Lab #6: Team
NIBP / TPR
Due: Start of NEXT lab session (1 week)

Name(s): _____________________________________ Team #: _______

Part I: NIBP (2.5 Marks)

A) Perform the following steps for each lab partner. Write all results on the back of this sheet or on a separate sheet.

B) Use a stethoscope and sphygmomanometer to measure the blood pressure using the left arm. Make sure that the arm is horizontal and approximately level with the heart.

Ans: ____________________________________ Person #1 (sys/dias)

Ans: ____________________________________ Person #2 (sys/dias)

C) Use the patient monitor to measure the blood pressure using the right arm. Make sure that the arm is horizontal and approximately level with the heart.

Ans: ____________________________________ Person #1 (sys/dias)

Ans: ____________________________________ Person #2 (sys/dias)

D) Assume that the values obtained in Part C are correct. Compute the upscale accuracy of the values obtained in Part B.

E) Estimate the resolution of the readings obtained in Part B. Explain how you came up with your estimate.

F) Use the value from Part E to compute Precision.

G) Assuming you had used the same method on the same arm of the same person to collect the four values in Parts B and C, compute Repeatability.
Part II : TPR (2.5 Marks)

A) For each lab partner, measure:
   1. height
   2. weight
   3. resting heart rate
   4. systolic and diastolic blood pressure (use most reliable value from NIBP section)

B) Assume that stroke volume varies linearly from 50 to 70 cc/CC for a person weighing 50 to 100 Kg respectively.
   1. Derive an equation for CO as a function of weight and HR.
   2. Use your equation and your measurements to estimate CO for each lab partner.

C) Use the Mosteller formula, the Fick estimate, and the CO you just computed to estimate the following for each lab partner.
   1. BSA
   2. Rate of oxygen uptake (VO₂)
   3. Oxygen concentration differential (Ca-Cv)

D) Estimate TPR assuming that:
   1. Systolic pressure ≈ AP.
   2. Diastolic pressure ≈ CVP.

E) If your systemic circulatory system was comprised of a single uniform blood vessel, how long would it be? Use the values calculated above and assume the following.
   1. Your blood vessel has a uniform cross-section. Use a caliper to measure the diameter of the largest visible vein on your forearm or wrist to determine this.
   2. The viscosity of blood is 3.5 mPas (mili-Pascal-seconds).

Deliverables:
   • This sheet and any additional work (calculations).