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Noninvasive pulmonary arterial pressure estimation using a logistic-based systolic model

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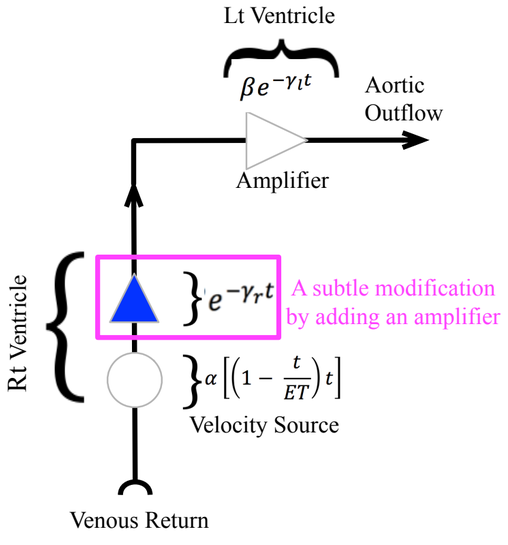
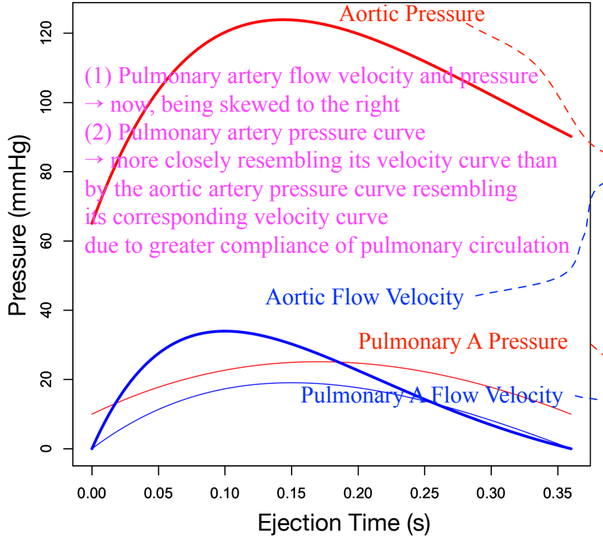
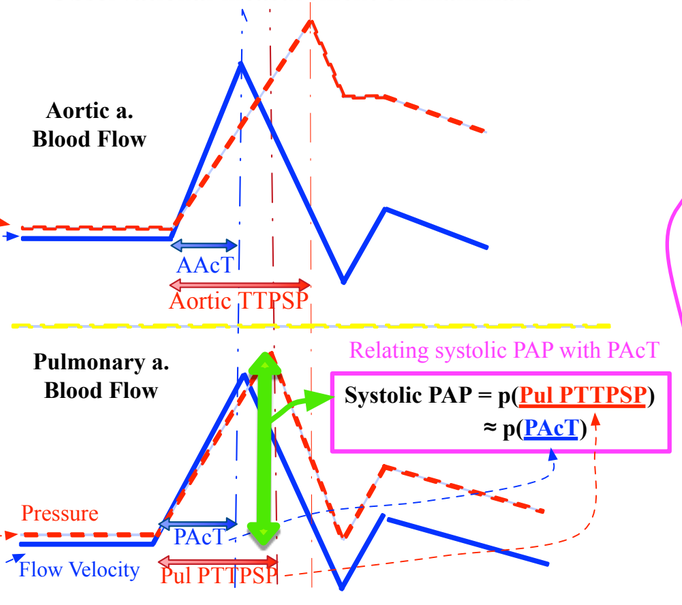
The logistic-based systolic model



Simulated results of the model



Observational measurement on mammals



Modified Bernoulli's equation:

systolic PAP = 4 · TR velocity^2 + RA pressure

Kitabatake's eqaution (1983):

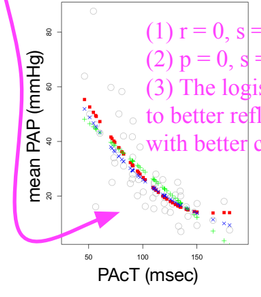
$\log(\text{mean PAP}) = 2.1 - 0.0068 \cdot \text{PAcT}$

Mahan's equation (1987):

mean PAP = 79 − 0.45 · PAcT

Logistic-based PAP estimation equation (Present study):

systolic PAP = $e^{p \cdot PAcT} \cdot [q + r \cdot PAcT + s \cdot PAcT^2] + u$



(1) r = 0, s = 0 → Kitabatake's equation
(2) p = 0, s = 0 → Mahan's equation
(3) The logistic-based PAP estimation equation seems to better reflect the concaved-up L-shaped distribution with better correlation on mean PAP and PAcT dataset.