INDICATION

A-a gradient should be used in cases of unexplained hypoxia or where degree of hypoxia exceeds degree of illness.

Allows comparrison to the expected A-agradient for healthy individuals with similar characteristics.

Can help identify the cause of hypoxaemia by determining whether the cause is intra or extra-pulmonary.

INTERPRETATION

Normal A-a O_2 GRADIENT = (Age_{years} / 4) +4

CAUSES OF HYPOXAEMIA	A-a O_2 GRADIENT SHIFT
V/Q Mismatch (eg PNA, CHF, PE, ARDS, atelectasis, etc)	Elevation
Shunt (eg PFO, ASD, pulmonary AVMs)	Elevation
Alveolar Hypoventilation (eg interstitial lung disease, environmental lung disease, PCP PNA)	Elevation
Hypoventilation (ex: COPD, CNS insult/disease, neuromuscular disease)	Depression
High altitude	Depression

CALCULATION

A-a O_2 GRADIENT= (FiO_2 × (Atmospheric Pressure - H_2O Pressure) - $PaCO_2$ / 0.8) - PaO_2

H_2O pressure = 6.25_{kPa} / 47_{mmHg}