

Bsp: Blutströmung

mittl. Strömungsgeschw \bar{v}

$$\text{H.P.: } I_v = \underbrace{\frac{\pi R^4}{8\eta L} \Delta p = A \bar{v} = \pi R^2 \bar{v}}$$

$$\Rightarrow \bar{v} = \frac{R^2}{8\eta L} \Delta p$$

Blut: $\rho = 10^3 \text{ kg/m}^3$; $\eta \approx 4 \cdot 10^{-3} \text{ Pa}\cdot\text{s}$

Aorta:

$$\left. \begin{array}{l} R \approx 1 \cdot 10^{-2} \text{ m} \\ L \approx 0.4 \text{ m} \\ \Delta p \approx 40 \text{ Pa} \end{array} \right\} \bar{v} = 0.3 \text{ m/s} \Rightarrow$$

$$Re = 1500$$

Kapillare

$$\left. \begin{array}{l} R \approx 4 \cdot 10^{-6} \text{ m} \\ L \approx 0.001 \text{ m} \\ \Delta p \approx 10^3 \text{ Pa} \end{array} \right\} \bar{v} = 5 \cdot 10^{-4} \text{ m/s}$$
$$Re = 0.001 \Rightarrow \text{nie turbulent}$$

