

Negative pressure

A negative value of a [pressure](#) variable.

[Air embolism](#) is a potentially fatal [complication](#) of any [operation](#) when an opening to [air](#) occurs in a non-collapsible vein (e.g. [diploic vein](#) or a [dural sinus](#)) when there is a negative pressure in the [vein](#) (e.g. when the [head](#) is elevated above the [heart](#)) ¹⁾.

[Air](#) is entrained in the [vein](#) and can become trapped in the right atrium of the heart, which may impair venous return, causing [hypotension](#). May also produce cardiac arrhythmias. Paradoxical [air embolism](#) can occur in the presence of a patent [foramen ovale](#) ²⁾ or pulmonary AV fistula, and may produce ischemic [cerebral infarction](#).

Greater negative pressures occur in the [sitting position](#) due to the extreme elevation of the head, but AE can occur in any operation with the head elevated higher than the heart. Incidence: a wide range has been quoted in the literature, and depends on the monitoring method used: $\approx 7\text{--}25\%$ incidence with the sitting position using Doppler monitoring is an estimate ³⁾.

Negative pressure wound therapy

¹⁾

Grady MS, Bedford RF, Park TS. Changes in Superior Sagittal Sinus Pressure in Children with Head Elevation, Jugular Venous Compression, and PEEP. J Neurosurg. 1986; 65:199-202

²⁾

Black S, Cucchiara RF, Nishimura RA, et al. Parameters Affecting Occurrence of Paradoxical Air Embolism. Anesthesiology. 1989; 71:235-241

³⁾

Standefer MS, Bay JW, Trusso R. The Sitting Position in Neurosurgery. Neurosurgery. 1984; 14:649-658

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