〇〇大学 医学部　　御中

血流解析サービス
解析結果報告書

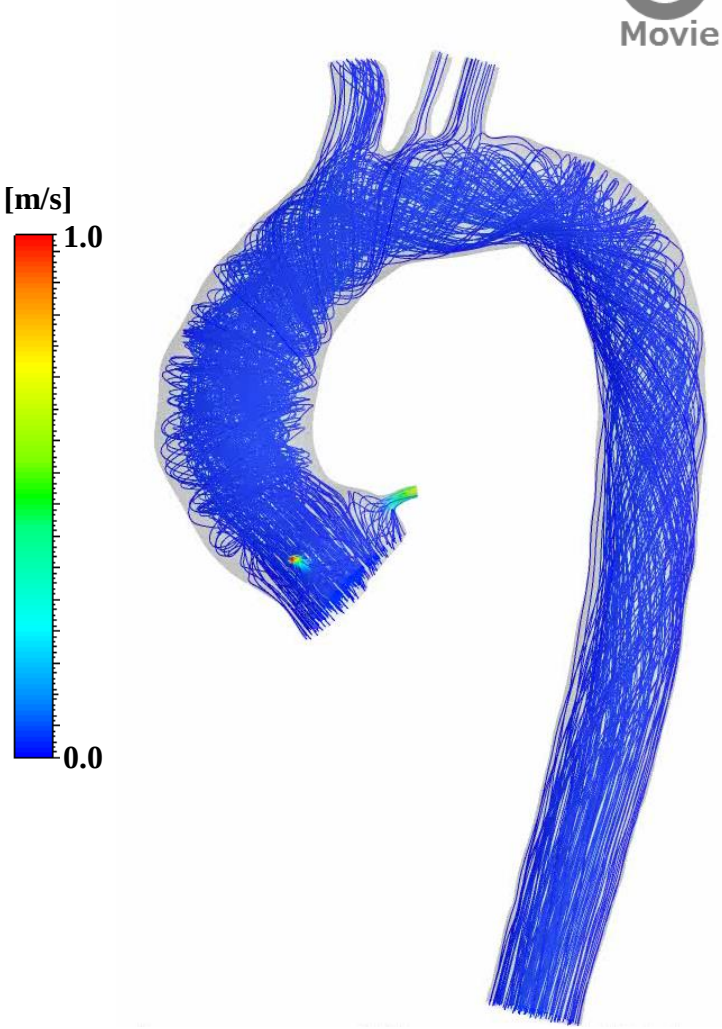
株式会社Cardio Flow Design
http://cfd.life

Cardio Flow Design

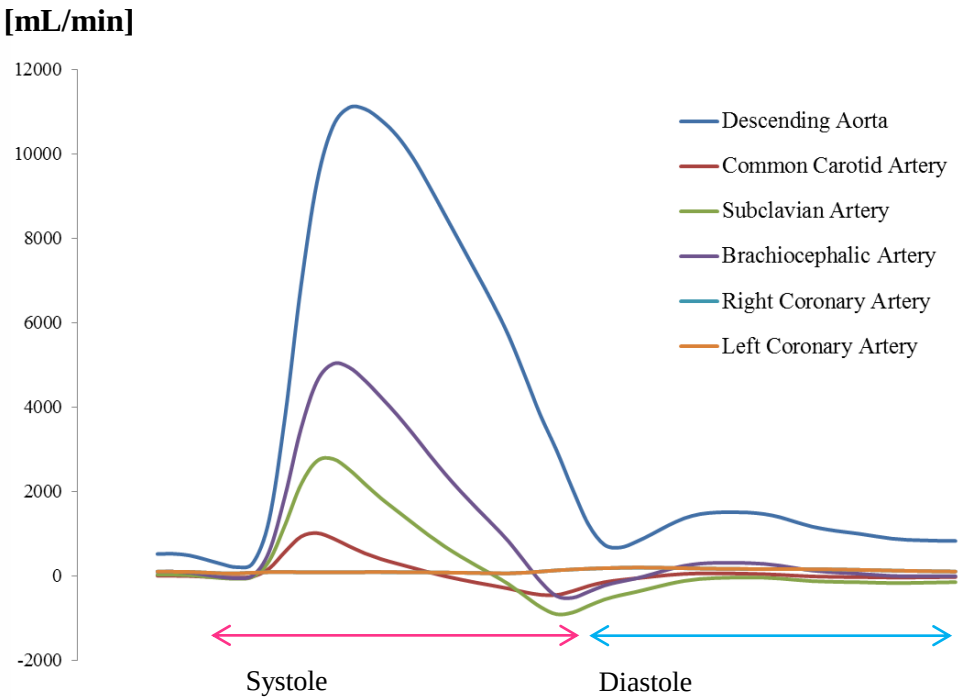
症例　1

Streamline

Movie

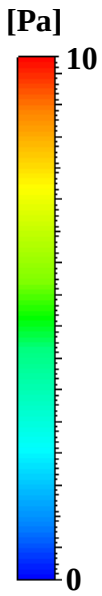


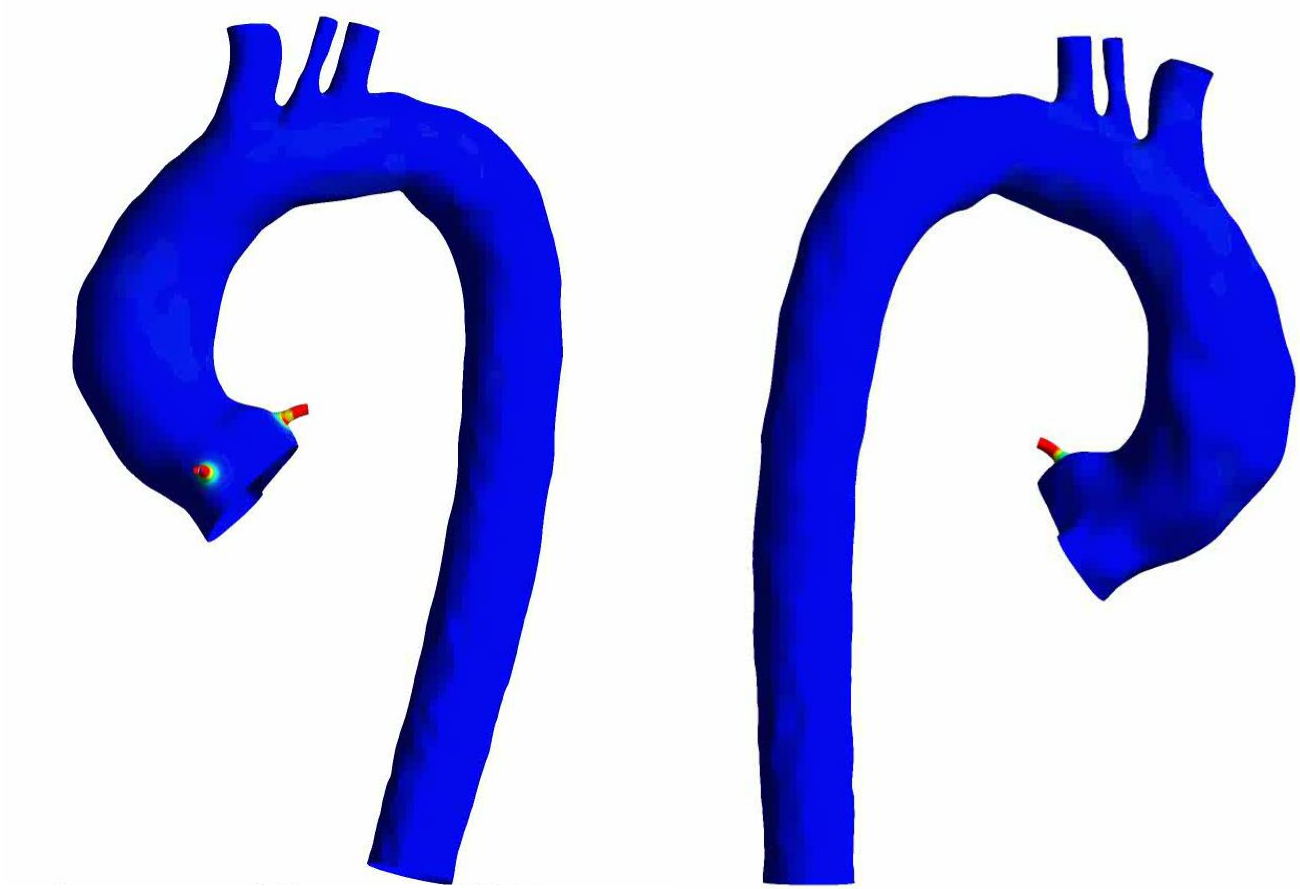
Flow Rate



症例　1

- Wall Shear Stress

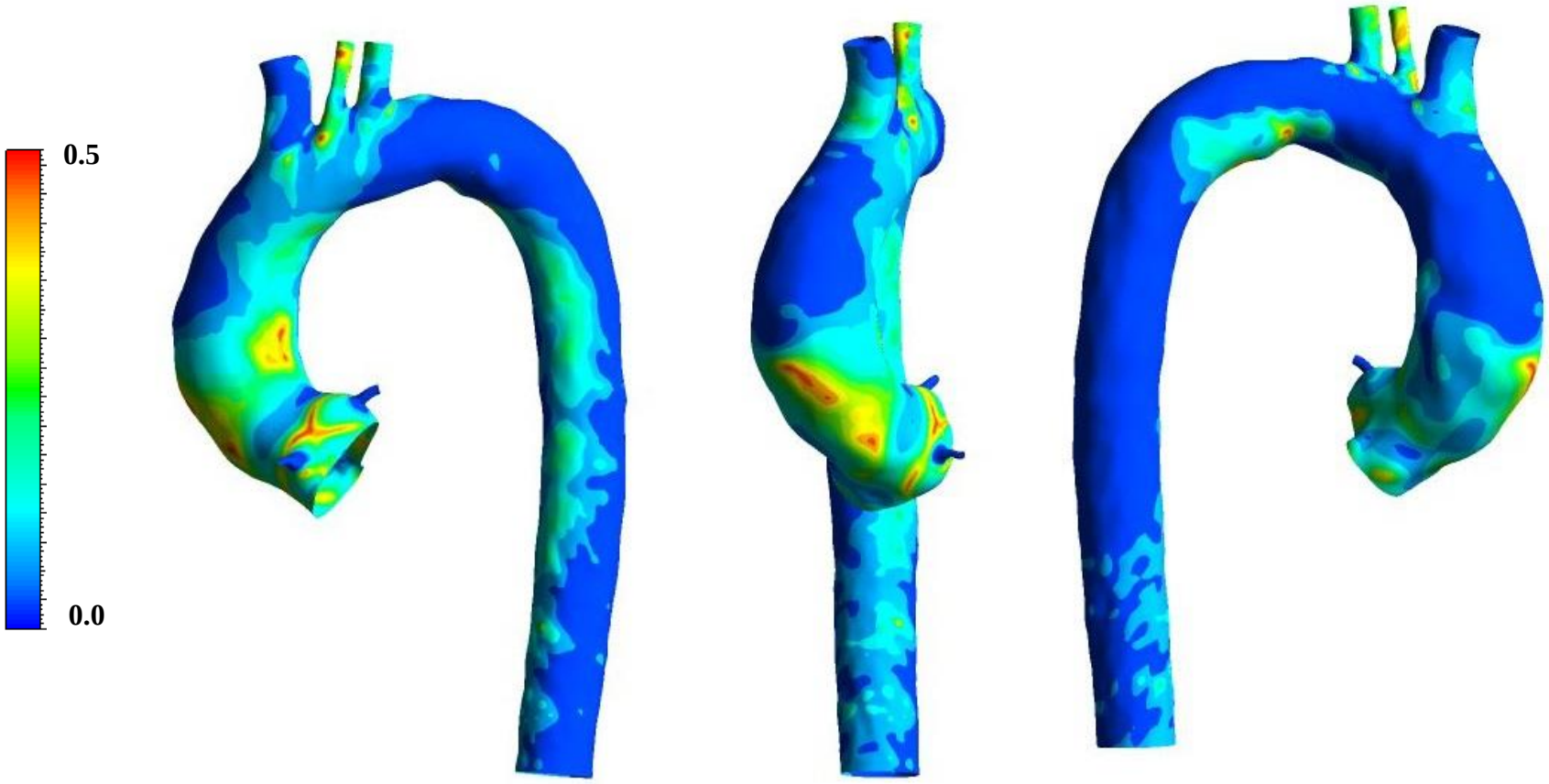




Movie

症例　1

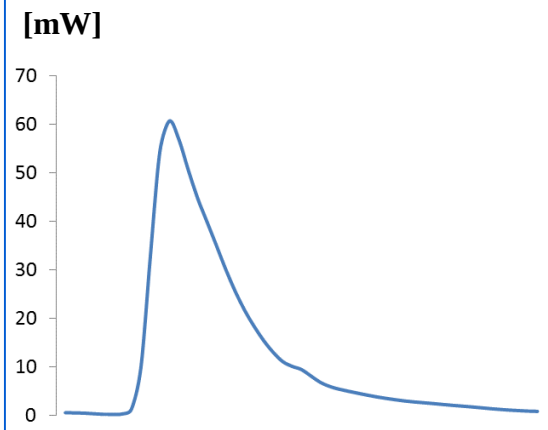
- Oscillatory Shear Index



症例 1

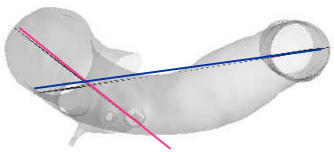
Energy Loss

Movie



Mean (1cycle): 12.16[mW]

Top View



症例　1

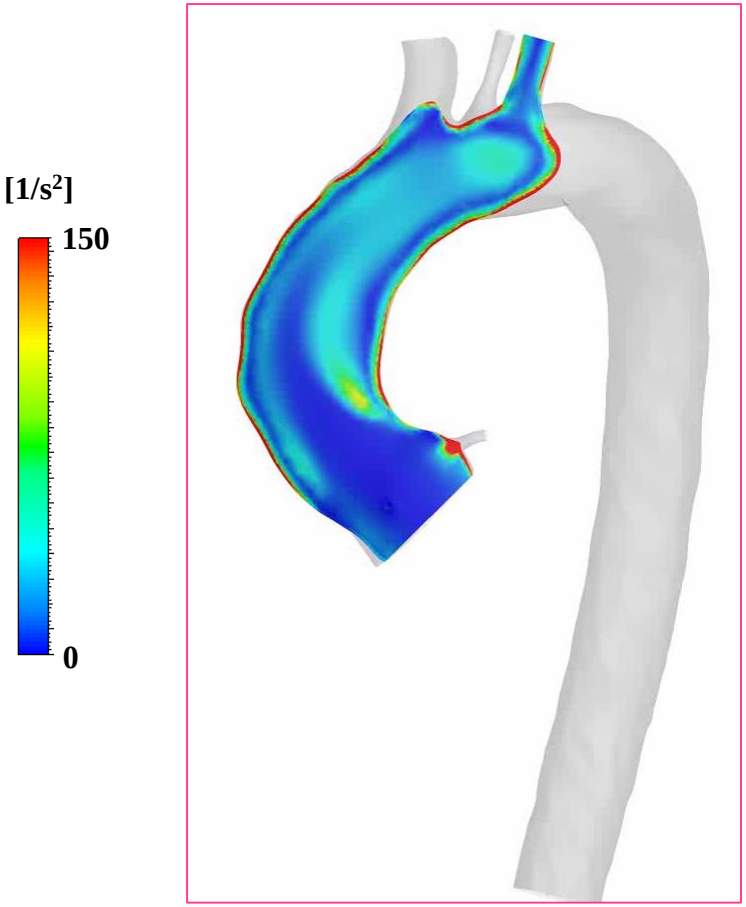
- Helicity

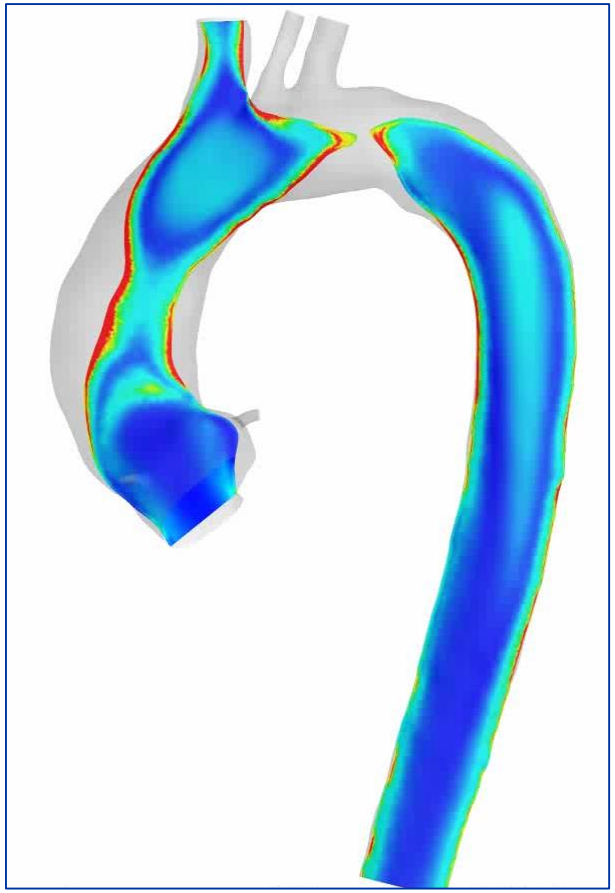
Movie

症例　1

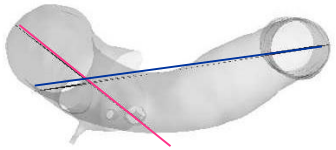
■ Enstorphy

Movie





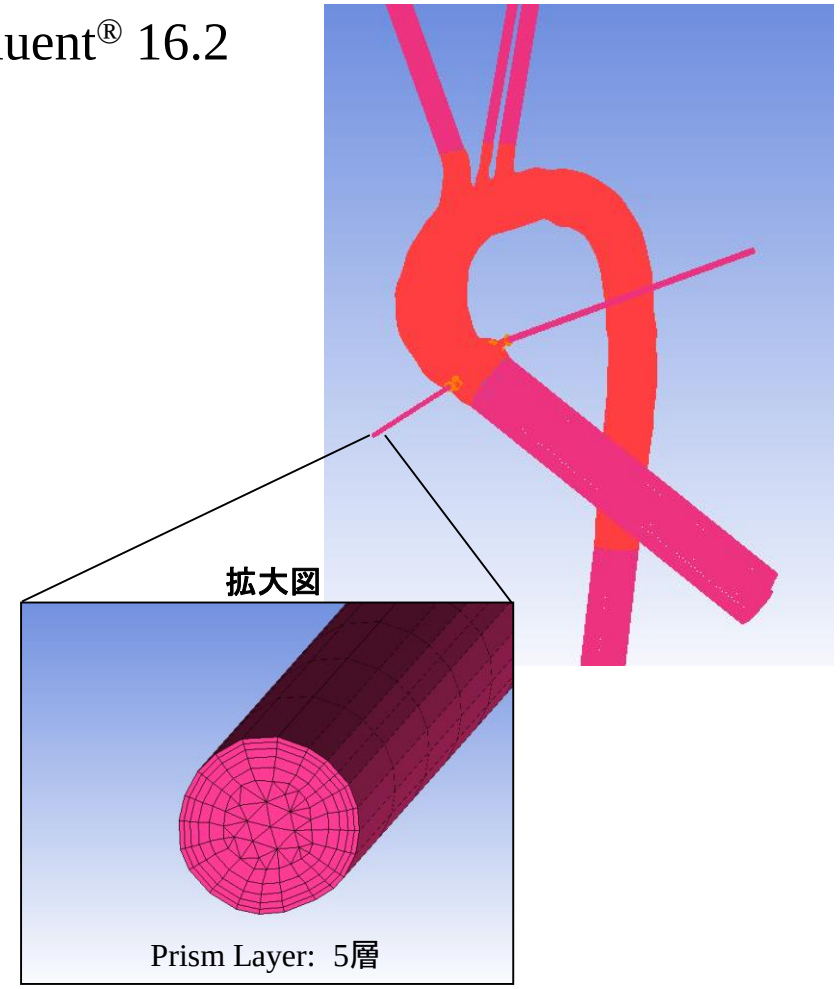
Top View



症例　1

CAE/CFD解析条件

- アプリケーション:　ANSYS® Fluent® 16.2
- 流体計算: 有限体積法
- 圧緩和法: PISO法
- 差分精度: 二次精度風上差分
- Time Step ：5e-5 [s]
- 乱流モデル: RNG k-ε
- 血液密度:　1060 [kg/m3]
- 粘性係数:　0.004 [Pa･s]
- 収束判定基準:　0.00001



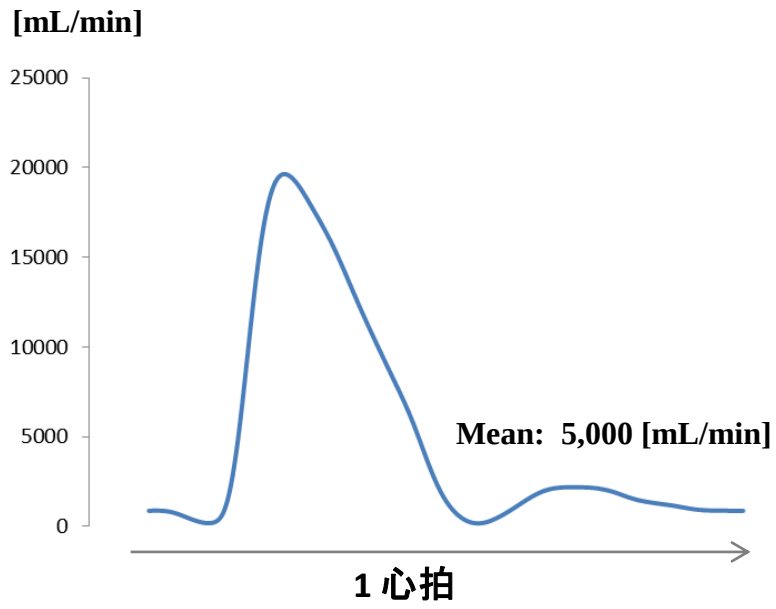
計算格子情報

- Total elements : 3,045,779
- Total nodes :　　1,170,294

症例　1

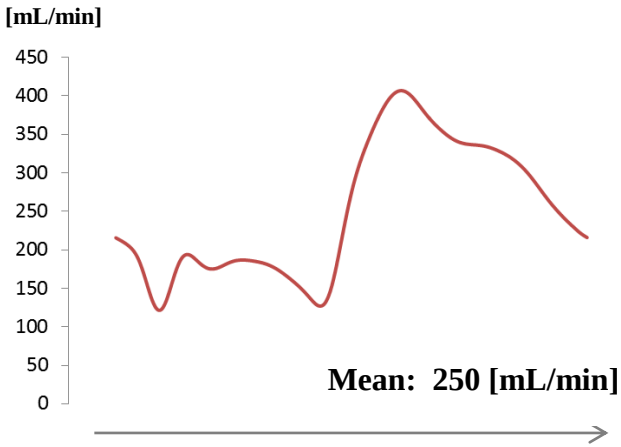
■ 流入境界条件

- 上行大動脈：流量

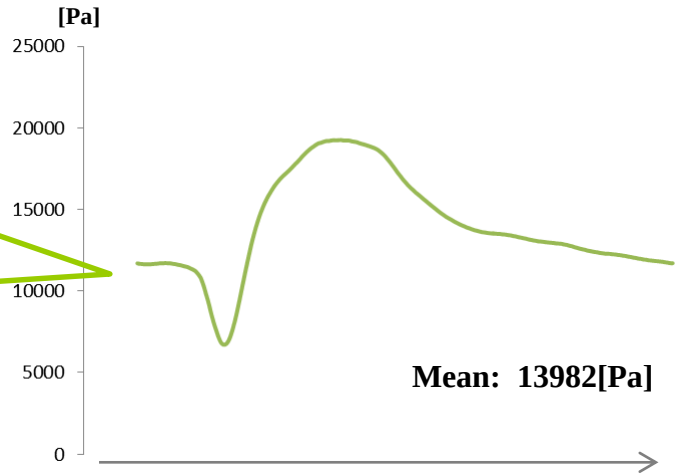


■ 流出境界条件

- 左右冠動脈：流量



- 下行大動脈：圧力



①抹消からの反射波
②血管慣性力
③自律神経応答

生理学的に正しい波形を再現するため、左記を考慮した境界条件を設定

$$P_{out} = Pref - L\frac{dQ}{dt} + H(Q)K(Qout - Qin)$$