

# Central venous catheter insertion by clinical nurse consultant or anaesthetic medical staff: A single centre observational study

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**Objective:** To compare clinical outcomes of elective central venous catheter (CVC) insertions performed by either a clinical nurse consultant (CNC) or anaesthetic medical staff (AMS).

**Design, setting and participants:** Prospective audit of a convenience sample of consecutive CVC insertions between July 2005 and October 2007 at a metropolitan teaching hospital in Sydney, Australia. The sample included all outpatients and inpatients requiring a CVC for either acute or chronic conditions.

**Results:** Over a 28-month period, 245 CVCs were inserted by AMS and 123 by the CNC. The most common indications for CVC placement in both groups were for the treatment of oncology and autoimmune disorders (61%) and for antibiotic therapy (27%). There was no significant difference in complications on insertion between the CNC and AMS groups. The rate of CVCs investigated for infection was twice as high in the AMS group as in the CNC group (19% v 8%). The confirmed catheter-related bloodstream infection (CRBSI) rate was 2.5/1000 catheters in the AMS group and 0.4/1000 catheters in the CNC group ( $P = 0.04$ ).

Group characteristics	AMS	CNC	<i>p</i>
Catheters inserted, n	245	123	
Patients, n	148	84	
Mean age in years (SD)	50(15)	49 (18)	0.59
Male sex, n (%)	130 (53%)	75 (61%)	0.12
<b>Indications for insertion, n (%):</b>			
Oncology/autoimmune	145 (59%)	81 (66%)	0.24
Parenteral nutrition	6 (2%)	3 (2%)	0.99
Antibiotic administration	74 (30%)	27 (22%)	0.09
Drug therapy	9 (4%)	3 (2%)	0.52
Other	11 (4%)	9 (7%)	0.25
<b>Insertion site, n (%):</b>			
Internal jugular	125 (51%)	81 (66%)	<0.01
Subclavian	115 (48%)	42 (34%)	<0.01
Femoral	5 (2%)	0	0.11
<b>Catheter type, n (%):</b>			
Vascath	29 (12%)	18 (15%)	0.55
Single lumen	42 (17%)	24 (20%)	0.68
Double lumen	23 (9%)	4 (3%)	0.06
Triple lumen	151 (62%)	77 (63%)	0.95

**Conclusion:** Insertion outcomes were favourable in both the AMS and CNC groups. Infection outcomes differed between groups, with a higher rate of CRBSI in the AMS group.

Outcomes on insertion of central venous catheters (CVCs)			
Complications on insertion, n (%)			
	AMS	CNC	<i>p</i>
Uneventful	194 (79%)	96 (78%)	0.91
Multiple passes	18 (7%)	5 (4%)	0.32
Arterial puncture	1 (<1%)	0	1.00
Failed access	12 (5%)	8 (7%)	0.69
Misplaced CVC tip	1 (<1%)	0	1.00
Difficult feed*	4 (2%)	4 (3%)	0.53
Difficult access	11 (4%)	9 (7%)	0.33
Pneumothorax	2 (1%)	0	0.55
Haematoma	2 (1%)	1 (1%)	0.56

Outcome of central venous catheter (CVC) tip surveillance			
	AMS	CNC	<i>p</i>
<b>Routine CVC tip surveillance</b>			
	103 (42%)	56 (58%)	
No tip growth	79 (77%)	51 (91%)	0.01
Tip growth	24 (23%)	5 (9%)	<0.01
<b>Clinically indicated</b>			
CVC tip surveillance, <sup>s</sup>	46 (19%)	10 (8%)	
No tip growth	20 (44%)	9 (90%)	0.04
Tip growth only	7 (15%)	0	0.33
BC growth only	3 (6%)	0	1.00
CRBSI	16 (35%)	1 (10%)	0.24
<b>CRBSIs/1000</b>			
Catheters	2.5	0.4	0.04
<b>Catheter-related thrombosis</b>			
	1 (<1%)	0	1.00

