

Shunt & Dead Space “A basic explanation”

V/Q V= ventilation of an alveolus
 Q= perfusion of an alveoli (the circulation that goes
 past the alveoli)

The average V/Q ratio of the entire lung is approximately
0.8 or V =4
 Q =5

$$V/Q = 4/5 = 0.8$$

If an alveoli lacks ventilation, V is interrupted and
decreases $V/Q = 3/5 = 0.6$

This is shunt effect or a decrease in V/Q

If there is total lack of ventilation, this is known as true
shunt.

An example of shunt would be a pt with pneumonia or
pulmonary edema.

If an alveolus lacks perfusion, Q is interrupted and
increases $V/Q = 4/4 = 1$

This is called dead space; an alveolus is being ventilated
but not all perfusion is allowed to reach the alveolus.

A good example of dead space is a pt with a pulmonary
embolism.

Deadspace ($V/\downarrow Q$) –

Anatomic: Volume of gas in conducting airways (nose, mouth, pharynx, larynx, and down to but not including the respiratory bronchioles). This gas is not perfused.

Alveolar: Alveolus ventilated but not perfused.

Physiologic: Sum on anatomic and alveolar dead space.

Shunt ($\downarrow V/Q$) – Cardiac output that enters the L ventricle without exchanging with alveolar gases (True shunt).
– Shunt effect: Blood does exchange with some alveolar gas.

There is much, much more to this explanation... but it will have to wait for another day in another class.