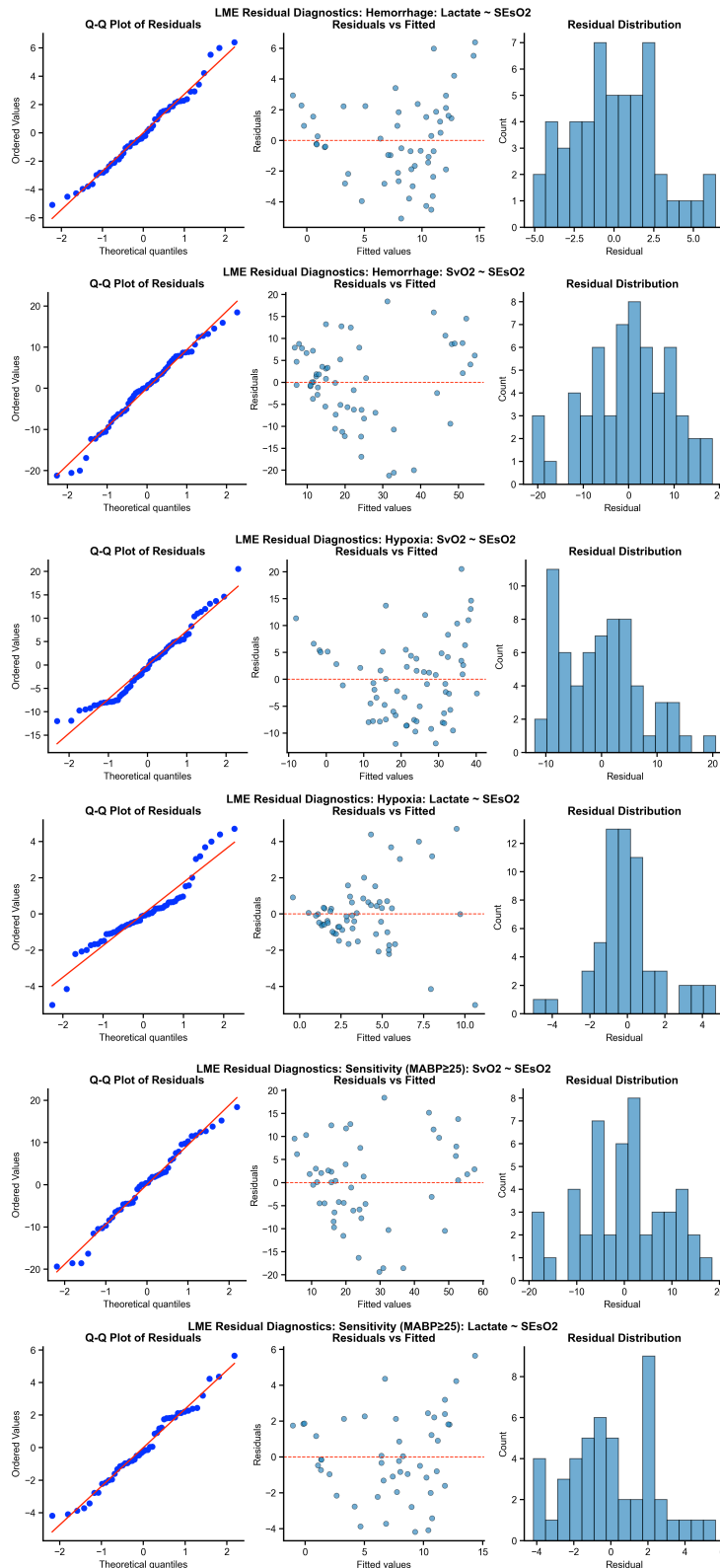
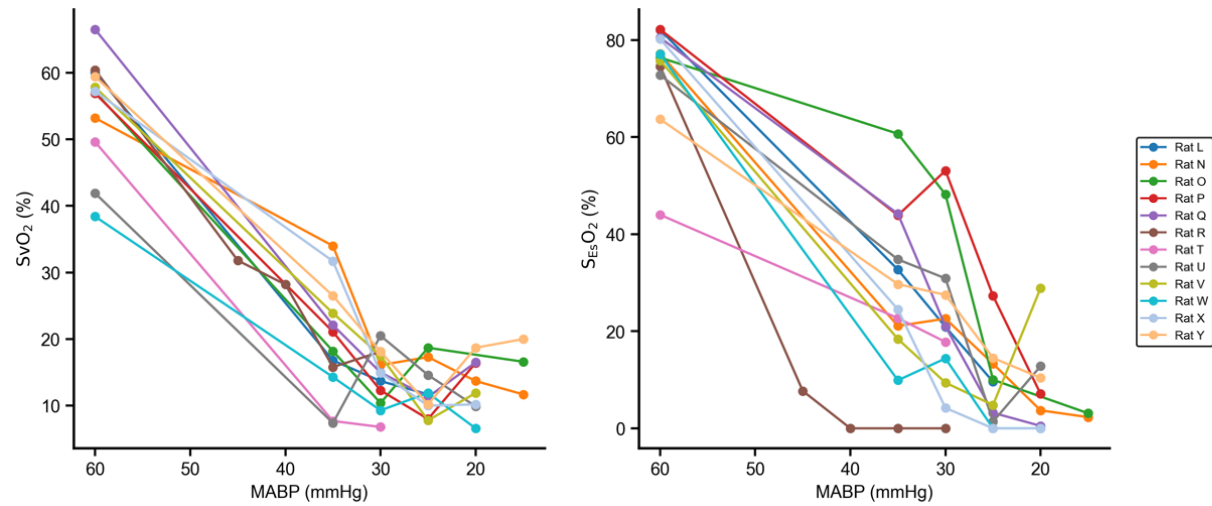


Supplemental 2. Residual Diagnostics of Linear Mixed Effects Models for SEsO_2 , Lactate and SvO_2 relationships.

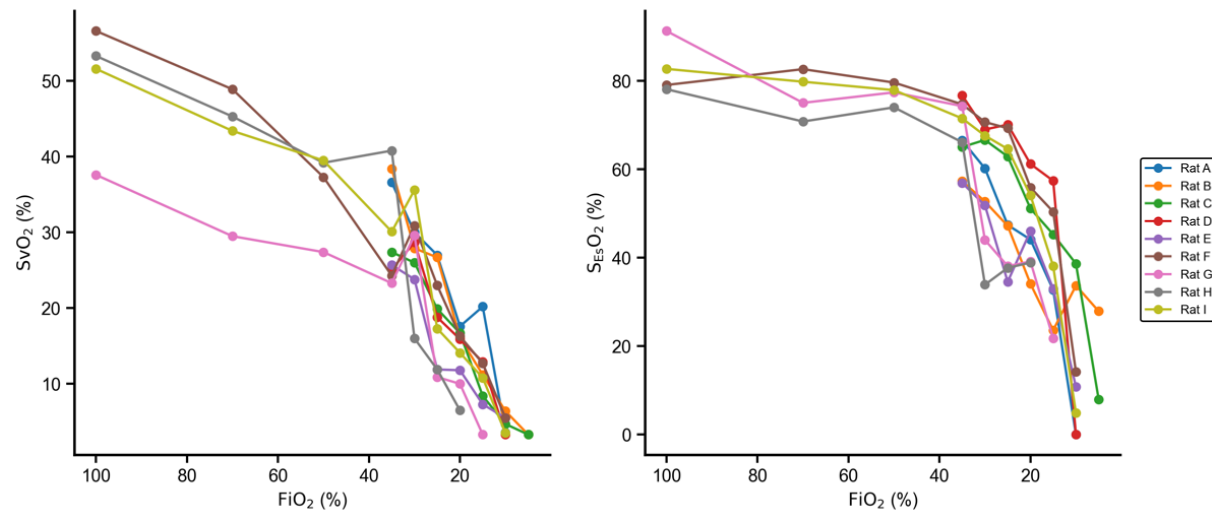


Supplemental 3. Spaghetti plots of within-animal trajectories of SvO₂ and SEsO₂

A) Hemorrhage Shock Model

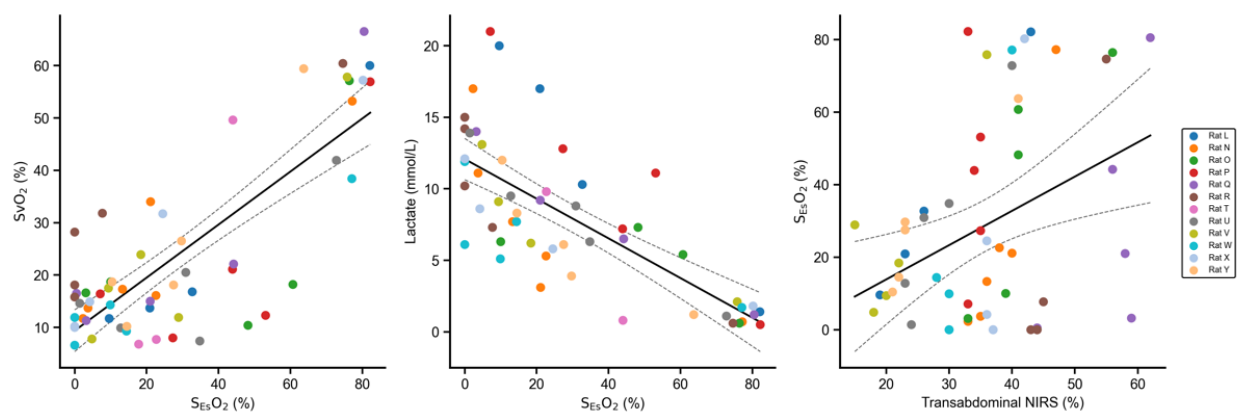


B) Hypoxic Shock Model

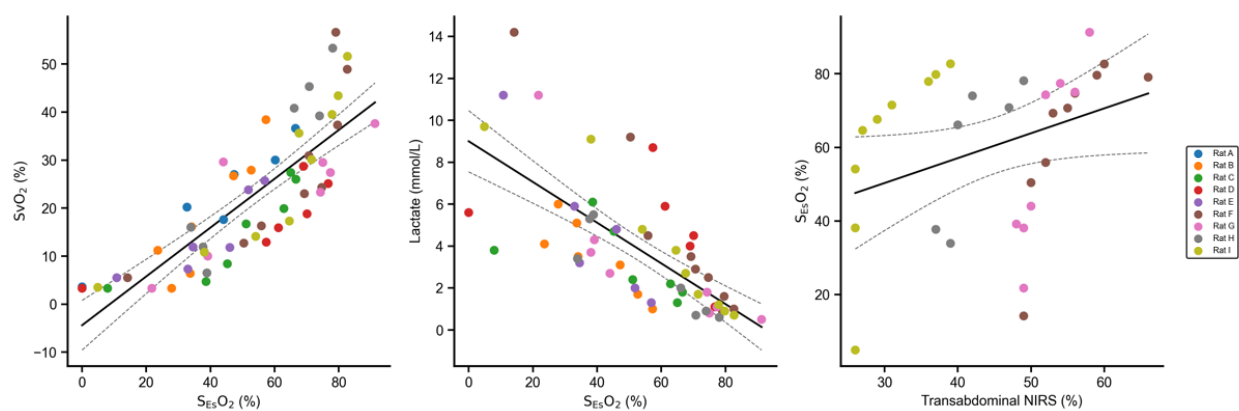


Supplemental 4. Colored correlation plots for visualization of per-animal contributions.

A) Hemorrhage



B) Hypoxia



Supplemental 5.

Table 1.Diagnostic performance by Youden's test of RRS and NIRS compared to SvO₂ sampling

Model	Diagnostic	Observations (n)	Animals (n)	Optimal cut-off%	Sensitivity	Specificity	PPV	NPV
Hemorrhage	SEsO ₂	58	12	43.9	0.9	1.0	1.0	0.7
Hemorrhage	NIRS	56	11	39.0	0.7	0.8	0.9	0.4
Hypoxia	SEsO ₂	65	9	65.0	0.7	1.0	1.0	0.3
Hypoxia	NIRS	32	4	59.0	1.0	0.3	0.8	1.0
Hemorrhage (MABP _≥ 25)	SEsO ₂	48	12	60.7	1.0	0.9	1.0	0.9