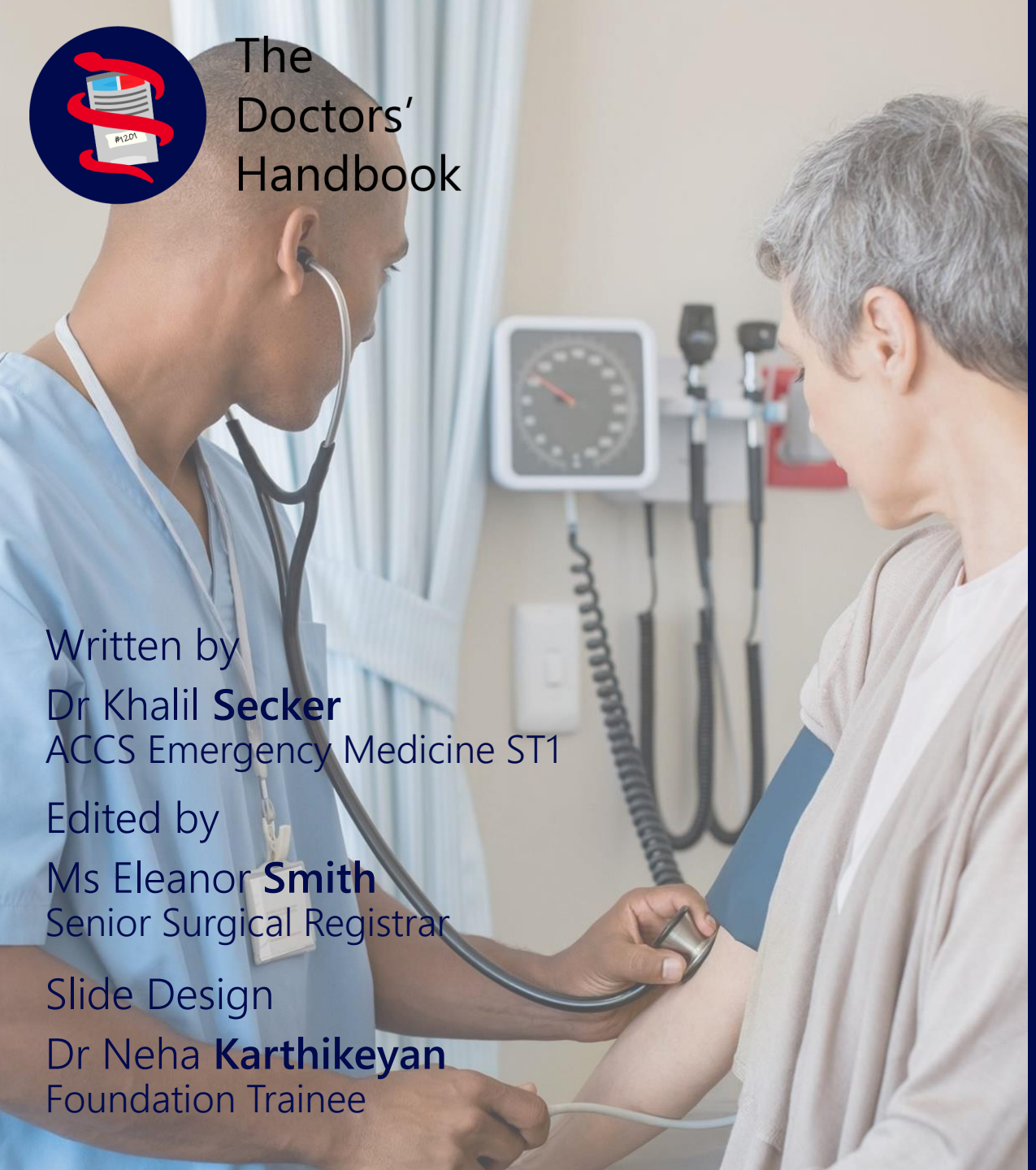

The Doctors' Handbook

You've Been **Bleeped:**

Hypotension & Falls

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This teaching session will first cover hypotension (including **post-operative** hypotension in a surgical context) followed by a **broader** consideration of falls

Hypotension – underlying causes

Hypovolaemia — Fluid failure

Reduced cardiac output
cardiogenic shock — Pump failure

Peripheral resistance
distributive shock — Pipe failure

What are some of the causes of each type?

Hypotension – underlying causes

Hypovolaemia

- Acute post-operative bleed
- Negative fluid balance/dehydration
- Third space loss e.g. ascites

Hypotension – underlying causes

Reduced cardiac output
cardiogenic shock

- Myocardial infarction
- Heart failure
- Massive PE causing RV strain

Hypotension – underlying causes

Peripheral resistance
distributive shock

- Sepsis
- Anastomotic leak
- Iatrogenic secondary to drugs used in theatre
- Iatrogenic secondary to routine medications
- Addisonian crisis

Questions to ask in the Hx

- Dizziness
- Chest pain
- Abdominal pain
- Diarrhoea/vomiting
- Oral intake
- Cough
- Urinary symptoms

You've been **bleeped:** Scenario 1

28F admitted for subtotal colectomy with ileostomy for her ulcerative colitis 2 days ago

No complications during surgery, otherwise well

Just had an SBP reading of 87

HR	SBP	RR	95%	T°
85	87	18	RA	37.2

Pt feels well. No dizziness when sitting up. No chest pain/palpitations/vomiting/diarrhoea

Scenario 1

	HR 85	SBP 87		RR 18	95% RA		T° 37.2

A Patent

B Chest clear, equal air entry bilaterally

C HS normal, CRT <2s, JVP not raised, **repeat SBP – 94**
Calves SNT, no pedal oedema

D GCS 15, PEARL, BM 6

E Mild tenderness along incision site, ileostomy looks pink and healthy

Fluid balance past 24 hours

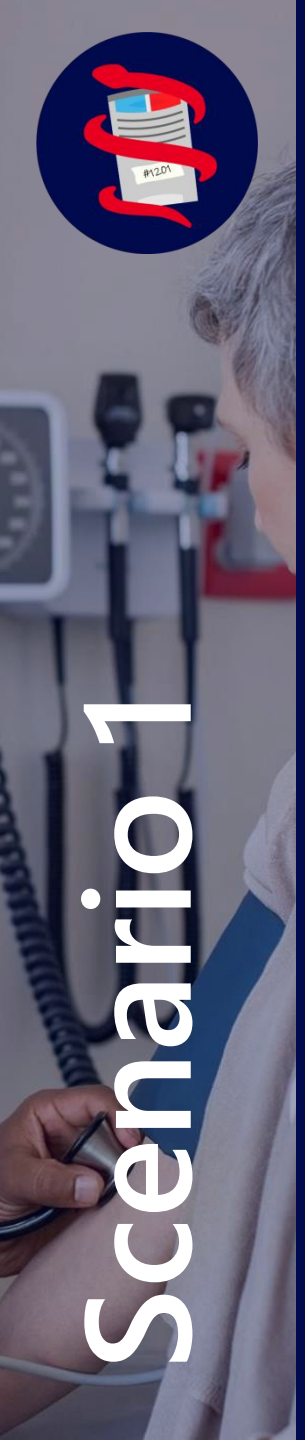
Total urine output	800ml
Total stoma output	500ml
Total IV input	2100ml
Total oral intake	300ml
Overall balance	**+1100**

Not including **insensible losses** of 500ml

Scenario 1

Looking at her obs chart, there's a trend of SBP being around 100mmHg during the day with a nocturnal dip down to 90mmHg.

The anaesthetic chart in the notes shows that the pre-op BP reading correlate with this picture. It also states that only a general anaesthetic was used, not a spinal



Scenario 1

Impression?

Impression

Normal physiology

No action required

You've been **bleeped:** Scenario 2

58M admitted as an emergency with ischaemic colitis 2 days ago, undergoing segmental colectomy with ileostomy

No complications during surgery

However, he's just had an SBP reading of 82; repeat SPB is 80.

HR	SBP	RR	97%	T°
102	80	20	RA	37

You've been **bleeped:** Scenario 2

Patient feels dizzy when sitting up in bed. Feels tired.

Has been using his PCA a lot due post-op pain

No vomiting but does feel very nauseous from the opiates in the PCA and so has had a reduced oral intake

He feels thirsty and has dry mucous membranes

You've been **bleeped:** Scenario 2

Anti-emetics have been written up PRN but none given. Patient hadn't been told about them and wasn't aware they could request any.

He has been written up for IV fluids, but his cannula came out this morning and another one hasn't been put back in yet as it's been very busy on the ward.

Scenario 2

HR	SBP	RR		T°
102	80	20	97% RA	37

A Patent

B Chest clear, equal air entry bilaterally

C HS normal, CRT 3s, JVP not raised, **repeat SBP – 84**
Calves SNT, no pedal oedema

D GCS 15, PEARL, BM 6

E Mild tenderness along incision site, ileostomy looks pink and healthy. Stoma bag is full of very loose stool. Mucous membranes appear dry

Fluid balance past 24 hours

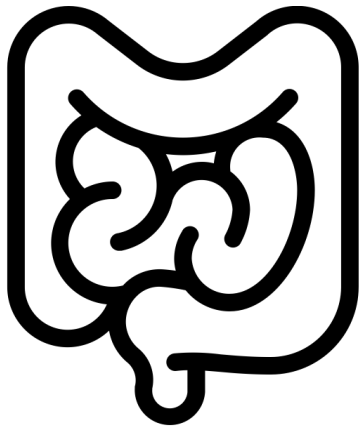
Total urine output	270ml
Total stoma output	2100ml
Total IV input	0ml
Total oral intake	300ml
Overall balance	**-2070**

Not including **insensible losses** of 500ml

Scenario 2

Impression?

Impression



Dehydration/negative fluid balance

Secondary to high output stoma/low oral intake

Consider GI infection

Management

Ensure IV access

Stat fluid bolus 500ml – repeat BP to check response
If good response (SBP >90mmHg), then 2nd bag 1L over 1hr, 3rd over 4hr, 6-8 hourly thereafter

If inadequate response dial 2222

Management

- Urgent senior review
- Increase frequency of nursing observations and keep a close eye on the patient's BP
- Repeat bloods (check for AKI / infection)
- Review drug chart for iatrogenic contributors e.g. B-blockers or ACE-inhibitors
- Stool MC&S

You've been **bleeped:** Scenario 3

48F admitted for an elective laparoscopic cholecystectomy 3 days ago

However, she's just had an SBP reading of 82

You're unable to review the patient immediately due to attending another very unwell patient. By the time you get there she's deteriorated further

Scenario 3

HR 102 | SBP 80 | RR 28 | 89% RA | T° 38.5

A Patent

B Reduced air entry bilaterally with coarse crackles at R base. You give 15L O_2 via non-rebreathe mask

C **Repeat SBP – 80**; patient is flushed and sweaty. HS normal, CRT 3s, IV cannula in situ. You write up a stat bolus of 0.9% NaCl

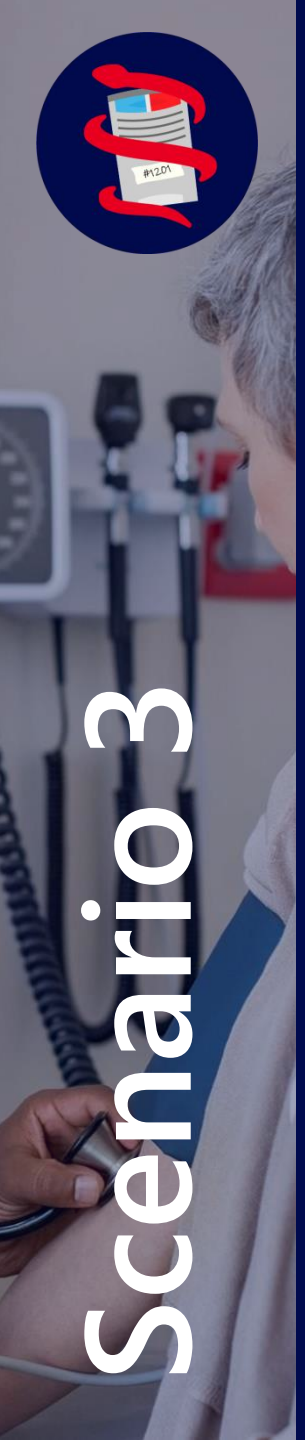
Scenario 3

HR 102 | **SBP** 80 | **RR** 28 | 89% RA | **T°** 38.5

D Drowsy but responsive to voice, BM 8.2

E Patient has mild abdominal tenderness around wound site, stoma looks pink and healthy. No rashes.

Repeat SPB – 97 (80) after 500ml stat fluid bolus

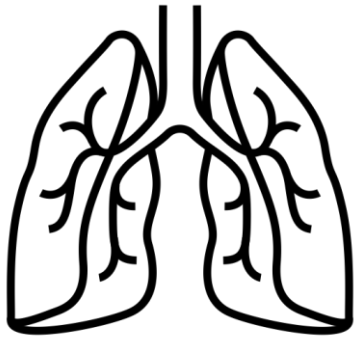


Scenario 3

Diagnosis?

Scenario 3

Impression



Chest sepsis with septic shock

Why was this patient at a **higher** risk for an LRTI?

Scenario 3

Abdominal pain → hypoventilation → stasis → **basal atelectasis** +/- infection

Atelectasis is a **common** cause of post-operative pyrexia

Adequate **pain control**, **chest physio** and **incentive spirometry** are very important for preventing a HAP

Clinical signs suggestive of sepsis

- Confusion/altered mental status
- Tachycardia
- Tachypnoea
- Hypotension
- Pyrexia or hypothermia
- High or low WBC
- Reduced urine output
- Localised signs of redness, swelling or pus

NB Pyrexia isn't always present, especially in elderly patients

Management

Escalate

For septic shock not responding to a fluid bolus – dial **2222 peri-arrest call**

If responding to fluid challenge then inform CCOT

Sepsis 7 - take 3, give 3, senior review

Take – Cultures, routine bloods, ABG for lactate and blood gases, catheter for fluid input/output chart
Give – fluids, oxygen, IV Abx

CXR

Urine dip

Inform your SpR

NB: ABG done for **hypoxia**, otherwise doing a VBG is fine

You've been **bleeped:** Scenario 4a

55M who is 24hrs post-op from a gastrectomy for a pyloric cancer

ATSP re: HR 110, BP 80/50

Patient is complaining of abdominal pain

Scenario 4a

HR	SBP	RR	99%	T°
110	80	22	RA	37

A Patent

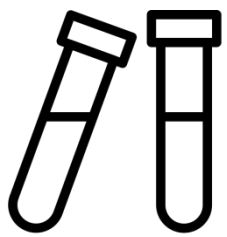
B Chest clear

C CRT 3-4s, JVP normal, **SBP – 80,** cool & clammy, calves SNT, no pedal oedema

D GCS 15, PEARL

E Abdominal distension and tenderness +++
Abdominal drain not has not produced anything

Investigations



VBG

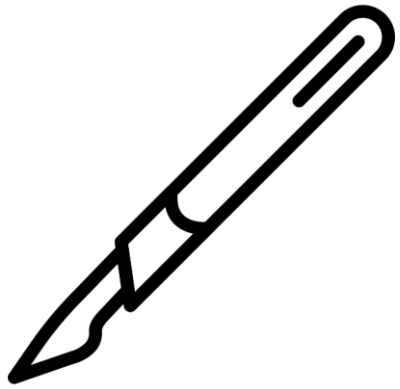
Lactate	3.2
Hb	77 (120)

NB VBGs are less accurate than lab bloods, so send off a set of bloods to the lab as well

Scenario 4a

Impression?

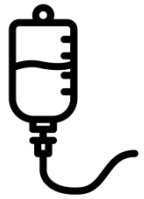
Impression



Post-op bleed resulting in shock

Abdominal drain blocked by clots / wrongly placed

Management



Stat 1000ml bolus – repeat BP after 10-15min

Urgent senior review

X-match 4 units packed RBC
2 units FFP

Scenario 4a

SBP rises from 80 to 100mmHg 15 minutes after starting the fluids

What do you **do**?

Scenario 4a

If BP is **responsive** to fluid challenge, then your senior may decide to await the cross-match from the lab

If you ring the Blood Transfusion Lab and explain the **urgency**, then they can speed things up for a turnaround time of approx. 30 minutes

Scenario 4b

SBP was 80, fluid challenge given, now 70mmHg
HR was 110, now 120 despite fluid challenge

What do you **do**?

Scenario 4b

Management of major intra-abdominal bleed in a haemodynamically **unstable** patient who is **unresponsive** to fluid challenge

Dial 2222

Activate the **Major Haemorrhage Protocol**

Ask for immediate support from the crash/on-call team

You need to ask specifically for both blood **and** the crash team

NB Different trusts will have different policies regarding their Major Haemorrhage Protocol

In some, activating the MHP via 2222 will result in **both** Flying Squad blood AND the crash team

In some others, it will only result in a porter coming to check the patient's wristband before going to the Blood Transfusion Lab. You would also need to tell the 2222 operator that you need the support of the crash team AND you would need to phone the Blood Transfusion Lab

In a nutshell: make sure you're familiar with your **local hospital protocol**

Differentials for **falls?**

Differentials for falls

Mnemonic

NIC-HIMM

N	Neuro	
I	Iatrogenic	drugs
C	Cardiovascular	
H	Hypovolaemia	
I	Infection	
M	Mechanical	multifactorial
M	Metabolic	hypoglycaemia/ hyponatraemia

Falls – overview

N Neuro

seizures/stroke

- Hx: aura, prolonged post-ictal phase, headache
- O/E: focal neurology
- Ix: CT head

I Iatrogenic

drugs

Anti-hypertensives
Sedatives
Diabetic meds (hypo)
Polypharmacy

C Cardiovascular

MI/arrhythmias/vasovagal syncope

- Hx: Dizziness, chest pain, palpitations. Cardiac syncope presents is generally sudden with no warning, whilst vasovagal syncope presents with pre-syncopal dizziness
- Ix: LSBP, ECG, troponin (if chest pain present)

Falls – overview

H Hypovolaemia

dehydration, haemorrhagic

- Hx: dizziness, poor oral intake, nausea/vomiting, diarrhoea, UGIB/LGIB
- O/E: tachycardic, hypotensive
- Ix: bloods show AKI/low Hb/raised lactate

I Infection / sepsis

- Hx: fevers, sweats, rigors, cough, SOB, dysuria
- O/E: pyrexia, sweating, tachypnoea, tachycardic, crackles on chest
- Ix: CXR, urine dip, bloods, VBG

Falls – overview

M Mechanical

dehydration, haemorrhagic

- Hx: clear Hx (either from patient or witness) of having tripped or lost their footing
- NB: usually multi-factoral. Balance, core-strength, proprioception, vision, reflexes, flexibility etc.

M Metabolic

hypoglycaemia/ hyponatraemia

- BM
- Recent bloods

Falls – overview

before

Do they remember what happened prior? Any chest pain/palpitations/dizziness/headache? Any warning symptoms at all?

during

Did they lose consciousness? Did they hit their head? Was it witnessed?

after

Were they able to get up off the floor without assistance? If they needed assistance in getting back to bed, how easy/difficult was it? Any suspicion of any injuries?

Falls – overview

Background questions for all patients:

Are they on any blood thinning meds? (especially a DOAC/warfarin)
Do they have a BG of dementia? (will be relevant both in getting a history and in determining their baseline GCS)

If there is **any** suspicion of hitting their head, ask nurses to do **neuro-obs** until you arrive

You've been **bleeped:** Scenario 5a

86F had a fall

Witnessed by nurse who was in the bay. Patient tried to get out of bed, tripped on her feet (one of her anti-slip socks was half-on, half-off) and slipped, falling onto her bottom.

She was then able to mobilise back to the bed with some assistance.

The nurse who witnessed it is the same person who phoned you, so they are able to inform you directly and with certainty that there was no head injury.

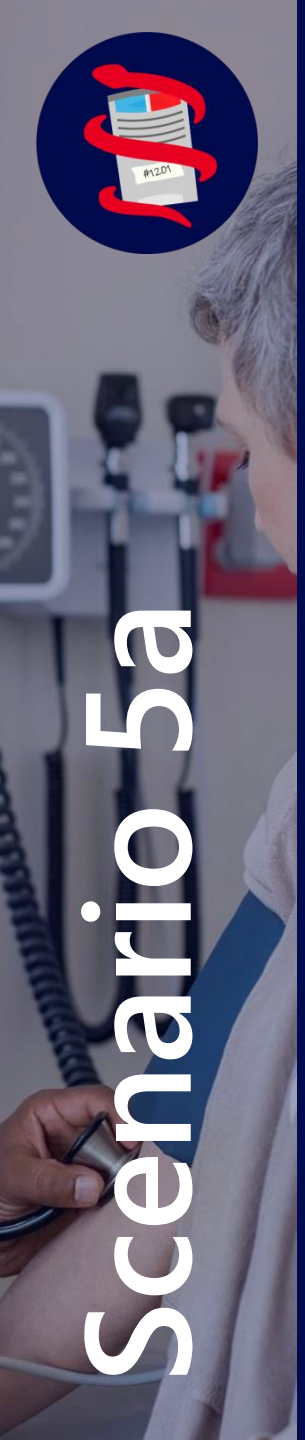
Obs – stable, EWS – 0

Scenario 5a

A B C D E intact

MSK exam

- No tenderness or bruising to scalp
- Full ROM and no tenderness to palpation of C, T and L-spine
- No tenderness to palpation of clavicles, shoulders, arms, elbows, forearms, wrists, hands
- Full ROM in hips including internal/external rotation
- No tenderness to palpation of hips, femurs, knees, tib/fib, ankles, feet



Scenario 5a

Impression?

Plan?

Impression

Trip secondary to footwear. No injury. No further action needed

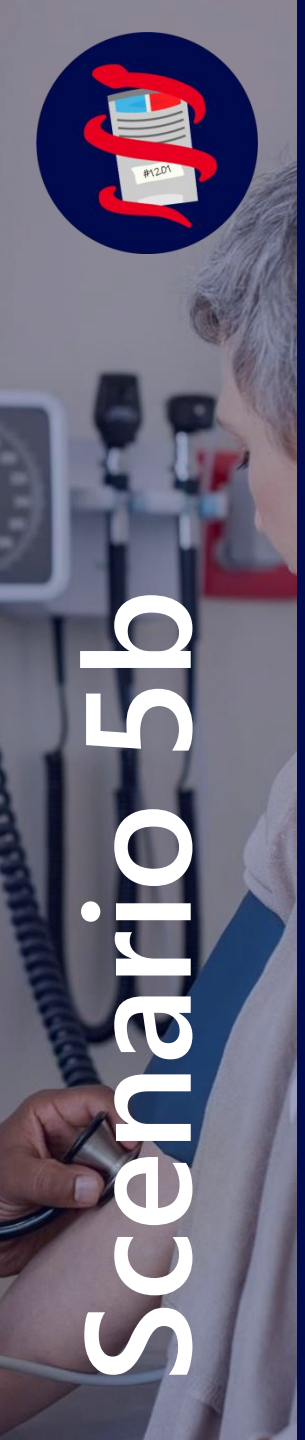
You've been **bleeped:** Scenario 5b

Same situation as before, but in this instance the patient has some tenderness in the right hip following the fall.

She can partially weight bear. She has slightly restricted ROM of the right hip due to pain.

PMHx

OA



Scenario 5b

Impression?

Plan?

Impression

Rule out #NOF

Management

Pelvic XR

Analgesia

You've been **bleeped:** Scenario 6

92M with dementia who was found on the floor in a sitting position by a nurse. Unwitnessed. They have started doing neuro obs already.

The nurse says the patient appears comfortable, but because he has dementia he is unable to recount the fall. He is on a DOAC for AF.

On assessment: Patient able to answer closed yes/no questions. Denies chest pain, palpitations, dizziness, headache or fevers.

Scenario 6

HR	114	RR	92% RA	97% 2L NC	T°
88	82	18			37

A Patent

B R basal creps, on 2L NC (target sats >92%)

C HS normal, CRT <2s, warm peripheries, calves SNT, no pedal oedema

D GCS 14 (dementia),BM 6

E Abdomen SNT

MSK exam

- No tenderness or bruising to scalp
- Full ROM and no tenderness to palpation of C, T and L-spine
- No tenderness to palpation of clavicles, shoulders, arms, elbows, forearms, wrists, hands
- Full ROM in hips including internal/external rotation
- No tenderness to palpation of hips, femurs, knees, tib/fib, ankles and feet

Neuro exam

NB: Due to patients' dementia only partially able to complete neuro exam

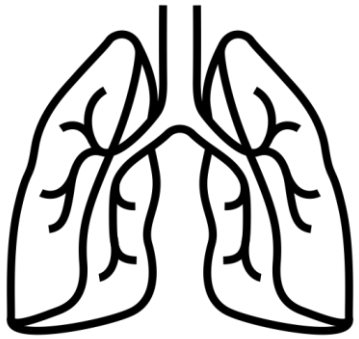
- PEARL, no facial weakness, no nystagmus
- UL: power 5/5, symmetrical reflexes
- LL: power 5/5, symmetrical reflexes, plantars downgoing

Scenario 6

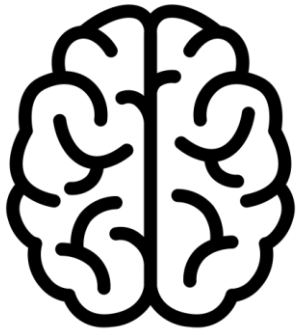
Impression?

Plan?

Impression



HAP



Need to rule out head injury in light of unwitnessed fall whilst on DOAC

Management

Neuro obs

CT head **urgently** – meets NICE criteria so can be approved by radiographer directly, no need to be approved by radiologist

CXR

Bloods including VBG

Given that patient is haemodynamically stable and apyrexic, then consider IV ABx after bloods and CXR (should only take 1 hour for results) – d/w senior

Less urgent: LSBP, ECG

Scenario 6

If he wasn't on a DOAC, but only on enoxaparin or even no anticoagulation at all – would you **still** order a CT head?

Scenario 6

Care of the Elderly specialty doctors generally have a **fairly low threshold** for doing a CT head, as the risk of a bleed from even a minor head injury is substantially higher in the older population.

If you are unsure, then discuss with your senior.

You've been **bleeped:** Scenario 7

Crash bleep goes off overnight. The team arrives to find a man sat in a chair and alert.

Nurses say he had gotten out of bed, complained of feeling dizzy then stumbled/partially collapsed into a chair.

NB: There is no suspicion of any traumatic injury as the nurse was able to partially assist him to stop him from falling over onto the floor

You've been **bleeped:** Scenario 7

HR 112

113 70

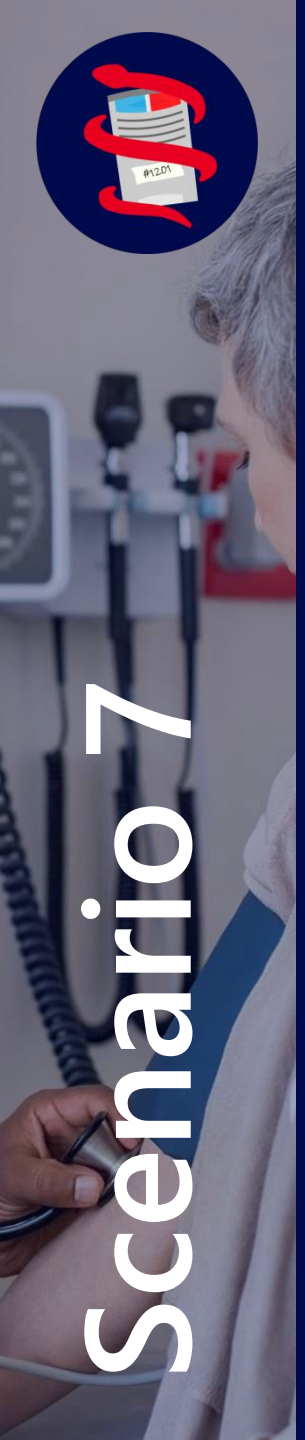
RR 18

98% RA

T° 37

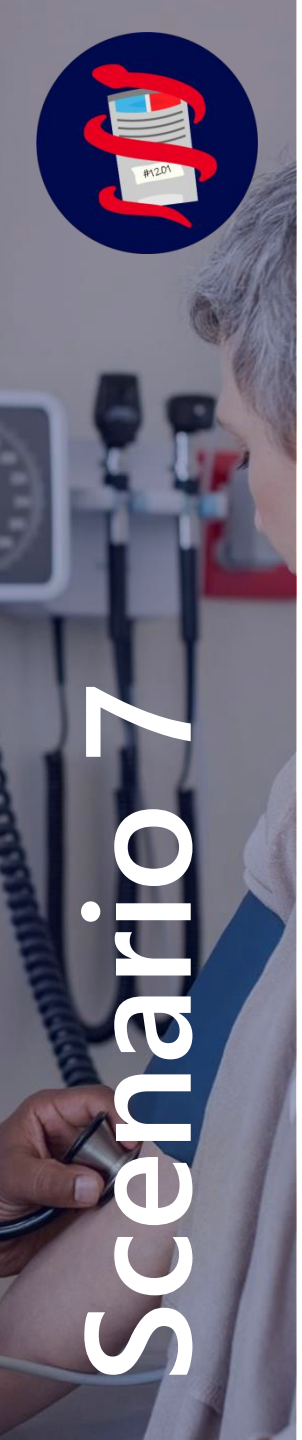
Patient says he felt dizzy on standing up and still feels somewhat dizzy (has been sitting down 2 minutes) but denies chest pain/palpitations. There was no LOC.

A-E exam otherwise unremarkable



Scenario 7

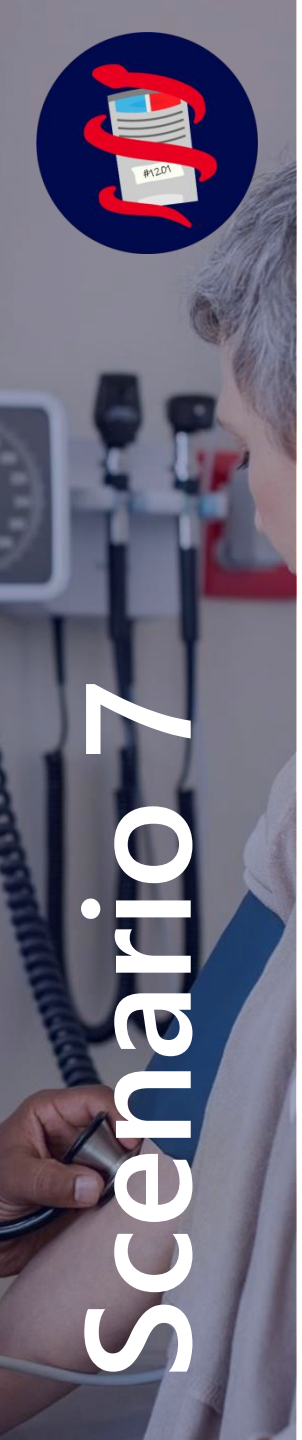
Impression?



Impression

Postural hypotension/vasovagal

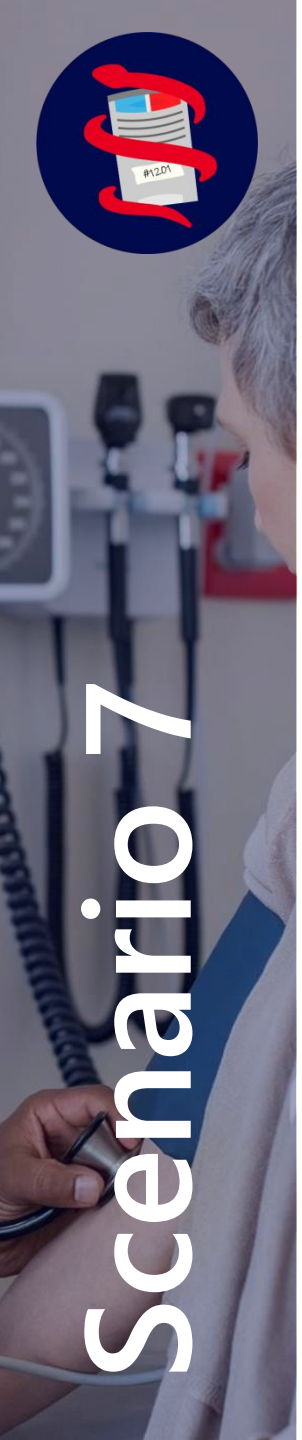
need to r/o other causes



Scenario 7

Your SHO colleague says ‘I mean it looks like a vasovagal right? I’m going back to my hypoxic patient upstairs’.

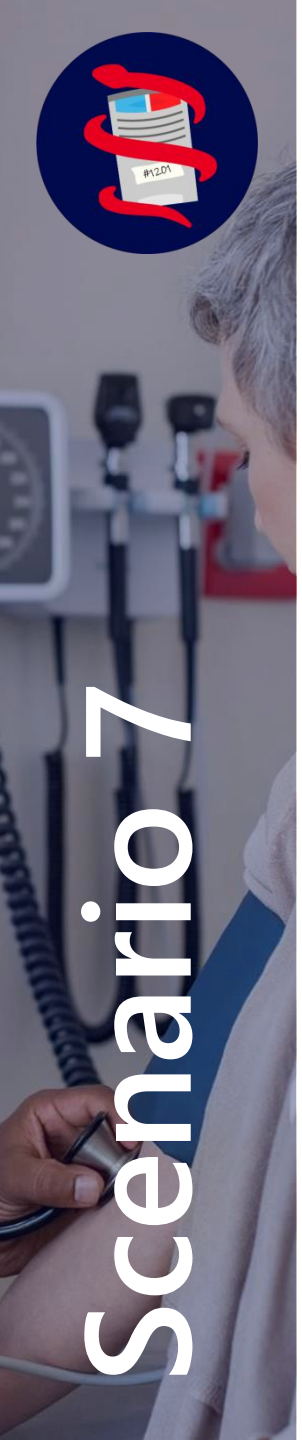
(It’s been a very, **very** busy night on ward cover)



Scenario 7

You go through his notes and discover that he was admitted under medics with an UGIB from a peptic ulcer

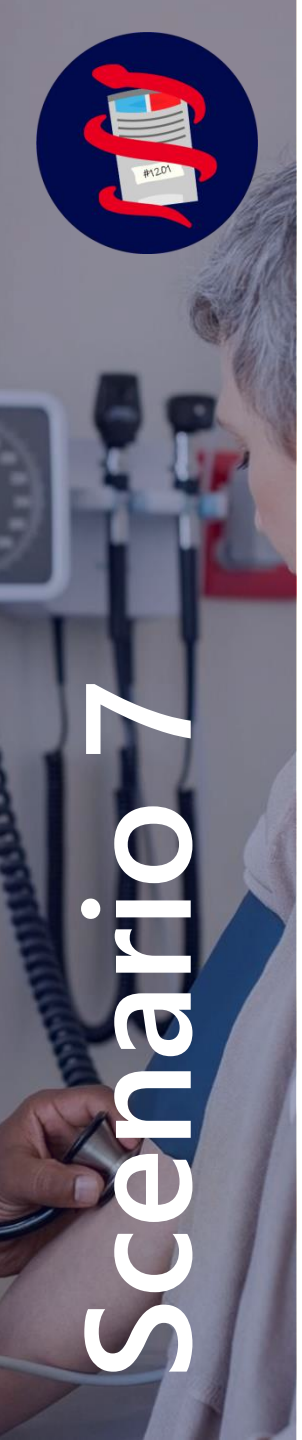
You repeat his VBG – Hb 103 (119 two days ago)



Impression

Hypovolaemia

Secondary to UGIB

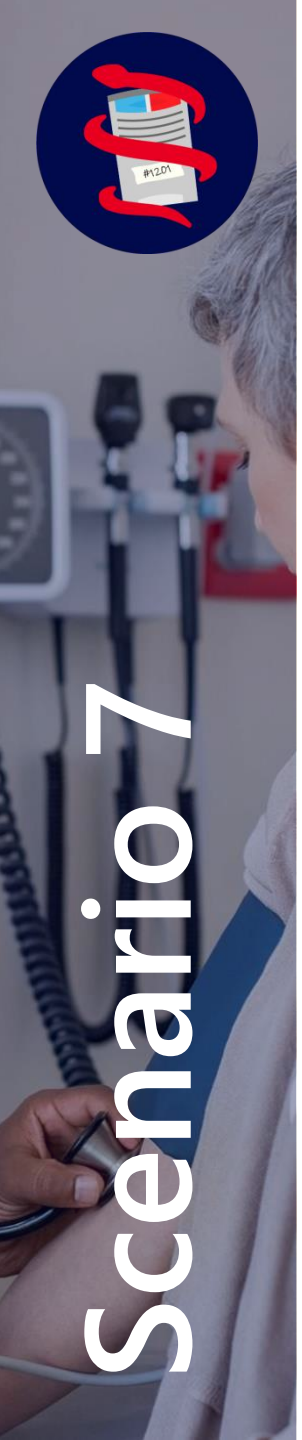


Scenario 7

Learning point:

It's often easy to assume that a fall is due to a vasovagal, a postural drop or a 'mechanical' cause.

It's important to **be systematic** in your approach and avoid jumping to conclusions.



Management

ECG (as he is tachycardic)

IVF bolus and repeat HR/BP

Repeat set of bloods – will likely need a cross match

Urgent discussion with senior

Will need an urgent OGD if not already scheduled