



Safe Power Injection of Contrast through Central Venous Catheters (CVCs)

Joy Blacka (RN, BN, MN, VA-BC)

This Session

- Discuss the link between NSQHS & Contrast Injection through Central Venous Access Devices
- Discuss the risks with power injection of contrast through Central Venous Access Devices
- Discuss the clinical processes to minimise risk when power injecting through CVCS
- Discuss the Safe Injection of Contrast through CVCs

National Standards Accreditation MI



Standard 1 – **Governance for Safety and Quality in Health Service Organisations**

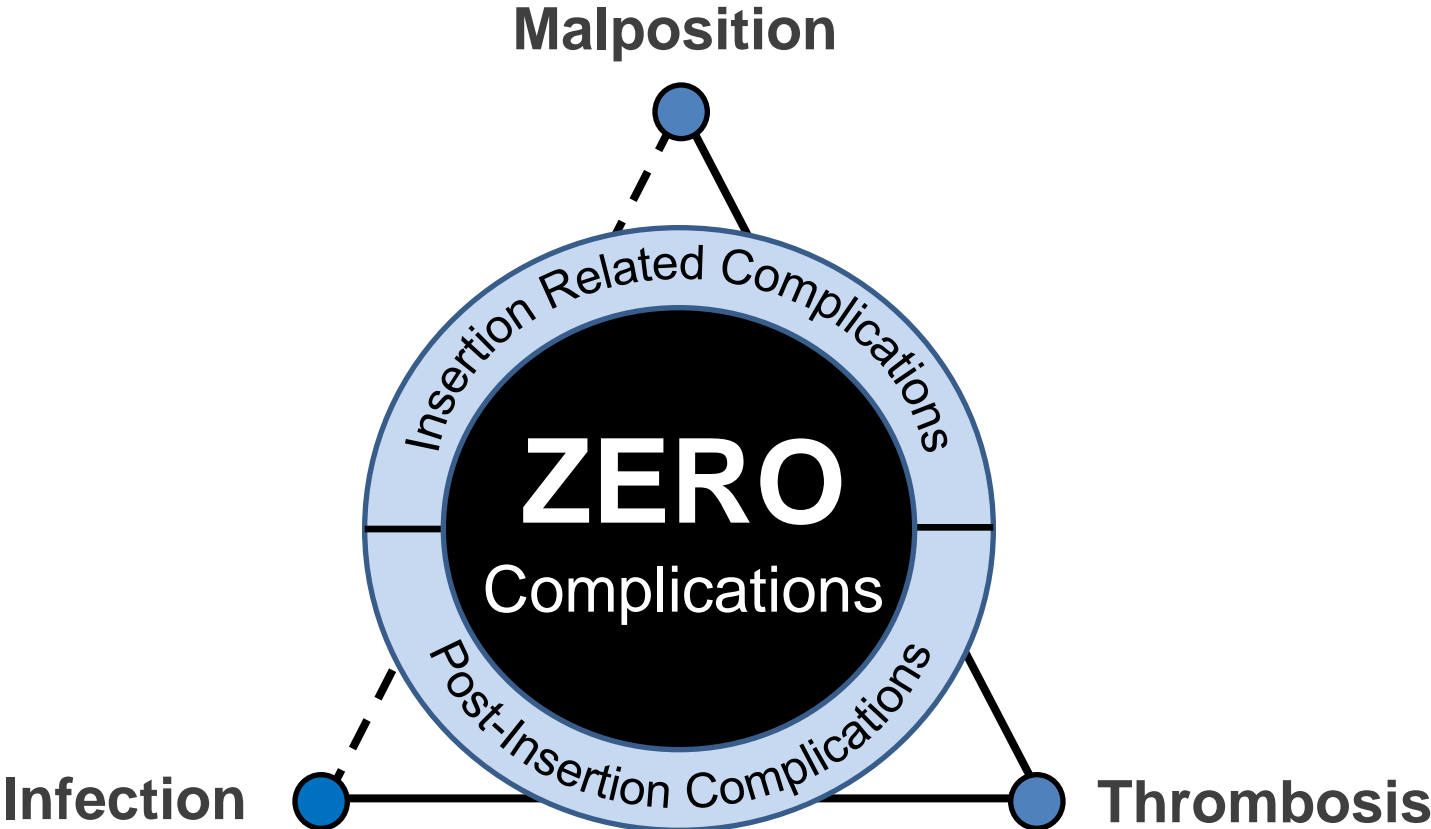


Standard 3 – **Preventing and Controlling Healthcare Associated Infections**



Standard 4 – **Medication Safety**

Goal of Zero



Indications for CVCs

- Multiple Infusions
- Fluid Monitoring
- Blood Letting
- Poor Peripheral Access
- Extended Length of therapy
- Hypertonic , Vesicant or pH Extremes
- *Injection of Contrast Media*



Risks with Injecting Contrast via Vascular Access Devices

1. Risks During Injection of Contrast

Infiltration Extravasation, Air Embolus, Rupture of tubing or catheter, Catheter embolus, Weakening of Catheter

2. Risks Post Injection of Contrast

Catheter failure, Septicaemia, Bacteraemia (CLABSI)

- Reminders from FDA Regarding Ruptured Vascular Access Devices from Power Injection
<http://www.fda.gov/cdrh/medicaldevicesafety/tipsarticles/reminder-rvad.html>
- Plumb et al (2011) *The use of central venous catheters for intravenous contrast injection for CT examinations* The British Journal of Radiology, 84 (2011), 197–203
- <http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/TipsandArticlesonDeviceSafety/ucm225493.htm> (2013)

Caution Advised in choosing Intravenous Catheters if Power Injection.....

<https://www.tga.gov.au/publication-issue/medical-devices-safety-update-volume-3-number-2-march-2015>

Preventing problems with incompatibility.....

- Power Injectors must be used with devices that have been pressure tested and deemed suitable to withstand the pressures produced during high-pressure contrast injection.

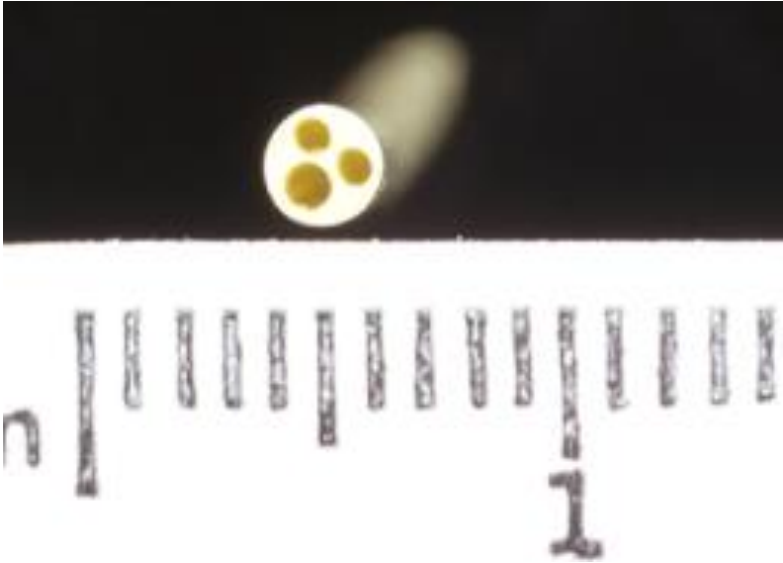
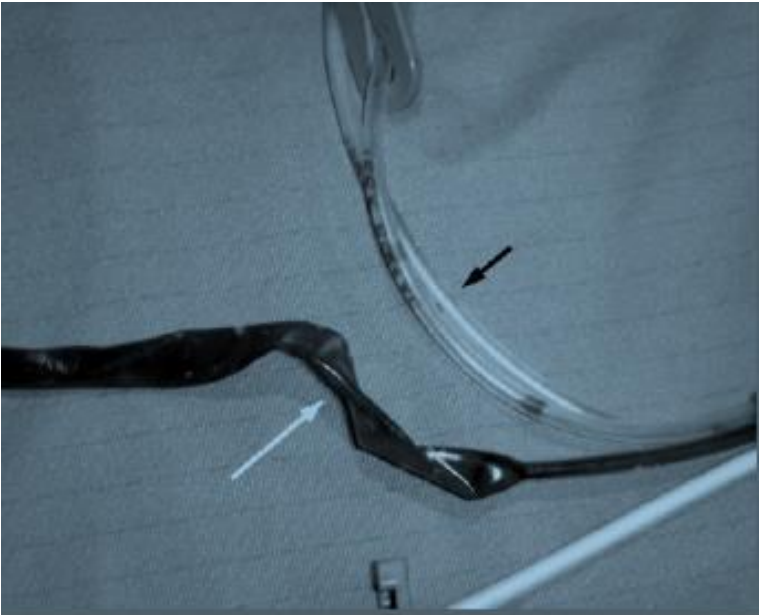
In general:

- when using a *peripheral access site* or *central venous catheter* for power injection, verify that the *devices are labelled as compatible* with the process
- ensure that you are familiar with your facility's protocols for the injection of contrast media using power injectors

Infiltration & Extravasation

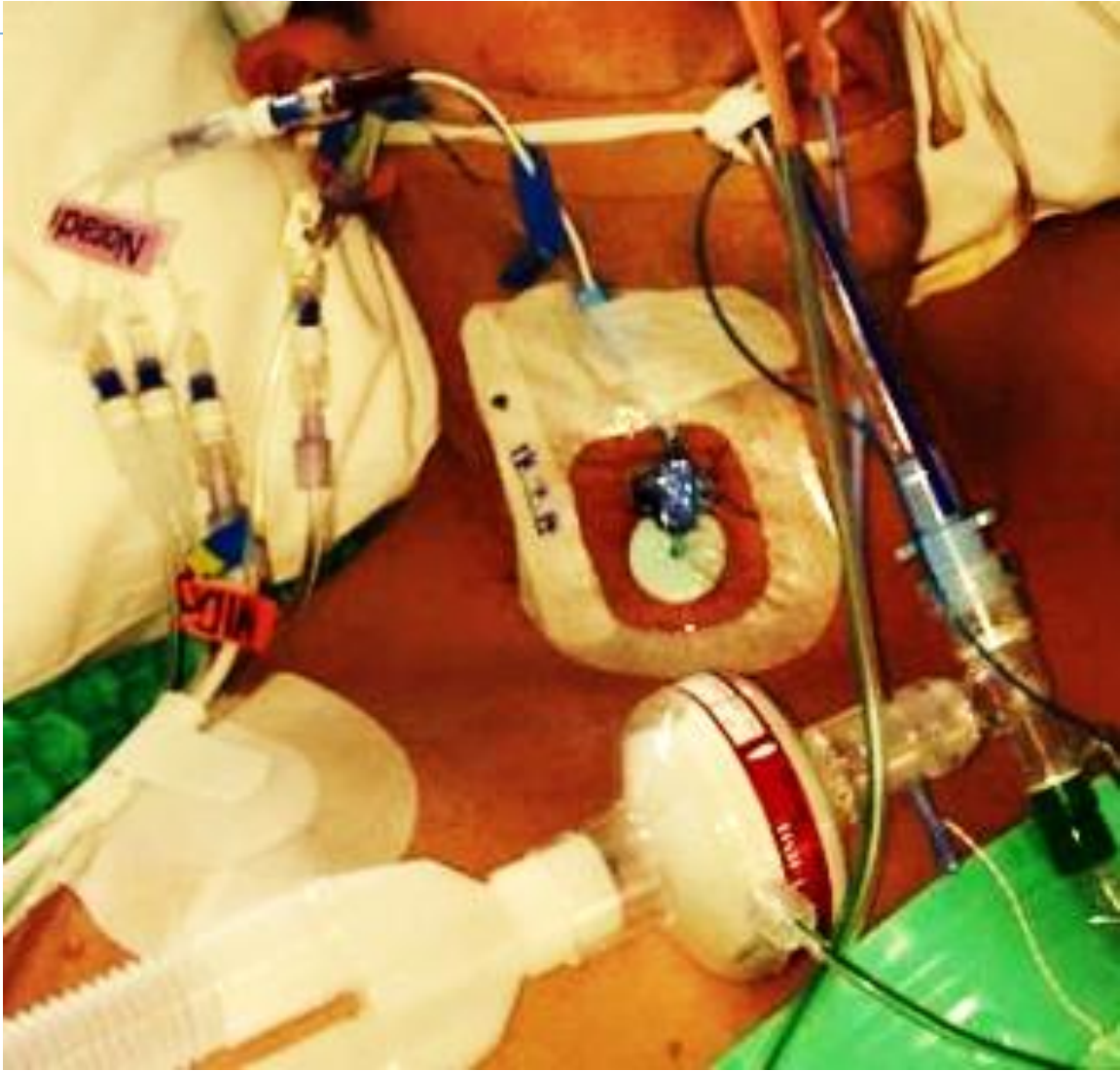


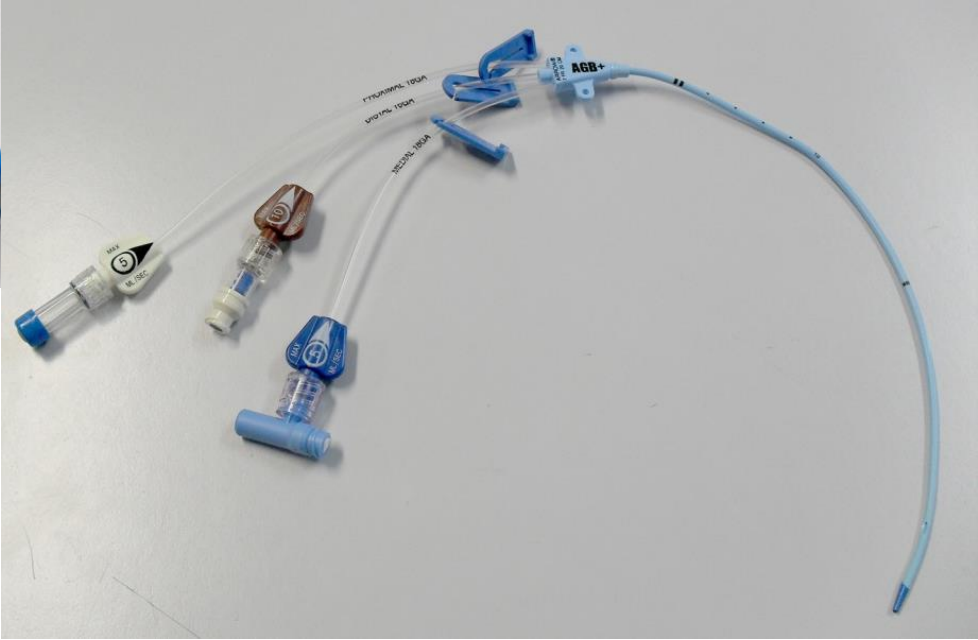
Weakening of the Catheter



INJECTION RATES FOR CT SCANS

- Depends on Region being scanned
- Scanner type & image acquisition time: the slices, the speed and the resolution
- Power Injector and hospital protocol (how to do you adjust PSI settings on your Power Injector?)
- Contrast volume and type to be used
- Flow rate of the vascular access catheter in the patient
- Venous or arterial phase enhancement studies





1 Identify

- That PICC/CVC is pressure injectable
- Check Position of Catheter

2 Aspirate

- Remove Injection Cap from catheter hub unless injection cap is indicated for pressure injection
- Disinfect hub or injection cap
- Attach normal saline filled 10ml syringe to hub/injection cap
- Aspirate & check for blood return

3 Flush

- Vigorously flush catheter
 - Clamp catheter
- Attach pre-primed pressure injection tubing to hub/injection cap, unclamp catheter & Pressure Inject (DO NOT EXCEED psi or rate recommendations on catheter hub).

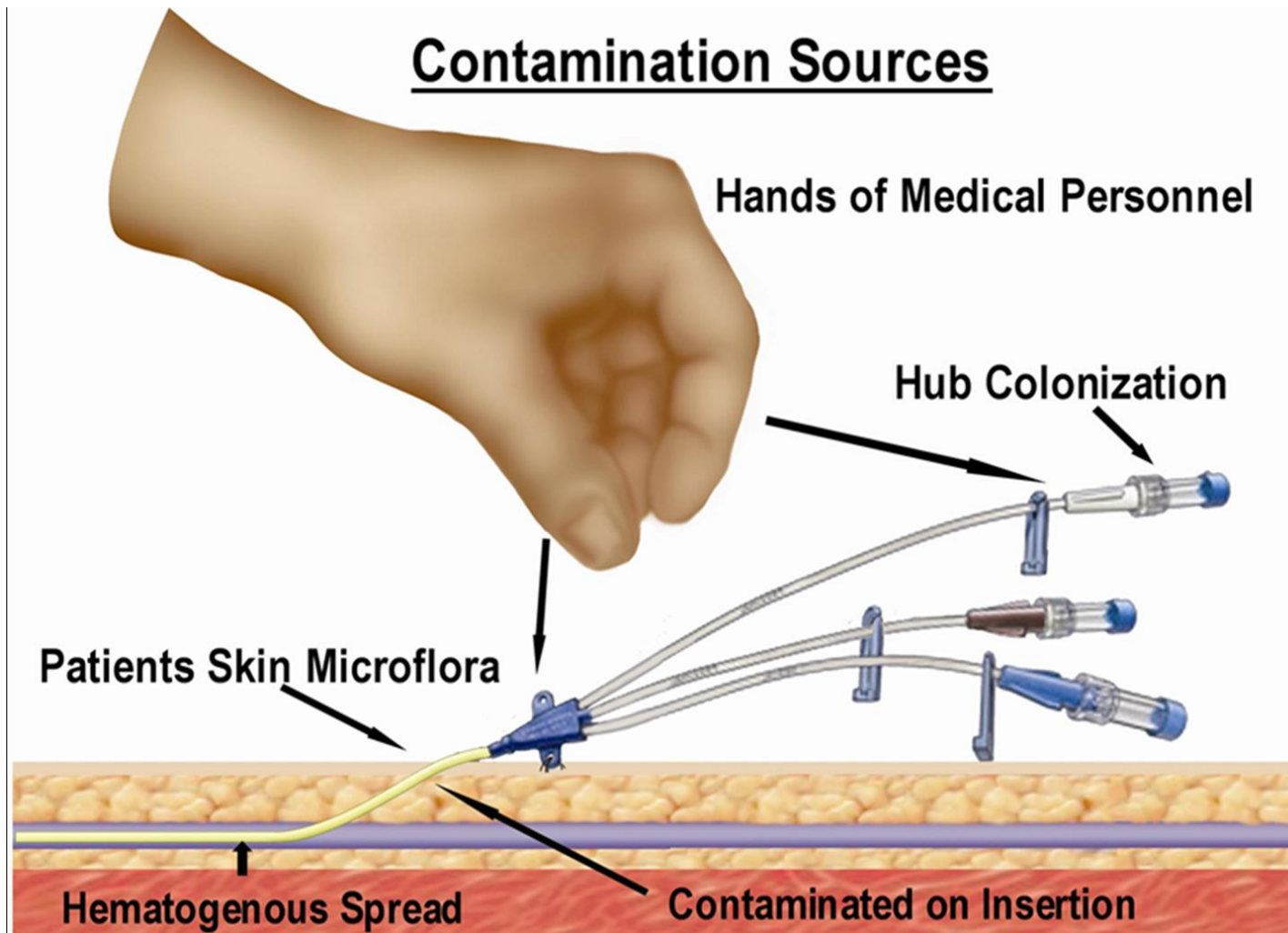
4 Finish

- Replace injection cap if removed
- Flush line with 10mls Normal Saline

Needleless Injection Bungs



Contamination Sources





Safe Implementation of New Technology in your Medical Imaging Department: the Team Approach: A case report

By Dr D Neil Jones, Staff Consultant Radiologist
Flinders Medical Centre, South Australia

Incident Details:

An oncology patient presented for a CT scan with IV contrast. On the CT table, she informed the staff that she had a new central venous line device and port that was safe for direct access and power-injection of IV contrast medium. She did not want a peripheral cannula inserted, which had been a very painful experience previously. The staff were surprised to hear this as they had been instructed not to inject such central venous devices for safety reasons. They called the Oncology clinic to enquire about this request. An oncology nurse attended the Medical Imaging department to assist, resulting in delayed CT scanning.

http://www.insideradiology.com.au/MISC_PDF/Jun09-Safe_Implementation-RaERR.pdf

Optimising Practice within your Facility.....

A multidisciplinary team meeting was organized involving radiologists, radiographers, Nursing and Oncology nursing staff, and the Hospital-wide central venous access and peripherally inserted central catheter (PICC) nurse. A wide range of issues was canvassed including:

1. Education/training sessions in Medical Imaging involving all staffing groups (also junior staff in training) including the review/accessibility of general hospital-wide central venous access and peripherally inserted central catheter (PICC) protocols (including infection control) and safe medication (heparin lock) administration (dose/volume) at end of procedure.
2. Support from the Oncology unit as required, and also the issue of safe after-hours use of the new device.
3. The need to ensure the correct set of available equipment in place in the Medical Imaging department, including the correct needling and connecting device to enable system-safety of power-injection. The pressure requirements of the power-injector also needed consideration, in order to allow satisfactory flow rates through this new device. Timing of CT scanning post-IV contrast administration would also need adjustment due to the central venous location of the catheter tip.

Safe Implementation of Medical Imaging Technology in your department: A Case Report

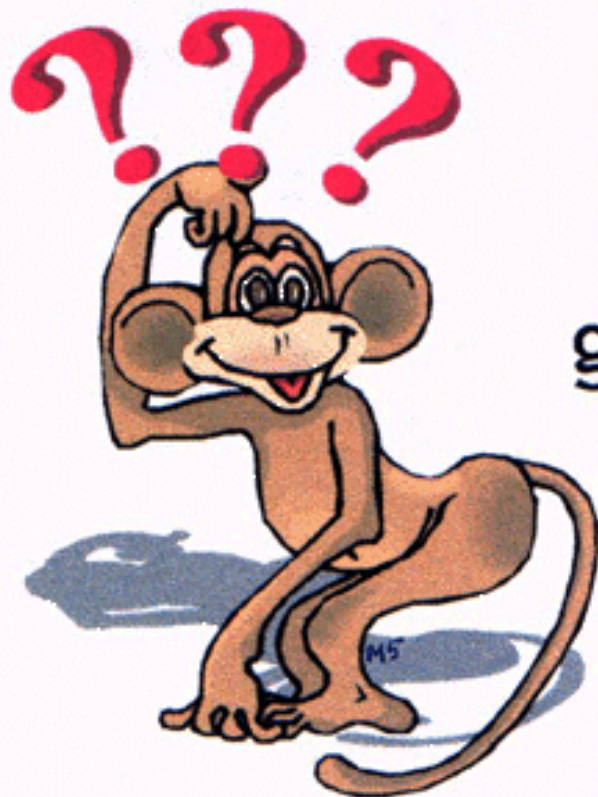
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SAFE PRESSURE/POWER THROUGH PICC / CVC

- 👉 PICC or CVC needs to be rated and registered for Pressure / Power Injection
- 👉 All tubing and caps needs to rated and registered for Pressure Injection
- 👉 Must check patency and position of VAD
- 👉 Must Use Aseptic technique



Questions
are
guaranteed in
life;
Answers
aren't.