

### **Answer on Question #66917, Physics / Atomic and Nuclear Physics**

Compute the decrease in the blood pressure of the blood flowing through an artery the radius in which is constricted by a factor of 4. Assume the average flow velocity is the unconstructed region is 25cm/sec. The density of blood is 1.05g/cm<sup>3</sup>. Express the pressure in millimeters of mercury.

**Answer:**

Assuming laminar flow, Poiseuille's law applies. This is given by

$$Q = (P_2 - P_1) \pi r^4 / 8 \eta l$$

$$(P_2 - P_1) = 8 \eta l Q / \pi r^4$$

The pressure will depend on the  $r^4$ .

Therefore, the pressure will decrease a factor of  $4^4 = 256$  times

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