

**What are the appropriate  
indications for a Port?  
Dr Andrew Bodenham Leeds**



# Leeds, England



# My medical background.

*Anaesthesia  
Critical Care  
Vascular access  
Medicolegal*

**Insertor rather than  
referrer/user.**

*Most of time choice of device  
already made by referring  
clinicians and patients.*

Consultant: CVC LINE CONS						Start: 08:30	Cases: 8	
Surgeon 1:						Finish: 12:30		
Anaesthetist 1: DR A. R. BODENHAM						Time Booked: 04:00		
Date of Birth	Sex	Anaesthetic	Procedure			Planned Start	Planned Finish	Status
		Image Intensifier	Allergies	X Matched	Transport	HDU/ICU Bed Required	TCI Date	
07-Sep-1971	F	Local Anaesthetic with Sedation	INSERTION OF VASCULAR CATHETER			08:30	09:00	Scheduled
							14-Nov-2016	
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
21-Sep-1934	M	Local Anaesthetic with Sedation	INSERTION OF PICC LINE <i>HICKMAN</i> (PACEMAKER) CAVA PATIENT			09:00	09:30	Scheduled
							14-Nov-2016	
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
23-Dec-1960	M	Local Anaesthetic with Sedation	INSERTION OF DOUBLE HICKMAN LINE			09:30	10:00	Scheduled
							14-Nov-2016	
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
25-Apr-1962	M	Local Anaesthetic with Sedation	INSERTION OF DOUBLE HICKMAN LINE			10:00	10:30	Scheduled
informatics						Report generated on 14-Nov-2016 14:13:16		
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
04-Jun-1957	M	Local Anaesthetic with Sedation	INSERTION OF DOUBLE HICKMAN LINE			10:30	11:00	Scheduled
							14-Nov-2016	
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
28-Feb-1951	F	Local Anaesthetic with Sedation	REMOVAL OF PORTACATH			11:00	11:40	Scheduled
							14-Nov-2016	
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
21-Jul-1948	M	Local Anaesthetic	INSERTION OF DOUBLE PICC LINE			11:40	12:10	Scheduled
							08-Nov-2016	
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
15-Oct-1946	F	No Anaesthetic	LINEOGRAM			12:10	12:30	Scheduled
							14-Nov-2016	
Management Intent: DC			RTT Breach:		Diag Breach:		Canc Op Breach:	
Consultant: CVC LINE CONS						Start: 13:30	Cases: 0	
Surgeon 1:						Finish: 17:30		

# What to consider?

## Clinical staff?

- Suitable device based on:
  - Duration of therapy
  - Intensity of therapy
  - What to be infused
- Reliable trouble free device.
- Minimal complications
- Easy to insert and remove.

## What does patient want?

- Same as staff: +
  - Body image considerations
  - Needle phobias
  - Cosmetic considerations
  - Sleeping at night
  - Bathing and showering

# Multiple variables to choose:

## Device related

- PICC (*midline*)
- Hickman type
- **Port (chest/arm)**
  
- Single lumen, double lumen
- High flows dialysis/apheresis
- CT rating: PVC, silicon.

## Patient related

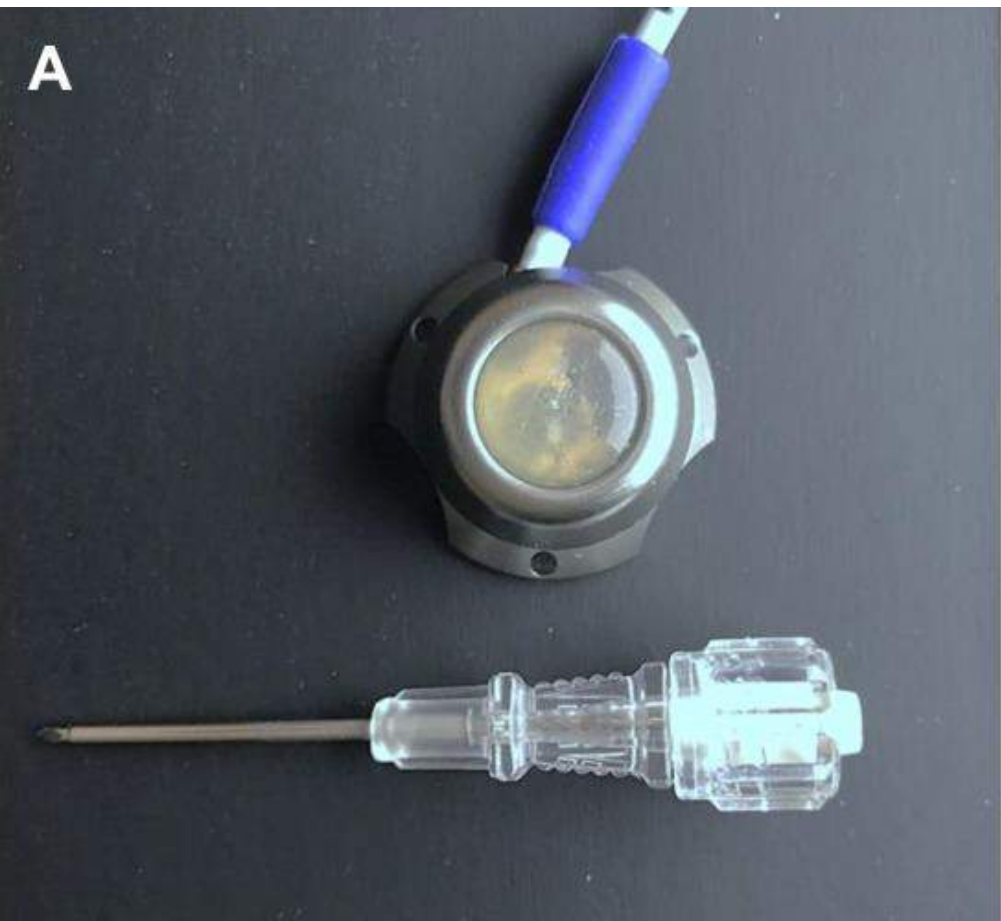
- Right vs Left
- IJV vs subclavian vs femoral
- Basilic vs brachial vein
  
- ***Packages of care.....***
  - Antibiotic/antimicrobial elements
  - Flushing protocols
  - Anchorage and dressings

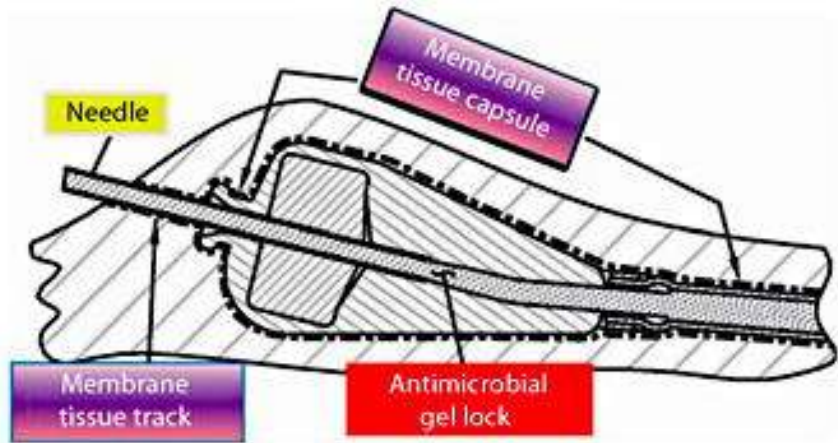
# What should you not use ports for?

- ***A few absolute contraindications:*** Dialysis
- ***Relative contraindications:***
  - Apheresis. What flows are achievable?
  - 24/7 very intensive inpatient therapy.
  - Dual membrane, 7 day swap.
  - Coagulopathy, Infected mobile skin.
- **Needle phobia.** Why do patients accept port needles, but not peripheral venous cannula?
- **Misuse:** IVDU, recreational use.
  - *IV vitamin supplements (at hairdressers!)*

# Port for apheresis

16G Access needle.

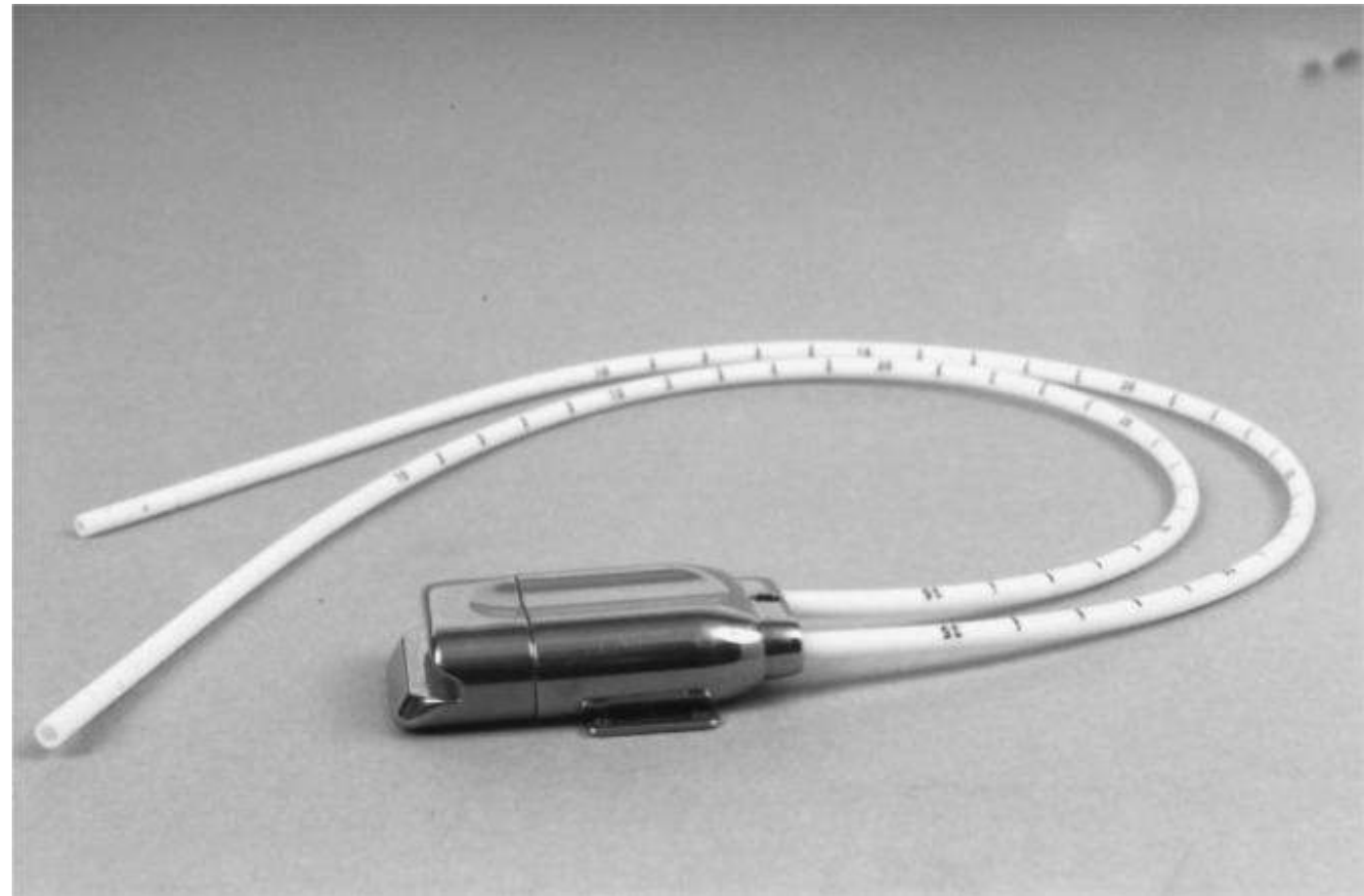
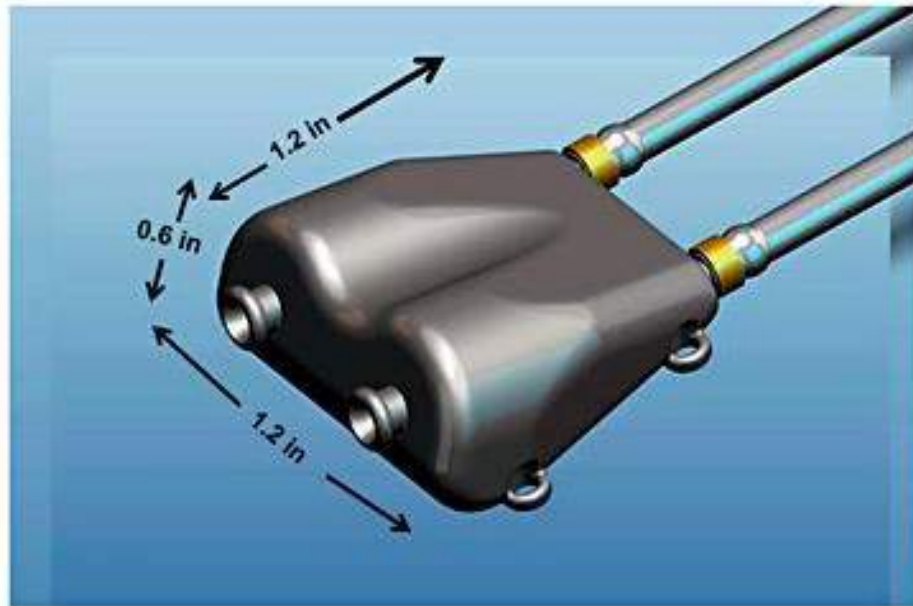




**Wide Bore ports for haemodialysis.  
Why did these devices not become  
mainstream?**

Fig. 2

A new port.





# What does the patient want from a port?

- ***Options:***

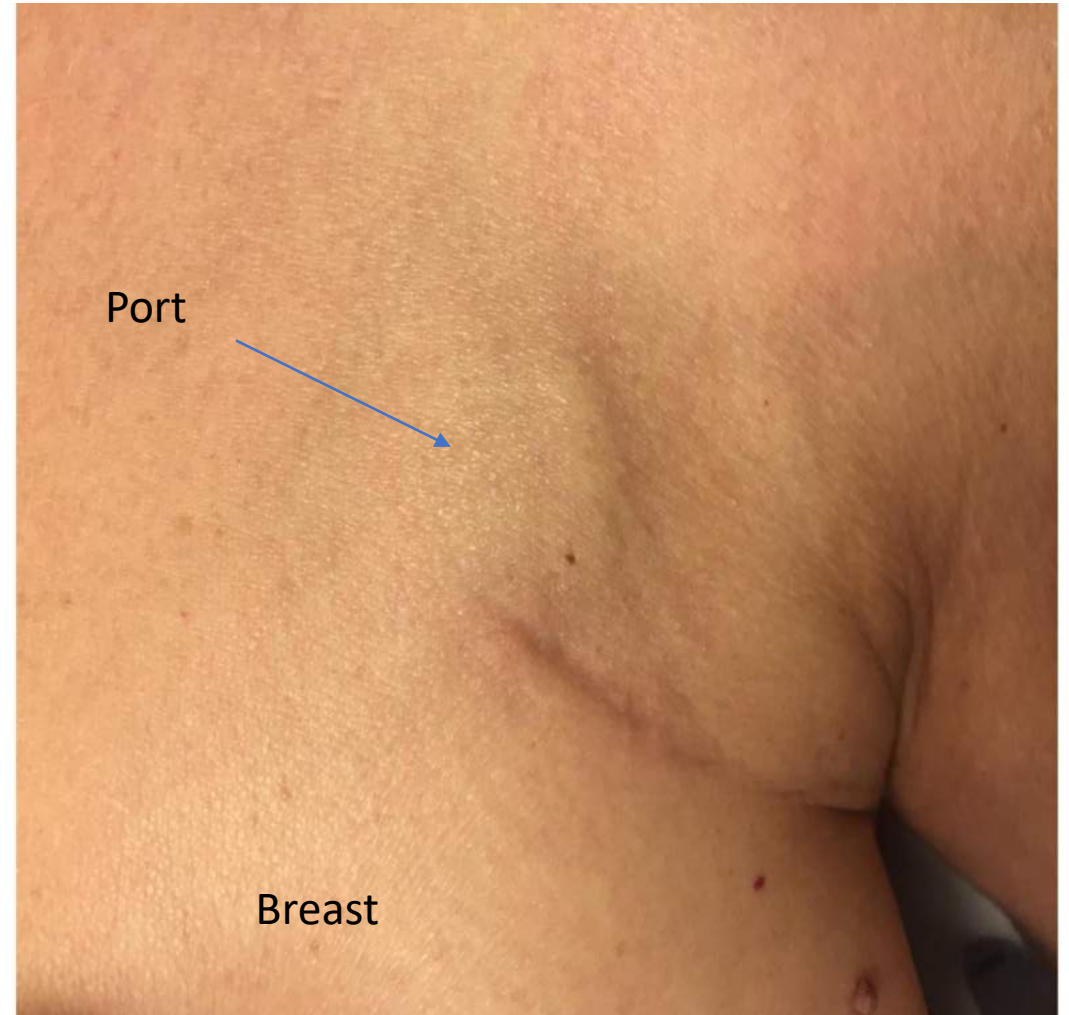
- Anterior Chest wall
  - Lateral Chest wall
  - Inner upper arm
  - Abdomen
  - Thigh
- 
- Cosmetic considerations; Neat scar easily hidden by clothes.
  - Non visible port chamber and tubing.

# Cosmetic issues? Same size device different result.

**Young Lady getting married in 6 weeks...right side**



**More Lateral approaches. Subclavian Left side**



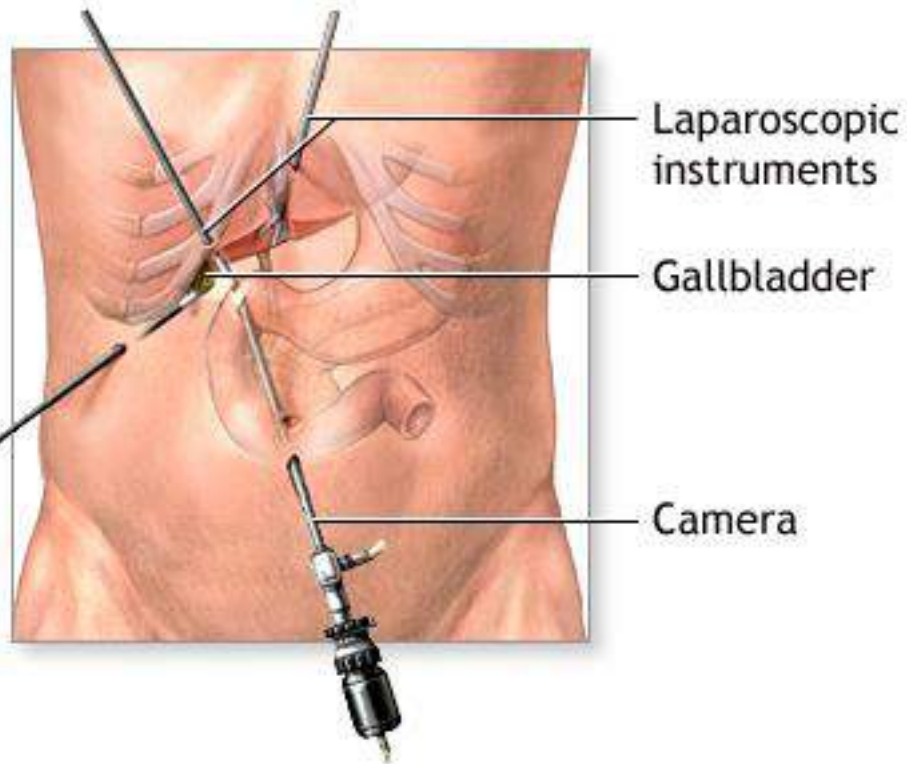
Sickle cell patient vein access: Keloid hypertrophic scars



# Components of port procedures

- Percutaneous element. Seldinger technique. Rapid and predictable.
- Tunnelling elements. Rapid but needs fairly extensive LA. Kinking can occur.
- Port placement. Surgical skills, diathermy, suturing, etc.
- What is most costly element? Theatre/Angio suite time 45-60 mins.
- Approx \$1200 per hour?

# Why does a port insertion take as long as a Lap cholecystectomy take? 45-60 mins?



Surgical elements  
Organisational issues  
Scrub Staff  
Radiographer  
Assistance

# What is the evidence base for such decisions.

- **No clear national or international guidelines to recommend one device over another.**
- Costs
- Infective
- Thrombotic
- Failure rates

# PICC v PORT v Hickman? What is being tested?

Different devices and packages of care.

- Size of vein and access site: Arm v subclavian v jugular.
- Size and type of tubing in vein (ratio sizes)
- How device exteriorized:
  - PICC; short tunnel no cuff, external anchor.
  - Hickman: longer tunnel, cuff, initial external anchor.
  - Port: Totally implanted, needle access.
- Other variables:
  - Dressings
  - Flushing regimens
  - Antibiotic prophylaxis
  - Tip position
  - Right v left side
  - Anchorage devices

# Recent prospective randomised controlled trials:

## *1. Swedish study*

- **PICCs vs Ports in cancer patients:** open-label, randomised, two-centre trial. Taxbro et al. Br J Anaesthesia, 122: 734-741; 2019.
- Adults solid tumour (breast & colorectal), followed to 1 yr, 2013-2017, .
- 399 participants (PICC, 201; PORT, 198).
- DVTs: PICCs 16 (8%) v Ports 2 (1%).
- Overall composite adverse events; higher for PICC versus PORT.
- **Conclusion:** PICCs associated with higher risk for DVT and other adverse events than PORTs.



# Recent prospective randomised controlled trials.

- ***French study:***
- **Randomised trial: PICCs v Ports;** adjuvant chemo, early breast cancer. Florian Clatot et al. Eur J Cancer 126; 2020: 116-124.
- 2014 - 2018, 256 patients.
- 31 patients (12.2%) experienced CR-SAEs, mainly DVT.
- Intention-to-treat analysis, the probability of CR-SAE was 7.8% with PORTs versus 16.6% with PICCs.
- Secondary objectives, no difference in QoL between the arms, but significantly more discomfort with PICCs than PORTs.
- **Conclusion:** PICCs have higher risk of CR-SAEs and discomfort. PORTs preferred for ACT administration in patients with EBC.

# Cancer & Venous Access (CAVA): randomised controlled trial of CVCs.

*J Moss, O Wu, A Bodenham, et al on behalf of the UK CAVA Trial Group.*

*Lancet.* [www.thelancet.com](http://www.thelancet.com). **Published on line July 20, 2021.**

*Funding: UK Health Technology Assessment Programme (HTA). £1 million +.*

# Methods: PICC v Port (chest wall) v Hickman

- Adults ( $\geq 18$  years) receiving therapy ( $\geq 12$  weeks), solid or haematological malignancy, 18 UK units. Pragmatic design.
- Primary outcomes: complication rate (composite of infection, venous thrombosis, pulmonary embolus, inability to aspirate blood, mechanical failure, other)
- Until device removal, withdrawal from study or one year follow.
- 4 randomisation options: *Hickman-PICCs-PORTs*, *PICCs-Hickman*, *PORTs-Hickman*, and *PORTs-PICCs*.
- Randomisation performed using algorithm stratifying by centre, body mass index, oncology disease, device history and treatment mode.

## Results. 2013-2018, 1061 patients randomised.

- PICCs (n=212) and Hickman (n=212) had similar complication rates; 52% and 49%. Non-inferiority of PICC was not confirmed.
- PORTs (n=253) were found superior to Hickman (n=303); complication rate 29% versus 43%.
- PORTs (n=147) were found superior to PICCs; (n=199) complication rate 32% versus 47% .
- Patient Satisfaction data was also collected.

# Insertion Costs

- PICCs (Approx \$500) had lower costs than Hickman.
- Total costs of PORTs (\$1400) were comparable with Hickman (\$1100), but higher than PICCs.
- When catheter dwell time was calculated, costs of PORTs were lower than PICCs in long duration placements.
- Costs of re-insertions not included e.g. PICC out then back in.

# Which device would I choose for myself ?

- PICC if less than 6-8 weeks duration.
- Chest wall port (*with arm size port 5Fr via central vein ?*).
- Arm port?
- Hickman type device for continuous infusions, very intense hospital treatment e.g. long term TPN, haematological malignancy.
- *What do insured self paying oncology patients/nurses/medical staff choose, in private sector in Leeds?*
  - *Almost exclusively ports.*

# Conclusion:

- Ports suitable for many long term access patients.
- More recent studies in oncology patients suggest ports have advantages over PICCs & Hickmans.
- Advantages most likely to occur with longer dwell times, including costs.
- A clinician/industry challenge is to make port insertion/removal quicker, cheaper, simpler and more of a bedside procedure. To allow wider acceptance and availability.
- In many UK centres; no timely/efficient port placement service. Is this true for your centre?