PHA – 6020Y

Person Centred Medicine from Bench to Bedside

Pain workshop

Student Name

Staff

Learning Outcomes

By the end of this workshop you will be able to:

- Make recommendations regarding pre and post-operative analgesia including:
  - Step up/step down of analgesia
  - Use of PCA
  - Prescribing for neuropathic pain
- Identify features of opioid toxicity including appropriate management
- Make recommendations on the management of palliative care including:
  - Calculating dose equivalents
  - Calculating PRN doses for breakthrough pain
  - Look at syringe driver compatibilities

Resources

- On Bb:
  - Screencasts: Pain clinical management / PCAs / Epidurals
  - NNUH Naloxone guideline for Task 2

Task 1 Post-Op Analgesia & Neuropathic Pain

Mr Stuart Hale is a 61yr old male, date of birth 18/01/1963, admitted to the surgical admissions unit for planned lower left leg amputation.

Address: Flat 3b, Bengal Tower, Flatplace, FL8 0LK

Medical History:
Hypertension
Type 1 diabetes mellitus
CKD 3 (baseline eGFR = 55ml/min/1.73m^2)

Drug History:
Ramipril 5mg OD
Furosemide 20mg OD
Simvastatin 40mg OD
Novorapid 8 units with meals
Lantus 18 units at night

Note: Caused by uncontrolled diabetes causing damage to nerves (easy to injure) and blood vessels, restricting blood flow can cause cell death or lack of immune cell delivery to infection sites impaired wound healing = gangrene.

Mr SH is planned to go to theatre though he is complaining of uncontrolled pain, he is currently prescribed:

- Paracetamol 1 g QDS PO
- Codeine 30 mg QDS PO

1. What signs and symptoms of pain might we see for this patient? What changes or additions can be made to Mr SH's medications to control his pain pre-operatively?

Patient reported pain, pain score.
Blood pressure, pulse rate (increased) respiratory rate (increased).
Check adherence.
Could try an alternative weak opioid (tramadol/dihydrocodeine) however low doses as renally impaired.
Stronger opioid if severe pain - PRN oxycodone liquid (1.25-2.5mg 2hrly PRN) (not morphine as CKD3).
NOT NSAID as CKD.

2. Mr SH has his lower leg amputated and is returning to the ward.
He is about to be initiated on:
Patient Controlled Analgesia (PCA) pump: Morphine - bolus 1mg, lockout 5 minutes.
Morphine 10mg/5ml liquid, 2.5mg PO 4 hourly PRN.
What pharmaceutical care issues can you identify regarding the two prescriptions above?

Pharmaceutical Care Issue	Action
CKD3 with baseline eGFR<60 & morphine chosen as the opioid (risk of accumulation due to impaired renal excretion)	Switch to fentanyl (NNUH guidance = 20mcg/ml concentration = 20mcg (1ml) dosing with 5 minute lockout) Note: If neuropathic pain – ketamine may be used also in the PCA alongside opioid (neuropathic pain not currently indicated)

Pharmaceutical Care Issue	Action
Oral morphine also charted	Assess whether oral or PCA route is most appropriate and stop one of the prescriptions. Whichever prescription continues – less renally excreted opioid (if PCA then fentanyl, if PO then oxycodone liquid)

Pharmaceutical Care Issue	Action
Other prescriptions not in place for opioid side effects and for non-opioid analgesia	Anti-emetic PRN in case of N&V side effects e.g. cyclizine 50mg TDS PRN – protocols for PO/IV/IM depending on route availability. Other considerations depending on signs/symptoms – naloxone for reversal, chlorphenamine for itching (4mg QDS PRN), laxatives if using opioid regularly (stimulant and osmotic e.g. laxido and senna – not bulk forming) Non-opioid analgesia e.g. paracetamol 1g QDS PRN

3. What are the treatment options for step down analgesia once the PCA is removed?

Paracetamol PO 1G QDS (or every 4-6 hours) (>50kg, LFTs in range)

Depending on PCA usage:
Strong opioid: oxycodone liquid 1.25-2.5mg 2 hourly PRN
Weak opioid:
Codeine PO 15-30mg QDS(or every 4-6 hours)
Tramadol PO 50mg QDS (or every 4-6 hours)
Dihydrocodeine PO 30mg QDS (or every 4-6 hours)

NOT Ibuprofen PO 400mg TDS – CKD3
NOTE: On discharge – aim to step down to a weak opioid with paracetamol, dependent on pain level. May be discharged with both and instructed to step down to codeine once able. ALL SHORT TERM prescriptions & follow ups arranged if necessary.

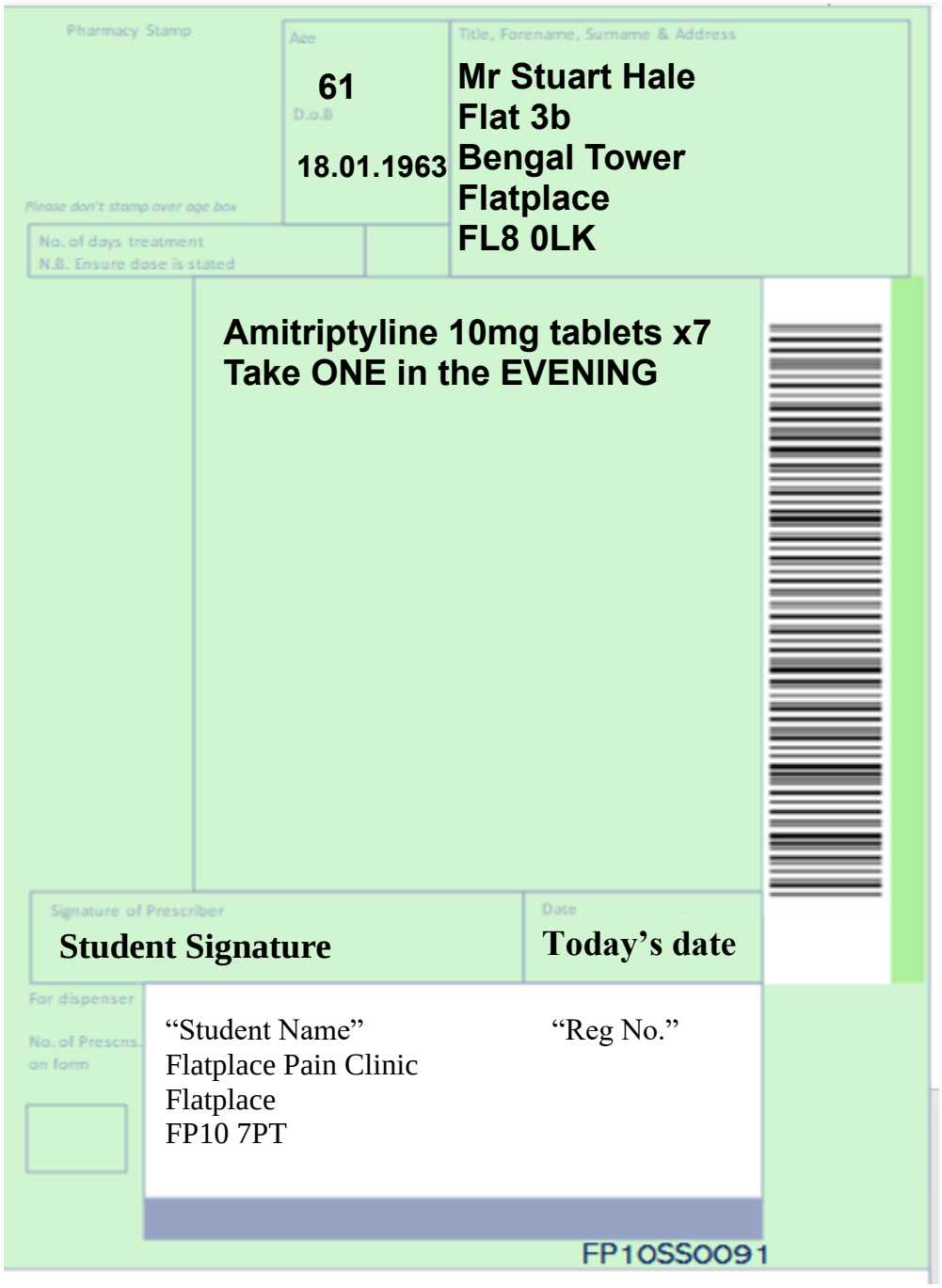
You are a now a prescribing pharmacist in Mr SH's GP surgery. He is attending your pain clinic 1 month post-op. Despite taking his analgesia prescriptions regularly, he is feeling pain and itching in his amputated leg; he describes the pain as mostly a tingling sensation but sometimes a sharp shooting pain.

4. What is the likely cause of Mr SH pain? What would you prescribe for Mr SH's pain management?

Phantom limb syndrome – pain is experienced in the lost limb, this can present as burning, itching and pain in the missing limb. Thought that the pain could be due to the peripheral nerves in the stump which are sensitive to stimuli – treated as neuropathic pain.
Pharmacological options: Amitriptyline/Gabapentin/Pregabalin/Duloxetine
Amitriptyline MOST appropriate as:
Duloxetine off-label use (BNF only has doses for diabetic neuropathy, not 'neuropathic pain' as with the others)
Gabapentin/Pregabalin have renal clearance issues – BNF recommends dose reductions for these drugs, however, has no recommendation for amitriptyline as this is not an issue.
Non-pharmacological treatment can help with this such as relaxation, medication, physical exercise.

5. Write a prescription which is the most appropriate option for controlled Mr Hale's pain, at the lowest recommended dose. You will follow up with Mr Hale in 1/52. You are prescribing in: Flatplace Pain Clinic, Flatplace, FP10 7PT

Legal requirements – Indelible ink/Date/signed/address & particulars of prescriber/name and address of patient/Age if under 12 (DOB & age of 12 above are good practice)



Task 2 – Opioid overdose

You are working as an on-call pharmacist when a junior doctor from A&E calls you regarding a patient who has come in with suspect opioid overdose. They tell you that she has found unconscious in her bedroom by her housemate, who also found an empty bottle of morphine liquid. She was supplied with this two days ago on discharge from hospital. She has no prior history of using regular opioids. She appears pale and her lips have started to turn blue.
The doctor wants to prescribe naloxone but does not know what dose to give.

1. What signs/symptoms exhibited in the information above, and on the patient's NEWS2 chart, suggest that she is in opioid toxicity? Calculate the patient's latest NEWS score as part of the answer this question

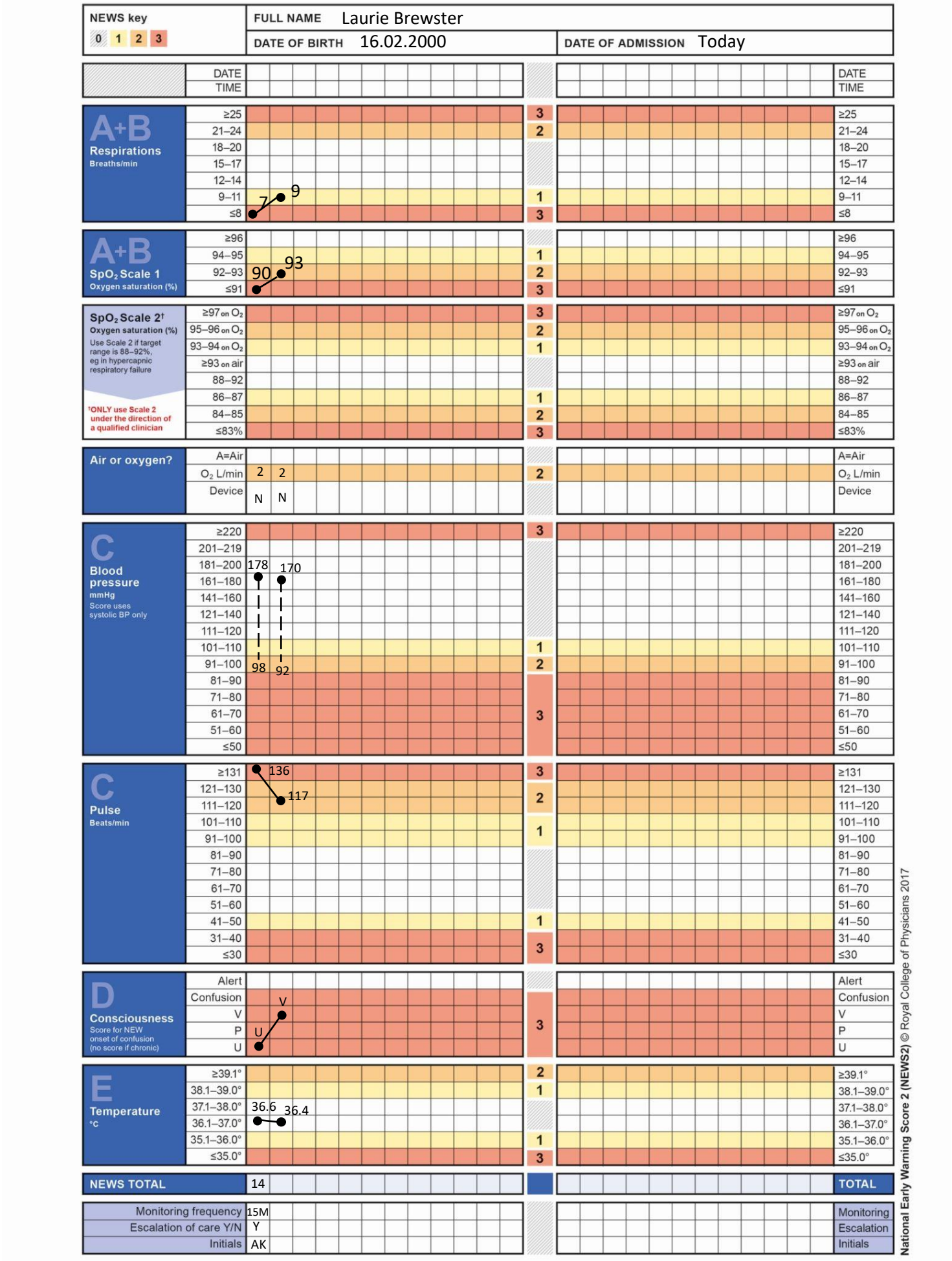
Latest NEWS2 Score = 10

Physical appearance – pale skin, blue lips – indicating hypoxia
Unconscious
Low respiratory rate <8 breaths per minute – activation of μ-opioid receptors in the brain stem that help to co-ordinate breathing
Low oxygen saturation on air on admission (increasing slowly now on oxygen)
Tachycardia
Clear indication of opioid use – empty bottle 24hours after discharge (typical bottle 100ml (10mg/5ml) = 200mg morphine)

2. Using the NNUH guideline, what dose of naloxone would you recommend?

Naloxone 400mcg as an IV bolus
If no response after 1 minute then administer 800mcg as an IV bolus
If a response is seen, repeat last IV bolus every 1-2minutes until good response seen (RR >12bpm AND improved AVPU to at least = V)
Refer Dr to trust guideline - Indication 1 (HIGH dose) – as suspected deliberate opioid overdose

NOTE: Another symptom not mentioned in this case – pin-point pupils. 3-5mm normal, opioids give you 2-3mm, direct response of pupil constricting to light & consensual response of the other eye constricting (should see dilation once light removed). Benzos / cocaine / ketamine / antihistamines = dilation (stimulants).



Task 3 – Palliative care

Mrs Josie Barratt, an 84 year old lady, has been admitted from her care home with declining medical condition and pain. Investigations show progression of her cancer.

PMH
Alzheimer's disease
Stage 4 breast cancer

Weight – 56kg
eGFR = 77ml/min/1.73m^2

Medications charted:
Amlodipine 5mg OD – held as hypotensive
Zomorph 30mg BD
Codeine 30mg QDS
Oramorph 1.25mg 4 hourly PRN – she has been taking 1.25mg every 4 hours for 3/7

1. Comment on Josie's analgesia regime and make recommendations to adjust therapy. Refer to https://bnf.nice.org.uk/guidance/prescribing-in-palliative-care.html for dose equivalences

Issues:
- Use of 2 regular opiates is not rational
- She is using the oramorph regularly which indicates that the regular opioid dose is not controlling her pain and should be increased
- The oramorph dose for breakthrough pain is not sufficiently high enough

From the BNF:
Codeine 100mg = morphine 10mg
Codeine 120mg = morphine 12mg

Oramorph use over 24 hours = 1.25mg x 6 = 7.5mg

12 + 7.5 = 19.5 mg
Increase regular dose by 19.5mg / day – round to 20mg/day as cannot halve a capsule
New dose = **Zomorph 40mg BD**

Increase oramorph dose to 1/10 to 1/6 regular daily dose = 8-13mg – Approximately
Oramorph 10mg 2-4 hourly PRN

+ STOP CODEINE

Monitor for side effects of therapy and consider medications if needed:
AVPU
Resp rate
Bowels
Nausea/vomiting

Note: You may also see dexamethasone used in oncological pain control (as per specialist teams only – not expected to recommend or dose this, just to be aware of use)

You attend the consultant ward round on Friday morning where you find that Josie is struggling to swallow her Zomorph capsules. The consultant wishes to change this to an equivalent buprenorphine patch and has asked you to prescribe this for her.

2. Using the 'Prescribing in Palliative Care' chapter in the BNF, what dose of buprenorphine patch do you prescribe?

Zomorph 40mg BD = 80mg morphine over 24 hours
Rounded to nearest 84mg morphine = buprenorphine '35' patch

Buprenorphine 35mcg/hour patch once weekly

Notes: If renal function was impaired we would prescribe fentanyl patch. Patches can be 72hrly/weekly/96hrly so check patch directions (majority buprenorphine weekly, fentanyl 72hrly).
Continuous release – e.g. patient concerned that their patch was changed two days early, is this a problem? No, just a waste of drug.

After the weekend, you attend Monday's ward round to find that Josie has unfortunately deteriorated and has been moved to a palliative care approach. Anticipatory injections have been started as follows:

Buprenorphine 35mcg patch once weekly
Oramorph 10mg 2 hourly PRN
Midazolam S/C 2.5 – 5mg 2 hourly PRN (restlessness/agitation)
Hyoscine butylbromide S/C 20mg 2 hourly PRN (secretions)
Levomepromazine S/C 6.25mg 2 hourly PRN (nausea & vomiting)
Morphine S/C 5mg 2 hourly PRN (pain/SOB)

Over the weekend, nurses report that she has become quite agitated, and her patch is rubbing off when she moves around causing her to be in pain when this goes unnoticed. She has received 4 injections of 5mg midazolam over the last 24 hours. The consultant wishes to start her on a 24 hour syringe driver which contains midazolam and morphine and asks you to prescribe the appropriate driver.

3. Identify and explain the appropriate medications, including dosages, diluent and size of syringe driver that you would prescribe. Use the compatibility table on the next page, and the prescribing in palliative care chapter of the BNF to make your recommendation.

Answer:
Morphine 42mg (In practice would be rounded to 40mg or 45mg as a multiple of 5 for administration purposes – rounding up/down would depend on clinical condition & level of pain)
Midazolam 20mg
Dilute to 17ml with WFI (17ml in 20ml syringe driver)

BNF Chapter:
Buprenorphine '35' patch = 84mg morphine
10mg PO Morphine = 5mg IV/SC Morphine
84mg PO Morphine = 42mg SC Morphine
Using 5mg x 4 midazolam over 24 hours = 20mg SC midazolam
Water for injection diluent in 17ml in 20ml driver as per compatibility chart

Table 2a: Subcutaneous Morphine Sulfate infusion TWO DRUG COMBINATIONS
Diluent: water for injection

- The figures in these tables are **NOT** clinical doses to prescribe. They are the ***maximum*** amounts of each drug that can be mixed in the syringe and generally be considered physically stable for 24 hours.
- **Most patients will require much lower doses**. Refer to relevant guidelines to obtain the usual dose range to prescribe for each drug. Use minimum effective dose and review according to response.
- Mixing of drugs in this manner is unlicensed but is supported by clinical practice.
- Seek specialist advice from a clinical pharmacist if the doses needed are greater than those stated in the tables.
- Check the infusion after set up and in acute setting every 4 hours for any signs of precipitation, cloudiness, particles or colour change as external factors, for example light and heat may cause problems.

Type of pump				
Drug Combinations	Dilute using water for injection to a final volume of:			
	17ml in 20ml syringe and use **CME T34 pump**	22 ml in 30ml syringe and use **CME T34 pump**	24ml in 50ml syringe and use **non ambulatory pump**	48ml in 50ml syringe and use **non ambulatory pump**
	MAXIMUM amounts that can be mixed together and are considered physically stable for 24h			
Morphine Sulfate Cyclizine*	270mg 150mg	350mg 150mg	380mg 150mg	760mg 150mg
Morphine Sulfate Haloperidol	225mg 6mg	290mg 8mg	315mg 8mg	730mg 10mg
Morphine Sulfate Hyoscine butylbromide	170mg 90mg	220mg 120mg	240mg 120mg	480mg 120mg
Morphine Sulfate Hyoscine hydrobromide	370mg 1200micrograms	480mg 1200micrograms	520mg 1200micrograms	1000mg 1200micrograms
Morphine Sulfate Levomepromazine	230mg 50mg	300mg 65mg	320mg 70mg	640mg 100mg
Morphine Sulfate Metoclopramide	120mg 50mg	160mg 70mg	175mg 75mg	350mg 120mg
Morphine Sulfate Midazolam	85mg 40mg	110mg 55mg	120mg 60mg	240mg 80mg
Morphine Sulfate Octreotide	115mg 460micrograms	150mg 600micrograms	160mg 650micrograms	320mg 1200micrograms

*Use water for injection as diluent for cyclizine