

Nonlinear Imputation of $\text{PaO}_2/\text{FIO}_2$ From $\text{SpO}_2/\text{FIO}_2$ Among Patients With Acute Respiratory Distress Syndrome

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eTable 1. Equations used to impute PaO₂ from SpO₂

Equation	Method	Populations
$PO_2 = \left\{ \frac{11,700}{(1/S - 1)} + \left[50^3 + \left(\frac{11,700}{1/S - 1} \right)^2 \right]^{1/2} \right\}^{1/3}$ $+ \left\{ \frac{11,700}{(1/S - 1)} - \left[50^3 + \left(\frac{11,700}{1/S - 1} \right)^2 \right]^{1/2} \right\}^{1/3}$	Non-linear*	Physiology laboratory(1); ED patients with pneumonia(2)
$PO_2 = F \cdot \left(\frac{S - 64}{0.84} \right)$	Linear	Patients with ARDS(3)
$PO_2 = F \cdot 10^{\left(0.48 + 0.78 \cdot \log_{10} \left(\frac{S}{F} \right) \right)}$	Log-linear	Patients undergoing general anesthesia(4); patients with ARDS(4)

*The equation is used to estimate PaO₂ from SaO₂. We did not formally model the relationship between SpO₂ and SaO₂.

eTable 2: Imputed PF ratio (cells) for combinations of SpO₂ (rows) and FiO₂ (columns)

	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
80%	148	127	111	98	89	81	74	68	63	59	55	52	49	47	44
81%	151	129	113	101	91	82	76	70	65	60	57	53	50	48	45
82%	155	132	116	103	93	84	77	71	66	62	58	55	52	49	46
83%	158	136	119	106	95	86	79	73	68	63	59	56	53	50	47
84%	162	139	122	108	97	89	81	75	70	65	61	57	54	51	49
85%	167	143	125	111	100	91	83	77	71	67	63	59	56	53	50
86%	171	147	129	114	103	94	86	79	73	69	64	61	57	54	51
87%	177	151	132	118	106	96	88	81	76	71	66	62	59	56	53
88%	182	156	137	121	109	99	91	84	78	73	68	64	61	58	55
89%	189	162	141	126	113	103	94	87	81	75	71	67	63	60	57
90%	196	168	147	130	117	107	98	90	84	78	73	69	65	62	59
91%	203	174	153	136	122	111	102	94	87	81	76	72	68	64	61
92%	213	182	159	142	128	116	106	98	91	85	80	75	71	67	64
93%	223	191	168	149	134	122	112	103	96	89	84	79	74	71	67
94%	236	202	177	157	142	129	118	109	101	94	89	83	79	75	71
95%	252	216	189	168	151	138	126	116	108	101	95	89	84	80	76
96%	273	234	205	182	164	149	136	126	117	109	102	96	91	86	82

eTable 3: Simplified lookup table for specific PF thresholds

FIO₂	For PF ≤ 100, qualifying SpO₂ must be less than	For PF ≤ 150, qualifying SpO₂ must be less than	For PF ≤ 200, qualifying SpO₂ must be less than	For PF ≤ 300, qualifying SpO₂ must be less than
0.30	ineligible	81%	91%	97%
0.35	ineligible	87%	94%	97%
0.40	ineligible	91%	96%	97%
0.45	81%	94%	97%	97%
0.50	86%	95%	97%	97%
0.55	89%	97%	97%	97%
0.60	91%	97%	97%	97%
0.65	93%	97%	97%	97%
0.70	94%	97%	97%	97%
0.75	95%	97%	97%	97%
0.80	96%	97%	97%	97%
0.85	97%	97%	97%	97%
0.90	97%	97%	97%	97%
0.95	97%	97%	97%	97%
1.00	97%	97%	97%	97%