




Vascular air embolism




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Introduction




- What is a vascular air embolism?
- Recent NSW experience
- Prevention strategies

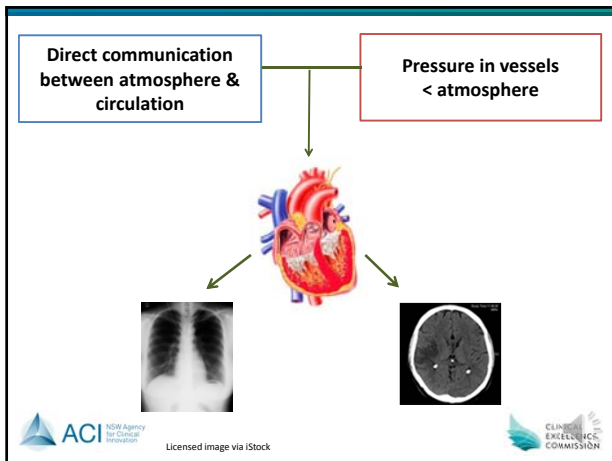


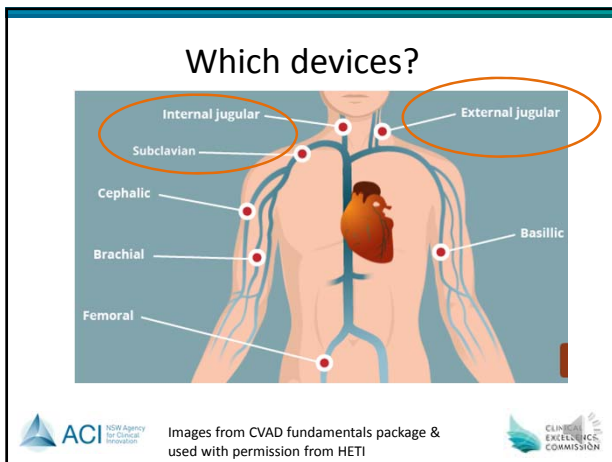
<http://www.cec.health.nsw.gov.au/programs/patient-safety/reports>

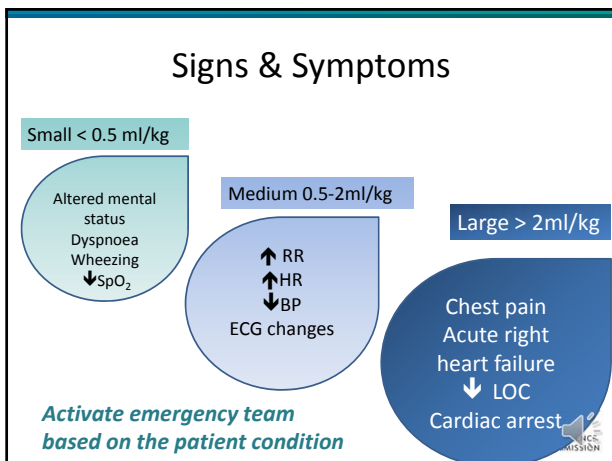


A vascular air embolism (VAE) is when air enters the vascular system and produces systemic effects









NSW Incidents Jan 2012-Apr 2015

- 14 events
- 9 incidents in critical care
- 6 deaths
- 9 during removal procedures
 - 7 semi-recumbent position



<http://www.cec.health.nsw.gov.au/programs/patient-safety/reports>



Prevention – INSERTION

Assess & Plan

- Most appropriate device
- Assess patient risks & plan

Position

- Supine or trendelenberg in bed

Prepare

- Priming, clamping & apply valves to each lumen
- Secure at 2 sites

Monitor

- Monitor patient



Prevention – LINE MAINTENANCE

Assessment

- CVAD still needed?
- Check connections each shift
- Document length of catheter outside vessel

Admin sets

- Minimise connectors
- Valves on each lumen with luer locks
- Clamps ON when disconnecting

IV pumps

- Use 'air in line' alarms



Prevention – REMOVAL

Assess & Plan

- Assess patient risks
- Seek advice if pt unable to lie flat or has high RR
- Plan & explain the procedure

Position


- Supine or trendelenberg in bed

Removal

- End inspiration & apply pressure to site until haemostasis
- Apply occlusive dressing for 48 hours

Monitor

- Check obs in the immediate post removal period
- Do not transfer patients within 30 minutes



Summary



CVAD needed

Assess & plan

Connections


Monitor

Role model

CVAD Training Information

HETI code	Name of course
92712530	Central Venous Access Devices: the Fundamentals – e learning module
92382298	CVAD Intravenous (IV) Administration Set Change Assessment Tool
92381360	CVAD Dressing and Swabable Capless Valve (SCV) Change Assessment Tool
92382007	CVAD Removal of Non- Tunnelled Assessment Tool
96342016	Vascular Air Embolism PODCAST (link out)
N/A	ACI -CVAD Training resources: http://www.aci.health.nsw.gov.au/networks/intensive-care/clinicians/ic-manual/cvad
N/A	Central Line Insertion NSW Health staff link http://edmoretraining.com.au/doh/ External link via CEC Website http://cec.health.nsw.gov.au/concluded-programs/clab-icu/cli-training/cli
N/A	Central Line Insertion Training Framework http://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0005/258350/training-framework.pdf



NSW Health

- Report CEC <http://www.cec.health.nsw.gov.au/programs/patient-safety/reports>
- Safety notice 002/15 <http://internal.health.nsw.gov.au/quality/sabs/pdf/2015-sn-002.pdf>
- Safety notice 004/14 <http://internal.health.nsw.gov.au/quality/sabs/pdf/sn004-14.pdf>
- PD2011_060 http://www0.health.nsw.gov.au/policies/pd/2011/pdf/PD2011_060.pdf
- ACI Guideline <http://www.aci.health.nsw.gov.au/networks/intensive-care/clinicians/ic-manual/cvad>



Further reading

- Pennsylvania Patient Safety Authority Reducing Risk of Air Embolism associated with Central Venous Access Devices 2012: [http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9\(2\)/Pages/58.aspx](http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/58.aspx)
- Mirski MA (2007) Anaesthesiology 106(1): 164-177
- Pinho J (2016) Journal of the Neurological Sciences. 362, p.160-4.



Case Studies

- **Vascular air embolism** <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3665124/>
- **A Patient With Acute COPD Exacerbation and Shock** <http://journal.publications.chestnet.org/article.aspx?articleid=1775337>



Contacts

Clinical Excellence Commission

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