampsia, nasogastric suctioning, fistula drainage</td>
</tr>
</tbody>
</table>
**Fractures**
Closed - simple
Open - compound

Displaced
Non-displaced

**Complete** – bone fragments separate completely
**Incomplete** – bone fragments partially joined

**Compression fractures** – osteoporosis

- **Linear fracture**: A fracture that is parallel to the bone's long axis.
- **Transverse fracture**: A fracture that is at a right angle to the bone's long axis.
- **Oblique fracture**: A fracture that is diagonal to a bone's long axis.
- **Spiral fracture**: A fracture where at least one part of the bone has been twisted.
- **Comminuted fracture**: A fracture in which the bone has broken into a number of pieces.
- **Impacted fracture**: A fracture caused when bone fragments are driven into each other.

**ORIF**

- **Femoral Neck Fracture**
- **Repair**
- **Intertrochanteric Fracture**
- **Repair**
Salter-Harris classification of epiphyseal disk (growth plate) fractures

I: Same level as growth plate
II: Above physis (chip # metaphysis)
III. Lower/L shaped (physis+ epiphysis)
IV. Through Epiphysis (meta +physis+ epiphysis)
V. Rammed (compression #)

types I and II (CMR, POP)
types III and IV (ORIF)
Patients with type V (growth abnormalities, refer peds podiatrist)
A) Garden I fracture: incomplete #, minimally displaced (Valgus malalignment)
(B) Garden II fracture: complete #, nondisplaced
(C) Garden III fracture: complete #, partially displaced (Varus malalignment)
(D) Garden IV fracture: completely displaced, with no engagement of the 2 principal fragments.
Mason’s classification of radial head fractures

A  B  C  D
Danis-Weber classification (Ankle Joint)

*Type A* depicts a transverse fibular avulsion fracture, occasionally with an oblique fracture of the medial malleolus. These result from internal rotation and adduction.

*Type B* describes an oblique fracture of the lateral malleolus with or without rupture of the tibiofibular syndesmosis and medial injury (either medial malleolus fracture or deltoid rupture). These result from external rotation.

*Type C* designates a high fibular fracture with rupture of the tibiofibular ligament and transverse avulsion fracture of the medial malleolus. Usually syndesmotic injury is more extensive than in type B. These result from adduction or abduction with external rotation.

A= Below T-F syndesmosis + oblique # (med malleolus)  
B= Same level T-F syndesmosis (fibula) + avulsion # (medial malleolus)  
C= Above T-F syndesmosis + avulsion # (medial malleolus)
Schatzker Classification

- Type I: lateral split fx
- Type II: split-depressed fx
- Type III: pure depression fx
- Type IV: medial plateau fx considered a dislocation pattern must rule out vascular injury
- Type V: bicondylar fx
- Type VI: metaphyseal-diaphyseal disassociation

Imagine shape: I = split, I+I= depression, II+I = depression, V= bicondylar, I+V = V+I codylar split + transverse
I- Lateral split #
II= Lateral split + depression
III = pure depression
IV = Lateral split + v(U) shaped med plateau #
V = Bicondylar
VI = condylar split + transverse
### Gustilo open fracture Classification

<table>
<thead>
<tr>
<th>Gustilo type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Open fracture, clean wound, wound &lt; 1 cm in length</td>
</tr>
<tr>
<td>II</td>
<td>Open fracture, wound &gt; 1 cm in length without extensive soft-tissue damage, flaps, avulsions</td>
</tr>
<tr>
<td>III</td>
<td>Open fracture with extensive soft-tissue laceration, damage, or loss or an open segmental fracture. This type also includes open fractures caused by farm injuries, fractures requiring vascular repair, or fractures that have been open for 8 h prior to treatment</td>
</tr>
<tr>
<td>IIIA</td>
<td>Type III fracture with adequate periosteal coverage of the fracture bone despite the extensive soft-tissue laceration or damage</td>
</tr>
<tr>
<td>IIIB</td>
<td>Type III fracture with extensive soft-tissue loss and periosteal stripping and bone damage. Usually associated with massive contamination. Will often need further soft-tissue coverage procedure (i.e. free or rotational flap)</td>
</tr>
<tr>
<td>IIIC</td>
<td>Type III fracture associated with an arterial injury requiring repair, irrespective of degree of soft-tissue injury.</td>
</tr>
</tbody>
</table>

I = 1 cm  
II = < 1 cm  
III = Soft tissue laceration  
A = adequate periosteal coverage  
B = bone damage  
C = cut arteries injury

### DFU Wagner Classification

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Skin intact but bony deformities lead to &quot;foot at risk&quot;</td>
<td>Shoe modifications with serial exams</td>
</tr>
<tr>
<td>1</td>
<td>Localized superficial ulcer</td>
<td>Office debridement and contact casting</td>
</tr>
<tr>
<td>2</td>
<td>Ulcer deep to tendon, bone, ligament, or joint</td>
<td>Operative formal debridement and contact casting</td>
</tr>
<tr>
<td>3</td>
<td>Deep abscess or osteomyelitis</td>
<td>Operative formal debridement and contact casting</td>
</tr>
<tr>
<td>4</td>
<td>Gangrene of toes or forefoot</td>
<td>Local vs. larger amputation</td>
</tr>
<tr>
<td>5</td>
<td>Gangrene of entire foot</td>
<td>Amputation</td>
</tr>
</tbody>
</table>
THE NEUTRAL POSITION

This is the position from which joint movement is measured.

0° is the neutral position.

[Diagram of joint movements and angles, including terms like extension, abduction, adduction, flexion, hyperextension, valgus, and varus.]
### Table 10.1 Nerve root supply and actions of main muscle groups

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Nerve root(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sternomastoids</td>
<td>Spinal accessory C2, 3, 4</td>
</tr>
<tr>
<td>Trapezius</td>
<td>Spinal accessory C3, 4</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>C3, 4, 5</td>
</tr>
<tr>
<td>Deltoid</td>
<td>C5, 6</td>
</tr>
<tr>
<td>Supra- and infraspinatus</td>
<td>C5, 6</td>
</tr>
<tr>
<td>Serratus anterior</td>
<td>C5, 6, 7</td>
</tr>
<tr>
<td>Pectoralis major</td>
<td>C5, 6, 7, 8</td>
</tr>
<tr>
<td>Elbow flexion extension</td>
<td>C5, 6</td>
</tr>
<tr>
<td>Supination</td>
<td>C5, 6</td>
</tr>
<tr>
<td>Pronation</td>
<td>C6</td>
</tr>
<tr>
<td>Wrist flexion extension</td>
<td>C6, (7)</td>
</tr>
<tr>
<td>Finger flexion extension</td>
<td>C6, 7, (8)</td>
</tr>
<tr>
<td>Hip flexion extension</td>
<td>C7, 8, T1</td>
</tr>
<tr>
<td>Hip adduction</td>
<td>C7, 8, T1</td>
</tr>
<tr>
<td>Hip abduction</td>
<td>C8, T1</td>
</tr>
<tr>
<td>Knee extension</td>
<td>L1, 2, 3</td>
</tr>
<tr>
<td>Knee flexion</td>
<td>L1, 2, 3</td>
</tr>
<tr>
<td>Ankle dorsiflexion</td>
<td>L4, 5</td>
</tr>
<tr>
<td>Ankle plantarflexion</td>
<td>S1, 2</td>
</tr>
<tr>
<td>Ankle inversion</td>
<td>L4, 5</td>
</tr>
<tr>
<td>Ankle eversion</td>
<td>L5, 5</td>
</tr>
<tr>
<td>Toe flexion</td>
<td>L5, S1</td>
</tr>
<tr>
<td>Toe abduction</td>
<td>S1, 2</td>
</tr>
</tbody>
</table>

10.5 Examination: Dermatomes supplied by the spinal nerve roots.
18.5 Lumbar spine x-rays (a, b) The most important normal features are demonstrated in the lower lumbar spine. In this particular case there are also signs of marked posterior vertebral body and facet joint erosions at L1 and L2, features that are strongly suggestive of an expanding neurofibroma.
Note the shape and position of the bones which make up the normal carpus: (a), scaphoid, (b), lunate, (c), triquetrum overlain by pisiform, (d), trapezium, (e), trapezoid, (f), capitate, (g) hamate.
**OT surgery notes**

**Above elbow amputation**
upper left limb cleaned and sterilised with povidon
incision made over proximal 3rd above the elbow.
incision made layer by layer
wound cleaned with hydrogen peroxide followed by normal saline
wound covered with bactigrass and creped bandage

Plan: W1 CM
to transfuse another 2 pints of pack cell
inform if bandage soaked
allow orally as tolerated
vital sign monitoring
IM pethidine 50 mg tds for one day

**Above Knee Amputation**
Patient positioned supine
Area cleaned and draped
Findings as above
Skin marked 5cm above patella
Skin, subcutaneous layer and fascia incised
Neurovascular bundle found and ligated
Muscle layer cut by diathermy
Bone cut by sagittal saw
Bleeding stopped by diathermy
Fascia closed by vicryl 1/0
Subcutaneous tissue closed by vicryl 2/0
Skin closed by dafilon 3/0
Wound covered by bactigrass, gauze and crepe bandage

plan: Allow orally as tolerable
Continue antibiotic and analgesia
W1 cm
STO D14
Inform if bandage soaked
Elevate stump on a pillow
DXT monitoring 4hourly KIV to restart old medication
Monitor VS hourly till stable
Trace C&S

**Below Knee Amputation**
Pt positioned supine
Area cleaned and draped
Finding as above
Neurovascular bundle identified and ligated
Right below knee amputation done
Haemostasis controlled
Wound washed with copious amount of normal saline
Layer closed with vicryl 1/0 and vicryl/ 2/0 adn dafilon 3/0
Stump dressed with bactigrass and crepe bandage applied

Pt positioned left laterally
Unhealthy tissue over sacral sore debrided
Haemostasis secured
Wound washed with copious amount of normal saline
Compression wound dressing with bactigrass and gauze
Elasto plast is applied over the wound

Plan:
To inform if dressing soaked
IM tramal 50mg tds
T.PCM 1g qid
Continue antibiotic
W1 CM
Monitor vital sign

**arthroscopic ACL/meniscus repair**
patient positioned supine
area cleaned and draped
tourniquet inflated
Incision made medial to tubial tubercle
Gracilis and semitendinosus tendon identified and harvested
Autograft prepared and sized
Arthroscopy inserted at anterolateral and anteromedial of right knee joint
Findings as above
Fat pad and debris shaven
Radial tear of medial meniscus removed
Torn ACL identified
Tibial tunnel and femoral tunnel drilled
Autograft size 7 inserted
Stability checked with cycling of knee
Femoral side graft fixed with endobutton
Tibial side graft fixed with bioscrew
Drain inserted and wound closed layer by layer
Dressed with primapore

Plan: Allow orally once pt fully conscious
CRIB 6 hours
W1 day 3
STO D14
T. Pcm 1g QID
IM Voltaren 50mg stat and TDS
Drain chart
To complete 3 doses of IV Zinacef
Strict circulation chart of right LL

**arthrotonomy**
patient positioned supine
area cleaned and draped
I+D of right leg done --> findings as noted
left knee wound debrided and extended
left knee washout done
capsule repaired with monosyn 1
subcutaneous tissue loosely tagged with monosyn 1, distal wound left open
right leg wound packed with diluted providone soaked gauze
gauze and crepe bandage applied

**wound debridement**
Patient positioned supine
Area cleaned and draped
Findings as above
Wound debrided
Wound washed with copious amount of normal saline
Right knee washout done with copious amount of normal saline
right knee joint capsule closed with vicryl 1/0, subcutaneous and fascia closed with vicryl 2/0
both wound dressed with bactigrass and gauze
crepe bandage applied

**carpal tunnel reduction**
Procedure:
Patient cleaned and draped
Incision about 2-3cm made over proximal right wrist
Flexor retinaculum identified and released
Wound washed with Normal saline
Wound closed with Dafilon 5/0
Wound dressed with CMC & Primapore

Post op order:
Allow orally when fully conscious
Elevate hand
STO D14
T. Celebrex 200mg od
T. PCM 1g qid
Calcaneal plating + bone grafting
Patient positioned left lateral
Skin cleaned and draped
Torniquet applied
L shaped lateral incision - full skin thickness
Findings as noted
Fracture site cleaned
Bone graft inserted
Fracture reduced with temporary k wires
Calcaneal locking plate inserted
temporary k wires removed
Wound washed with Normal Saline
subcutaneous tissue closed with vicryl 2/0
skin closed with dafilon 3/0
dressed with primapore, orthoban and crepe bandage
plan: allow orally as tolerated
cont IV Zinacef 750mg to complete 3 doses
Xray on the way to ward (right calcaneum/ankle jt)
elevate right leg
continue epidural as per anaes
T. PCM 1g QID
STO D14
inform if bandage soaked
DO NOT open dressing unless patient has fever

DHS
Procedure:
area clean and draped
incision made layer by layer by lateral approach
finding as noted
guide wire inserted
check under I/l acceptable
plate inserted over the femur
guide wire drill
then plate remove and drill until 75 mm
hip screw inserted size 70mm
then 3 hole plate inserted
hole drill and screwed
check under i/i acceptable
wound washes with NS
wound close layer by layer
cmc ointment applied and LA given
Plan:
STO D14
cont iv zinacef 750mg 3 doses
im tramal 50mg tds
t. pcm 1g tds
WNB ambulation with crutches
check x-ray
allow orally once fully conscious

TKR
Finding:
Rt knee joint -fibrous tissue ++++ around the joint , osteophytes++
Rt tibia medial tibial condyle posteromedial deficiency ~25mm
Implant size - Femur component - size 3. Tibia component- size 3
Insert - size 3 . patella; size 3
Procedure incision
Pt in supine position
skin cleaned and draped
mid line incision done
medial parapatellar approach
ACL already absent
femoral notch osteotomised to expose PCL; PCL detached by
cutting diathermy
tibial plateau subluxed forwards; PCL footprint also detached
femoral drillhole for intramedullary referencing
anterior rough cut at 3deg ER
distal femur cut at 6deg valgus
femoral sizing for #D; routine completion cuts
tibial plateau exposed and drilled for IM referencing
(later assessed for standard 10mm stem - would not fit therefore
short stubby stem used)
tibial step cut jig assembled; cut level assessed - due to large defect,
10mm step cut chosen
standard medial 10mm cut attempted; saw failed halfway; cuts
completed freehand with HAm pang saw.
flexion-extension gap assessment satisfactory
overtight in varus, so full medial release performed including
osteophytes, MCL and Pes anserinus, lateral part of
semimembranosus footprint
trial components - satisfactory for #D femur, #3 tibia, 10mm medial
block
patellar tracking satisfactory
Then washout done using normal saline and pulsed- irrigation
apparatus
Surface of the bone washed pulsed saline
Femur and tibial component cemented in with Palacos
Then polyethylene insert was inserted
Final washout done using normal saline
Torniquet was deflated
Radivac drain size 10 inserted
capsule repaired using vicryl 0
Subcutaneous fat closure -vicryl 2.0
Outer skin closure- staples
Plan:
4hly vital sign
inform if dressing soak
drain chart
post op FBC
Check x-ray post OP
continue IV zinacef 750mg tds
mobilise FWB tomorrow
wound inspection day2
elevate RT leg using pillow

Incision and drainage
patient positioned supine
area cleaned and draped
+D of right leg done --> findings as noted
left knee wound debrided and extended
left knee washout done
capsule repaired with monosyn 1
subcutaneous tissue loosely tagged with monosyn 1, distal wound
left open
right leg wound packed with diluted providone soaked gauze
gauze and crepe bandage applied
allow orally, CRIB 6 hours
continue antibiotics and noradrenaline
WI cm, Trace C+S
Hemiarthroplasty
pt in lateral position
area clean and draped
incision made layer by layer by lateral approach
external rotator cut and then tag with vicryl
lateralization done by using jig
stem and trial inserted
wound washed with NS
implant inserted
wound washed once again
external rotator repair
wound closed layer by layer
cont iv zinacef 750mg 3 doses
im phetidine 50mg tds
iv t. pcm 1g tds
keep npo2 3 L
check x-ray
WI D2
FBC post op
STO D14
allow orally once fully conscious

Hip replacement
Procedure
Pt under GA
Positioned true lateral
Area prep and draped
Posterior approach to the hip
Implant identified
Femoral stem removed – size noted
Cement mantle not compromised and intact – NOT removed
Trocanteric osteotomy done to expose acetabulum
Acetabular implant removed
Acetabulum debrided, fibrous tissue removed
Wound and acetabulum irrigated
Bone graft inserted at acetabulum defect, impacted
Shell implant (acetabulum) inserted and impacted in situ
Screws inserted at superior aspect to hold acetabular shell
Acetabulum polyethylene implant inserted with cement interface
Wound irrigated
Femur prepared with reamer and broached up to size 37.5 mm
Trials inserted, femur reduced and tested for stability
Femoral canal washed
Cement restrictor inserted and canal washed again
Femoral component size 37.5 mm cemented into canal
Neck standard size inserted
Hip reduced, stability checked
Haemostasis secured, wound washed
External rotators repaired
Radivac inserted
Fascia lata repaired with vicryl 1
Tissue closed in layers
Skin closed with dafilon 3/0
Dressing done

Primary Total Hip Replacement
Pt under spinal
Positioned left lateral
Area cleaned and draped
Posterior approach to the hip
Skin curvilinear incision made
Fascia lata divided and gluteus maximus muscle split along incision line
Greater trochanter bursa excised
Short external rotator muscles identified and divided near incision line
Posterior capsulotomy done
Femoral head dislocated
Neck osteotomy done
Acetabulum visualised
Labrum excised
Reaming done up to size 48 mm reamer
Trial done to confirm stability
Shell implant 48 mm (acetabulum) inserted and impacted with bone graft in situ
3 cancellous screws to secure acetabular shell
Acetabulum polyethylene implant inserted
Wound irrigated
Femur prepared with reamer and broached up to size 37.5 mm
Trials inserted, femur reduced and tested for stability
Femoral canal washed
Cement restrictor inserted and canal washed again
Femoral component size 37.5 mm cemented into canal
Neck standard size inserted
Hip reduced, stability checked
Haemostasis secured, wound washed
External rotators repaired
Radivac inserted
Fascia lata repaired with vicryl 1
Tissue closed in layers
Skin closed with dafilon 3/0
Dressing done

Insertion of Gamma Nail
Patient was positioned supine
Area cleaned and draped
Skin incision proximal to greater trochanter
Gamma nail inserted (no reaming done in view that GT is already fractured)
checked under i-I
Lag screw followed by distal locking screw inserted
set screw inserted
wound washed with normal saline
fascia closed with vicryl 2/0
subcutaneous tissue closed with vicryl 2/0
skin closed with dafilon 3/0
dressed with primapore
Allow orally once fully conscious
IV Zinacef 750mg for another 2 doses
T. PCM 1g qid
Cap Celebrex 400mg bd
Cap Tramal 50 mg tds
strict circulation chart
check xray on the way to ward (left hip AP/lat)
Elevate Left LL
To sit up patient tomorrow
Encourage walking frame ambulation the day after tomorrow
**Knee washout**
Patient positioned supine
Area cleaned and draped
Findings as above
Wound debrided
Wound washed with cupious amount of normal saline
Right knee washout done with cupious amount of normal saline
right knee joint capsule closed with vicryl 1/0, subcutaneous and fascia closed with vicryl 2/0
both wound dressed with bactigrass and gauze
crepe bandage applied

**Ray Amputation**
Patient positioned supine
area cleaned and draped
incision made over left hand from dorsal to upper end of forearm
aspiration of hand and wrist joint was done
findings as noted
wound washed with normal saline
skin closed using brillon 3/0
wound dressed with primapore, gauze and crepe bandage
ray amputation of left 4th toe done
wound debrided and washed with NS, diluted H2O2
skin closed using brillon 3/0
wound dressed with bactigrass, gauze and crepe bandage

**MUA**
Left upper limb in valrus position (Gunstock deformity)
Pre-MUA of left elbow joint:
Extension 5 degree
Flexion 90 degree
Post MUA of left elbow joint:
Extension 0 degree
Flexion 100 degree
Allow orally
For physiotherapy of left UL --> ROM exercise
sy PCM (15mg/kg) PRN
KIV discharge cm if ptt well

**Tension Band wiring**
Findings
Comminuted fracture of left patella, 2 main segments & 1 small fragment
Procedure
Patient cleaned and draped
Midline incision made layer by layer
Findings as noted
Fracture site cleaned
Fracture site reduced
2 k-wires inserted
Tension band wire inserted
Fracture site stable
Intraarticular surface no step
Wound washed with Normal Saline
fascia closed with vicryl 2/0
subcutaneous tissue closed with vicryl 2/0
skin closed with dafilon 3/0
dressed with primapore

**Skin graft (SSG)**
Patient positioned
area cleaned and draped
Skin graft taken form left thigh
Graft applied to wound on left upper limb
Graft sutured with vicryl 4/0
Wound dressing done with Acriflavine emulsion

**Plan**
Allow orally
IM Tramal 50mg tds
T. PCM 1q qid
Check X-ray left knee (AP lat)
STO D14 (23/06/09)
Elevate leg
<table>
<thead>
<tr>
<th><strong>Full blood picture</strong></th>
<th><strong>Renal Function Test</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TWBC</strong></td>
<td>4.0-11.0 x10^9/L</td>
</tr>
<tr>
<td><strong>RBC</strong> M</td>
<td>4.5-6.5 x10^11/L</td>
</tr>
<tr>
<td><strong>RBC</strong> F</td>
<td>3.9-5.6 x10^11/L</td>
</tr>
<tr>
<td><strong>Hb</strong> M</td>
<td>13.5-18 g/L</td>
</tr>
<tr>
<td><strong>Hb</strong> F</td>
<td>11.5-16.0 g/L</td>
</tr>
<tr>
<td><strong>PCV</strong> M</td>
<td>0.4-0.54 L/L</td>
</tr>
<tr>
<td><strong>PCV</strong> F</td>
<td>0.37-0.47 L/L</td>
</tr>
<tr>
<td><strong>MCV</strong></td>
<td>76.96 fL</td>
</tr>
<tr>
<td><strong>MCH</strong></td>
<td>87.32 pg</td>
</tr>
<tr>
<td><strong>MCHC</strong></td>
<td>30.36 g/dL</td>
</tr>
<tr>
<td><strong>Neutrophils</strong></td>
<td>2.0-7.5 x10^9/L</td>
</tr>
<tr>
<td><strong>Lymphocytes</strong></td>
<td>1.5-3.5 x10^9/L</td>
</tr>
<tr>
<td><strong>Monocytes</strong></td>
<td>0.2-0.8 x10^9/L</td>
</tr>
<tr>
<td><strong>Eosinophils</strong></td>
<td>0.04-0.44 x10^9/L</td>
</tr>
<tr>
<td><strong>Basophils</strong></td>
<td>0.0-0.1 x10^9/L</td>
</tr>
<tr>
<td><strong>Platiet</strong></td>
<td>150-400 x10^9/L</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>135-145 mmol/L</td>
</tr>
<tr>
<td><strong>Potassium</strong></td>
<td>3.4-5.0 mmol/L</td>
</tr>
<tr>
<td><strong>Urea</strong></td>
<td>2.5-7.5 mmol/L</td>
</tr>
<tr>
<td><strong>Creatinine</strong> M</td>
<td>70-130 mmol/L</td>
</tr>
<tr>
<td><strong>Uric Acid</strong> F</td>
<td>130-360 mmol/L</td>
</tr>
<tr>
<td><strong>Calcium</strong></td>
<td>Total 2.2-2.6 mmol/L</td>
</tr>
<tr>
<td><strong>Phosphate</strong></td>
<td>0.5-1.52 mmol/L</td>
</tr>
<tr>
<td><strong>Amylase</strong></td>
<td>&lt;82 IU/L</td>
</tr>
<tr>
<td><strong>Glucose</strong> FBS</td>
<td>4.0-5.5 mmol/L</td>
</tr>
<tr>
<td><strong>Chloride</strong></td>
<td>98-107 mmol/L</td>
</tr>
<tr>
<td><strong>Magnesium</strong></td>
<td>0.5-1.05 mmol/L</td>
</tr>
<tr>
<td><strong>Osmolality</strong></td>
<td>225-295 mosm/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Urine</strong></th>
<th><strong>BUSE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Albumin</strong></td>
<td>&lt;150 mg/24h</td>
</tr>
<tr>
<td><strong>Amylase</strong></td>
<td>&lt;600 IU/24h</td>
</tr>
<tr>
<td><strong>Calcium</strong></td>
<td>2.5-7.5 mmol/24h</td>
</tr>
<tr>
<td><strong>Creatinine</strong> Total</td>
<td>8800-17700 umol/24h</td>
</tr>
<tr>
<td><strong>Clearance</strong></td>
<td>70-140 ml/24h</td>
</tr>
<tr>
<td><strong>Magnesium</strong></td>
<td>2.0-6.2 mmol/24h</td>
</tr>
<tr>
<td><strong>Phosphate</strong></td>
<td>162-495 mmol/24h</td>
</tr>
<tr>
<td><strong>Potassium</strong></td>
<td>40-120 mmol/24h</td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>&lt;250 mg/24h</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>80-250 mmol/24h</td>
</tr>
<tr>
<td><strong>Uric Acid</strong></td>
<td>1.5-4.4 mmol/L</td>
</tr>
<tr>
<td><strong>VMA</strong></td>
<td>&lt;51 umol/24h</td>
</tr>
<tr>
<td><strong>Osmolality</strong></td>
<td>300-900 mosm/kg</td>
</tr>
<tr>
<td><strong>Urine output</strong></td>
<td>0.5-1.0 ml/kg</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>135-145 mmol/L</td>
</tr>
<tr>
<td><strong>Potassium</strong></td>
<td>3.5-5.0 mmol/L</td>
</tr>
<tr>
<td><strong>Urea</strong></td>
<td>2.7-7.5 mmol/L</td>
</tr>
<tr>
<td><strong>Chloride</strong></td>
<td>98-107 mmol/L</td>
</tr>
<tr>
<td><strong>Ammonia</strong></td>
<td>6.0-35 mmol/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Liver Function Test</strong></th>
<th><strong>Cardiac Enzyme</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Protein</strong></td>
<td>Adult 66-87 g/L</td>
</tr>
<tr>
<td><strong>Children</strong></td>
<td>60-80 g/L</td>
</tr>
<tr>
<td><strong>Infant</strong></td>
<td>48-76 g/L</td>
</tr>
<tr>
<td><strong>Neonate</strong></td>
<td>48-68 g/L</td>
</tr>
<tr>
<td><strong>Albumin</strong></td>
<td>36-50 g/L</td>
</tr>
<tr>
<td><strong>Globulin</strong></td>
<td>28-43 g/L</td>
</tr>
<tr>
<td><strong>Billirubin</strong> Total</td>
<td>3.4-17.1 umol/L</td>
</tr>
<tr>
<td><strong>Direct</strong></td>
<td>0.8-5.1 umol/L</td>
</tr>
<tr>
<td><strong>Indirect</strong></td>
<td>2.6-12.0 umol/L</td>
</tr>
<tr>
<td><strong>AST</strong> M</td>
<td>&lt;37 IU/L</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>&lt;31 IU/L</td>
</tr>
<tr>
<td><strong>ALT</strong> M</td>
<td>&lt;40 IU/L</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>&lt;31 IU/L</td>
</tr>
<tr>
<td><strong>ALP</strong> Adult</td>
<td>39-117 IU/L</td>
</tr>
<tr>
<td><strong>ACP</strong> Total</td>
<td>&lt;10 IU/L</td>
</tr>
<tr>
<td><strong>Prostatic</strong></td>
<td>&lt;3.5 IU/L</td>
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<tr>
<td><strong>Lactate</strong></td>
<td>0.63-2.44 mmol/L</td>
</tr>
<tr>
<td><strong>CK</strong> M</td>
<td>&lt;195 IU/L</td>
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<tr>
<td><strong>F</strong></td>
<td>&lt;170 IU/L</td>
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<tr>
<td><strong>CK-MB</strong></td>
<td>&lt;25 IU/L</td>
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<tr>
<td><strong>LDH</strong></td>
<td>230-460 IU/L</td>
</tr>
<tr>
<td><strong>AST</strong> M</td>
<td>&lt;37 IU/L</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>&lt;31 IU/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Cerebral Spinal Fluid</strong></th>
<th><strong>Coagulation test</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Protein</strong> Total</td>
<td>0.15-0.45 g/L</td>
</tr>
<tr>
<td><strong>Glucose</strong></td>
<td>2.2-4.4 mmol/L</td>
</tr>
<tr>
<td><strong>Chloride</strong></td>
<td>118-132 mmol/L</td>
</tr>
<tr>
<td><strong>TT</strong></td>
<td>10-15s</td>
</tr>
<tr>
<td><strong>PT</strong></td>
<td>10-14s</td>
</tr>
<tr>
<td><strong>PTT</strong></td>
<td>35-45s</td>
</tr>
<tr>
<td><strong>Endocrine</strong></td>
<td><strong>Cortisol</strong> am 450-700 mmol/L</td>
</tr>
<tr>
<td></td>
<td>midnight 20-280 mmol/L</td>
</tr>
<tr>
<td><strong>TSH</strong></td>
<td>0.5-5.7 mU/L</td>
</tr>
<tr>
<td><strong>T4</strong></td>
<td>70-140 mmol/L</td>
</tr>
<tr>
<td><strong>T3</strong></td>
<td>30-Dec mmol/L</td>
</tr>
<tr>
<td><strong>am</strong></td>
<td>450-700 mmol/L</td>
</tr>
<tr>
<td><strong>midnight</strong></td>
<td>20-280 mmol/L</td>
</tr>
</tbody>
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