**Appendix 1.**

**Drug Calculation Test** (answers are shown at the end of the test for readers)

Circle one: resident or faculty. If resident, please circle: CBY, CA-1, CA-2, CA-3

How many years are you post-residency? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many hours did you sleep last night? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. An 80 kg patient is ordered intravenous dexmedetomidine for sedation in the ICU. After a loading dose is administered, an infusion of 0.3 mcg/kg/h is prescribed. If dexmedetomidine is supplied in a concentration of 100 mcg/ml, calculate the ml/h. (do not round off answer)

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml/h

2. A 15 year old who weighs 30 kg, sustains a cardiac arrest. Ten mcg/kg epinephrine is ordered IV STAT. If the epinephrine is supplied as 1:10000 in a pre-filled syringe, how many ml of the IV solution should you administer?

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml

3. Treatment with IV treprostinil (5 mg/ml) is initiated as a continuous infusion at 12 mcg/kg/min in a 67-year-old male with functional class III pulmonary hypertension. Calculate the number of ml/h required to treat this 57 kg patient (round off to one decimal point).

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml/h

4. A 62-year-old female is treated with IV epoprostenol for functional class III pulmonary hypertension. The patient weighs 72 kg. Three hours after continuous infusion at 6 ng/kg/min the patient develops drug related adverse side effects. Calculate the total dose in mcg of epoprostenol administered during the first three hours.

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mcg

5. A 58-year-old African American male is admitted to the emergency room with a diagnosis of hypertensive emergency. His initial blood pressure on arrival is 230/125mmHg. You immediately start the patient on an intravenous infusion of sodium nitroprusside at a dose of 3 mcg/kg/min. Calculate the initial infusion volume (ml/min) for this 108 kg patient, knowing that nitroprusside is formulated as 20 µg/ml in D5W.

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml/min

6. An 8-year-old child weighing 28 kg requires patient-controlled analgesia (PCA) with morphine for post-operative pain control. The PCA is programmed with a basal rate of 2 mcg/kg/h and a bolus of 40 mcg/kg with a 10-minute lockout interval. If the child takes 3 boluses within one hour, calculate the total dose of Morphine consumed during that one hour period. (round off to two decimal points)

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mg

7. A 60-year-old 95 kg woman with deep-vein thrombosis (DVT) is anticoagulated with unfractionated heparin. After developing thrombocytopenia to the heparin, the heparin is discontinued and replaced with lepirudin, a direct thrombin inhibitor. lepirudin is administered as a bolus of 0.4 mg/kg followed by 0.15 mg/kg/h as a continuous IV infusion. Calculate the infusion rate (mg/h) for lepirudin. (round off to one decimal point)

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mg/h

8. A 6-year-old patient weighing 23 kg has a caudal epidural catheter placed for post-operative analgesia. You wish to administer a continuous infusion of 0.125% bupivacaine at a rate of 0.2 mg/kg/h. Calculate the infusion rate (in ml/h) of bupivacaine for this patient. (rounded off to one decimal point)

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml/h

9. A 58-year-old female is admitted to the emergency room with a diagnosis of aortic dissection and a blood pressure of 176/98 mmHg. You immediately start an intravenous infusion of Nitroglycerin at a dose of 1500 mcg/min. Calculate the initial infusion volume (ml/min) for this 100 kg patient, knowing that nitroglycerin is available in a concentration of 50mg/250 ml.

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml/min

10. A 10-year-old patient weighing 32 kg is started on Ketorolac for postoperative pain control. Ketorolac is provided intravenously q6h over a 24-hour period. If the total daily dose administered is 96 mg, how many mg/kg of Ketorolac were used q6h?

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mg/kg

11. A 64 year old Latin American male weighin 63 kg, is admitted to the ICU after open thoracotomy. The patient is started on low-dose ketamine infusion for post-thoracotomy pain control. A continuous infusion is administered at 0.15 mg/kg/h. Calculate the number of ml/h required if ketamine is available in a 2 mg/ml dilution. (round off to one decimal point)

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml/h

12. Intranasal midazolam premedication (0.2 mg/kg) is ordered for a 21 kg child with ADHD. If Midazolam is supplied in a 5 mg/ml concentration, and the dose will be divided between the two nostrils, how many ml should be instilled into each nostril? (rounded to one decimal point)

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml/nostril

13. During surgery, the anesthesiologist notifies the operating room team that a malignant hyperthermic reaction is developing and requests IV dantrolene. Each ampoule of dantrolene contains 20 mg of the drug together with 3 gm of mannitol to speed dissolution. If 2.5 mg/kg of dantrolene needs to be administered to the 30 kg patient, how much mannitol per kg will the patient receive? (round off to two decimal points)

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gm/kg

14. A 5-year-old patient weighing 17 kg is started on Cefazolin postoperatively at a dose of 25 mg/kg intravenously q8h. What is the daily dose of Cefazolin in mg?

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mg

15. An 80-year-old male with congestive heart failure is started on Milrinone in the ER. A loading dose of 50 mcg/kg is given IV over 10 min followed by a continuous infusion of 0.4 mcg/kg/min. If the patient weighs 72 kg and Milrinone is supplied in a concentration of 100 mcg/ml, what is the maintenance infusion rate in ml/min of Milrinone? (please round off answer to one decimal point)

Answer:  **\_\_\_\_**\_\_\_\_\_\_\_\_\_\_\_\_ml/min

**Answers:**

1) 0.24: 2) 3: 3) 8.2: 4) 77.8 5) 16.2: 6) 3.42: 7) 14.25 8) 3.7: 9) 7.5: 10) 0.75 11) 4.7: 12) 0.4: 13) 0.4: 14) 1275 15): 0.29