



OMGPVC
One Million Global Catheters
PVC Worldwide Prevalence Study

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CE Code (Attendee Use Only): _____

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Financial Disclosures

Please include the following information:

1. Disclosure of Relevant Financial Relationships

I have the following financial relationships to disclose:

Education Services for:

Cook Medical Australia
Angio Dynamics Australia
Flo Medical Australia
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3M
BBraun
Cook Medical
Flo Medical
Hospira

2. Disclosure of Off-Label and/or investigative Uses

I will not discuss off label use and/or investigational use in my presentation.

Background

- Over a billion PIVCs inserted annually in hospitalised patients
- Most commonly practiced procedure in the clinical setting
 - Emergency admission / resuscitation
 - Blood sampling
 - Parenteral medication & fluid replacement
 - ***One of the most important innovations in health in the last 200 years***



- Nearly 60% of hospitalised patients have a short PIVC – OMG Pilot

- PRNewswire. (2014). Global Peripheral I.V. Catheter Market 2014-2018. from <http://www.prnewswire.com/news-releases/global-peripheral-iv-catheter-market-2014-2018-257019061.html>
- Alexandrou, Evan, Ramjan, Lucie, Murphy, Jeff, Hunt, Leanne, Betihavas, Vasiliki, & Frost, Steven A. (2012). Training of Undergraduate Clinicians in Vascular Access: An Integrative Review. *Journal of the Association for Vascular Access*, 17(3), 146-158.

Background

- PIVCs are not without risk
- Can contribute to hospital acquired infection
 - 1 infection for every 1000 PIVCs inserted – developed nations
 - 19 infections for every 1000 PIVCs - developing nations
- Developing nations at greater risk
 - Re-use of needles, syringes and gloves
 - Less than 20% adherence to hand hygiene
 - Low Government health spending
 - USA \$9,146 per capita (USD)
 - Australia \$1,456 per capita (USD)
 - China \$92 (USD)
 - **Dem Rep Congo \$4 (USD) – 1 PIVC = capita**



- Maki, Dennis G, Kluger, Daniel M, & Crnich, Christopher J. (2006). The risk of bloodstream infection in adults with different intravascular devices: a systematic review of 200 published prospective studies. *Mayo Clinic Proceedings*, 81(9), 1159-1171.
- Allegranzi, Benedetta, Nejad, Sepideh Bagheri, Combescure, Christophe, Graafmans, Wilco, Attar, Homa, Donaldson, Liam, & Pittet, Didier. (2011). Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. *The Lancet*, 377(9761), 228-241.
- <http://data.worldbank.org/indicator/SH.XPD.PCAP>

Background

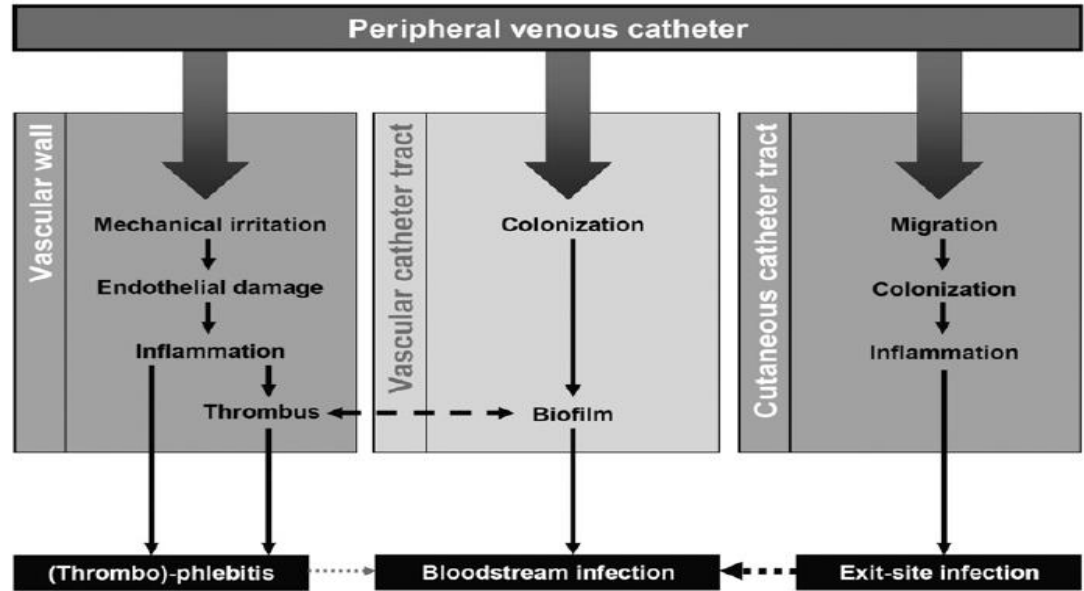


- Despite PIVCs being so common...
- Data on the use and management of PIVCs around the world is largely unknown
- We do know from available literature:
 - Regions in China, Russia and India - steel needles still used instead of PIVCs
 - Localised complications remain an under reported problem (Phlebitis rates vary widely from 1-60%)
 - Local uptake on latest evidence on dressing, securement and management of PIVCs is uncertain

- Allegranzi, Benedetta, Nejad, Sepideh Bagheri, Combescure, Christophe, Graafmans, Wilco, Attar, Homa, Donaldson, Liam, & Pittet, Didier. (2011). Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. *The Lancet*, 377(9761), 228-241.
- Wallis, Marianne C, McGrail, Matthew R, Webster, Joan, Gowardman, John R, Playford, G, & Rickard, Claire M. (2014). Risk factors for PIV catheter failure: a multivariate analysis from a randomized control trial. *Infection Control and Hospital Epidemiology*, 35(1), 63-68.

Background

We also know...



- Zingg, Walter, & Pittet, Didier. (2009). Peripheral venous catheters: an under-evaluated problem. *International journal of antimicrobial agents*, 34, S38-S42.

Background

- Professional organisations / government bodies have best available evidence for us...
 - PIVC replacement
 - Dressing choice, replacement and management
 - Administration set replacement
 - IV fluid replacement
 - Flushing techniques
 - New evidence continually be updated



Guidelines for the Prevention of
Intravascular Catheter-Related
Infections, 2011



Available online at www.sciencedirect.com

Journal of Hospital Infection

Journal homepage: www.elsevierhealth.com/journals/jhin



epic3: National Evidence-Based Guidelines for
Preventing Healthcare-Associated Infections in
NHS Hospitals in England

#AVASM15



Background

- Yet.....
 - Phlebitis rates vary widely 1-60%
 - Catheter infiltration 6 – 34%
 - PIVC occlusion 3 – 33 %
 - PIVC dislodgement 4 – 10%
 - 1 – 19 infections for every 1000 PIVCs inserted
- So what does this mean??



- Helm, Robert E, Klausner, Jeffrey D, Klemperer, John D, Flint, Lori M, & Huang, Emily. (2015). Accepted but Unacceptable: Peripheral IV Catheter Failure. *Journal of Infusion Nursing*, 38(3), 189-203.
- Zingg, Walter, & Pittet, Didier. (2009). Peripheral venous catheters: an under-evaluated problem. *International journal of antimicrobial agents*, 34, S38-S42.
- Rickard, Claire M, Webster, Joan, Wallis, Marianne C, Marsh, Nicole, McGrail, Matthew R, French, Venessa, Zhang, Li. (2012). Routine versus clinically indicated replacement of peripheral intravenous catheters: a randomised controlled equivalence trial. *The Lancet*, 380(9847), 1066-1074

Background

- This means.....

- Premature cessation of IV therapy
- Re insertion of new PIVC
- Time delay for treatment
- Patient reported pain / anxiety
- Increased length of hospital stay
- Increased cost to facility
- VENOUS DEPLETION (Vessel Health Compromised)



- Helm, Robert E, Klausner, Jeffrey D, Klemperer, John D, Flint, Lori M, & Huang, Emily. (2015). Accepted but Unacceptable: Peripheral IV Catheter Failure. *Journal of Infusion Nursing*, 38(3), 189-203.
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Background

- PIVC Failure is multifactorial:
 - Patient related
 - Co morbid conditions
 - Blood disorders
 - Venous depletion
 - Device related
 - Catheter material can be thrombogenic (especially where blood flow limited)
 - Catheter design to reduce traction and skin indentation
 - Securement / stabilisation of device
 - Clinician related
 - Medications chosen for PIVC infusion
 - Device manipulation or traumatic insertion
 - Anatomical placement (areas of high flexion)

Background



- Why are these rates unacceptably high?
 - What is happening clinically in your hospital, your region, your country or globally?
 - What is being done better elsewhere that you can adapt?
 - We don't really know because we have never really looked widely.....

OMG Study

- International prevalence study
- Targeting PIVC assessment & management



Aims:

- Identify prevalence of PIVCs in hospitalised patients worldwide
- Evaluate prevalence of PIVC complications
- Benchmark to improve care of PIVCs
- Identify prevalence of redundant PIVCs
- Identify practices in PIVC securement
- Evaluate PIVC insertion training and organisational management of PIVCs

OMG Study



Significant interest worldwide:

- 750 hospitals in 68 countries registered to participate
- Largest prevalence study in vascular access
- Hospitals from both developed and developing nations
- Hospital collects data on as many patients as possible over a day to a week

OMG Study

Pilot Study Completed November 2014:

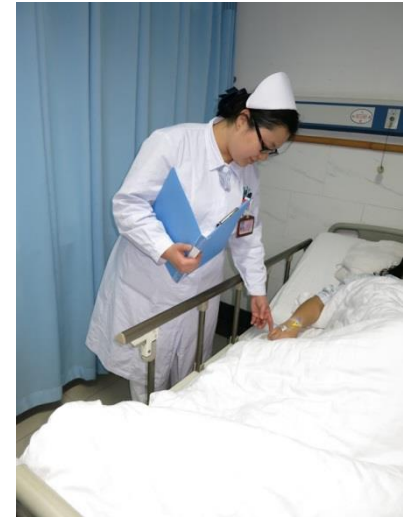
- Aim was to assess whether a larger study would provide beneficial data
- We collected:
 - Demographics
 - PIVC dwell
 - PIVC type / brand / gauge
 - Where and who inserted PIVC
 - Anatomical position
 - Dressing type / brand / connectors
 - Site assessment
 - Medications and fluids given on the day
 - Site information



OMG Study

Pilot Study Completed November 2014:

- Sites asked to collect as much data as possible on the day
- Fourteen sites in 13 countries
 - Total 479 patients
 - 281 PIVCs audited (Overall prevalence of 59%)
 - Mean age 59 years (18)
 - More men than women
 - Predominantly medical patients
 - Prevalence PIVC range 24% - 100%
 - Prevalence of other device PICC / CICC – 16%
 - A quarter (25%) had no device at all



Qilu Hospital - China

OMG Study

TABLE 1. Number of Patients and Catheters Screened by Region and Country

Region/Country	PIVC, n (%)	Other VAD, n (%)	No IV, n (%)	Total Patients, n
North America				
Canada	10 (48)	11 (52)	0	21
United States of America	16 (64)	9 (36)	0	25
Latin America				
Argentina	50 (79)	3 (5)	10 (16)	63
Western Europe				
England	23 (100)	0	0	23
Greece	5 (71)	2 (29)	0	7
Italy	12 (34)	9 (26)	14 (40)	35
Malta	18 (78)	0	5 (22)	23
Scotland	12 (100)	0	0	12
Spain	59 (83)	3 (4)	9 (13)	71
Asia				
China	23 (24)	24 (26)	46 (50)	93
India	16 (73)	2 (9)	4 (18)	22
Oceania				
Australia	18 (37)	13 (26)	18 (37)	49
New Zealand	19 (54)	0	16 (46)	35

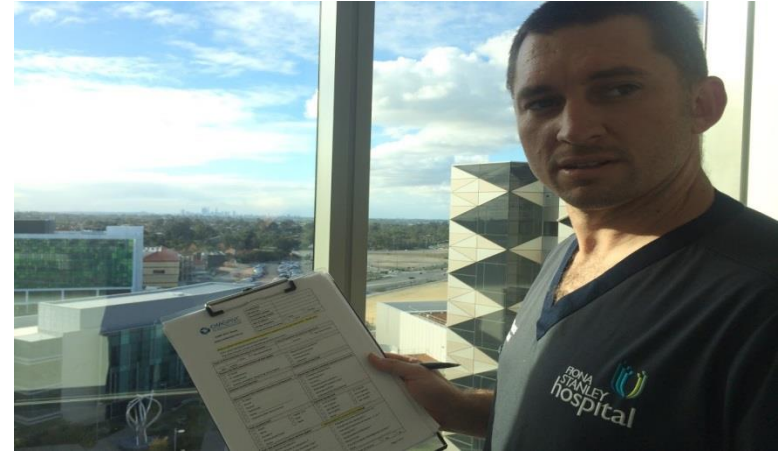


OMG Pilot Study

IV Fluid and Medication orders:

TABLE 2. Characteristics of Patients and PIVCs

Population Group*	Region					Total
	North America	Latin America	Western Europe	Asia	Oceania	
Current IV fluid orders, n (%)						
Yes	10 (38)	27 (54)	62 (48)	33 (85)	14 (38)	146 (52)
Current IV meds orders, n (%)						
Yes	22 (85)	40 (80)	93 (72)	37 (95)	16 (43)	208 (74)
No IV or meds order, n (%)						
Yes	3 (12)	6 (12)	20 (16)	1 (3)	16 (43)	46 (16)



Fiona Stanley Hospital, Australia

OMG US Study Data

Characteristics of US Hospitals

Region	West	Midwest	North East	South	Total
Number of Hospitals	5	16	8	23	52
Number of PIVCs, n	573	1716	902	2144	4978
Age, mean (SD), y	58 (20)	59 (20)	61 (22)	60 (21)	60 (21)
Males, n	256 (45)	820 (48)	460 (51)	853 (40)	2389 (48)



Royal Devon and Exeter Hospital UK

OMG US Study Data

	PIVC Characteristics		
	n, (%)		95% Confidence Interval
PIVC inserted by,			
Specialist Team	550 (11)		(10% - 12%)
Nurse	3463 (70)		(68 - 71%)
Doctor	58 (1)		(1% - 2%)
Technician	161 (3)		(3% - 4%)
Unknown	570 (11)		(11% - 12%)
Prehospital / Other	167 (4)		(3% - 4%)
Where PIVC Inserted,			
Prehospital	125 (3)		(2% - 3%)
Emergency	1347 (27)		(26% - 28%)
General ward	2158 (44)		(42% - 45%)
ICU / CCU	261 (5)		(5% - 6%)
Operating Room	448 (9)		(8% - 10%)
Radiology	50 (1)		(1%)
Unknown	570 (11)		(11% - 12%)



Centre Medical Evangelique, Democratic Republic of Congo

OMG US Study Data

PIVC Characteristics

n, (%)

p

Current IV Fluid Orders,

Yes

2377 (49)

No

2470 (51)

Current IV Medication Order,

Yes

1580 (31)

No

3398 (68)

<0.001

No IV or Fluid Orders,

Yes

2027 (42)

95% Confidence Interval

Dressing Type,

Borderless Transparent

2778 (55)

(56% - 60%)

Bordered Dressing

2200 (44)

(44% - 47%)

Gauze and tape

60 (1)

(1% - 2%)

Chlorhexidine impregnated

30 (0.5)

(1%)

Tape only

29 (0.5)

(1%)



Baptist Hospital of Miami

OMG US Study Data

	PIVC Characteristics	
	<i>n</i> , (%)	95% Confidence Interval
Dressing Quality,		
Clean and intact	3881 (80)	(79% - 82%)
Dry but soiled	334 (7)	(6% - 8%)
Loose or lifting	370 (8)	(7% - 9%)
Moist and soiled	139 (3)	(2% - 3%)
Symptoms of phlebitis,		
Nil	3990 (82)	(82% - 83%)
Pain	366 (7)	(7% - 8%)
Redness	116 (2)	(2% - 3%)
Swelling	67 (1)	(1%)
Purulence	8 (0.2)	(1%)
Partial or complete dislodgement	31 (0.6)	



St Olav's Hospital, Norway

OMG US Study Data

PIVC Characteristics		
	n, (%)	95% Confidence Interval
PIVC Position,		
Antecubital Fossa	1250 (26)	(25% - 27%)
Foot	37 (0.8)	(1%)
Forearm	1725 (35)	(34% - 37%)
Hand	1081 (22)	(21% - 24%)
Head	6 (0.1)	(1%)
Upper arm	151 (3)	(3% - 4%)
Wrist	521 (11)	(10% - 12%)
Catheter Gauge,		
14G (Orange)	2 (0.4)	(1%)
16G (grey)	62 (1)	(1% - 2%)
18G Green)	802 (17)	(16% - 18%)
20G (Pink)	2220 (46)	(45% - 47%)
22G (blue)	1378 (28)	(27% - 30%)
24G (Yellow)	303 (6)	(5% - 8%)
Non visible	70 (1)	(1% - 2%)



Poster at ICPI Conference Geneva by Elie Kasindi Kabululu
– Democratic Republic of Congo

OMG US Study Data

Symptoms of Phlebitis x Insertor

	Specialist Team	Nurse	Doctor	Technician	<i>p</i>
Symptoms of Phlebitis,					
Nil	455 (85)	2807 (84)	47 (82)	123 (76)	<0.001
Pain	48 (9)	254 (7)	4 (7)	10 (6)	
Redness	23 (4)	81 (2)	0	2 (1)	
Swelling	8 (1)	46 (1)	1 (2)	4 (2)	
Purulence	0	4 (0.1)	0	0	

BRIEF REPORTS

International Prevalence of the Use of Peripheral Intravenous Catheters

Evan Alexandrou, RN, BHealth, ICU Cert, MPH, PhD^{1,2,3*}, Gillian Ray-Barruel, RN, BSN, BA, ICU Cert^{3,4},
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The study team



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Dr Niall Higgins, Dr Frances Lin, Laura Alberto, Prof Leonard Mermel, Prof Claire Rickard

To contact us:

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Twitter: [@OMGstudy1](https://twitter.com/OMGstudy1)

OMG US Study Data

Who has submitted data?

- Over 400 hospitals have submitted data so far
- Representing 50 countries
- Over 3000 wards screened
- **So far....40,000 PIVCs audited globally**
- Estimated 65,000 patients screened
- Still more data to be entered!



Greenville memorial Hospital, South Carolina



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