




Administration sets/infusion tubing: How often should they be changed to prevent CRBSI?

Ms Emily Larsen, Griffith University, Australia

Broadcast live from the 2017 conference of the Australasian College of Infection Control



Broadcast live from



Administration sets/infusion tubing: How often should they be changed to prevent CRBSI?

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This study:
Intravascular device administration sets:
Replacement after Standard Versus Prolonged use
(The RSVP trial)

V3 02/05/2017

NHMRC project grant 2011-2015, AUD\$1.7 million





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Background

- IVDs used extensively worldwide. Many use AS to deliver fluids, medication and pressure monitoring
- Since 1971, AS have been time limited for use (firstly 24 hours, then longer)
- Replacing AS may remove contaminated sets, or may instead allow contamination by breaking a closed circuit
- Routine AS change: ↑ equipment, ↑ nursing time costs, and ↑ medical waste, ↑ profits for manufacturers.



Background

Cochrane Database of Systematic Reviews

Optimal timing for intravascular administration set replacement

New search | Conclusions changed | Review | Intervention


Amanda J Ullman, Marie L Cooke, Donna Gillies, Nicole M Marsh, Azlina Daud, Matthew R McGrail, Elizabeth O'Riordan, Claire M Rickard

First published: 15 September 2013

Editorial Group: Cochrane Anaesthesia, Critical and Emergency Care Group

DOI: 10.1002/14651858.CD003588.pub3 [View/save citation](#)

- A Cochrane systematic review (2013) included 16 RCTs (5001 pts) - Most papers included were of moderate to high risk of bias (or unclear)
- Cochrane has determined “There are currently an inadequate numbers of trials to examine the effect of AS use beyond 96hrs”
- Australian Infection Control Guidelines (2010): “Leave AS that do not contain lipids, blood/blood products in place up to 4 days”
- CDC Guidelines 2011: “In patients not receiving blood, blood products or fat emulsions, replace AS no more frequently than at 96-hour intervals, but at least every 7 days.” Category 1A



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The Team



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Chief Investigator




Ms Nicole Marsh
Project Manager

- (Other) Site Investigators:
 - Professor Joan Webster
 - Professor Jeanine Young
 - Professor John Fraser
 - Professor Geoffrey Playford
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 - Dr Matthew McGrail
 - Dr Fenella Gill
 - Dr Bradley Wibrow
 - Dr Naomi Runnegar
 - Dr Adrian Regli
 - Dr Stuart Baker
 - Dr John Gowardman
 - Tim Spencer
 - Claire Reynolds

+ 26 Research Nurses over a period of 6 years. An amazing team!



Research Question





Aim: To compare the impact of 4 vs 7 day administration set (AS) replacement on infective, clinical and cost outcomes?


Hypotheses:

- ▶ 7 day use is non-inferior (no worse) to 4 day for IADs for CRBSI - Sample: 680 IADs (baseline CRBSI 0.8%)
- ▶ 7 day and 4 day use is equivalent (+/- 2%) CVADs (all) for CRBSI - Sample: 2,220 CVADs (baseline CRBSI 1.9%)

PRIMARY OUTCOME: CRBSI (matched tip/blood; or differential time to positivity criteria) CDC 2011, IDSA 2009




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Design

- Multi-centre, RCT of 2,941 patients
- Pragmatic design of 4 day vs 7 day policy for crystalloid based infusions and non-lipid PN
- Centralised, stratified, block randomisation (concealed)
- Not blinded to patients, clinical or research staff, but blinded primary endpoint CRBSI assessments (ID physician)
- One device per patient. Intention to Treat approach
- Data Safety Monitoring Committee


Inclusion criteria	Exclusion criteria
✓ Any inpatient/any age	X Current bloodstream infection
Update! Waiver of consent	X Device removal ≤ 24 h
✓ CVAD or IAD in situ with AS	X Device in situ >96 h
✓ Device <i>in situ</i> >24 hours	X Original AS replaced
✓ Device expected ≥ 7 days	





Study Population


Population	Clinical Setting	Devices
<ul style="list-style-type: none">• Adults• Paediatrics	<ul style="list-style-type: none">• Intensive Care• Cancer Care Services• Medical/Surgical	<ul style="list-style-type: none">• Arterial Lines (IALs)• Central Venous Catheters (CVCs)• Peripherally Inserted Central Catheters (PICC)• Cuffed Catheters• Implanted Ports





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10 Hospitals Included



WA

Sir Charles Gairdner

St John of God (Murdoch)

Princess Margaret Hospital

QLD

Royal Brisbane and Women's Hospital

Princess Alexandra Hospital


Lady Cilento Children's Hospital / Royal Children's Hospital

The Prince Charles Hospital

NSW

Royal Prince Alfred Hospital

Liverpool Hospital





Approvals

- Human Research Ethics Committees:
 - Update: Children's Health Queensland Hospital and Health Services Human Research Ethics Committee (HREC) (5 Hospitals - from 2013-2016)
 - New South Wales (NSW): Royal Prince Alfred Hospital HREC (2 Hospitals)
 - Western Australia (WA):
 - Princess Margaret Hospital HREC (1 Hospital)
 - Sir Charles Gairdner and Osborne Park Health Care Group HREC (1 Hospital)
 - St John of God Health Care HREC (1 Hospital)
- Site Specific Approvals (for each hospital)
- QCAT (QLD Civil and Administrative Tribunal) and NCAT (NSW Civil and Administrative Tribunal)
- Public Health Act approval (permission to access confidential health information)
- Registered on the Australian and New Zealand Clinical Trials Registry

.....lots of paperwork.....




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Study Population


	4 day	7 day
Age	49 yrs	50 yrs
Females	37%	37%
ICU / PICU	52% / 10%	51% / 9%
Med/Surg	4% / 11%	4% / 12%
Onc / Haem	4% / 20%	5% / 19%
Diabetes	16%	16%
Leucopenic	5%	5%






Results: CVADs

	4 day	7 day	IRR	p
Devices	1097	1124	-	-
CLABSI	48 (4.4%)	62 (5.5%)		
/1000 days	3.2	4.2	1.3	0.17
CRBSI	16 (1.5%)	20 (1.8%)	-	
/1000 days	1.1	1.4	1.26	0.50




Tip +ve
4 Day: 1.3%; 7 Day: 1.1%; p = 0.76

Mortality
4 Day: 5.1%; 7 Day: 3.7%; p = 0.12




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Results: IALs


	4 day	7 day	IRR	p
Devices	363	357		
CLABSI	10 (2.8%)	6 (1.7%)		
/1000 days	3.8	2.4	0.63	0.38
CRBSI	0 (0%)	1 (0.28%)		
/1000 days	0	0.4	N/A	0.49



Tip +ve
4 Day: 0%; 7 Day: 0.8%; p=0.08

Mortality
4 Day: 6.6%; 7 Day: 7.3%; p=0.72






Interpretation

Now:

- ✓ 4 day & 7 day AS replacement equivalent for CVADs
- ✓ Day 7 is not worse than Day 4 for arterial devices
- ✓ **Policies can change to 7 day AS replacement for crystalloid-based infusions and non-lipid PN**
- ✓ Less AS replacement procedures reduce work and costs

Future:


- ✓ Many ICU (and other units) have CLABSI >1/1000 days
- ✓ Focus needed on highly prevalent ICU device failure
- ✓ Why are so many ICU devices removed “routinely”?
- ✓ Why are so many ICU and CCS “suspected CLABSIs” not confirmed?



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Limitations

- Only outcome assessors were blinded
- PICC & CVCs unable to be powered separately
- Not generalizable to lipids, blood, chemotherapy, Cyclosporin, inotropes
- These are preliminary results and may change
- Multivariate, subgroup and cost-effective analysis to come



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Alliance for Vascular Access Teaching and Research

Thank you for listening.
Any questions?

THAT'S A GOOD QUESTION!



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The screenshot shows the homepage of the Australasian College of Infection Prevention and Control (ACIPC). The navigation bar at the top includes links for HOME, ABOUT ACIPC, ACIPC MEMBERS AREA, EDUCATION, CREDENTIALLING, and RESEARCH, along with an email icon and the address admin@acipc.org.au. The main content area features a teal geometric background with the website URL www.acipc.org.au in large white text. Below this is the full name of the organization, "AUSTRALASIAN COLLEGE OF INFECTION PREVENTION AND CONTROL Ltd", and a brief description: "ACIPC is the peak body for Infection Prevention and Control in the Australasian region." A green button labeled "Membership" is positioned below the text. To the right is the ACIPC logo, which consists of a stylized network of nodes and lines. The bottom of the page is divided into four dark-colored boxes with white text: "EDUCATION" (College provides... development to), "ANNUAL CONFERENCE" (Our annual conference is), "JOIN ACIPC" (Become a ACIPC member to develop your IPC skills and), and "CREDENTIALLING" (Credentialling pro... a career pathway).

The screenshot displays a teleclass schedule from Webber Training. At the top, the URL www.webbertraining.com/schedule1.php is shown in white text on a red background. The schedule lists three teleclasses:

- November 21, 2017**: *(European Teleclass)*
THE ROLE OF RAPID DIAGNOSTICS IN PREVENTING HEALTHCARE INFECTION
Speaker: **Dr. Hilary Humphreys**, The Royal College of Surgeons in Ireland
- December 7, 2017**: **BEYOND HIGH-TOUCH SURFACES: FLOORS, PORTABLE EQUIPMENT, AND OTHER POTENTIAL SOURCES OF HEALTHCARE INFECTION TRANSMISSION**
Speaker: **Prof. Curtis J. Donskey**, Case Western Reserve University, Cleveland
- December 14, 2017**: *(FREE Teleclass)*
ENHANCED PERFORMANCE FEEDBACK AND PATIENT PARTICIPATION TO IMPROVE HAND HYGIENE COMPLIANCE
Speaker: **Dr. Hugo Sax**, University of Zurich Hospitals, and **Dr. Andrew Stewardson**, Hand Hygiene Australia

At the bottom, it is noted that the teleclasses are *Sponsored by GOJO (www.gojo.com)*. The bottom of the page features a decorative banner with the year "2018" in large, dark, stylized numbers against a warm, golden background.

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