

Supplement**Table S1. Univariate analysis of the influence of time-weighted mean PaO₂ on in-hospital mortality**

Time-weighted mean PaO₂ [mmHg]	survived (n=1170)	deceased (n=1477)	p-value
on day 1	91 ± 21	92 ± 25	0.183
during day 2 and 3	82 ± 13	83 ± 18	0.117
during day 4 to 7	82 ± 11	82 ± 14	0.987
during day 8 to 14	83 ± 11	82 ± 12	0.216

Data are given as mean ± standard deviation. PaO₂ = arterial partial pressure of oxygen.

Table S2. Univariate analysis of the influence of PaO₂-integrals on in-hospital mortality

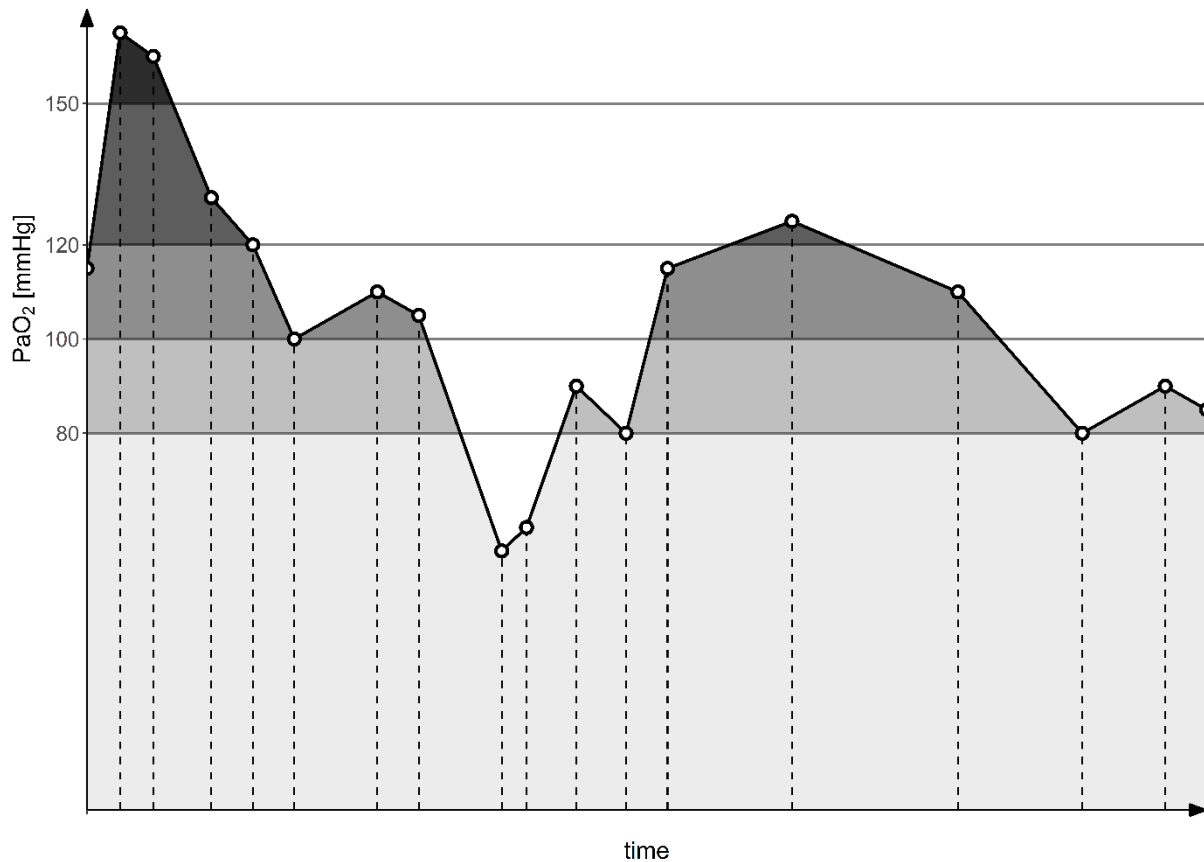
oxygenation parameter	survived (n=1170)	deceased (n=1477)	p-value
on day 1			
PaO ₂ integral above 80 mmHg [mmHg/d]	15.33 ± 18.71	17.07 ± 22.21	0.034
PaO ₂ integral above 100 mmHg [mmHg/d]	7.94 ± 15.32	9.77 ± 18.56	0.007
PaO ₂ integral above 120 mmHg [mmHg/d]	4.92 ± 12.74	6.45 ± 15.56	0.007
PaO ₂ integral above 150 mmHg [mmHg/d]	2.92 ± 9.94	4.02 ± 12.20	0.013
admission up to day 3			
PaO ₂ integral above 80 mmHg [mmHg/d]	10.43 ± 11.74	13.11 ± 16.26	< 0.001
PaO ₂ integral above 100 mmHg [mmHg/d]	4.53 ± 8.52	6.89 ± 13.07	< 0.001
PaO ₂ integral above 120 mmHg [mmHg/d]	2.55 ± 6.48	4.38 ± 10.73	< 0.001
PaO ₂ integral above 150 mmHg [mmHg/d]	1.39 ± 4.72	2.66 ± 8.31	< 0.001
admission up to day 7			
PaO ₂ integral above 80 mmHg [mmHg/d]	9.41 ± 10.06	12.03 ± 15.31	< 0.001
PaO ₂ integral above 100 mmHg [mmHg/d]	3.74 ± 6.75	6.09 ± 12.23	< 0.001
PaO ₂ integral above 120 mmHg [mmHg/d]	1.99 ± 4.64	3.81 ± 10.01	< 0.001
PaO ₂ integral above 150 mmHg [mmHg/d]	0.99 ± 2.84	2.29 ± 7.77	< 0.001
admission up to day 14			
PaO ₂ integral above 80 mmHg [mmHg/d]	9.52 ± 10.93	11.82 ± 15.09	< 0.001
PaO ₂ integral above 100 mmHg [mmHg/d]	3.84 ± 7.98	5.93 ± 12.03	< 0.001
PaO ₂ integral above 120 mmHg [mmHg/d]	2.07 ± 6.00	3.68 ± 9.85	< 0.001
PaO ₂ integral above 150 mmHg [mmHg/d]	1.04 ± 4.17	2.20 ± 7.65	< 0.001

Data are given as mean ± standard deviation. PaO₂ = arterial partial pressure of oxygen.

Table S3. Multivariable analysis of the influence of PaO₂-integrals on in-hospital mortality

oxygenation parameter	odds ratio	lower CI	upper CI	p-value
on day 1				
PaO ₂ integral above 80 mmHg [mmHg/d]	1.005	1.001	1.009	0.022
PaO ₂ integral above 100 mmHg [mmHg/d]	1.006	1.001	1.012	0.013
PaO ₂ integral above 120 mmHg [mmHg/d]	1.007	1.001	1.014	0.021
PaO ₂ integral above 150 mmHg [mmHg/d]	1.008	1.001	1.017	0.039
admission up to day 3				
PaO ₂ integral above 80 mmHg [mmHg/d]	1.015	1.008	1.021	< 0.001
PaO ₂ integral above 100 mmHg [mmHg/d]	1.022	1.013	1.032	< 0.001
PaO ₂ integral above 120 mmHg [mmHg/d]	1.027	1.015	1.041	< 0.001
PaO ₂ integral above 150 mmHg [mmHg/d]	1.035	1.018	1.055	< 0.001
admission up to day 7				
PaO ₂ integral above 80 mmHg [mmHg/d]	1.018	1.010	1.025	< 0.001
PaO ₂ integral above 100 mmHg [mmHg/d]	1.030	1.019	1.042	< 0.001
PaO ₂ integral above 120 mmHg [mmHg/d]	1.043	1.026	1.061	< 0.001
PaO ₂ integral above 150 mmHg [mmHg/d]	1.069	1.042	1.100	< 0.001
admission up to day 14				
PaO ₂ integral above 80 mmHg [mmHg/d]	1.015	1.008	1.022	< 0.001
PaO ₂ integral above 100 mmHg [mmHg/d]	1.025	1.014	1.036	< 0.001
PaO ₂ integral above 120 mmHg [mmHg/d]	1.033	1.018	1.050	< 0.001
PaO ₂ integral above 150 mmHg [mmHg/d]	1.052	1.027	1.081	< 0.001

Separate binary logistic regression model for each oxygenation parameter, adjusted for age and sepsis-related organ failure assessment score on day 1. CI = 95% confidence intervals; PaO₂ = arterial partial pressure of oxygen.

Figure S1. Exemplary calculation of integrals

Calculation of integrals above the set thresholds of 80, 100, 120 and 150 mmHg based on an exemplary sample of arterial blood gas analyses. Circles represent the obtained PaO_2 values, the dashed vertical lines refer to the time of measurement; solid black line represents the presumed linear change in between; horizontal gray lines depict the thresholds above which the integrals were calculated.

mean PaO_2 = light gray + medium-light gray + medium-dark gray + dark gray + black shaded areas.

integral above 80 mmHg = medium-light gray + medium-dark gray + dark gray + black shaded areas.

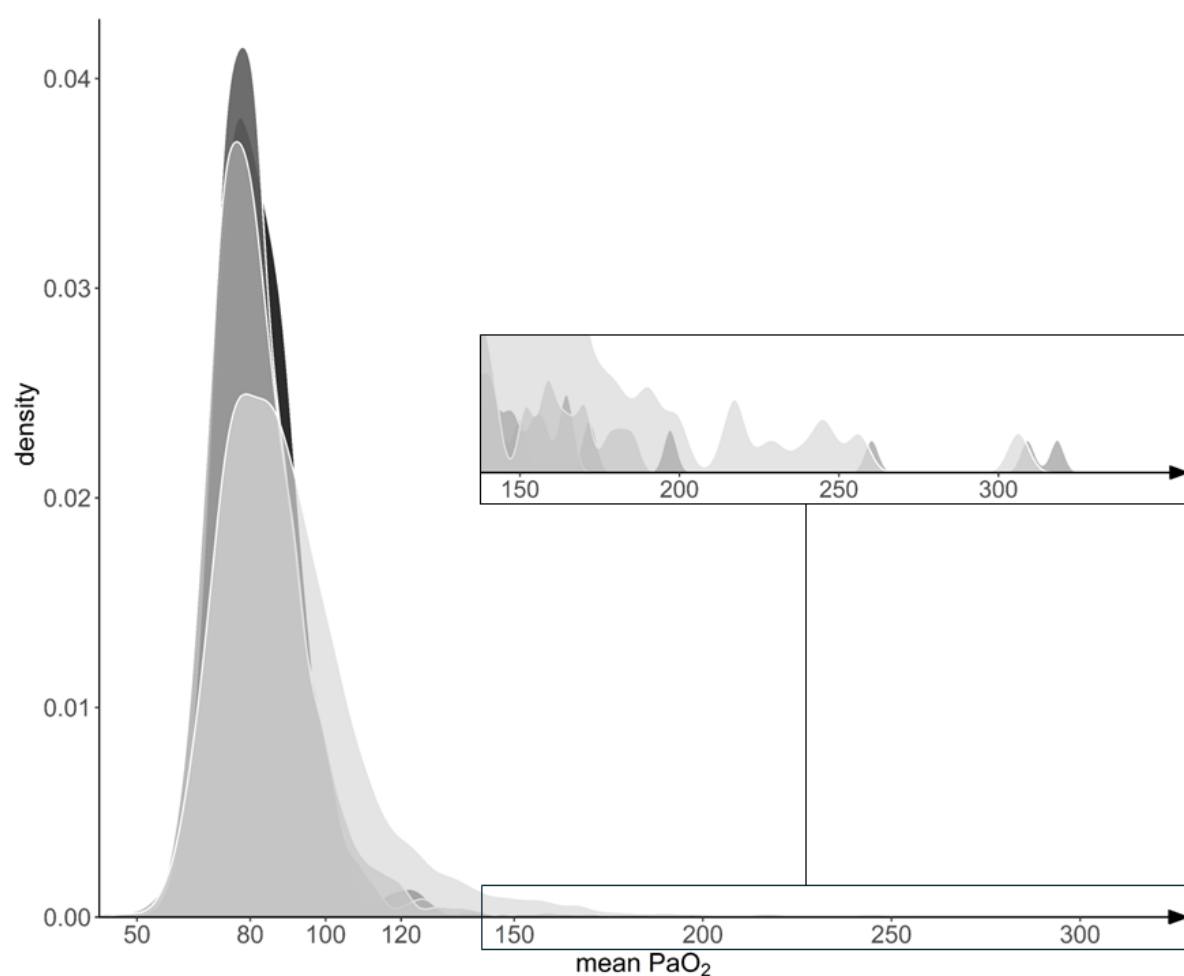
integral above 100 mmHg = medium-dark gray + dark gray + black shaded areas.

integral above 120 mmHg = dark gray + black shaded area.

integral above 150 mmHg = black shaded area.

PaO_2 = arterial oxygen partial pressure.

Modified from Grensemann, J.; Mader, M.M.; Westphal, M.; Kluge, S.; Czorlich, P. Hyperoxia is Dose-Dependently Associated with an Increase of Unfavorable Outcomes in Ventilated Patients with Aneurysmal Subarachnoid Hemorrhage: A Retrospective Cohort Study. *Neurocrit Care* **2022**, 37, 523-530, doi:10.1007/s12028-022-01534-y.

Figure S2. Distribution of time-weighted mean PaO₂ on day(s) 1, 2-3, 4-7 and 8-14

Light gray = distribution of time-weighted mean PaO₂ on day 1, n=2602.

Middle gray = distribution of time-weighted mean PaO₂ on day 2 and 3, n=2330.

Dark gray = distribution of time-weighted mean PaO₂ during day 4 to 7, n=1878.

Black = distribution of time-weighted mean PaO₂ during day 8 to 14, n=1442.

PaO₂ = arterial partial pressure of oxygen.