

Supplementary material

Table S1. Non-individualized simulation parameters - Cardiovascular simulation model parameters not individually adapted to every animal used for the simulation.

Symbol	Description	Value
Systemic circulatory system		
R_s	Systemic arterial resistance	See Table 1 $\text{mmHg} \cdot \text{s}/\text{ml}$
Z_c	Specific aortal resistance	See Table 1 $\text{mmHg} \cdot \text{s}/\text{ml}$
C_s	Systemic arterial compliance	See Table 1 mmHg/ml
$V0_{sC}$	Unstressed volume of the systemic arterial compliance	0 ml
Rv_s	Systemic venous resistance	0.084 $\text{mmHg} \cdot \text{s}/\text{ml}$
Cv_s	Systemic venous compliance	85 mmHg/ml
$V0_{vC}$	Unstressed volume of the systemic venous compliance	See Table 1 ml
Pulmonary circulatory system		
R_p	Pulmonary arterial resistance	0.08 $\text{mmHg} \cdot \text{s}/\text{ml}$
Z_p	Specific resistance of the pulmonary artery	0.004 $\text{mmHg} \cdot \text{s}/\text{ml}$
C_p	Pulmonary arterial compliance	0.1 mmHg/ml
$V0_{pC}$	Unstressed volume of the pulmonary arterial compliance	0 ml
Rv_p	Pulmonary venous resistance	0.08 $\text{mmHg} \cdot \text{s}/\text{ml}$
Cv_p	Pulmonary venous compliance	10 mmHg/ml

$V0_{v_pC}$	Unstressed volume of the pulmonary venous compliance	0 ml
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Valves

TV	Resistance of the tricuspid valve	0.01 mmHg · s/ml
PV	Resistance of the pulmonary valve	0.001 mmHg · s/ml
MV	Resistance of the mitral valve	0.01 mmHg · s/ml
AV	Resistance of the aortic valve	0.001 mmHg · s/ml

Time varying elastance right atrium

E_{ES}	Slope of the linear ESPVR	0.1 mmHg/ml
$V0_{ES}$	Unstressed volume of the ESPVR	20 ml
E_{ED}	Slope of the EDPVR	0.1 mmHg/ml
$V0_{ED}$	Unstressed volume of the EDPVR	-25 mmHg
k_D	Time shift of normalized time t_n	0 s
k_O	Offset shift of normalized time t_n	-0.2 s

Time varying elastance left atrium

E_{ES}	Slope of the linear ESPVR	0.1 mmHg/ml
$V0_{ES}$	Unstressed volume of the ESPVR	20 ml
E_{ED}	Slope of the EDPVR	0.1 mmHg/ml
$V0_{ED}$	Unstressed volume of the EDPVR	20 ml
k_D	Time shift of normalized time t_n	0 s

k_O	Offset shift of normalized time t_n	-0.2 s
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Time varying elastance right ventricle

$V0_{ED}$	Slope of the linear ESPVR	1 mmHg/ml
$V0_{ES}$	Unstressed volume of the ESPVR	10 ml
$P0$	Coefficient of the exponential EDPVR	1 mmHg
λ	Coefficient of the exponential EDPVR	0.025
$V0_{ED}$	Unstressed volume of the EDPVR	45 ml
k_D	Time shift of normalized time t_n	0.2 s
k_O	Offset shift of normalized time t_n	-0.2 s

Time varying elastance left ventricle

E_{ES}	Slope of the linear ESPVR	See Table 1	mmHg/ml
$V0_{ES}$	Unstressed volume of the ESPVR	See Table 1	ml
$P0_{ED}$	Coefficient of the exponential EDPVR	See Table 1	mmHg
λ	Coefficient of the exponential EDPVR	See Table 1	
$V0_{ED}$	Unstressed volume of the EDPVR	See Table 1	ml
k_D	Time shift of normalized time t_n	0.2	s
k_O	Offset shift of normalized time t_n	-0.2	s

Activation function ventricles and atria

i	A_i	$B_i(s)$	$C_i(s)$
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1	$-1.637 \cdot 10^1$	$2.280 \cdot 10^{-1}$	$9.525 \cdot 10^{-2}$
2	$2.561 \cdot 10^{-1}$	$2.519 \cdot 10^{-1}$	$4.046 \cdot 10^{-2}$
3	$6.580 \cdot 10^{-1}$	$2.100 \cdot 10^{-1}$	$5.217 \cdot 10^{-2}$
4	$1.651 \cdot 10^1$	$2.294 \cdot 10^{-1}$	$1.012 \cdot 10^{-1}$
5	$1.662 \cdot 10^{-1}$	$5.914 \cdot 10^{-2}$	$4.036 \cdot 10^{-2}$

Initial Parameters

$V_{lv,0}$	Initial volume of the left ventricle	130.9 ml
$V_{la,0}$	Initial volume of the left atrium	126.5 ml
$V_{rv,0}$	Initial volume of the right ventricle	132.8 ml
$V_{ra,0}$	Initial volume of the right atrium	35.27 ml
V_{C_s}	Initial systemic arterial compliance volume	94.8 ml
V_{Cv_s}	Initial systematic venous compliance volume	1924.9 ml
V_{C_p}	Initial pulmonary arterial compliance volume	1.9 ml
V_{Cv_p}	Initial pulmonary venous compliance volume	192.9 ml