**Appendix**

We performed an additional study to determine if the addition of compliance (captured by an electrical analog of a capacitor) in parallel to the pulmonary arterial system (**Fig. S1a**) can match clinically-measured pressure and diameter waveforms more accurately. To do so, Eq. (1f) was modified as follows:

$\frac{dV\_{pa}(t)}{dt}=q\_{pvv}\left(t\right)-q\_{pa}\left(t\right)-q\_{pa2}\left(t\right)$(A1a)

$q\_{pa2}=C\_{pa}\frac{dP\_{pa}}{dt}$(A1b)

with$ C\_{pa}=0.0025 Pa•ml$ as well as increasing the stiffness of the pulmonary arteries with the parameters $c\_{PA,1}$ = 90kPa, $c\_{PA,2}=200kPa, c\_{PA,4} = 10 kPa. $ This addition of compliance led to a better match of the pulmonary artery pressure and diameter waveforms, as well as the pressure-volume loops with the experimental data (**Fig. S1b - d**).



**Figure S1 (a):** Modified framework with an additional compliance (in red) in the pulmonary circulation**.** Comparison of **(b):** pressure-volume loops**, (c):** pressure waveforms of the pulmonary circulation and **(d)** pressure-diameter waveform**.**