

Shock Quiz

CSRs page overhead for a tech check on a cat. You go outside to see the cat open-mouth breathing in the car and covered in blood. Despite this, the cat is alert and responsive and her gum color is pink. The owner is hysterical and screams that her baby was attacked by a dog.

Do you?:

- A. Tell the owner that the cat is stable to wait
- B. Rush the cat to treatment and call for a doctor asap
- C. Take the cat to outpatient treatment and ask another senior tech to assess the patient

The doctor comes to assess the patient and tells you that the patient is in shock. What type of shock is this patient likely in?

- A. Cardiogenic Shock
- B. Obstructive Shock
- C. Hypovolemic Shock
- D. Distributive Shock

After their exam the doctor asks you to record some vitals while they quickly get full authorization for treatment and code status from the owner.

Patient's Vital Signs;

- HR=230
- RR=panting
- MM/CRT=now pale and prolonged
- Pulses are weak
- Mentation is AR, anxious, painful
- Paws are cold but rectal temp is 99.0F

Based on the Vital Signs, what stage of shock is this patient likely in?

- A. Compensatory
- B. Early Decompensatory
- C. Late Decompensatory

The Doctor orders a PCV, lactate and blood pressure. While getting your diagnostics, the patient is vocalizing and the HR is still 230.

The PCV= 45%, TP= 5.5

The lactate= 7.5mmol/L

The doppler bp = 86, 82, 84

Circle the 2 tests that are directly related to the patient's perfusion.

True or False

1. Based on the PCV the patient did not have enough blood loss to warrant a transfusion at all - **FALSE**
2. The lactate is severely high- **TRUE**
3. The blood pressure is normal for this patient- **FALSE**

The Lactate tells us;

- A. How much lactic acid the body is producing
- B. How much anaerobic metabolism the cells in the body are using
- C. How well the patient is perfusing
- D. All of the above**

The doctor orders an IV catheter placed and crystalloid fluids started on this patient. She weighs 5.6kg and the doctor would like a 15mL/kg bolus. How many mLs is this? **84mLs**

The doctor orders 0.3mg/kg of Methadone IV. Methadone concentration is 10mg/mL. How many mLs of Methadone do you draw up? **0.17mLs**

The doctor wants to start the patient on a vasopressor. Which drug out of the following is considered a vasopressor?

- A. Atropine
- B. Dopamine**
- C. Fentanyl
- D. Naloxone

After finishing these treatments you get another set of vitals on the cat.

- HR is now 130
- RR is 58 with abdominal effort
- MM is more pale and unable to get a CRT
- Pulses are absent
- Mentation is obtunded
- Rectal temp is now 97.0F

True or False

The patient is responding to our treatments. **FALSE**

What stage of shock is the patient likely in now?

- A. Compensatory
- B. Early decompensatory
- C. Late decompensatory**

The doctor asks you to repeat the PCV and Lactate

PCV= 20%

Lactate= 9mmol/L

The doctor asks you to start a CRI of VetStarch @5ml/kg/hr. What is your rate? 28mLs/hr

The doctor orders another bolus of 20ml/kg of crystalloids. How much do you administer?
112mLs

After receiving the above treatments the patient seems to be responding.
Name 3 parameters that you would look at to see if this patient is responding?

Mentation

Pulse quality

MM/CRT

Blood pressure

Lactate

Normalized HR and RR

Basic Math:

1. Which number has the highest value?
 - a. 0.175
 - b. 0.089
 - c. 3.015
 - d. 1.081
2. Which number has the lowest value?
 - a. 0.344
 - b. 1.085
 - c. 1.166
 - d. 0.099
3. Round each number to the nearest hundredth
 - a. 2.154
 - b. 0.739
 - c. 2.072
 - d. 0.056
4. Round each number to the nearest tenth
 - a. 1.18
 - b. 2.684
 - c. 0.222
 - d. 1.506
5. Multiply the numbers round to the nearest hundredth
 - a. 1.49×0.05
 - b. 0.15×3.04
 - c. 5.3×1.02
 - d. 0.2×0.02
 - e. 0.4×1.75
 - f. 1.31×2.07
6. Divide the numbers round to the nearest hundredth
 - a. $5.32/2.11$
 - b. $4.39/0.02$
 - c. $2.132/4.08$
 - d. $6.874/0.912$
 - e. $0.55/2.5$
 - f. $0.025/3.5$
7. Convert the following kgs to lbs
 - a. 2.13kg
 - b. 99.2kg
 - c. 4.156kg
 - d. 43.7kg
8. Convert the following lbs to kgs
 - a. 41.2lb
 - b. 3.65lb

- c. 8.195lb
 - d. 27.27lb
9. Convert the following mcgs to mgs
 - a. 2.2mcg
 - b. 102mcg
 - c. 1022mcg
 - d. 0.2mcg
 10. Convert the following mgs to gs
 - a. 100mg
 - b. 250mg
 - c. 2.5mg
 - d. 5015mg
 11. Convert the following gs to kgs
 - a. 250g
 - b. 199g
 - c. 678.9g
 - d. 15g

Fluid Rate Calculations:

1. Your canine patient weighs 76.4lbs. The doctor orders 1x maintenance fluids. What is your rate in mL/hr?
2. Your canine patient weighs 23.9kg. The doctor orders 2.5x maintenance fluids. What is your rate?
3. Your feline patient weighs 3.5lbs. The doctor orders 0.5x maintenance fluids. What is your rate?
4. Your rabbit patient weighs 350g. The doctor orders 2x maintenance fluids. What is your rate?
5. Your feline patient weighs 12.8lbs. The doctor orders 3x maintenance fluids. What is your rate?

Common Additives:

1. You are opening a new 1L bag of Isolyte. The doctor orders 20mEq/L of KCl for your patient. The concentration of KCl is 2mEq/mL. How many mLs of KCl do you need to add to your bag?
2. Your patient currently has 750mLs of Isolyte in their bag. There currently are no additives. The doctor orders 20mEq/L of KCl added to the bag. KCl is 2mEq/mL. How many mLs of KCl do you need to add to your bag?
3. You are opening a new 1L bag of Isolyte. The doctor wants to add Dextrose to the bag at 2.5%. The concentration of Dextrose is 2.5%. How many mLs of Dextrose do you need to add to your bag?
4. What does q.s. stand for? Please briefly explain what this means.
5. You are opening a new 1L bag of Isolyte. The doctor orders q.s. 15mEq/L of KCl.
 - a. How many mLs of KCl do you add to the bag?

- b. The doctor later wants to increase the KCl to q.s. 30mEq/L. There is now 750mLs left in the bag. How much additional KCl do you need to add to the bag?
6. Your patient currently has 500mL left of Isolyte in the bag. The doctor wants to add Dextrose to the bag to make it 7.5%. How many mLs of Dextrose do you need to add to the bag?
 - a. Are there any safety protocols you need to follow when giving this dose of Dextrose? If so, please explain.

Basic Medical Math:

Oral Medications:

1. Trazodone comes in 100mg tablets. How many mgs are in 2.5 tablets?
2. Gabapentin comes in 300mg capsules. How many capsules would you give your patient if the dose was 638mg
3. Prednisone comes in 5 mg tablets. How many mgs are in half of a tablet?
4. Levothyroxine comes in 0.4mg tablets. Your patient weighs 45lbs. Your doctor orders 0.01mg/kg PO BID for this patient. How many tablets would you give in a single dose?
5. Your patient weighs 95lbs. The doctor orders a one time dose of Cerenia at 2mg/kg PO. Cerenia comes in 16mg, 24mg, and 60mg tablets. Which size tablets would you use and how many tablets would you give?

Injectable Medications:

1. Your patient weighs 8lbs. The doctor orders 0.03mg/kg of Buprenorphine IV. The concentration of buprenorphine is 0.6mg/mL. How many mLs would you draw up?
2. Your patient weighs 36kg. The doctor orders 0.5mg/kg of Diazepam IV for this patient. The concentration of Diazepam is 5mg/mL. How many mLs would you draw up?
3. Your patient weighs 49lbs. According to our dexdomitor chart a full IV dose for this patient is 0.6mL.
 - a. The doctor orders a $\frac{1}{4}$ IV dose for this patient. How many mLs would you draw up?
 - b. Later the doctor only wants you to reverse half of the dose you gave. How many mLs of antisedan would you draw up?
4. Your patient weighs 8.6lbs. The doctor orders 8mg/kg of Convenia SQ for this patient. The concentration of Convenia is 80mg/mL. How many mLs would you draw up?
5. Your patient got stung by a bee and now has a swollen face. He weighs 53.8lbs and the doctor orders 1mg/lb of Benadryl IM and 0.4mg/kg of Dex SP IV for this patient. The concentration of Benadryl is 50mg/mL and the concentration of Dex SP is 4mg/mL.
 - a. How many mLs of Benadryl would you draw up?
 - b. How many mLs of Dex SP would you draw up?
6. Your patient hurt his neck while playing fetch with the owners. She weighs 23.8kgs. The doctor orders a dose of Carprofen at 2mg/lb. The concentration of Carprofen is 50mg/mL. How many mLs of Caprofen would you draw up?

Intermediate Medical Math:

Injectable Medications:

7. Which is more frequent, QID or q4h?
8. Your patient just came out of surgery for a GI foreign body removal. He weighs 109lbs. The doctor orders Unasyn at 30mg/kg IV TID. Unasyn when diluted is 45mg/mL. How many mLs would you draw up for a single dose for this patient? How frequent is TID?
9. Your patient weighs 48.6lbs. The doctor orders a push of fentanyl at 4mcg/kg. Then they want a CRI of 3mcg/kg/hr. The concentration of Fentanyl is 50mcg/mL.
 - a. How many mLs is your push of Fentanyl?
 - b. What is your rate for your CRI in mL/hr?
10. Your rabbit patient weighs 1550g. The doctor orders a dose of Buprenorphine at 0.05mg/kg IV. The concentration of Buprenorphine is 0.6mg/mL. How much Buprenorphine do you draw up?

Percentages:

1. How many mg/mL are in a 2% solution of Lidocaine?
2. How many mg/mL are in a 0.5% solution of Marcaine?
3. The doctor orders 25mcg/kg of Lidocaine for a 62lb dog? How many mLs would you draw up?
4. Your patient weighs 32.45kg. The doctor orders 10mg/kg of Baytril IV SID. Baytril comes in a 2.27% solution. How many mLs would you draw up?
 - a. Are there any safety protocols you should follow when giving this medication? If so, please explain.
5. Your patient weighs 4.67kg. The doctor orders 0.5g/kg of Mannitol to be given over 30min. Mannitol comes in a 20% solution. How many mLs of Mannitol do you need to draw up?
 - a. When you set up your syringe pump, what is your rate in mL/hr?
 - b. Are there any safety protocols you should follow when giving this medication? If so, please explain.
6. Your 12.4lb patient is currently hypocalcemic. The doctor orders 2.5mL/kg of the 10% calcium gluconate solution. We ran out of the 10% solution and only have the 23% solution. How many mLs do you draw up of 23% Calcium gluconate?
 - a. How many mLs would you draw up if we had the 10% solution?
 - b. How long would you administer this over?
 - c. Do you recommend any monitoring equipment during administration? If so, which would you use?

Bolus Administration:

1. Your patient weighs 50kg. The doctor orders a 10mL/kg bolus given over 30min. How much is your bolus in mLs?
 - a. What is your rate in mL/hr?
2. The doctor orders 1L of fluids given as fast as possible. Which is faster; opening up the line and letting it drip from as high as possible or setting up the pump at the highest rate it can go?
 - a. If you leave the line open and let it drip, are there any safety concerns you should be aware of when administering the fluids? If so, please explain.
3. Your patient comes presents in hypovolemic shock. The doctor orders a 20mL/kg bolus given over 20min. Your patient weighs 10.5kg. How much is your bolus in mLs?
 - a. What is your rate in mL/hr?
4. You have a new bag of fluids for your patient. The doctor orders a 150mL bolus given over 15min. What is your rate in mL/hr?
 - a. The doctor would like you to give the remainder of your fluids over the next 4hrs. What will be your new rate in mL/hr?
5. Your feline patient weighs 22lbs. The doctor orders a 15mL/kg bolus given over 20min, then wants you to set the rate to 1.5x maintenance. How many mLs is your bolus?
 - a. What is the rate of your bolus in mL/hr?
 - b. What rate will you set the pump to after the bolus has finished?

Urine Output Calculations:

1. It is currently 1500. The last time you checked your patient's collection set was at 1300. You draw out 60mL of urine from the collection set. Your patient is 9.4kg. What is the UOP in mL/kg/hr for this patient?
2. It is currently 1730. The last time you checked your patient's collection set was at 1500. You draw up 19mL of urine from the collection set. This is the same 9.4kg patient from earlier. What is the new UOP in mL/kg/hr?
 - a. Is this an adequate UOP for a patient this size who is receiving IV fluids?
3. What is the minimum UOP in mL/kg/hr that your patient should be producing?
4. It is currently 1100. The last time you checked your patient's collection set was at 0945. You draw out 500mL of urine from the collection set. Your patient is 105lbs. What is the UOP in mL/kg/hr for this patient?
5. It has been 3 hours since you last checked your patient's collection set. You draw out 30mL of urine from the collection set. Your patient is 9.35lbs. What is the UOP in mL/kg/hr for this patient?

CRI Calculations (Common):

1. Your patient weighs 23.9kg. The doctor orders a Fentanyl CRI at 2-10mcg/kg/hr. Fentanyl is 50mcg/mL. What is your rate range in mL/hr?
 - a. The doctor wants you to start the Fentanyl at 5mcg/kg/hr. What is the rate in mL/hr at this dose?

- b. The doctor would like you to stay at this dose for 6hrs. How much Fentanyl in mL would you draw up for this many hours at the previous dose?
2. Your patient weighs 12.29kg. The doctor orders a Fentanyl CRI at 2-5mcg/kg/hr. Fentanyl is 50mcg/mL. What is your rate range in mL/hr?
 - a. You start your patient at 4mcg/kg/hr but he starts whining dramatically. You increase the dose to 5mcg/kg/hr but the whining gets worse. The doctor is currently unavailable to talk to. What is your next step?
3. Your patient weighs 37.6kg. The doctor orders a Fentanyl CRI at 3mcg/kg/hr. Fentanyl is 50mcg/mL. What is your rate in mL/hr?
 - a. You draw up 18mLs of Fentanyl. How many hours worth of Fentanyl is this at the rate mentioned above?
4. Your patient weighs 32.4kg. The doctor orders a dexdomitor CRI at 1-2mcg/kg/hr. The doctor would like you to dilute this into a total of 60mL with saline. The doctor would like your rate range to be at 2.5-5mL/hr. The concentration of Dexdomitor is 0.5mg/mL. How much Dexdomitor would you add to your syringe?
 - a. Taking the volume of Dexdomitor that you add into account. How many mLs of saline do you actually need to make the total 60mL?
5. Your patient weighs 10.87lb. The doctor orders a dexdomitor CRI at 1mcg/kg/hr. You want your rate to be 1mL/hr. You want to have enough to last your patient 12hrs. What would be your total volume in mL of saline/dexdom to last 12hrs at this rate?
 - a. For the total volume that you want, how much Dexdomitor would you add to your syringe? Dexdomitor is 0.5mg/mL.
6. How many hours are most diluted CRIs good for?
7. If the drug you are giving is light sensitive, what do you need to do to your fluid bag or syringe pump to make it safe to administer?
8. Your patient weighs 95lbs. The doctor orders a Dexdomitor CRI at 2mcg/kg/hr. The doctor does not give you a volume or rate for this patient. Dexdomitor is 0.5mg/mL. What would be an appropriate rate for this patient? (Hint: there is more than one right answer)
 - a. For the rate you choose, what would be an appropriate volume of saline/dexdom to dilute this to? (Hint: there are more than one right answers)
 - b. With the volume that you choose, how many mLs of Dexdomitor do you need to add?
9. Your canine patient weighs 52.4kg. The doctor orders a Metoclopramide CRI at 1mg/kg/day. The doctor would like you to add the metoclopramide to the bag of Isolyte. There is currently 350mL of Isolyte left in the bag and the rate is at 2x maintenance. What is the current rate in mL/hr?
 - a. The concentration of Metoclopramide is 5mg/mL. How many mL of Metoclopramide do you need to add to your bag?
10. Your patient weighs 5.3kg. The doctor orders 1.5mg/kg/day of Metoclopramide. You want to set your rate to 1.5mL/hr. You would like to have the CRI last for at least 8hrs. How many mLs of saline/metoclopramide would you need to have in total?
 - a. The concentration of Metoclopramide is 5mg/mL. How many mLs of Metoclopramide do you need to add to your syringe?

- b. Taking into account the volume of Metoclopramide you add to the syringe, what is the actual volume of saline you are diluting it with to make it the total that you want?
11. Your patient weighs 2.37kg. The doctor orders a Metoclopramide CRI at 1-2mg/kg/day. Metoclopramide is 5mg/mL. The doctor does not give you a volume to dilute it to or a rate range. What would be an appropriate rate range for this dose? (Hint: there are more than one right answers)
- a. For the rate that you chose, what would be an appropriate volume to dilute this to? (Hint: there are more than one right answers)
 - b. For the volume you chose to dilute it to, how many mLs of Metoclopramide would you need to add to your syringe?

CRI Calculations and Fluid Additives (Uncommon):

1. Your patient weighs 84lbs. The doctor orders a Lidocaine CRI at 25mcg/kg/min. The concentration of Lidocaine is 2%. What is your rate for this patient in mL/hr?
 - a. If you want your CRI to last 8hrs, what is the minimum volume you need to draw up?
2. Your patient weighs 34kg. The doctor orders a Lidocaine CRI at 50-75mcg/kg/min. The concentration of Lidocaine is 2%. What is the rate range in mL/hr for this patient?
 - a. Choose a volume you would draw up of Lidocaine in mLs and please briefly explain your reasoning?
3. Your patient weighs 15lbs. The doctor orders a Dopamine CRI at 2.5mcg/kg/min. Dopamine is 40mg/mL. You would like your rate to be 2.5mL/hr. The doctor would like the CRI to last 12hrs. What is the total volume of saline/dopamine that you would need in order for it to last that long?
 - a. Taking into account the previous information, how many mLs of Dopamine would you need to add to your total volume?
 - b. Taking into account the volume of Dopamine you are adding, what is the actual volume of saline that you would need?
4. Your patient weighs 39kg. The doctor orders a Dopamine CRI at 5-10mcg/kg/min. Dopamine is 40mg/mL. What would be an appropriate rate range for this dose? (Hint: there are multiple right answers)
 - a. What would be an appropriate volume of Dopamine/saline to dilute this to? (Hint: there are more than one right answers)
 - b. Taking into account the rate range and the total volume you have chosen, how many mLs of Dopamine would you need to add to your syringe?
5. Your patient weighs 99lbs. The doctor orders a Norepinephrine CRI at 0.1mcg/kg/min. The concentration of Norepinephrine is 1mg/mL. Norepinephrine is stored in an ampule. What equipment do you need to open the ampule and draw up the medication?
 - a. What is the only type of fluid you can dilute Norepinephrine with?
 - b. You want your rate to be 1mL/hr and you want it to last at least 12hrs. What is the total amount of Norepi/diluent you will need in mLs?

- c. For the total volume you chose, how many mLs of Norepinephrine will you need to add?
 - d. Taking into account the amount of Norepinephrine you have drawn up, how much diluent will you actually need to make the total volume that you want?
6. Your patient weighs 47kg. The doctor would like you to start an MLK CRI. You will need to add this to a new bag of Isolyte. The current rate of fluids this patient is getting is 1x maintenance. What is the current rate in mL/hr?
 - a. The dose for Morphine is 0.1mg/kg/hr. The concentration of Morphine is 50mg/mL. How much Morphine would you add to the bag?
 - b. You discover that the 50mg/mL concentration is on backorder and we can only get the 15mg/mL concentration. What would be your volume at the newer concentration?
 - c. The dose for Lidocaine is 2mg/kg/hr. The concentration of Lidocaine is 2%. What is the volume of Lidocaine you need to add to your bag?
 - d. The dose for Ketamine is 0.5mg/kg/hr. The concentration of Ketamine is 100mg/mL. What is the volume of Ketamine you need to add to your bag?
 - e. Taking into account all the drugs you are adding to your bag (with Morphine at the 15mg/mL concentration), what is the volume of Isolyte you will need to remove before adding in your drugs?
7. Your canine patient weighs 8kgs. The doctor would like her to be on 3.5x maintenance. The doctor would also like you to add 50mEq/L of KCl and 30mEq/L of KPhos to the fluids. You have a new bag of fluids. What is your fluid rate?
 - a. The concentration of KCl is 2mEq/L. How many mLs do you add to your bag?
 - b. The concentration of KPhos is 4.4mEq/L. How many mLs do you add to your bag?
 - c. What is your concentration in mEq/mL of K+?
 - d. The max dose of K+ for a patient is 0.5mEq/kg/hr. Is your patient receiving too much K+?
8. Your patient weighs 24kg. The doctor would like to start a Dobutamine CRI at 5mcg/kg/min. The concentration of Dobutamine is 12.5mg/mL. Please explain in a short paragraph how you would go about doing this.
9. Your patient weighs 3.4kg. The doctor would like you to start a Lasix CRI at 0.8mg/kg/hr. The concentration of Lasix is 5%. What is the generic name for Lasix?
 - a. Please explain in a short paragraph how you would go about doing this.
10. The doctor would like you to prepare an insulin CRI for your patient who weighs 19kg. The amount of insulin you will add to your bag is 2.2U/kg. What type of insulin will you use and how much will you add to your bag?
 - a. What type of fluid will you add this to?
 - b. Once you have added the insulin to the bag is there anything you need to do prior to administering it to your patient? If so please explain.
 - c. The doctor has you use the chart below to decide your patient's rate. Currently your patient is on 5% dextrose with no insulin. Your BG reads 223. What rate of insulin will you need to administer?
 - d. What concentration of dextrose should be going into your IV fluids?

Blood glucose	Insulin CRI	IV fluids-dextrose
>250	10mL/hr	No dextrose
200-250	7mL/hr	2.5% dextrose
150-200	5mL/hr	2.5% dextrose
100-150	5mL/hr	5% dextrose
<100	D/C	5% dextrose