***HASPI Medical Biology Lab 01b***

**Medical Biology Measurements**

*Lab Answer Sheet*

**Station 1. Ratios & Percentages: Getting Into Medical School**

1. Use the directions at Station 1 and the data from Table 1 to complete.

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| **Table 3. Competition Ratios & Percent of Acceptance 2011** |
| **School** | **Competition Ratio** | **Percent of Students Accepted** |
| U.S. |  |  |
| Stanford | 1:33 | 3.03% |
| George Washington University |  |  |
| UC San Francisco |  |  |
| Harvard |  |  |
| UCLA |  |  |
| Mayo Medical School |  |  |
| University of North Carolina |  |  |

1. Use the directions at Station 1 and the data from Table 2 to complete.

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| **Table 4. Medical Specialty Competition & Completion Ratios 2011** |
| **Specialty** | **Competition****Ratio** | **# of Students that Completed** | **Completion****Ratio** |
| General Surgeon |  |  |  |
| OB/GYN |  |  |  |
| Cardiology |  |  |  |
| Pediatrics |  |  |  |
| Radiology |  |  |  |
| Intensive Care  |  |  |  |
| Clinical Oncology | 1:1.7 | 27 | 1:1.6 |

1. What are the chances (ratio or percentage) of a student that gets into Stanford becoming a general surgeon? Explain your answer.

**Station 2. Measuring Mass and Volume: Creating IV Solutions**

1. What is saline solution, and why is it used in IV drip bags?
2. Calculate how much salt and how much water is needed to create 10 ml of 10% saline solution.

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| **Table 5. Mass and Volume to Create 10 ml of 10% Saline Solution** |
| **Salt Mass** |  grams | milligrams | kilograms |
| **Water Volume** | milliliters | liters | deciliters |

1. What type of equipment is used to measure mass?
2. What type of equipment is used to measure volume?
3. Why do you think it is important for nurses to monitor the administration of fluids through an IV drip bag?
4. How much salt would be needed to make 50 ml of 5% saline solution?

**Station 4. Measuring Length: Can Fractures Affect Bone Length?**

1. Complete Table 8 using measurements from the patient’s x-rays.

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| **Table 8. Forearm Bone Length** |
| **Right Forearm** | **Bone** | **Length** **in cm** | **Length** **in mm** | **Length** **in m** |
| Radius |  |  |  |
| Ulna |  |  |  |
| **Left Forearm** | Radius |  |  |  |
| Ulna |  |  |  |
| **Right vs. Left****Difference** | Radius |  |  |  |
| Ulna |  |  |  |

1. What are broken bones more commonly called?
2. Why do you think a fracture at the growth plate is more of an issue in a child, rather than an adult?
3. Compare the right and left forearms. Do you think the fracture has affected the growth of the right forearm? Explain your answer.
4. Would you recommend surgery for this patient? Why or why not?
5. What equipment was used to measure length?

**Station 3. Graphing: Comparing Hormone Levels**

1. What are hormones?
2. What are the main sex hormones produced to start puberty in males? Females?
3. Looking at your graph and Table 7, did Patients A and B have normal testosterone levels as they developed? Explain your answer.
4. Why are graphs an important way to present information?



**Station 5. Making Observations: Mole or Skin Cancer?**

1. What is the difference between qualitative and quantitative data? Give an example of each.
2. Complete Table 9 based on your observations.

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| **Table 9. Analysis of Patient Moles**  |
| **Patient** | **Observations***List any possible* *cancerous traits* | **Recommendation***Do you recommend a biopsy? Why or why not?* |
| 1-0345 |  |  |
| 2-0298 |  |  |
| 3-0126 |  |  |
| 4-0920 |  |  |
| 5-0554 |  |  |
| 6-0177 |  |  |

1. Why are observations important during a physical exam?

**Station 6. Measuring Time: Pulse and Respiration Rates**

1.Complete the table based on your own pulse and respiration rate.

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| **Table 10. Pulse and Respiration Rates** |
| **Resting****Vitals** | **# of Pulse** **Beats in** **10 Seconds** | **Beats Per Minute****(BPM)** | **Respiration****Rate** |
|  |  |  |

1. What is the range for a normal resting heart rate and respiration rate?
2. Were your respiration and heart rates within the normal range?
3. How do you think exercise would affect your respiration and heart rates? Why?
4. How do you think sleeping would affect your respiration and heart rates? Why?
5. What equipment was used to measure time?

**Station 8. Measuring Temperature: Body Heat**

1.Record the body temperatures at the following body locations.

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| **Table 11. Body Temperature** |
| **Location** | **Temperature**(Fahrenheit) | **Temperature**(Celsius) | **Temperature**(Kelvin) |
| Under Tongue |  |  |  |
| Elbow |  |  |  |
| Armpit |  |  |  |
| Forehead |  |  |  |
| Pinch Between Fingers |  |  |  |

1. Why is maintaining a constant body temperature important?
2. What is the normal average body temperature in Celsius?
3. Where can body temperature be measured on the body?
4. The temperature at your armpit and forehead are normally higher than at the elbow and fingers. Hypothesize why this occurs.
5. What equipment is used to measure temperature?

**Station 7. Research and References: To Vaccinate or Not**

1. Summarize how vaccines work, based on the video.
2. Summarize the scientific journal or magazine article that you researched.
3. Provide the APA reference.
4. Provide the MLA reference.