Lesson 13 Data Report

PULMONARY FUNCTION II

Pulmonary Flow Rates

- Forced Expiratory Volume (FEV₁,₂,₃)
- Maximal Voluntary Ventilation (MVV)

Manual Revision
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Number of cycles in 12 second interval

MVV = (Average volume per cycle) \times (Number of cycles per minute)
PULMONARY FUNCTION II

Pulmonary Flow Rates

- Forced Expiratory Volume (FEV\textsubscript{1,2,3})
- Maximal Voluntary Ventilation (MVV)

DATA REPORT

Student’s Name: ________________________________

Lab Section: ________________________________

Date: ________________________________

I. Data and Calculations

Subject Profile

Name ________________________________ Height ________________

Age ________________________________ Weight ________________

Gender: Male / Female

A. Vital Capacity (VC)

CH 1 p-p measurement: ________________

B. Comparison of FEV\textsubscript{x} % to Normal Values

<table>
<thead>
<tr>
<th>Time Interval (sec)</th>
<th>Forced Expiratory Volume (FEV) [p-p]</th>
<th>Vital Capacity (VC) \textit{from A}</th>
<th>FEV/VC calculate</th>
<th>(FEV/VC) x 100 = % calculate</th>
<th>\textit{=} FEV\textsubscript{x}</th>
<th>Averages for reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FEV\textsubscript{1}</td>
<td>83%</td>
</tr>
<tr>
<td>0-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FEV\textsubscript{2}</td>
<td>94%</td>
</tr>
<tr>
<td>0-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FEV\textsubscript{3}</td>
<td>97%</td>
</tr>
</tbody>
</table>
C. **MVV Measurements**  
(Note, all volume measurements are in liters)

1) Number of cycles in 12-second interval: ______

2) Calculate the number of respiratory cycles per minute (RR):

\[ RR = \text{Cycles/min} = \text{Number of cycles in 12-second interval} \times 5 \]

Number of cycles in 12-second interval (from above): ______ \times 5 = ______ cycles/min

3) Measure each cycle

Complete Table 13.3 with a measurement for each individual cycle. If the Subject had only 5 complete cycles/12-sec period, then only fill in the volumes for 5 cycles. If there is an incomplete cycle, do not record it. (The Table may have more cycles than you need.)

<table>
<thead>
<tr>
<th>Cycle Number</th>
<th>Measurement [CH 2 p-p]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle 1</td>
<td></td>
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<td>Cycle 2</td>
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<td>Cycle 3</td>
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<td>Cycle 12</td>
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<td>Cycle 13</td>
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<tr>
<td>Cycle 14</td>
<td></td>
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<tr>
<td>Cycle 15</td>
<td></td>
</tr>
</tbody>
</table>

4) Calculate the average volume per cycle (AVPC):

Add the volumes of all counted cycles from Table 13.3.

\[ \text{Sum} = \text{__________________________ liters} \]

Divide the above sum by the number of counted cycles. The answer is the average volume per cycle (AVPC)

\[ \text{AVPC} = \frac{\text{_________}}{\text{____________________}} = \text{_________________ liters} \]

\[ \text{Sum} \quad \text{# of counted cycles} \]
5) Calculate the MVV<sub>est</sub>

Multiply the AVPC by the number of respiratory cycles per minute (RR) as calculated earlier.

\[ \text{MVV} = \text{AVPC} \times \text{RR} = \frac{\text{AVPC}}{\text{RR}} = \text{_________________________ liters/min} \]

II. Questions

D. Define **Forced Expiratory Volume** (FEV).

E. How do the Subject’s FEVx values compare to the average per Table 13.2?

- FEV<sub>1</sub> less than same as greater than
- FEV<sub>2</sub> less than same as greater than
- FEV<sub>3</sub> less than same as greater than

F. Is it possible for a Subject to have a vital capacity (single stage) within normal range but a value for FEV<sub>1</sub> below normal range? Explain your answer.

G. Define **Maximal Voluntary Ventilation** (MVV).

H. How does the Subject’s MVV compare to others in the class?

less than same as greater than
I. Maximal voluntary ventilation decreases with age. Why?

J. Asthmatics tend to have their smaller airways narrowed by smooth muscle constriction, thickening of the walls, and mucous secretion. How would this affect vital capacity, FEV1, and MVV?

K. Bronchodilator drugs open up airways and clear mucous. How would this affect the FEV and MVV measurements?

L. Would a smaller person tend to have less or more vital capacity than a larger person? 
   ______ Less      ______ More

M. How would an asthmatic person’s measurement of FEV1 and MVV compare to an athlete? Explain your answer.

End of Lesson 13 Data Report