



A Geriatrician's approach to managing anaemia in the elderly trauma patient

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Content

- Ageing process and physiology
- Brief over view of the causes of anaemia
- Clinical implications
- Case examples to help explore
 - Types of injury and bleeding risk
 - Role of the Geriatrician
 - Management options

I have no disclosures

Ageing body

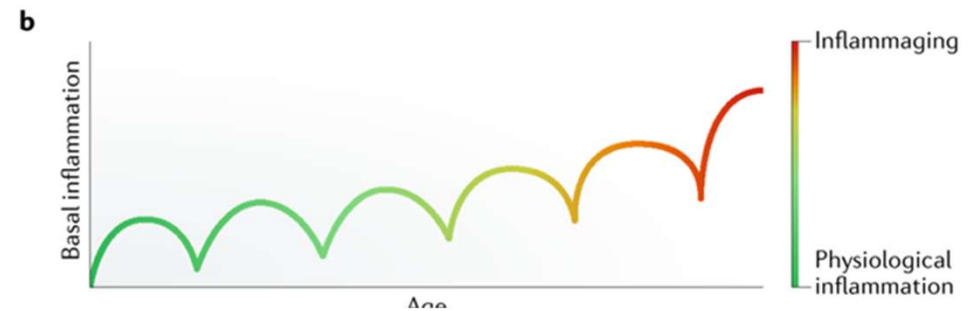
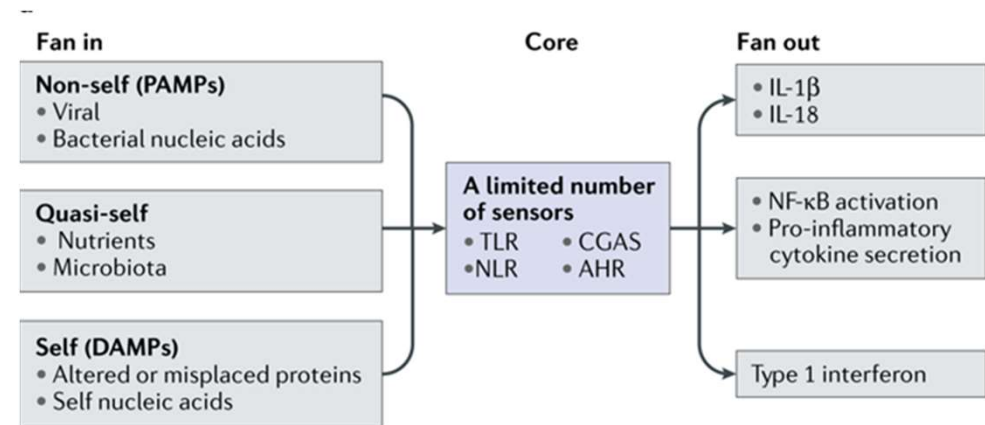
Progressive physiological changes affecting every system

- 🔥 Increased vascular stiffness, reduced cardiac output
- 🌬️ Chest wall stiffness and reduced elasticity, decreased lung function
- 👂 Reduced renal function and drug clearance
- 🍽️ Poor nutritional status and bowel absorption
- 🦴 Sarcopenia, loss of bone mass, joint and ligament stiffening

Immunosenescence

'Inflammaging'

- Low-grade pro-inflammatory state associated with the ageing process and immunosenescence
- Implicated in anaemia of unexplained cause



Franceschi C, Bonafè M, Valensin S, et al. Inflamm-aging. An evolutionary perspective on immunosenescence. *Ann N Y Acad Sci.* 2000;908:244-254.

Causes of anaemia

Anaemias based on iron/folate/B12 deficiency

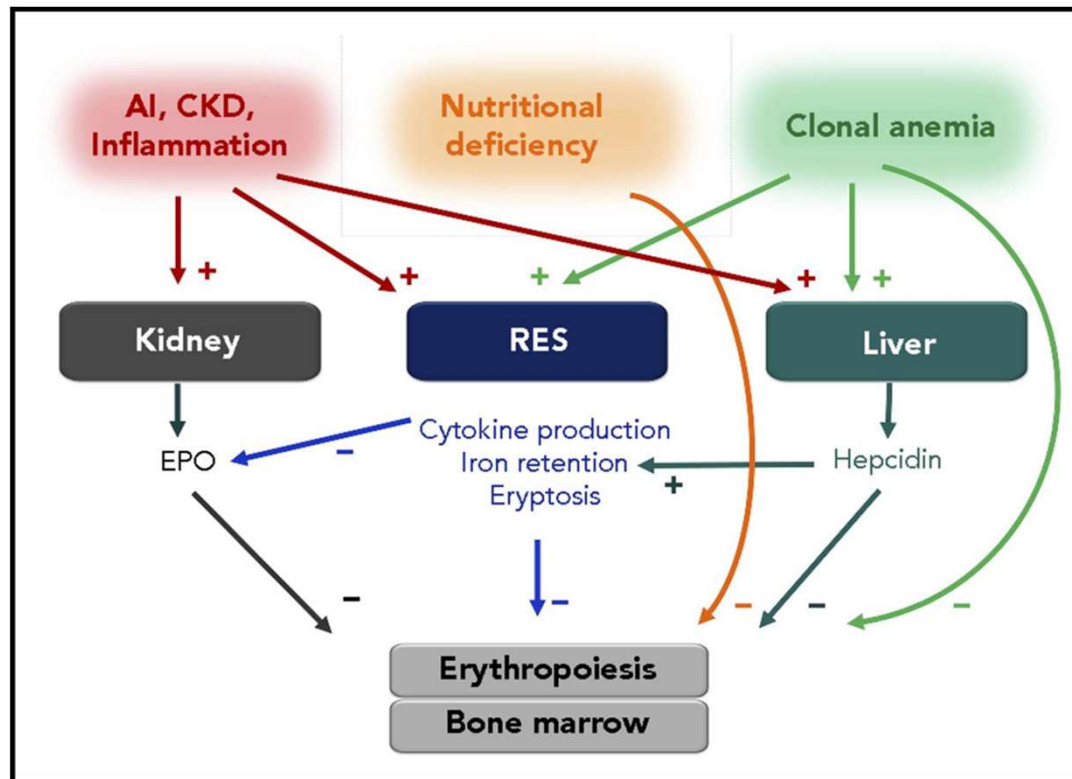
- Iron deficiency most common
- GI tract pathology eg cancer, most clinically likely in elderly
 - Malnutrition, drugs, renal and liver disease, other sources of blood loss

Anaemias based on chronic inflammation or CKD

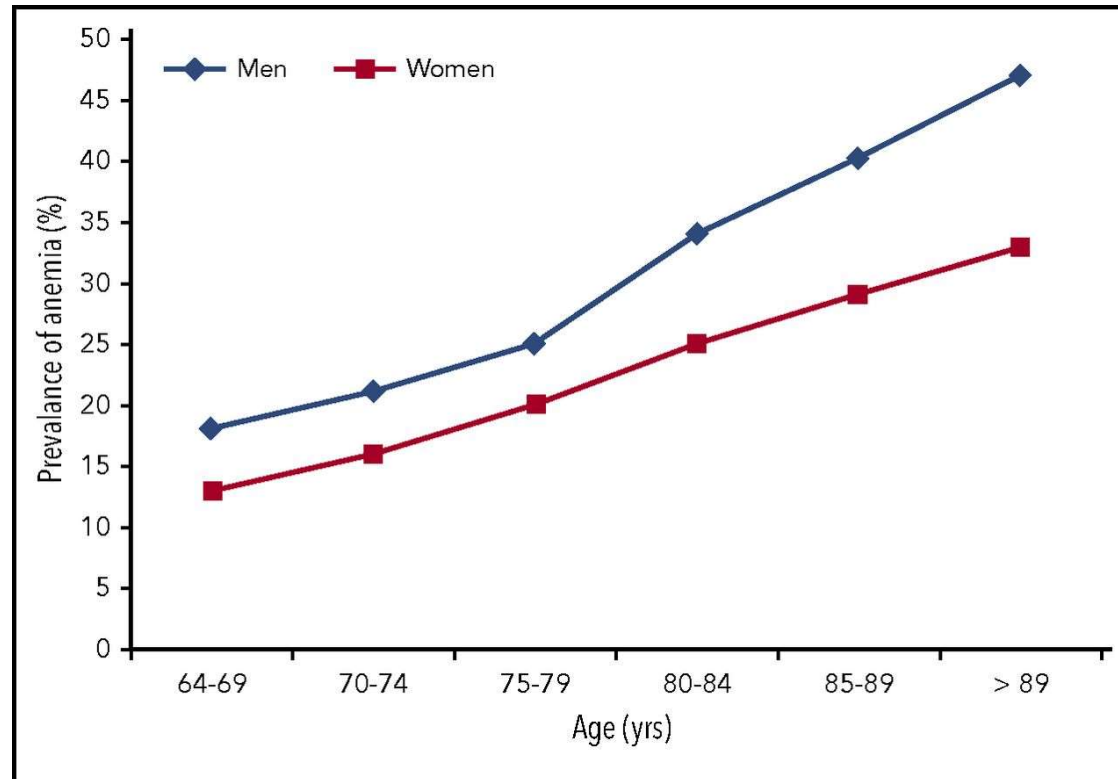
- Hyperinflammatory state present in at least 1/3 adults >65 yrs
- Multiple medical conditions
 - eg rheumatological, chronic infection, cancer, endocrine disorders and diabetes
- Inflammaging

Haematological disorders and malignancy

- Clonal leukocytes are common in the elderly

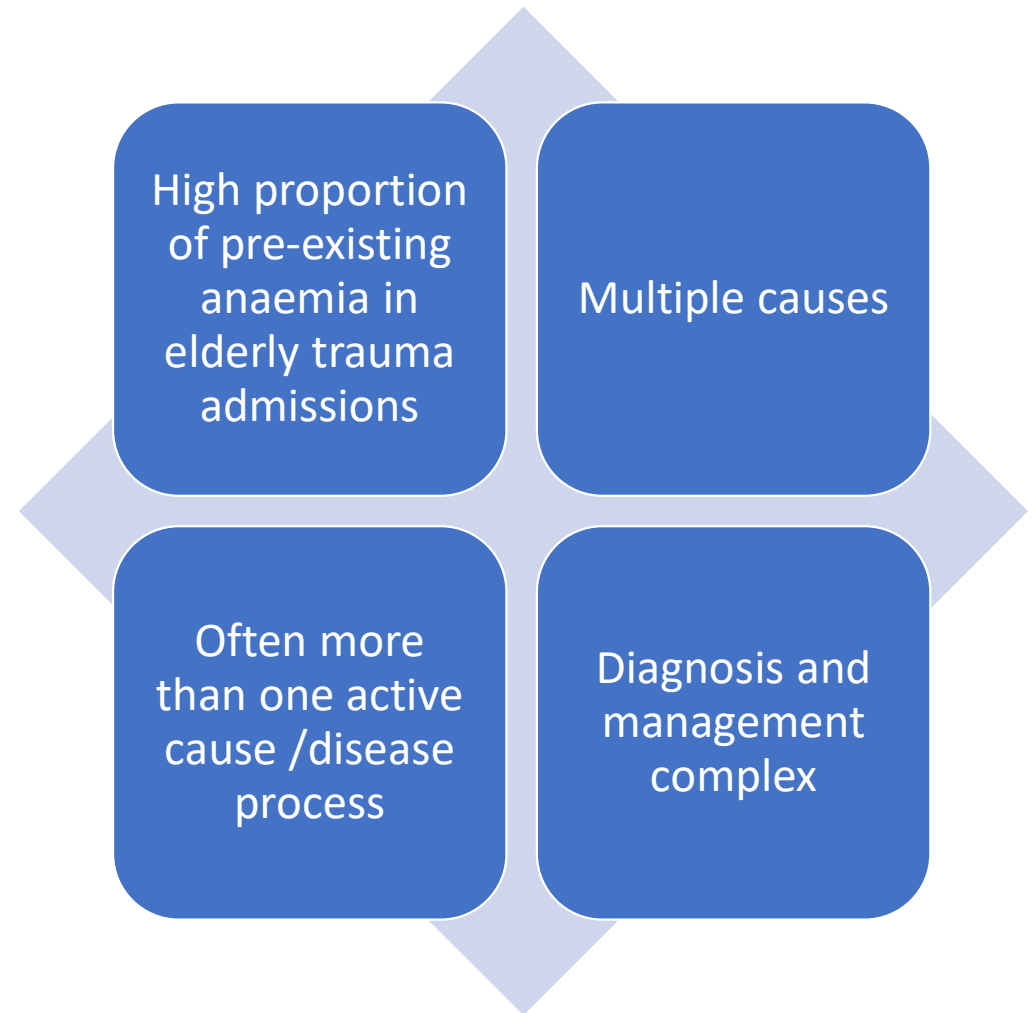


Pathophysiological mechanism



Prevalence of anaemia

So?

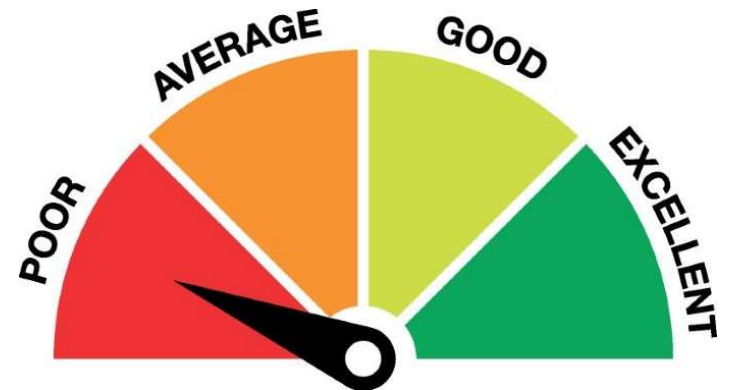


And?

Fracture type /surgery	Estimated blood loss
Femoral fracture	1000-1500ml
Tibia/fibula	500ml
Pelvis	1000-2000ml
Wrist	100ml
Hemiarthroplasty	300-500ml
Intramedullary nail	500-1500ml
Revision THR for periprosthetic fracture	1500-2000ml

Implications in trauma

- Age is an independent predictor of poor outcome following trauma
- More severe injury
- Impaired physiological responses can mask injury and prevent/delay adequate resuscitation
- Anticoagulants
- Anaemia contributes to:
 - poor post-op recovery, poor wound healing and increased infection rates
 - increased length of stay
 - increased costs



So many guidelines.....Not enough evidence



London Major Trauma System
Management of Older Major Trauma Patients
Third Edition
April 2021



NICE National Institute for Health and Care Excellence

Major trauma: assessment and initial management
NICE guideline [NG39] Published: 17 February 2016

Hip fracture: management

Clinical guideline [CG124] Published: 22 June 2011 Last updated: 06 January 2023



National Hip Fracture Database (NHFD)



MAY 2019

BOA Standard

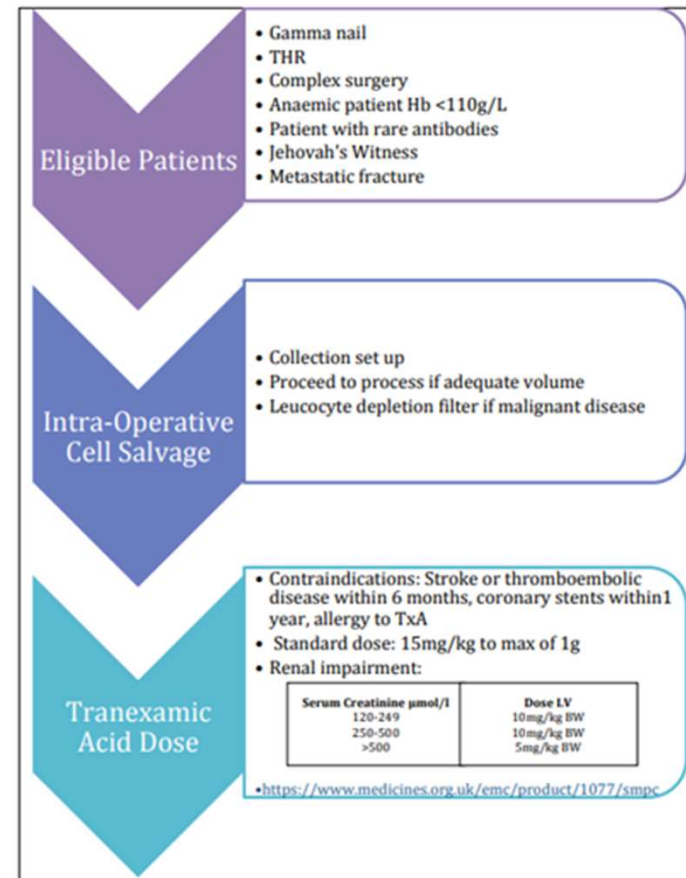
The care of the older or frail orthopaedic trauma patient

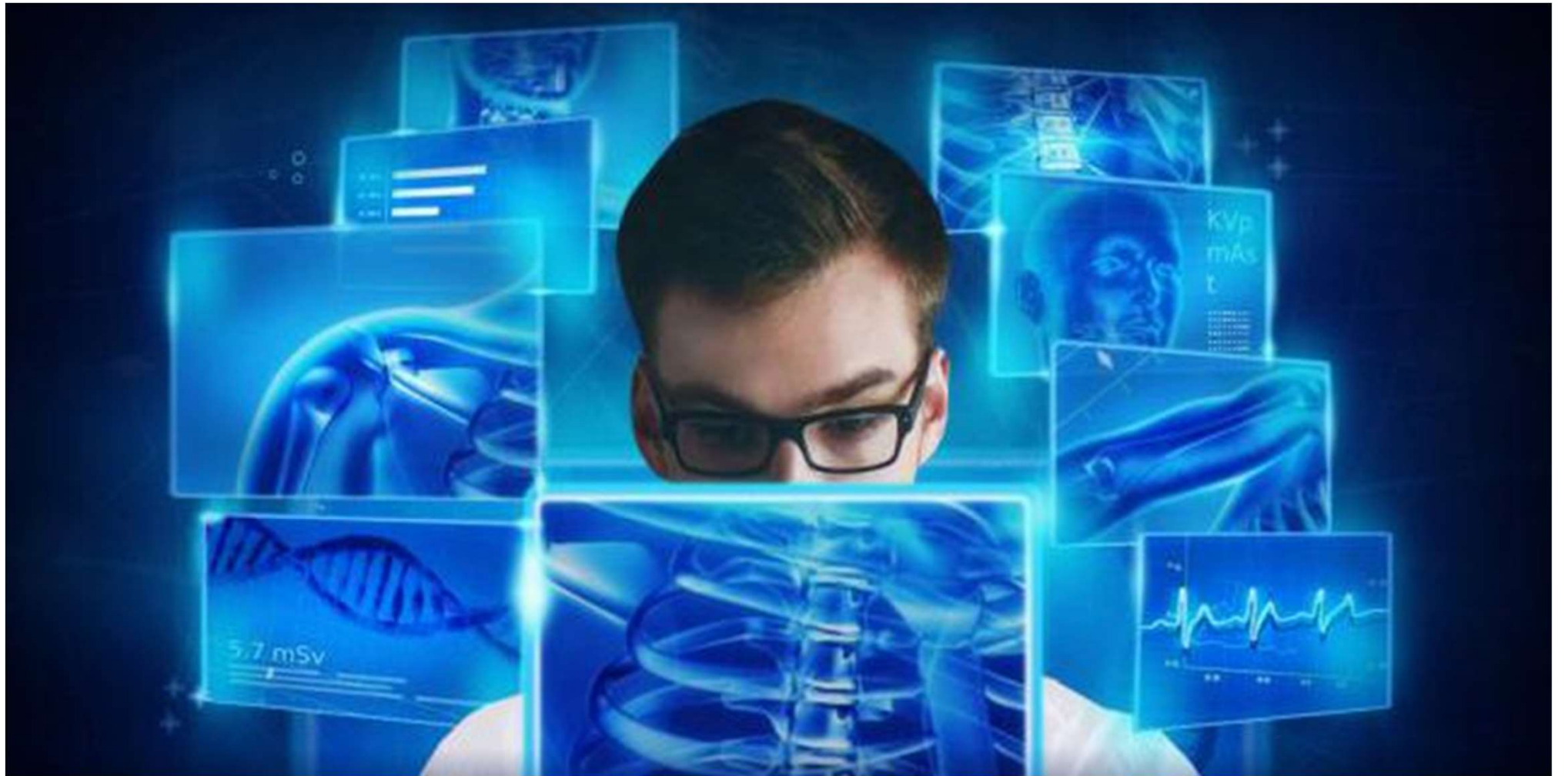
With reference to anaemia management

Pre and post op anaemia is common but no clear evidence on the optimum transfusion threshold / target

Conflicting evidence on the use of iron

Patient Blood Management in Hip fracture Surgery





Case 1



- 92 yr old male
- Fall at home resulting in right #NOF
- Active medical problems
 - Anaemia Hb 98
 - Untreated prostate cancer
- Past medical problems
 - Bowel cancer treated with a hemicolectomy
 - Pulmonary emboli (on lifelong Apixaban)

BMJ Open Should surgery be delayed in patients taking direct oral anticoagulants who suffer a hip fracture? A retrospective, case-controlled observational study at a UK major trauma centre

Barry Mullins,¹ Harold Akehurst,¹ David Slattery,² Tim Chesser¹

- Ortho team stopped apixaban
- Planned operation was DHS the next morning
- Bleeding risk = moderate
 - Long bone fracture, on apixaban, time until surgery
 - Low risk surgery
 - Already anaemic
- Geriatrician r/v
 - Already anaemic with Hb <100 likely to drop to around 80
 - Anaemia will impact rehab
 - Need to discuss ReSPECT and appropriate level of intervention

- Review of medical history and anaemia
 - Anaemic since 2021, normocytic,
 - Investigated by GP in 2022, iron deficient (ferritin 12), previous CT CAP showed normal bowel/no evidence of recurrence
 - Prostate cancer worked-up by urologists but joint decision with patient to actively monitor, no evidence metastases on bone scans
 - No evidence active bleeding, ongoing iron deficiency
- Causes for anaemia
 - ✓ Chronic low level inflammation from prostate cancer , Ageing
 - ✓ Malabsorption of iron ? Undetected chronic bleeding
 - ✓ Acute blood loss
- Discussion with patient
 - Did not want any investigation for cancer, or life prolonging interventions
 - Agreed for treatment of anaemia or symptoms
 - Pre-op Iron infusion and 1 unit blood x-matched for theatre

RESPECT

Recommended Summary Plan for
Emergency Care and Treatment

Case 1 outcome

- 1 unit blood given intra-op
- Haemocue in recovery 89
- Post-op Hb 90
- Vasovagal (drop in BP) on day one post-op during physio
- Recheck Hb 97, remained stable
- Wound healed well, minimal haematoma, apixaban restarted day 2, no further complications
- Discharged to a rehab facility at day 15



Benefits

What are the Benefits?



Risks

What are the Risks?



Alternatives

What are the Alternatives?



Nothing

What if I do Nothing?



Case 2

- 80 yr old male
- Fall resulting in a periprosthetic femoral shaft fracture
- Active medical problems
 - Anaemia (Hb 108, 117 on admission)
- Previous medical problems
 - Ischaemic heart disease, bypass grafting 2010 – on long term aspirin
 - Type 2 diabetes – stable on tablets
 - Urethral strictures – intermittent dilatations
- Stable for theatre, long wait due to specialist surgeon/kit required, aspirin withheld from admission

- Bleeding risk = high
 - Shaft fracture, aspirin, long wait
 - Open, complex surgery
- Geriatrician r/v – no additional issues identified
- Surgery completed on day 3 of admission
 - No repeat bloods pre-op
 - TXA, no cell salvage
 - Haemocue 80, patient stable in recovery
 - Post-op Hb 82
- Episode of chest pain when mobilised day 1 - Type 2 MI
 - Urgent Consultant r/v requested, significance of low Hb recognised and further investigations recommended



- Review of anaemia
 - Hb in the normal range until acute admission, normocytic
 - Vitamin B12 level 150 ng/L
 - Alcohol intake 40 units/week in previous year
 - Recurrent UTIs and haematuria until urethral dilatation 6 months prior to admission
 - Ferritin, renal function, LFTs, urine - normal
 - ✓ Chronic inflammation – diabetic, recurrent UTIs
 - ✓ Blood loss – fracture, ??haematuria
 - ✓ Alcohol and new vitamin deficiency
-
- Vitamin B12 IM loading
 - Alcohol detox and advice
 - GP to monitor

RESULT Hip

The impact of **RE**strictive vers**U**s Libera**L** Transfusion strategy on cardiac injury and death in patients undergoing surgery for **Hip** Fracture (RESULT-Hip)



Case 2 outcome

- Recheck Hb 74, postural hypotension
 - 2 units blood given
 - Delay mobilisation until Hb improved, care with posture
- Hb stable (94-100) for rest of admission
- Swollen thigh but no wound problems

- No further chest pain, minor ECG changes and troponin rise, routine cardiology follow up
- Surprisingly good rehab and d/c home at day 12

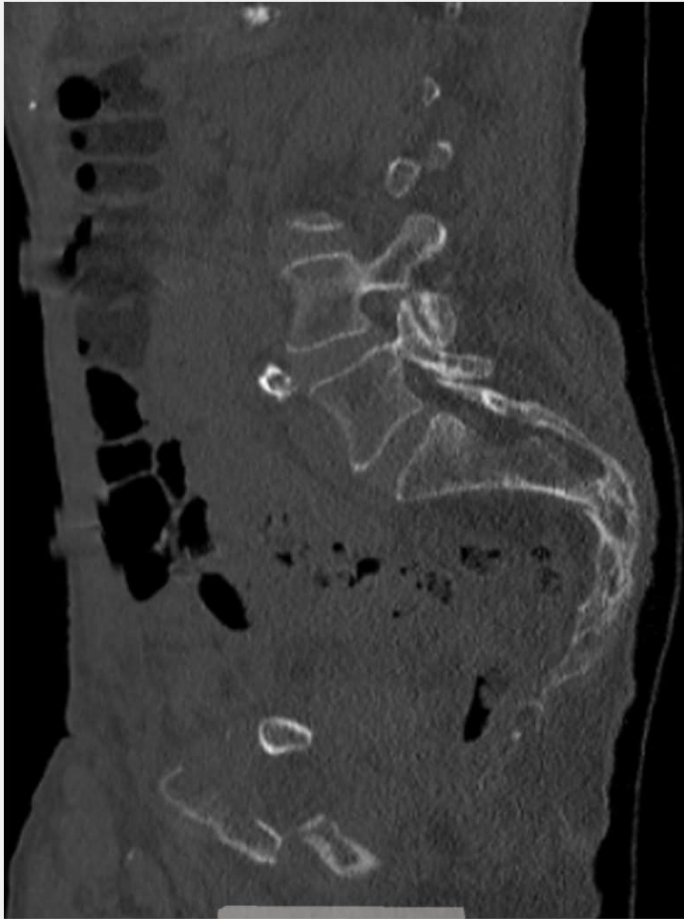
Case 3

- 72 yr female
- Fall over doorstep resulting in pubic ramus & distal radius fractures
- Dog bites to shoulder and neck
- Minor head injury
- Medical hx – mild cognitive impairment, UGI bleed due to gastric erosions 5 yrs ago

- Very stressful transfer to hospital
- Paracetamol and oramorph for pain
- Sedated for wrist manipulation
- Bloods normal (Hb 137), and all observations stable



- Referral to plastics team for wound exploration
 - No vascular injury, wounds cleaned and stitched
- Bleeding risk = low
 - Small, low risk pelvic fracture
 - No surgery required
- Deterioration on ward
 - Unwell, nauseous and vomiting
 - Ongoing pain and difficulty weight bearing
 - Unstable BP and drop in Hb to 91



- Uncertainty how to investigate
- Geriatrician r/v
 - Significant Hb drop, no evidence to support GI bleed (Urea stable, small vomits, no frank blood / melaena)
 - Ongoing bone pain
 - Highly likely to be hidden injuries
- CT pelvis recommended
- 1 unit blood and fluid boluses to stabilise BP

Case 3 outcome

- Started on omeprazole
 - No UGI bleeding during admission
- Kept on trauma discussion list
 - Low threshold for further scanning +/- surgery
- Regular Hb monitoring
 - Hb in low 90's, impact on rehab regularly evaluated
 - Haematinics normal, no other contributing causes
- Early rehab decision-making
 - Very slow rehab, tilting chair used
 - Early decision / referral for slow stream rehab on discharge
 - Managing expectations of the patient and family

references

Anemia at older age: etiologies, clinical implications, and management; R Stauder et al; Blood (2018) 131 (5): 505-514; American Society of Hematology

Trauma in the Elderly Patient, A. Atinga, A. Shekkeris et al, The British Journal of Radiology, Vol.91, No.1087

Pharmacological interventions for the prevention of bleeding in people undergoing definitive fixation of hip, pelvic and long bone fractures: a systematic review and network meta-analysis; V. Gibbs, R Champaneria et al, Cochrane Database Syst. Rev. 2019; 2019 (12)

HiFIT Study : Hip Fracture: Iron and Tranexamic Acid (HiFIT)

British Orthopaedic Association Guidelines (BOAST) (boa.ac.uk)

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Hip Fracture Management – plenty of guidelines, not enough evidence; British Geriatrics Society