

## Prescribing Safety Assessment

Training Workshop

### Introduction to PSA Item authoring

*Writing Single Best Answer items*

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## Agenda

- Writing single best answer items
- PSA item styles
- House style
- Common pitfalls



## SBA's have three parts:

- A clinical scenario (the 'stem')
- A question to be answered (the 'lead-in')
- A list of possible answers (the 'options')



## First decide on the testing point

- Identify the topic (important, not trivial)
  - Draw material from encounters with students who are not certain to pass, such as:
    - unexpected ignorance
    - misconceptions
    - errors of judgement
- Limit item to a single testing point
  - think about what precise knowledge is being tested
  - ensure that correct answer demonstrates knowledge being tested



## Frame the item around the question

- Identify 4 plausible distractors that are:
  - incorrect/clearly less correct than agreed answer
  - not widely divergent
  - not worded as 'all/none of the above'
- Build the stem as a fictional scenario that includes sufficient information to choose the correct answer (and no more)



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## Planning management items (MAN)

This item type presents:

- a clinical scenario followed by a request to **identify the most important/appropriate treatment** for initial management

This will involve:

- selecting between options (e.g. medicines, fluids or other treatments) that would be of real benefit and others that would be less beneficial or harmful

The candidate will have to decide on:

- the most appropriate treatment, based on symptoms, signs and investigations



## A scenario with ONE most appropriate action

**Case presentation**  
A 70-year-old woman is admitted to hospital with worsening breathlessness and a cough productive of green sputum. PMH: Hypertension, DM, Amiodipine 5 mg orally daily, salbutamol 200 micrograms inhaled as required, amoxicillin 500 mg orally b.i.d. for 5 days, BM. Longstanding smoker.

**On examination**  
Temperature 38.5°C, HR 96/min and rhythm regular, BP 170/80 mmHg, RR 22/min, O<sub>2</sub> sat 98% (24-26) breathing air. Respiratory examination reveals a widespread expiratory wheeze.

**Investigations**  
CXR shows hyperexpansion of the lung fields and some old scarring at the left apex.

**Question**  
Select the most appropriate management option at this stage. (mark it with a tick)

MANAGEMENT OPTIONS		
A	atenolol 50 mg orally	<input type="checkbox"/>
B	fluticasone 50 mg IV	<input type="checkbox"/>
C	hydrocortisone 100 mg IV	<input type="checkbox"/>
D	oxygen 35% via a Venturi mask	<input type="checkbox"/>
E	salbutamol 5 mg nebulised in air	<input checked="" type="checkbox"/>

**Answer box**

Option A Justification  
There are no indications other than the raised blood pressure for atenolol and the presence of worsening reversible airways obstruction would contraindicate it in the acute situation.



## Templates are there to help you

The screenshot shows a digital interface for a clinical scenario. It includes a 'Case presentation' section with text about a patient's symptoms and history. Below this is a 'MANAGEMENT OPTIONS' table with five rows (A-E) and two columns for selection. To the right is an 'Answer box' with five 'Option A Justification' fields for providing reasoning for the chosen option.



## Providing information items (COM)

This item type presents:

- a clinical scenario where **someone needs information** about medicines
- a request to identify the **most important** information that should be provided to the **patient/carer/HCP**

This will involve:

- selecting the information that would be most important to provide for the patient and disregarding other potentially correct but less important information



## A scenario with ONE most important piece of information

Style Draft ID CS1 CS2 Diagnosis BNF 1 BNF 2 Age Sex Last Edit Author QA FAC DIS

COM 15 SUR MED Coagulation disorders 2 - 36 M 24-05-2016 Lyme Buntington VD - - G G O

**Case presentation**  
A 36-year-old man is assessed on the medical admissions unit for a suspected DVT following recent orthopaedic surgery to his knee. DM. Groupamin sodium 100 mg SC daily (commenced on arrival). He has been given the result of his D-dimer (subsequent positive) and told that he will require oral treatment for a maximum of 3 months.  
He is advised take warfarin sodium 3 mg orally daily.

**Question**  
Select the most important information option that should be provided for the patient. (mark it with a tick)

**Resource associated with this item:**  
No resource has been associated with this item.

**INFORMATION OPTIONS**

A	the major adverse effect of warfarin is bleeding	<input checked="" type="checkbox"/>
B	warfarin 3 mg tablets are blue	<input type="checkbox"/>
C	warfarin is better tolerated if taken in the evening	<input type="checkbox"/>
D	warfarin therapy reduces the risk of a second DVT	<input type="checkbox"/>
E	weekly blood tests will be required throughout treatment	<input type="checkbox"/>

**Answer box**

Option A Justification  
Warfarin is an anticoagulant that carries a significant risk of bleeding. This risk is reduced if the INR is regularly monitored.

Option B Justification



## Adverse drug reaction items (ADR (A-D))

4 types of ADR item style:

- A: identifying likely adverse reactions,
- B: identifying drugs causing specific adverse drug reactions,
- C: identifying drug interactions,
- D: managing the adverse effects of a drug



## There are 4 templates (A-D) (ensure you select the correct one for the question being asked)

Style	Draft ID	CS1	CS2	Diagnosis	BNF 1	BNF 2	Age	Sex	Last Edit	Author	QA	FAC	DIS
Adm-A	16	ELD	MED	Oncology symptoms/signs	4	-	67	M	23-05-2016	Lynne Bollington	VD	-	-

**Case presentation**  
A 67-year-old man has started to take morphine sulfate (Sivvedol®) 10 mg orally 4-hrly for pain associated with a gastric carcinoma.

**Question**  
Select the adverse effect that is most likely to be caused by morphine sulfate. (mark it with a tick)

**Resource associated with this item:**  
No resource has been associated with this item.

**ADVERSE EFFECT OPTIONS**

A	dizziness	<input type="checkbox"/>
B	rowsiness	<input checked="" type="checkbox"/>
C	itching	<input type="checkbox"/>
D	palpitations	<input type="checkbox"/>
E	sweating	<input type="checkbox"/>



## Drug monitoring items (TDM)

**This item type** presents:

- a scenario that involves making judgements about how best to assess the impact of planned or ongoing treatments
- demonstrating an understanding of **how to monitor** the **beneficial** and **harmful** effects of medicines and when to do so

**The correct course of action** may involve:

- deciding which tests or observations to perform
- deciding which is the most appropriate indication of outcome
- deciding on the timing of test measurements



## What (and when) to monitor – for harmful OR beneficial effects

Style	Draft ID	CS1	CS2	Diagnosis	BNF 1	BNF 2	Age	Sex	Last Edit	Author	QA	FAC	DIS
Item	16	MED	ELD	Bacterial infection	5	-	71	F	24-05-2016	Lynne Bollington	VD	-	-

**Case presentation**  
A 71-year-old woman is admitted with severe community-acquired pneumonia. She has been coughing up thick green sputum for 2 days.

**On examination**  
Temperature 36.8°C, RR 20/min. Dullness to percussion and crackles at right lung base.

**Investigations**  
CXR confirms right lower lobe pneumonia.  
Treatment with co-amoxiclav 1.2 g IV 8-hrly is initiated.

**Question**  
Select the most appropriate option to monitor for beneficial effects of this prescription in the first 3 days of treatment. (mark it with a tick)

**Resource associated with this item:**

**MONITORING OPTIONS**

A	chest X-ray appearance	<input type="checkbox"/>
B	disappearance of basal crackles	<input checked="" type="checkbox"/>
C	reduction of dullness to percussion	<input type="checkbox"/>
D	respiratory rate	<input checked="" type="checkbox"/>
E	sputum colour	<input type="checkbox"/>

**Answer box**

Option A Justification  
The chest X-ray appearance is unlikely to resolve in the early stages of treatment.



## Data interpretation items (DAT)

**This item type** will involve:

- interpreting data in the light of a clinical scenario
- deciding on the most appropriate course of action with regard to prescribing **based on the data**

**The correct course of action** may involve:

- withdrawing a medicine
- reducing its dose
- no change
- increasing its dose
- prescribing a new medicine



## DAT items MUST contain data that is required to answer the question

Style	Draft ID	CS1	CS2	Diagnosis	BNF 1	BNF 2	Age	Sex	Last Edit	Author	QA	FAC	DIS
Item	14	ELD	MED	Neurology symptoms/signs	4	-	72	M	24-05-2016	Lynne Bollington	VD	-	-

**Case presentation**  
A 72-year-old man is admitted to hospital with epileptic seizures that have been increasing in frequency. PHM. Epilepsy following a head injury sustained 5 weeks previously. He was discharged 4 weeks ago. DM. Phenytoin sodium capsules 200 mg orally daily (previously discharged taking phenytoin suspension 300 mg orally, but switched 2 weeks ago when he was able to tolerate capsules). His wife confirms that he has excellent adherence to his phenytoin.

**Investigations**  
serum phenytoin (3 weeks ago) 48 µmol/L (30–80),  
serum phenytoin (now) 32 µmol/L (40–80).

**Question**  
Select the most appropriate decision option with regard to the phenytoin sodium prescription based on these data. (mark it with a tick)

**Resource associated with this item:**

**DECISION OPTIONS**

A	phenytoin sodium 200 mg orally daily	<input type="checkbox"/>
B	phenytoin sodium 250 mg orally daily	<input checked="" type="checkbox"/>
C	phenytoin sodium 300 mg orally daily	<input type="checkbox"/>
D	phenytoin sodium 400 mg orally daily	<input type="checkbox"/>
E	phenytoin sodium treatment should be discontinued	<input type="checkbox"/>

**Answer box**

Option A Justification  
Preparations containing phenytoin sodium are not bioequivalent to those containing phenytoin base (such as Doanville suspension): 100 mg of phenytoin sodium is approximately equivalent in therapeutic effect to 82 mg phenytoin base. A further dose increase, with careful monitoring, may be required when switching from liquid to tablets.



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## House style

PSA Item writing manual sets out preferred approach to drafting PSA items:

- intended to ensure consistency of presentation to allow candidates to speed-read text and avoid wasting time

It includes:

- detailed descriptions of each item style
- guidance on good item writing
- house style guide
- accepted abbreviations
- reference ranges



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## Common pitfalls

- Item on the wrong template
- Information presented out of order in case presentation, examination or investigations
- Inclusion of superfluous detail in case presentation
- Use of unlisted abbreviations
- Options in Providing Information Items using inappropriate language/terminology
- Options listing drugs for which no indication is given in stem
- Data Interpretation items containing no data, or data unlikely to affect decision re drug dosage
- Incomplete Justifications for answers



## Reviewing real item usage data

Fac: 35.0%  
Dis: 0.044

This item may have been ambiguous, or the optimum answer open to debate

**Case presentation**  
An 82-year-old woman is reviewed in the pain clinic. She complains of chronic severe lower back pain following a mechanical fall 6 weeks ago in which she sustained an L2 wedge fracture. PMH: Hypertension, depression, osteoporosis. DM. Loxoprofen sodium 75 micrograms orally daily, mitazapone 15 mg orally nightly, niaspan sodium 36 mg orally weekly, co-codamol 800 units orally 12 hourly, paracetamol 500 mg orally 6 hourly and cyclocodone 2.5 mg as required. She is taking a total of 10 mg oxycodone orally daily.

**On examination**  
Vital signs are normal. Glasgow coma score 15/15, mini-mental state examination 29/30. Weight 44 kg.  
She is advised to apply oral buprenorphine 5 micrograms/hour transdermal patch topically weekly.

**Question**  
Select the most appropriate monitoring option to assess the beneficial effects of this treatment. (Mark it with a tick)

MONITORING OPTIONS		
A	ask the patient's opinion after 7 days	<input checked="" type="checkbox"/>
B	assess breakthrough analgesia requirement after 24 h	<input checked="" type="checkbox"/>
C	assess pain score after 3 days	<input checked="" type="checkbox"/>
D	count the number of patch changes after 3 days	<input checked="" type="checkbox"/>
E	measure respiratory rate after 24 h	<input checked="" type="checkbox"/>

**Answer box**

Option A Justification  
Although the patient's subjective view should be considered, there are more appropriate and objective methods available. An assessment should be made sooner than 1 week after initiation of therapy.

Option B Justification



## Reviewing real item usage data

Fac: 68.5%  
Dis: 0.296

This item required more than just 'look up' skill and performed well

**Case presentation**  
A 37-year-old woman is referred to the emergency department with a 3-day history of fever and back pain. PMH: Hypertension, occasional back pain. DM. Heroin 5 mg orally daily, amoxicillin 5 mg orally daily. She weighs 60 kg. A provisional diagnosis of acute pyelonephritis is made and she is treated with gentamicin 120 mg by slow IV injection 8 hourly.

**Investigations**  
Serum gentamicin:  
blood sample drawn just before third dose 2.3 mg/L (0.2-0.9 mg/L)  
blood sample drawn 1 h after third dose 0 mg/L (0-10 mg/L)

**Question**  
Select the most appropriate dosage of gentamicin based on these data. (Mark it with a tick)

DECISION OPTIONS		
A	120 mg IV 12-hourly	<input checked="" type="checkbox"/>
B	120 mg IV 8-hourly	<input checked="" type="checkbox"/>
C	120 mg IV daily	<input checked="" type="checkbox"/>
D	80 mg IV 12-hourly	<input checked="" type="checkbox"/>
E	80 mg IV 8-hourly	<input checked="" type="checkbox"/>

**Answer box**

Option A Justification  
Raised trough concentration indicates need to reduce dosing frequency.



If you have questions, please contact me:

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