



Belfast Health and
Social Care Trust

Haematology Association of Ireland Nurses Group

Chronic Haematology Conditions

Central Venous Access Devices Case Studies

25th May 2007

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- Central Venous Catheters
- Indications / Considerations
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- Questions?



Infusional Services

- Specialist Nurses
- Expert Knowledge / Skills IV Therapy
- Education / Training / Research / Audit
- Safe / Effective / Competent IV administration
- Provision of education to MDT
- Consultancy role
- Policies / Procedures / Guidelines
- Competencies
- Placement of PICCs



Which Device?

Choice of catheter depends upon type / duration of therapy, vascular anatomy and patient's choice

- Peripheral
- Midline
- Central
 - PICC
 - Tunnelled Catheter
 - Non-tunnelled Catheter
 - Implantable Port



Central Venous Catheters

- Tip located in SVC
- Developed early 1970's -1990's
- Silicone or polyurethane
- Measures 50-70cms in length
- External diameter range from 2-11.5fr
- Single / dual / triple lumen configurations
- Open ended / closed valved system



Indications for CVADs

- Medium / long term IV access
 - Chemotherapy
 - TPN
 - IV fluids / antibiotics
 - Bone Marrow Transplant / Stem Cell
 - High dose chemotherapy
 - Factor VIII
 - Poor venous access
 - Needle phobia
 - Preservation of future veins
 - Patient / clinician



Considerations for CVAD choice

- Duration / type of therapy required
- Venous access
- Surgery / irradiation
- Axillary node dissection / lymphoedema
- Venous thrombosis
- SVC obstruction
- Fractured clavicle
- Severe bleeding disorder
- Presence of cardiac pacemaker
- Body image / lifestyle



Potential CVAD Complications

- Air embolism
- Pneumothorax / Haemothorax
- Mechanical Phlebitis
- Thrombosis
- Exit site / systemic infection
- Catheter occlusion
- Catheter fracture
- Migration
- Malposition
- Extravasation



PICC Complication Rates

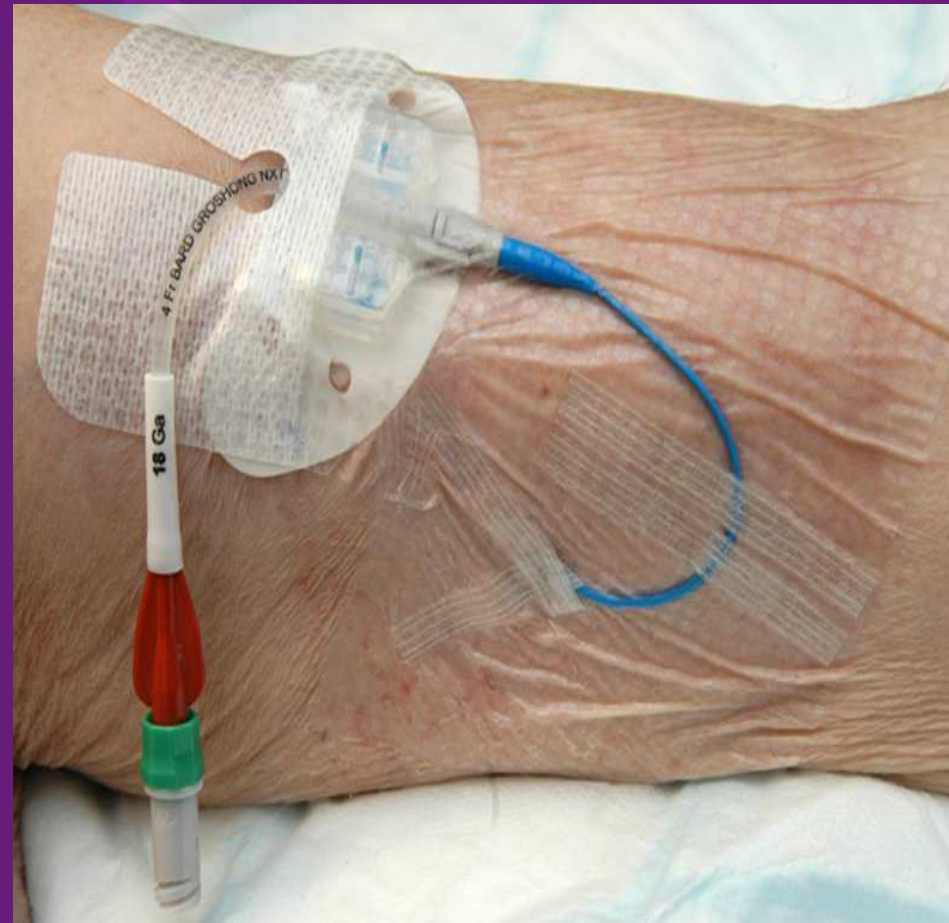
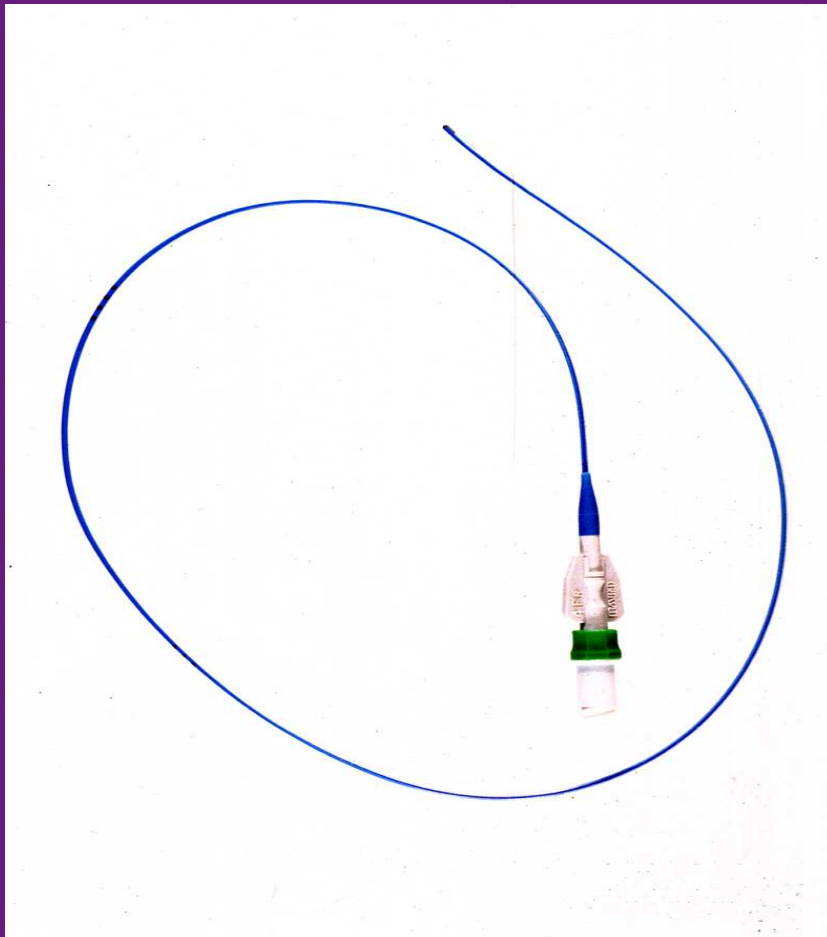
Total No. of PICCs inserted in 2006 = 668

Complication	Nos.	Percentage
Migration	38	5.4%
Partial Withdrawal occlusion	37	5.3%
Fracture	23	3.2%
Thrombosis	23	3.2%
Systemic infection	20	2.8%
Skin reaction	10	1.4%
Mechanical phlebitis	6	0.8%
Exit site infection	5	0.7%
Malposition	2	0.3%



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Peripheral Inserted Central Catheter (PICC)





Case Study 1

- Ca Breast
 - To commence FEC
 - PICC inserted 3 days previously for PVA
 - Complains of pain / erythema of arm
 - Apyrexia / no exudate / no swelling
- Mechanical Phlebitis



Mechanical Phlebitis

- Firm fixation of catheter
- Heat application
- Exclude other causes – 7-10 days
- Gentle exercise
- Elevation of arm
- Consider anti-inflammatory
- Review



Case Study 2

- Ca oesophagus
- Admitted to ward for 2nd cycle ECF
- No blood return from PICC
- No pain / swelling in arm
- Persistent Withdrawal Occlusion



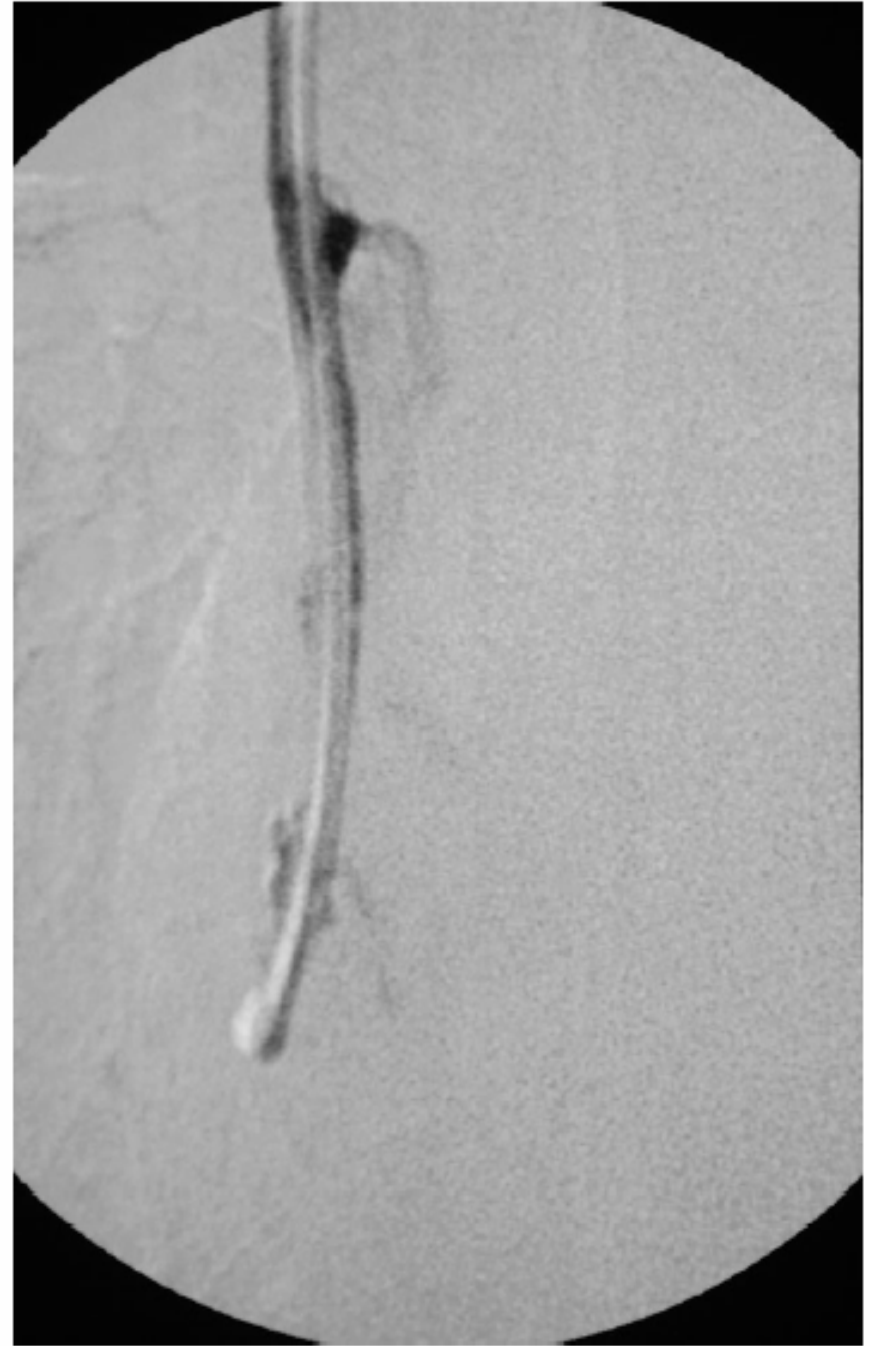
Persistent Withdrawal Occlusion

- Catheter kinking
- Postural change
- Repeat aspiration / saline
- Chest x-ray confirm catheter tip
- Position satisfactory – lytic agent
- Attempt withdrawal
- Repeat if necessary
- Linogram



Fibrin Sheath

- Can inject but not aspirate
- Decreased flow rate
- Pain in neck on injection or with infusion





Case Study 3

- Ovarian Ca
 - 4th cycle Taxol / Carboplatin
 - PICC inserted 3 months previously for PVA
 - Routine weekly dressing – lengthened x 3cms
- Migration



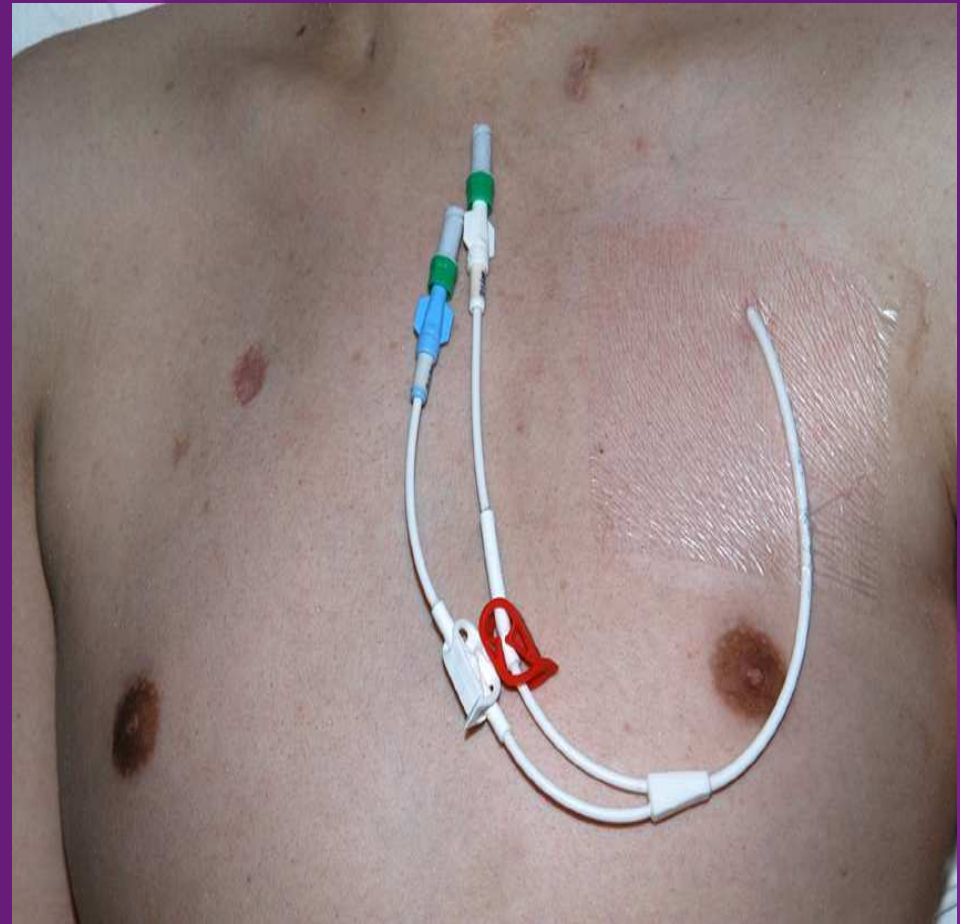
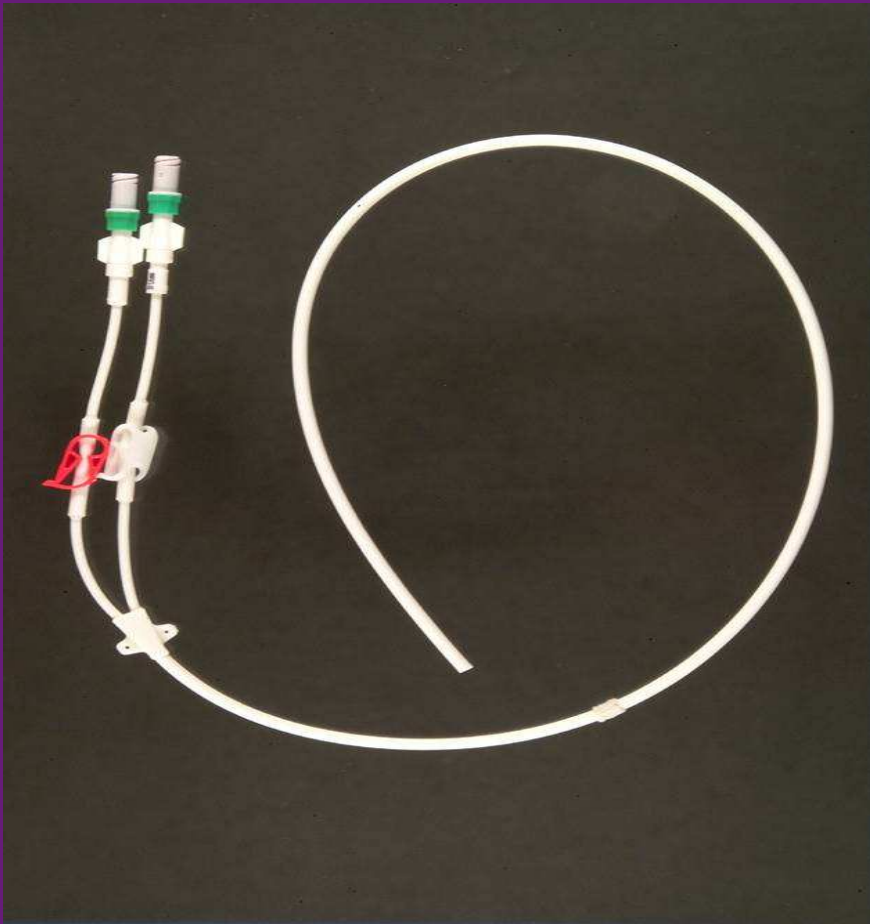
Catheter Migration

- Document original length
- Measure / record weekly
- Careful dressing / statlock
- Lengthens / shortens >2cms – Chest x-ray to ascertain tip position
- Position dictates action



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Tunnelled Catheter





Case Study 4

- Ca Breast - bilateral mastectomy
 - Tunnelled catheter inserted
 - 3rd cycle FEC
 - Presented to O/P with redness, pain, minimal exudate at exit site
 - Apyrexia
- Exit site infection



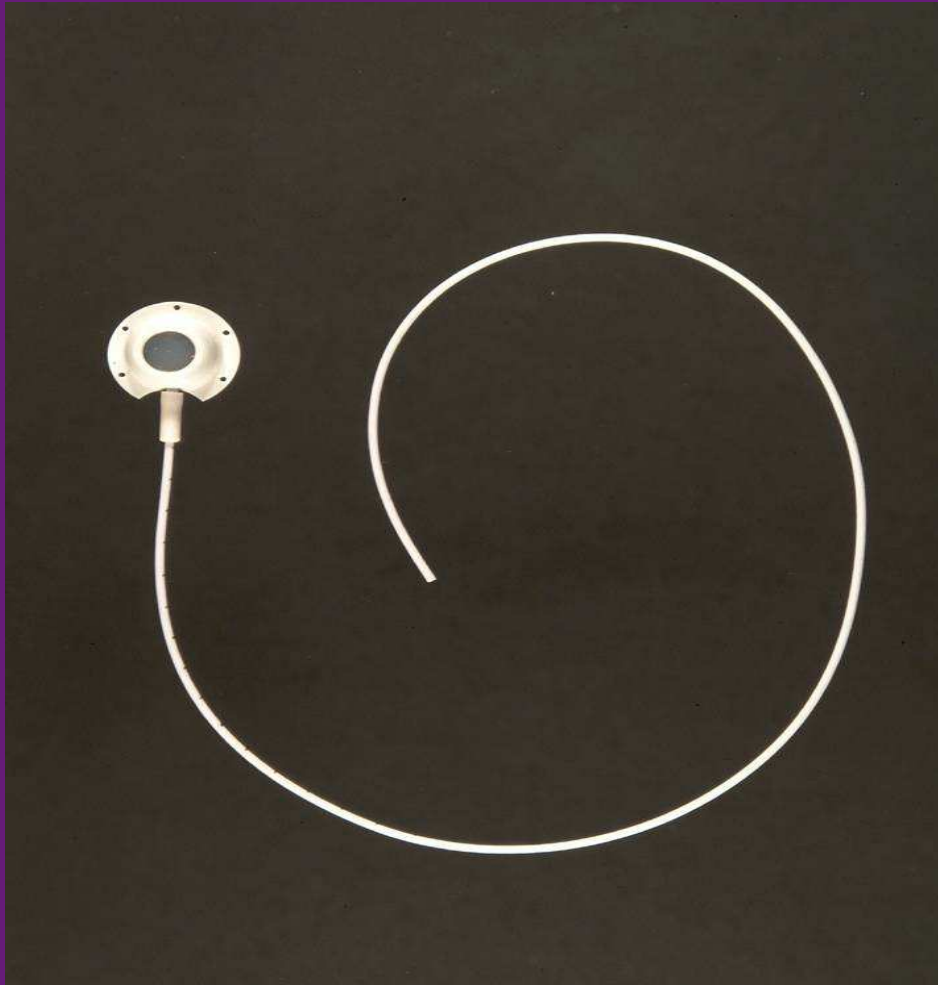
Exit Site Infection

- Swab for O&S
- Apply gauze dressing to absorb exudate
- Renew dressing daily until resolved
- Record vital signs
- Exclude systemic infection
- Commence oral antibiotics
- Advise patient to report any exacerbation of symptoms



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Implantable Port





Case Study 5

- Sarcoma left leg
 - Implantable port inserted
 - 5th cycle VIDE
 - Complains of pain, burning sensation at ipsilateral chest region region during administration
- Extravasation



Extravasation

- Incidence CVADs is lower, severity of injuries may be far greater – later detection / volume / group
- Damage may occur in superficial tunnel / deep tissues
- Changes in sensation/ pain/burning/swelling at any point along pathway of catheter or ipsilateral chest, change in IV flow rate
- Treat tunnelled s/c section extravasation as peripheral
- Inject 10ml NaCl 0.9% rapidly down line. Allows targeting of tx
- Extravasation in deep implanted area rare, much more serious
- If suspected – admission analgesia, IV antibiotics, assessment
- Local debridement / plastic surgeon



Causes for CVAD Extravasation

- Fibrin sheath formation
- Catheter fracture
- Needle dislodgement in s/c implanted devices
- Portal separation
- Suture nick
- Device defect
- Venous perforation from catheter erosion



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1: Doxorubicin immediately
post incident

2: Taxotere 4-8 weeks
post incident

3: Epirubicin 12-20 weeks
post incident





Tunnelled Extravasation

May decrease the incidence but increase the severity.

Two fold risk

- Tunnelled section
- Internal / deep section



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Tunnelled Extravasation





Key Points of Extravasation Management

- Vital to act promptly
- Clear guidelines for prompt management
- Comprehensive tx / expert advice availability
- Clear instructions that are easy to follow
- Tx aim to remove as much of offending drug asap
- Tx should not cause further damage



CVAD Key Points

- Competent practitioner
- Aseptic technique – insertion / accessing / single use
- Single lumen
- Multi-lumen - one exclusively for TPN
- Treat each lumen separately
- Maintain closed system at all times
- Disconnection only in extreme circumstances
- Minimum manipulation
- Venous return before use
- Do not force fluids
- > 10ml luer lock syringe
- Pulsatile / positive pressure flushing
- Remove when no longer required



epic2 Guidelines

Multi-professional national evidence-based guidelines, commissioned by DOH. Systematic and expert review of all available scientific evidence. Provide evidence base for many elements of clinical practice that are essential in prevention / control of HCAI which can be adapted for use locally by all HCPs.

Pratt, R.J. Pellowe, C.M. Wilson, J.A. et al. (2007) epic2: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. *Journal of Hospital Infections*. 65S, S1-S64.



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