Q_c	Pulmonary capillary blood volume
Q_{sp}	Physiologic shunt flow (total venous admixture)
$\dot{Q}_{sp}/\dot{Q}_{tot}$	Shunt as percent of total blood flow

Diffusing Capacity

D_{LCOsb}	Diffusing capacity of the lung for carbon monoxide determined by the single-breath technique
D_m	Diffusing capacity of the alveolocapillary membrane (STPD)
D/V_A	Diffusion per unit of alveolar volume, with D at STPD and VA in liters BTPS

SI Units with Abbreviations

SI units are decimal units of measurement for physical properties and quantities that have been adopted by the scientific community worldwide. The reader is referred to Respir Care 1988;33:861-873, Respir Care 1989;34:145, and Respir Care 1997;42(6):639-640 for more information.

Variable	Unit	Abbreviation
temperature	kelvin	K
length	meter	m
mass	kilogram	kg
time	second	s
pressure	pascal	Pa
work, or energy	joule	J

Système International: Examples of Conversions Commonly Used in Respiratory Physiology and Respiratory Care

Physical Quantity	Known Unit	Desired Unit	Example of Conversion Calculation
Force (or mass)	lb	kg	$150 \text{ lb} \times \frac{0.4536 \text{ kg}}{1 \text{ lb}} = 68 \text{ kg}$
	kg	lb	$68 \text{ kg} \times \frac{1 \text{ lb}}{0.4536 \text{ kg}} = 150 \text{ lb}$
Pressure	torr	kPa	$35 \text{ torr} \times \frac{0.1333 \text{ kPa}}{1 \text{ torr}} = 4.7 \text{ kPa}$
	kPa	torr	$4.7 \text{ kPa} \times \frac{1 \text{ torr}}{0.1333 \text{ kPa}} = 35 \text{ torr}$
	psi	torr	$1.0 \text{ psi} \times \frac{70.31 \text{ cm } H_2O}{1 \text{ psi}} \times \frac{0.7355 \text{ torr}}{1 \text{ cm } H_2O} = 52 \text{ torr}$
	torr	psi	$51.72 \text{ torr} \times \frac{1 \text{ cm } H_2O}{0.7355 \text{ torr}} \times \frac{1 \text{ psi}}{70.31 \text{ cm } H_2O} = 1.0 \text{ psi}$
Work	$L \cdot cm\ H_2O$	$kg \cdot m$	$20 \text{ L} \cdot \text{cm } H_2O \times \frac{0.09806 \text{ J}}{1 \text{ L} \cdot \text{cm } H_2O} \times \frac{1 \text{ kg} \cdot \text{m}}{9.807 \text{ J}} = 0.2 \text{ Kg} \cdot \text{m}$
	J	$L \cdot cm\ H_2O$	$2 \text{ J} \times \frac{1 \text{ kg} \cdot \text{m}}{9.807 \text{ J}} \times \frac{1 \text{ L} \cdot \text{cm } H_2O}{0.01 \text{ kg} \cdot \text{m}} = 20 \text{ L} \cdot \text{cm } H_2O$
Power	$kg \cdot m \cdot min^{-1}$	W	$2.5 \text{ kg} \cdot \text{m} \cdot \text{min}^{-1} \times \frac{0.1634 \text{ W}}{1 \text{ kg} \cdot \text{m} \cdot \text{min}^{-1}} = 0.41 \text{ W}$
Compliance	$mL/cm\ H_2O$	L/kPa	$100 \text{ mL} \cdot \text{cm } H_2O \times \frac{1\text{L}}{1000 \text{ mL}} \times \frac{10.20 \text{ L} \cdot \text{kPa}^{-1}}{1 \text{ L} \cdot \text{cm } H_2O^{-1}} = 1.02 \text{ L} \cdot \text{kPa}^{-1}$
Resistance	$cm\ H_2O \cdot s \cdot L^{-1}$	$kPa \cdot s \cdot L^{-1}$	$55 \text{ cm } H_2O \cdot \text{s} \cdot \text{L}^{-1} \times \frac{0.090806 \text{ kPa} \cdot \text{L}^{-1}}{1 \text{ cm } H_2O \cdot \text{s} \cdot \text{L}^{-1}} = 5.4 \text{ kPa} \cdot \text{s} \cdot \text{L}^{-1}$

Note: Retain all digits during computation to avoid roundoff error. However, the least precise measurement used in a calculation determines the number of significant digits in the answer. Thus, the final product or quotient should be written with the same number of significant figures as the term with the fewest significant figures, as shown in the examples above. The least ambiguous method of indicating the number of significant figures is to write the number in scientific notation. For example, the number 30 may have either one or two significant figures, but written as 3.0×10^1, it is understood that there are two significant figures. For more information about scientific notation, significant figures, and rounding off, see Lough MD, Chatburn RL, Shrock WA, Handbook of respiratory care. Chicago: Yearbook Medical Publishers, 1985:170-173.

Système International: Conversion Factors for Units Commonly Used in Medicine

Physical Quantity	Conventional Unit	SI Unit	Conversion Factor*
Length	inch (in.)	meter (m)	0.025 4
	foot (ft)	m	0.304 8
Area	in.^{2}	m^2	6.452×10^{-4}
	ft^2	m^2	0.092 90
Volume	dL (= 100 mL)	L	0.01
	ft^3	m^3	0.028 32
	ft^3	L	28.32
	fluid ounce	mL	29.57
Amount of substance	mg/dL	mmol/L	10/molecular weight
	mEq/L	mmol/L	valence
	mL of gas at STPD	mmol	0.044 62
Force (weight)	pound (lb)	newton (N)	4.448
	dyne	N	0.000 01
	kilogram-force	N	9.807
	pound	kilogram-force	0.453 6
	ounce	gram-force	28.35
Pressure	cm H_2O	kilopascal (kPa)	0.098 06
	mm Hg (torr)	kPa	0.133 3
	pounds/in.^{2} (psi)	kPa	6.895
	psi	cm H_2O	70.31
	cm H_2O	torr	0.7355
	standard atmosphere	kPa	101.3
	millibar (mbar)	kPa	0.100 0
Work, energy	kg · m	joule (J)	9.807
	L · cm H_2O	joule (J)	0.098 06
	calorie (cal)	joule (J)	4.185
	kilocalorie (kcal)	J	4 185
	British thermal unit (BTU)	—	1055
Power	kg · m · min^{-1}	watt (W)	0.163 4
Surface tension	dyn/cm	N/m	0.001
Compliance	L/cm H_2O	L/kPa	10.20
Resistance	cm $H_2O \cdot s \cdot L^{-1}$	$kPa \cdot s \cdot L^{-1}$	0.098 06
	cm $H_2O \cdot min \cdot L^{-1}$	$kPa \cdot s \cdot L^{-1}$	5.884
Gas transport (ideal gas, STPD)	$mL \cdot s^{-1} \cdot cm\ H_2O^{-1}$	$mmol \cdot s^{-1} \cdot kPa^{-1}$	0.455 0
Temperature	°C	°K	°K = °C + 273.15
	°F	°C	°C = (°F − 32)/1.8
	°C	°F	°F = (1.8 · °C) + 32

*To convert from conventional to SI unit, multiply conventional unit by conversion factor. To convert in the opposite direction, divide by conversion factor. Examples: 10 torr = 10 × 0.133, 3 kPa = 1.333 kPa, 1 L = 1 L/0.10 = 10 dL