J Vasc Access 2011; 12 (1): 79-98
DOI:

Abstracts from WoCoVA 2010, 1st World Congress on Vascular Access, Amsterdam, The Netherlands, June 16-18

1.
TO ONCOLOGY AND BEYOND! HOW AN ULTRASOUND GUIDED PICC INSERTION SERVICE HAS BENEFITED NON-ONCOLOGY PATIENTS IN A UK HOSPITAL

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Introduction: The use of the Peripherally Inserted Central Catheter (PICC) has gained popularity over the last 30 years in the United States (US) and now become an important form of vascular access in many parts of the world. In the 1990's nurses in the US began to place PICCs using ultrasound guidance (Moureau 2006) and development of these techniques has greatly enhanced PICC insertion services with studies showing improved success rates and reduced complications (Simcock 2008). PICC insertion services have developed in the UK over the last 15 years and were initially used for the delivery of parental nutrition (PN) (Hamilton 2005) and chemotherapy, (Gabriel 2003). Subsequent developments saw the use of PICCs in the community (Kayley 2003) and the adoption of ultrasound guided techiniques. An ultrasound guided PICC insertion service was set up in a district general hospital for non-oncology patients. It was expected that the greatest users of the service would be patients requiring PN. Retrospective audit has shown however, that the largest group of patients to benefit from the PICC insertion service have been those with difficult venous access. Discussion of the results of this audit, will show the distribution of PICC insertion categories along with some specific clinical considerations and associated benefits to the hospital Trust.
Method: A retrospective audit was completed using a convenience sample of all patients receiving a PICC over a 3 year period. Data was collected at the time of each insertion and included the reason that the PICC was being inserted. Results 119 non-oncology patients required PICC insertion over the audit period with the distribution of categories as follows (Tab. I)
Discussion: The total number of patients receiving a PICC because of difficult venous access was 62 representing 52% of the total number of PICC placements. Patients with difficult venous access included those with fragile veins, non-palpable veins, damaged veins (due to previous chemotherapy or IV drug abuse), obesity and oedema. The next largest category with 35 patients representing 29% of the total placements was patients receiving IV therapy in the community. The benefits of this service included an improved patient experience, reduced risk of acquiring a healthcare associated infection and the release of acute beds to the hospital Trust. Over the study period bed-day savings increased from 67 in year 1 to 609 in year 3 (Tab. II)
Conclusion: The development of an ultrasound guided PICC insertion service has benefited many non-oncology patients in a district general hospital setting. Patients who would otherwise have had difficulty in receiving intravenous therapy due to difficult venous access have been significantly helped by the service (Tab. I). Patients have also been able to leave hospital earlier to continue intravenous therapy in the community and the saving of bed days has released valuable resources to the hospital Trust (Tab. II)

TABLE I

Reason for PICC insertion	Number of patients	Percentage of total
Difficult venous access	51	43%
Difficult venous access and PN	11	9%
PN	9	8%
Mid to long term IV therapy	13	11%
IV therapy in the community	35	29%

TABLE II

Year	Bed-days saved
2007	67
2008	215
2009	609

2.
USE OF THE ELCAM MEDICAL CATHETER TIP LOCATOR SYSTEM (THE CATFINDER) TO DETERMINE CATHETER TIP LOCATION IN 131 PATIENTS

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Introduction: Verification of catheter tip location for central vascular access devices is required prior to initiating infusion therapy. The CatFinder (Elcam Medical, BarAm, Israel) is a non-invasive system intended to assist in catheter tip localization during placement of peripherally inserted central catheters (PICCs). This study was performed to correlate the fluoroscopic post-placement tip location of PICCs with the tip position predicted using the CatFinder.
Method: This was a single center, prospective, non-randomized trial evaluating tip position after PICC placement. Following initial ultrasound guided upper extremity venous access, a central venogram was performed to evaluate for central stenoses and/or thrombosis, and to identify the atriocaval junction. As the PICC was advance to the atriocaval junction, it was connected externally to the CatFinder device. ECG leads and a transducer were used to measure venous pressure. As the PICC was advanced centrally in 2.5cm intervals, the system analyzed the delay between the two signals and converted that to distance from teh atriocaval junction. The threshold point for success was considered 2.5cm (+/-1.5cm) from the atriocaval junction. Results: 131 patients were enrolled in the study (mean age 54.7yrs, range 19-86yrs). The most common indications for PICC placement included infection (n=86) and cancer (n=23). All patients received either a 5F or 6F device. There were no complications during PICC placement. Using the threshold point as defined, the success rate of predicting the PICC tip position within 2.5cm of the atriocaval junction was 95.4%.
Discussion & Conclusion: The Elcam Medical Catheter Tip Locator System (the CatFinder) appears to be an accurate system for PICC tip localization. Further investigation to validate the system on smaller devices is needed.

3.
CLINICAL MANAGEMENT OF PICC TECHNIQUE

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Beijing Chest Hospital, affiliated to Capital University of Medical Sciences, is a specialist hospital of tuberculosis and thoracic tumour that set clinic, research and teaching in one body. Patients who are admitted to our hospital are mainly thoracic tumour and tuberculosis patients mostly with a longer

course of disease. In order to avoid the damage from the long-term infusion of chemotherapeutic agents and irritating drugs to peripheral superficial vein, nursing department has sent nursing backbones and head nurses out to learn and organized hospital training since PICC technique was introduced into our hospital in 2003. Now Our hospital already has a group of high-level experts on tube insertion and maintenance, established a scientific system of clinical management system, and become the designated PICC technique training base . Our hospital has trained large numbers of students from across the country. Peripherally inserted central catheter (PICC) technique is a tube indwelling technique of peripheral intravenous to the central venous. It is applicable to the patient intravenous infusion of antibiotics, irritating drugs, chemotherapeutic agents or total parenteral nutrition for a long time (more than 5d). Because of its simple operation (small puncture wound, high success rate) good safety and retention for a long time, PICC not only reduces the suffering caused by repeated puncture, but also avoids the damage of drugs to peripheral venous. PICC technique establishes a safe and convenient venous pathway for patients requiring long-term venous transfusion, brings innovation and development of intravenous infusion method of idea and also improves the work efficiency of nurses. Now it is widely used in our hospital.

4.
EVALUATION OF TRAINING IN VASCULAR ACCESS FOR NURSING STUDENTS

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Introduction: The training of nursing students in basic skills is essential for the development of good professionals in the future. We emphasize the need for better structuring the basis and scientific knowledge of students and their training in nursing and academic standards at university level, rather than different levels of heterogeneous and unstructured knowledge.
Methods: Surveys have been conducted at 29 nursing students selected by their place of practice in the later years of degree from the University Complutense of Madrid, in Spain, the issues are closed answer, value of 1 to 10 agreed with the following statements: 1. In the current nursing care study plans have extensive training in vascular access. 2. In the training period we have enough time to train properly in venous access. 3. We distinguish a perfectly good venous access for a not so good. 4. In the training period we have enough time to train in blood samples. 5. Nurses are prepared to channel central venous access. We also conducted a survey in universities from different countries of our European environment, as well as North America (Mexico and United States), asking teachers spend many hours in their teaching practice venous access, both theoretical and practical hours, not counting hospital practices.
Results: For nursing students questions are on average results for all five issues: 1. Average rating (AR): 6.34; standard deviation (SD) 1,987; 2: AR 6.07; SD 2,434;3. AR 8.14; SD 1,457; 4. AR: 6.41; SD 2,758; 5. AR 4.28; SD 2,016 The question of nursing teachers from different countries on the average number of hours dedicated to training has resulted in a commitment of 3.5 hours classroom theory and 4.3 hours spent in practice in simulators. It should be noted that Portugal has a comprehensive plan and that Ireland is now living his education implementation plan.
Conclusions: Knowledge of venous access, both at the level of anatomical knowledge, are in deficit during the period of university studies, specially in central venous access, with the result that new nursing graduates arrive at the beginning of his professional life as nurses with a knowledge deficit high, for a techniques, which surely will have to apply in large measure a large number of patients.
Discussion: Nursing skills that contain a high level practical weight are often neglected in the curricula of many universities, leaving the fate of the student, if not its motivation and the carrying out further so essential technique in patient care as venepuncture for blood specimen collection and channelling of channels for intravenous infusion therapies. Although supervised hospital practices, the need to implement specific training plans for undergraduates and even graduate, is fundamental to modern nursing.

5.
IMPROVING ANTIBIOTIC TREATMENT OUTCOMES THROUGH THE IMPLEMENTATION OF A MIDLINE: PILOTING A CHANGE IN PRACTICE FOR CYSTIC FIBROSIS PATIENTS

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Introduction: Evidence suggests that peripherally inserted central catheter use in cystic fibrosis patients leads to superior vena cava obstruction/occlusion and establishment of chest collateral vessels, potentially precluding patients from receiving a lung transplant. Drawing on the current 'Guidelines for the Prevention of Intravascular Catheter-Related Infections' and a review of research evidence, midline use was re-examined in a cystic fibrosis control group. The aim was to establish whether the use of midlines improved treatment outcomes in this patient group.
Method: A cost analysis emphasizing known infection rates, cost benefit and a reduction in patients requiring multiple lines was submitted to the hospital. Following ethical approval, 42 inpatients with cystic fibrosis were identified and informed of the trial and possible risks of midline use. Patients were requested to report early signs of infection to the cystic fibrosis nurse coordinator. Lines were checked daily until removal. All midline tips were sent for culture on removal and data from the 42 midlines placed in 2006 were retrieved from the hospital scientist for analysis.
Results: On conclusion of the trial, data demonstrated both zero infection and thrombus rates in the patient population. Midlines were continually monitored for a further 12 months following conclusion of the trial and infection rates continued to be below 1% and thrombus rates lower than 2%.
Discussion & Conclusion: Midlines have many advantages for chronically ill patients needing two to four weeks of intravenous therapy and medications, and when inserted in a sterile environment and correctly monitored and maintained, have a significantly lower association of infection and thrombus than previously suggested. Due to a reduction in central collateral vessel formation from incursions into the superior vena cava, outcomes for cystic fibrosis patients requiring lung transplant may also improve.

6.
BEDSIDE VERSUS DEDICATED AMBULATORY FOR PICCS PLACEMENT. 1000 CASES ANALIZED

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In our institution since 2006 we implanted PICCs for nutritional and intravenous therapy use. From June 2009 a bedside implantation team was created to implantation of PICCs and not tunneled Cvc in not transportable patients, in critical patients and in septic patients. From June 2009 to February 2010 we implanted 718 PICCs. 334 bedside, 384 in dedicated facility. We analyzed implantation difficulty and implant related complications to evaluate difference between logistical situations. Devices, procedures and guidelines are the same. Also echographic device used is the same type. We individuated as parameters of logistical related complications the procedure failure, the medium number of vein puncture, the primary tips wrong position and the first 7 days cvc related sepsis. Also time for each procedures and difficult score are registered.

	Bedside	Ambulatory
Total	334	384
Failure	12	16
Medium n° of punctures	1.2	1.3
Primary tip wrong position	18	24
Sepsis	1	1
Medium time (min)	48	29
Medium difficulty score (1-10)	6	4

Our analysis demonstrate that for a specialized team bedside implantation has the same quality of ambulatory implantation but requested more time and it is more difficult. We suggest to reserve this procedure only for selected patients.

7.
FROM INTERNATIONAL GUIDELINES TO A SHARED CLINICAL PATHWAY: THE IEO PICC TEAM EXPERIENCE

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Introduction: "All clients requiring vascular access, regardless of duration of therapy, require the use of a structured approach such as an algorithm to facilitate a comprehensive client assessment and the development of a vascular access care plan prior to the initiation of therapy." [From: Assessment and device selection for vascular access. Registered Nurses Association of Ontario 2004]. The implantation of a venous access, for therapeutic or diagnostic purposes, is one of the first clinical approaches to a patient. An evaluation of the patient means to assess the best peripheral vein to use and to appraise in a systematic and comprehensive way the diagnostic and therapeutic process the patient will have to undergo. This is important in an oncologic setting, where patients are followed continuatively, usually by the same working team, and often receive several lines of treatment. As stated by the National Pathway Association, the application of a clinical pathway can improves multidisciplinary approaches, based on guidelines and evidence where available for a specific patient group. This paper aims to present the initial application of clinical pathway methodology in a cancer center where a PICC team was established.
Methods: We shared the clinical pathway with our patients to create a new tool: a Shared Clinical Pathway. All implants were discussed between an expert nurse and the patient's physician. After reaching a consensus on the type of catheter to be used, the choice was routinely discussed between the nurse and the patient. A prospective data base was set up and all relevant information was reported for procedure monitoring and quality assurance evaluation.
Results: In 18 months 70 PICCs were inserted, under US guidance, both in medical and surgical settings. 41 PICCs were implanted for medical care (palliative or active treatments), 15 for post-surgery parenteral nutrition (TPN) and 1 for long-term antibiotic therapy. 12 patients were discharged with the device, all of them used it for both indications (TPN & chemotherapy or chemotherapy & palliative care). 3 patients used it as a "bridge" catheter. We observed 3 different types of complications: 1 early removal for occlusion, 1 deep venous thrombosis, 3 primary malpositions.
Discussion & Conclusions: The systematic use of this Pathway improved the quality of life of cancer patients, since their veins were preserved and they felt involved in the decision-making process. This approach allowed to cut costs, saving time and resources and it led to a small but significant cultural change in a specialized cancer center with a high-case volume of central venous port implantation. This pathway has systematized our approach in choosing the best venous access among the many available. The current objective of the PICC team is now to design hospital-specific guidelines to choose the best venous access for cancer patients in different clinical situations.

8.
SECURACATH SUBCUTANEOUS SECUREMENT IN PERIPHERALLY INSERTED CENTRAL CATHETERS: RESULTS OF A PROSPECTIVE 50 PATIENT TRIAL WITH AN INTERNAL SECUREMENT DEVICE

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Introduction: 50 patients requiring vascular access with peripherally inserted central catheters were enrolled in this trial to test an internal securement mechanism.
Methods: Both in and out patients referred to a nursing vascular access team and to the interventional radiology departments of a university hospital for placement of dual lumen PICCs were screened for entry into the trial. All patients received 5Fr dual lumen SecurAcath PICCs. PICCs were placed in the interventional radiology suite with tip placement confirmed with fluoroscopy. Adult patients were enrolled with a mean age of 56.46 years (range 20-77). There were 25 were females and 25 were males. Reasons for PICC placement included IVAB therapy, repeated venous sampling , lack of peripheral access, IV fluids, TPN, blood products and chemotherapy with many patients having multiple indications. The majority of PICCs were placed in the basilic vein.
Results: Time required for deployment of the securement mechanism averaged 11.6 seconds with a range of 5-120 seconds and a median of 10 seconds. Mean PICC dwell time was 19.08 days with a range of 0-125 days. 13 patients (26%)received both in hospital and at home or alternate care setting services. 78% of PICCs were removed at completion of therapy. 22% were removed for other reasons including 3 removed for discomfort at the site, 2 for deep vein thrombosis and others for oedema (1), bacteremia (1) leaking (1) and operator failure to accurately deploy the securement mechanism (2). An additional patient had a catheter removed for fever, with the catheter tip culture proving negative for infection.
Discussion and Conclusions: The SecurACath system represents a novel approach to catheter securement for peripherally inserted central catheters. The complication profile for SecurACath PICCs in this study resembled that of standard PICCs. Cost savings were realized in reduced dressing materials and ability to forgo disposable securement systems. Clinician education and training are important in attaining accurate device deployment. Application of the securement system to other vascular access devices and catheters should be investigated in the future.

9.
THE GREAT ANATOMIC MISCONCEPTION: THE CENTRAL VENOUS CATHETER IS IN THE AXILLARY VEIN, NOT THE SUBCLAVIAN VEIN

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Introduction: In 2000, the author began a project to prospectively record his results for sonoguided "subclavian(SCV)" venipuncture. By strictly applying the anatomic definition of the lateral border of the 1st rib as the junction between the axillary(AXV) and SCV, the author soon found that he was always cannulating the AXV. SCV is never(almost never) cannulated with ultrasound.
Method: 2660 consecutive AXV sonoguided cannulations.
Results: 11 pneumothorax (.5%) 28 arterial punctures (1.1%)
Discussion and conclusion: The anatomy of the human venous system has been accurately known for more than 300 years. When blood leaves the arm, it enters the AXV, then flows into the SCV and on into the brachiocephalic and the vena cava. When the AXV reaches the lateral border of the 1st rib, the vein becomes the SCV. The SCV lies in the bony tunnel bordered by the clavicle and 1st rib. This makes visualization of the infraclavicular SCV very difficult or impossible in many patients. Visualization of the SCV requires placing the ultrasound probe at a funny angle, which is not conducive to venipuncture. The SCV is taught to be an uncompromisable structure. The same factors that cause the SCV to be uncompressible (the bony tunnel) cause it to be difficult to visualize with ultrasound. In contadistinction, the AXV is easy to visualize and compress. Compression is one of the aids in distinguishing the AXV from the axillary artery.The practical ramifications of this anatomic misconception are: 1. The AXV is not the SCV. 2.The AXV is eminently compressible. 3. Intentional puncture of the AXV outside of the thoracic cage (lateral to the 2nd rib) will potentially lower the incidence of pneumothorax. 4. Thrombosis of the more central SCV may have a different clinical course, than thrombosis of the AXV. 5. If one were to injure the AXV (or axillary artery), the surgical approach is quite a bit simpler than the approach to the SCV (or subclavian artery), which will generally require a thoracotomy for control. 6. When the Centers for Disease Control (11) and the Institute for Healthcare Improvement (12) issue their recommendations that the SCV is the preferred site for non-tunneled CVA, they are inadvertently advocating blind sticking, since the SCV cannot be accessed with US guidance. This goes against the large body of literature that supports the US-guided CVA as the safer method. The author regards this as an unintended consequence based on anatomic misconcep-

tion. 7. The distance from the SCV to the cavoatrial junction is different from the AXV to the heart. Furthermore, I believe that since the anatomy of the human venous system has been completely understood for more than three centuries, the scientific literature must be accurate in this matter. Very little knowledge is handed down to succeeding generations of physicians if we misidentify an anatomic structure. At the heart of the matter, this is the issue: does anatomy matter.

10.
MAINTAINING A ZERO CENTRAL LINE ASSOCIATED BLOOD STREAM INFECTION RATE FOR 17 MONTHS ACROSS A LARGE AND DIVERSE ADULT PATIENT POPULATION

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Introduction: In order to improve patient outcomes and reduce costs, the objective of every health care facility is to achieve and maintain a zero Central Line Associated Blood Stream Infection (CLABSI) Rate. This facility achieved the goal of zero CLABSIs by applying evidence based enhancements to the Central Line Bundle. These additional interventions were clinically evaluated by the Vascular Access Team (VAT) which concluded significant benefit to patient care would be realized upon their implementation. An essential component of this improvement program is a dedicated VAT. An important aspect of any improvement program is introducing innovations to improve patient care in combination with vigorous, continuous staff education in outstanding care of the patient.
Method: Prospective surveillance and enhanced central line care has been implemented through a dedicated VAT for the last 6 ½ years. The team's interventions to reduce infection included many innovations, a few in order of appearance include vigorous insertion and site care education, a swabable positive displacement needleless connector, chlorhexidine patch, and switching to a clear version of the same needleless connector. The VAT initiated a rigorous staff education program which included staff awareness and adherence to proper catheter care and maintenance protocols and proper application, defined by the device manufacturer's instructions for use, of all devices which were implemented related to vascular access.
Results: There were over 13,000 central line catheter days of prospective surveillance per year. Rates were calculated for the Intensive Care Units, Medical-Surgical units, Spinal Cord Injury Unit, and Transitional Care. Since June 2006 the facility saw a steady reduction in CLABSIs after the CHG patch, increased use of PICCs, instituting clear swabable needleless connectors, and vigorous maintenance education of CVCs. The facility achieved a zero CLABSI rate in the year 2008 ($p < 0.05$) which was maintained through July 2009. This is clinically significant.
Discussion and Conclusion: The successful CLABSI reduction program initiated at this facility included implementation of the IHI Central Line Bundle along with more recently introduced interventions associated in this surveillance with a decrease in CLABSI rates. Innovations introduced into the facility coupled with an VAT to guide their successful implementation, along with vigorous staff education, successfully sustained a zero CLABSI rate. Care and maintenance of CVCs that includes clear, swabable, positive displacement needleless connectors and a rigorous, reinforced education program on access port disinfection, catheter flushing with normal saline, daily site assessment and the use of a chlorhexidine impregnated disk were associated with reduced bloodstream infection rates. Innovations require a well planned educational program that includes proper device use and training in outstanding patient care.

	Inception of the CLABSI Reduction Program	Change in
Intervention Implemented	Date	Infection
PICC Insertion Team Established	1992	Rate
Formation of the Vascular Access Team (VAT)	January 2003	Decrease
Implement swabable, positive displacement needleless connector	January 2003	1.73 to 0.84
	Implementation of the Central Line Bundle (CLB) for Insertion	
Intervention Implemented	Date	
Hand Hygiene	April 2005	
Maximal Barrier Precautions upon insertion		
Chlorhexidine skin antisepsis		
Optimal catheter site selection and avoiding femoral in adult		
Daily review of line necessity		Decrease
Standardized checklist		1.01 to 0.17
Poor MD compliance with maximal sterile barrier precautions		Increase
Poor nursing care and maintenance	June 2006	0.17 to 1.92
	Beyond the CLB - The Care and Maintenance Bundle	
Intervention Implemented	Date	
Implement the use of chlorhexidine impregnated disk	January 2006	
Increase use of PICCs in place of centrally inserted CVCs		Decrease
Daily review of CVC necessity and prompt removal of unnecessary lines		1.92 to 1.34
Change to the same needleless connector with clear housing	January 2007	
Hospital staff continuously educated on care and maintenance		
Flush with 20ml of normal saline		
Change needleless connector if visible signs of debris or blood		Decrease
Vigorous "Scrub the Hub" connector Care and Catheter Maintenance		1.34 to 0.00

11.
VISUALIZING VEINS WITH NEAR-INFRARED LIGHT REDUCES UNSUCCESSFUL ATTEMPTS IN BLOOD WITHDRAWAL IN CHILDREN

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Introduction: Intravenous access for infusion or blood withdrawal may be cumbersome, especially in smaller children. Multiple puncture attempts for gaining intravenous access are traumatic and painful for the child. To improve vessel puncturing, we developed a system based on infrared transillumination (the VascuLuminator) to visualize blood vessels. A feasibility study to the clinical use of the prototype in the procedure of blood withdrawal in children was conducted.
Methods: The usefulness of the Vasculuminator during blood withdrawal in children of 6 years and younger was studied in 45 children and compared to 80 children without the system at the laboratory of the outpatient clinic of a pediatric university hospital. Failure rate (i.e. percentage of procedures where more than one puncture was necessary to gain blood) was measured. Potential confounders, such as skin color and subcutaneous fat, were registered. The laboratory technicians were asked to rate the use of the VascuLuminator after each procedure as positive, neutral or negative.
Results: The prototype was able to visualize vessels in all of the patients in at least one of the puncture sites (hand, foot, antecubital fossa) used for blood withdrawal. The failure rate of the procedures performed with the VascuLuminator (1/45; 2.2%) was smaller (p = .05) than in the procedures without the VascuLuminator (10/80; 12.5 %). There was no confounding from the measured potential confounders. In 26 of the 45 cases, the laboratory technicians rated the use of the VascuLuminator during the procedure positive. In none of the cases, the use of the VascuLuminator was rated negative.
Conclusion: The VascuLuminator enabled visualization of relevant veins underneath the skin which are otherwise not visible. The first clinical evaluation showed promising results in facilitating blood withdrawal in children by decreasing the failure rate.

12.
REDUCTION OF PRIMARY BACTEREMIA FOLLOWING THE INTRODUCTION OF CHLORHEXIDINE-IMPREGNATED SPONGES COMBINED WITH TRANSPARENT DRESSINGS ON CENTRAL VENOUS CATHETERS IN A MIXED ICU

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Introduction: In our 32-beds mixed ICU, ongoing multimodal strategy targeted at prevention of catheter-related infection combine education to general measures of hygiene with specific guidelines for catheter insertion and dressing since several years 1. In this context, we tested the introduction of a chlorhexidine-impregnated sponge for catheter dressing 2.
Material and methods: Prospective surveillance of primary bacteremia is performed according to standardized definitions. New guidelines for catheter dressing included the combination of a chlorhexidine-impregnated sponge (BioPatch) with a transparent occlusive dressing (Tegaderm) with planning for refection every 7 days. Other elements of the preventive strategy were not modified (alcoholic hand-rub with overall compliance of 65 to 68%; non coated catheters ; maximal sterile precautions for insertion ; skin disinfection with alcoholic (70deg) solution of chlorhexidine (0.5%).
Results: New guidelines were introduced in 4Q 2007. Due to cost constraints, Biopatch was used only for internal jugular and femoral sites. Incidence densities of primary bacteremia are displayed in Table. According to local condition at insertion sites, dressing needed to be changed every 3 to 4 days.

	2003	2004	2005	2006	2007	2008
ICU stays	2027	2041	2228	2317	2408	2448
Central venous catheter-days	7576	8272	8651	8615	9332	10145
Primary bacteremia/1000 CVC-days*	3.3	2.3	3.0	2.7	2.4	1.4

* Significant reduction of incidence-density in 2008 « moving average charts » JMP7.1

Discussion/Conclusion: The introduction of a new dressing technique, combining of a chlorhexidine-impregnated sponge with a transparent occlusive dressing and planning for refection every 7 days for all patients with a central venous access in internal jugular and/or femoral site resulted in a significant reduction of primary bacteremia. Further generalization of use of the chlorhexidine impregnated device to all central venous vascular and arterial vascular access may be justified on the basis of these preliminary results. These preliminary results strongly suggest that combined with occlusive dressings, the introduction of chlorexidine impregnated sponge for dressing of all central venous catheters inserted in internal jugular and/or femoral site, significantly reduces the rate of primary bacteremia.

13.
IV CANNULATION - A FOCUS ON FILM DRESSINGS AND REDUCING COMPLICATIONS

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Introduction: The IV insertion team collected data over an 8 month period, focusing on complication rates associated with cannula insertion and maintenance of these devices. The data was collated into significant events affecting longevity of theses devices and cost impact of re-insertion, as well as film dressing choice for retention of these devices. A further trial is currently being undertaken utilising IV3000 in place of current film dressing with an expected measurable reduction in dressing related complications of approx 80%.
Method: 5963 cannulations were captured and subsequently monitored for associated complications. 2521 complication s were captured and further broken down into the following categories: Tissued- 805 Pulled out- 474 Fell out- 1218 Infected site- 24 Cost of Initial Insertions, using current film dressing- $1,341 AUD Cost of re-insertions using current film dressing- $2,033.
Results: Complication rate was 42.3% of all peripheral IV lines placed with the major complication being dislodgement (Fell or Pulled out): 1692 combined dislodgements. 805 cannula tissuing events may at times be attributed to poor cannula fixation. This was the first comprehensive study of cannula complication events within our institution and those involved in gathering and collating data were genuinely concerned at the complication rates captured. Total cost of re-insertion was greater than initial insertion, due to resources and equipment necessary for re-insertion. A review of the data demonstrated that a review of film dressings retaining cannula would be beneficial and a vital first step in reducing dislodgement events.
Discussion and conclusion: A large component of cannula insertions captured, were conducted by the 'after hours' IV cannula team for acutely unwell patients, often confused and irritable. A large proportion of cannula insertions are also undertaken within the Emergency Department on patient admission. This patient group may also be acutely unwell resulting in diaphoresis or 'clammy' skin, resulting in poor adhesion from current hospital film dressings. A proposal to trial Smith & Nephew IV3000 was proposed and adopted. Research and Development suggests increased 'breathability' up to 13 times superior to current film dressing in use, improving adhesiveness of dressing, thus reducing dislodgement events. The trial is centred within the Emergency

Department and all patients receiving cannulations will be followed through admission to assess ongoing cannula placement and record episodes of dislodgement, tissuing and infection events. As discussed, an expectation of 80% improvement in dressing related complications is expected and will be reported on at WoCoVa conference in June 2010.

14.
VENOUS INTERNATIONAL CLASSIFICATION: VIA PROJECT: STUDY FOR THE VALIDATION OF A CLASSIFICATION OF THE PERIPHERAL VENOUS SYSTEM WITH PROGNOSTIC VALUE AND USEFULNESS IN PATIENTS UNDER INTRAVENOUS THERAPY

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Introduction: In the diagnostic and therapeutic processes of many diseases and of acute and chronic processes, the intravenous route is the first election for the boarding of the patient. The knowledge of the venous peripheral system on the part of the professionals of the health goes beyond the anatomical location in the moment of the boarding for the channeling of a catheter or the puncture for an extraction of blood. Aims: 1. Establish in every patient and in a temporary point a categorization of venous peripheral system across the measurement of a few parameters of observation. 2. Validate the grading scale proposed venous five degrees. 3. Correlate with the proposed scale ultrasound evaluation of peripheral venous system.
Methods: Single centre, observational, open, non aleatorized. We appreciated best possible puncture in the veins of the arm, forearm and back of the hand, the possibility of channeling of different sizes of catheters, the perceived risk of extravasation, and the presence or absence of venous phlebitis and other injuries. We perform ultrasound study of the veins. The five grades proposed are: GRADE I: Full venous system. At least 6 optimal puncture in one of the dorsal veins of the hand, forearm, cephalic and basilic easily to channel large catheters, at least 18 G. Extravasation risk (ER): remote. GRADE II: At least 4 optimal puncture in one of the dorsal veins of the hand, forearm Cephalic and Basilic low difficulty for the channeling of large catheters, at least 20 G. ER: possible. GRADE III: At least 2 optimal puncture in one of the dorsal veins of the hand, forearm, Cephalic and Basilic, difficulty channeling fine gauge catheters (22-24 G), the possibility of channeling caliber catheters (> 20 G). Tendency to phlebitis after intravenous treatments (IT). ER: low. GRADE IV: At least 1 optimal puncture site in one of the dorsal veins of the hand, forearm, cephalic and basilica high difficulty for channeling fine gauge catheters (24 G and below), phlebitis after IT, blood samples difficulty. ER: high. GRADE V: No optimal puncture site in one of the dorsal veins of the hand, forearm, cephalic and basilic, inability to channel fine gauge catheters (24 G and below), phlebitis after IT, high difficulty for blood samples. ER: very high.
Results: From 2009 Feb. until 2010 April we performed 174 VIA I Project independent assessments, and we have started and made initial ratings VIA II and VIA III, with ultrasound studies. The degree of coherence of Kendall's W is 0,833, with a statistical significance $p < 0.001$. The overall Kappa index for grades tested is 0.7370, with a CI of 95%.
Conclusions: Significant findings at ultrasound size of the veins depend on the classification given. We need to perform more surveys to get a validation of the proposed optimal scale, but we can affirm that we are in a good way to get it. Once a time the uses of a scale to the venous peripheral system classify can we choose the best venous access option for the patient.

15.
IMPACT OF A PERIPHERAL INTRAVENOUS CANNULATION TEAM

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Introduction: This paper is a report of a European Working Time Directive (EWTD) initiative to reduce non-consultant hospital doctors (NCHD's) hours by piloting an intravenous (IV) nurse team. A university hospital in Ireland was chosen to initiate a pilot peripheral intravenous cannulation (PIVC) team, in order to ascertain whether cannulation insertion could be performed effectively by a team of nurses.The EWTD limits the number of hours that doctors are allowed to work over an average week (Garvin, McLaughlin et al. 2008). These limitations present nurses with new opportunities, and the potential for role expansion. An increasing number of patients are being treated for acute and chronic illnesses, and subsequently will need an IV device at some point during their treatment (Waitt, Waitt et al. 2004; Camp-Sorrell 2007). It has been previously demonstrated that the use of trained specialists in performing this function can improve accuracy rates, and reduce pain and distress for patients (Dougherty 2008).
Methods: A team of Registered General Nurses (RGNs) (n=4), led by a senior phlebotomist provided PIVC. Request books were placed on each ward and data was recorded prior to, and after, each insertion. Information recorded in the request sheet included patient details and ward location, consultant and specialty, time requested, reason for PIVC, and reason for change of cannulae. Detailed analysis was performed on a speciality ward request book. Prospective descriptive statistics were employed using statistical software packages MAKESENS and SPSS (statisical package for social sciences).
Results: A Mann-Kendall trend test statistic was calculated. This value was statistically significant (p-value <0.05) indicating the presence of an increasing monotonic (constantly increasing) trend in the percentage of first-time cannulation with a 98% success rate in first-time insertions at the end of 5 months of the pilot scheme. Consistent improvement is demonstrated over the study period. Detailed analysis of ninety nine requests on an orthopaedic ward revealed that ninety six (92.3%) of the cannulae inserted were 22 gauge; 2 cannulae were 20 gauge, and 1 cannula was 18 gauge in size. Of 99 cannulae inserted, 82 cannulae (82.8%) of PIVC were inserted in the back of the hand region. 9 (9.1%) were inserted in the ante cubital fossa, and 7 (7.1%) were inserted in the region between the ante cubital fossa and the wrist. Site of insertion and gauge size of the cannula are in accordance with best practice guidelines.
Conclusions: IV teams performing PIVC can effectively reduce insertion rate attempts, and potentially offer a solution to the current manpower issues arising as a result of implementation of the EWTD. A critical review of studies on cannulae size revealed an infection increase when larger size cannulae were inserted (Tagalakis, Kahn et al. 2002). A team approach to PIVC insertion and management can become the standard for large hospitals.

16.
REGISTERED PROFESSIONAL NURSES PLACING CENTRAL VASCULAR ACCESS CATHETERS VIA THE INTERNAL JUGULAR VEIN AT THE BEDSIDE: ONE YEAR EVALUATION OF A PILOT PROGRAM

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Introduction: This program was designed to demonstrate the accuracy and effectiveness of a program for registered professional nurses (RPNs) to place central vascular access devices via the internal jugular vein at the bedside.
Method: A retrospective review of clinical outcomes after central vascular

access device (VAD) placement by RPNS was performed. All RPNs evaluated had significant experience in ultrasound guided PICC placement and were educated in central VAD placement using an internal jugular vein approach. The educational program consisted of didactic lectures followed by a clinical mentoring program.
Results: 12 RPNs participated in this program and placed a minimum of 10 non-tunneled, non-cuffed central VADs under the supervision of an interventional radiologist. 129 patients were referred for central VAD placement during the first year of the program. 123/129 (95.3%) were placed successfully at the bedside using ultrasound guidance via the internal jugular vein. Complications during device placement included tip malposition (n=2), and inadvertant carotid artery puncture (n=1). 108/123 VADs (91.1%) were removed at the completion of therapy, while 11/123 (8.9%) were removed for reasons including the need for a more permanent device and accidental withdrawal. There were no device related infections or thrombotic complications. During the first year of this program, referrals to interventional radiology for non-tunneled central VAD placement decreased by 40% during the week and by 60% on the weekend. The delay from the identification of need for vascular access to device placement was decreased from a mean of 96 hours to < 12 hours.
Discussion & Conclusion: Central VAD placement via the internal jugular vein by RPNs who have undergone a focused educational program is safe and effective. Further education and monitoring will be required if the practice is to be expanded. The collaboration between interventional radiology and nursing has resulted in standardization of practice for site care and patient assessment.

17.
THE NURSING ROLE IN CENTRAL VENOUS CANNULATION: IMPLICATIONS FOR PRACTICE POLICY AND RESEARCH

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Aims and objectives: The aim of this article is to review published studies about central vein cannulation in order to identify implications for policy, practice and research within an advanced practice nursing role.
Design: Modified integrative literature review Methods: Searches of the electronic databases: Cumulative Index of Nursing and Allied Health Literature (CINAHL); Medline, Embase, and the World Wide Web were undertaken using MeSH key words. Hand searching for relevant articles was also undertaken. All studies relating to the nurses role inserting central venous cannulae in adults populations met the search criteria and were reviewed by three authors using a critical appraisal tool.
Results: Ten studies met the inclusion criteria for the review, all reported data were from the United Kingdom. There were disparate models of service delivery and study populations and the studies were predominantly non experimental in design. The results of this review need to be considered within the methodological caveats associated with this approach. The studies identified did not demonstrate differences in rates of adverse events between a specialist nurse and a medical officer.
Conclusions: There were only a small number of studies found in the literature review and the limited availability of clinical outcome data precluded formal analysis from being generated. Relevance to clinical practice: Central vein cannulation is potentially an emerging practice area with important considerations for policy practice and research. Training specialist nurses to provide such a service may facilitate standardising of practice and improving surveillance of lines, and possibly improve the training and accreditation process for CVC insertions for junior medical officers. For this to occur, there is a need to undertake well-conducted clinical studies to clearly document the value and efficacy of this advanced practice nursing role.

18.
HARMONIZATION OF PORT HANDLING: OVERVIEW OF A TRAINING KIT

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Introduction: The use of Ports is very common (chemotherapy, antibiotics, ...) in France. In 2000, national guidelines were published to reduce the occurrence of Port complications. Despite those guidelines protocols, practices, and complications rate are highly variable from one hospital to another. We considered essential to update those guidelines and improve their dissemination to harmonize practices in" Ile-de-France".
Methods: A multidisciplinary working group of practitioners and experts in the field of Ports (nurses, managers, physicians, surgeons, hygienists, pharmacists, manufacturers of medical devices and communication professionals) met in 2004. The group focus its work on information about Port handlings. Safety, efficiency, ergonomics care, patient comfort, economic constraints were part of reflection. So the group created a training kit about Ports handlings and maintenance. This kit contains a small poster to stick in the nurse office and a slideshow to argue poster's information and help its dissemination. Practical tool with many photos, the poster is about the handlings (IV line's connection, Huber needle insertion, dressing management, respect of closed system, flushing method, needle withdrawal, blood sampling's possibility), Port maintenance (IV line, dressing and needle's replacement frequency), traceability, good working indicators and complications management (extravasation, Port or catheter blockage, use of Urokinase).
Results: Impact on nurses Port knowledge was evaluated before and 4 months after poster sticking (29 interviews). Knowledge improvement was observed. Poster content evolved since October 2004 and was finally ratified by the "Ile de France" hygienic committee in January 2007.
Conclusion: Tested by many nurses in and out hospital, these 2 tools are very useful and popular now. This work has also shown: - specialized IV team (physicians, nurses, …) experience and multidisciplinary reflection are important to create appropriate tools - Dissemination of information requires time and knowledge - Lack of status for IV teams in France has been a restriction for the validation and dissemination of our work

19.
WOUND HEALING AND OTHERS COMPLICATIONS FOLLOWING CENTRAL VENOUS PLACEMENT IN PATIENTS TREATED WITH BEVACIZUMAB: A SINGLE-CENTER, THREE- YEAR EXPERIENCE WITH A SERIES OF 336 PATIENTS

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Purpose: To determine the incidence of wound dehiscence or failure to heal after port placement in patients receiving Bevacizumab therapy, to precise the best interval between port insertion and Bevacizumab administration to reduce the risk, to determine other side effects of Bevacizumab (thrombosis, skin necrosis in patients with skin metastases).
Materials and methods: Medical records of 336 patients (266 breast cancer) who were treated with Bevacizumab from January 2007 through December 2009 were reviewed. All these patients except 22 underwent port insertion in our institution. 14 patients underwent explant-reinsertion during Bevacizumab therapy. Data analyzed included patients demographics, indication for port removal, schedule of Bevacizumab therapy, and other complications during Bevacizumab therapy. A continuous survey recording exists. 4196 ports were inserted during the same period to patients who were not treated with Bevacizumab.

Results: 328 ports were evaluated (172 by internal jugular vein, 154 by sub-clavian vein and 4 by femoral vein). 3 patients were lost to follow-up. 13 of 328 ports (4%) were associated with wound dehiscence requiring port removal. All dehiscences except one required port removal. The interval between Bevacizumab dosing and port placement in patients with dehiscence was always within 7 days of port insertion. 150 ports were inserted in the week before Bevacizumab administration. When Bevacizumab was given within 7 days of port placement, the absolute risk of port removal for a wound healing complication was 8.6 % (13/150). The absolute risk is the same from 0 to 7 days. 5 of 13 dehiscences developed local infection and local and general infection for one case (4 S. aureus meti S, 1 S. Lugdunensis). There were 8 dehiscences in patients who did not receive Bevacizumab therapy: 8/4196 (0.19 %) (fisher test: p<0.001). Others indications for removal included : completion of treatment in 3 (0.91 %, thrombosis in 5 (1.5 %), other mechanical problem in 6 (1,8%), local infection without dehiscence in 1 (0.31 %). Thrombosis were diagnosed at 2 month1/2, 3 month, 5 month, 7 month and 22 month of the port insertion and Bevacizumab administration. There were 51 thrombosis in patients who did not receive Bevacizumab therapy: 51/4196 (1.2 %) (Fisher test p=0.43). 28 of 51 were treated without port removal. 9 patients with advanced breast cancer presenting skin metastases developed extensive and durable skin necrosis despite early stopping of Bevacizumab therapy and intensive skin care in a specialized unit.
Conclusion: Patients receiving Bevacizumab within 7 days of port placement had a high incidence of wound dehiscence and port removal. The risk of thrombosis is not higher. We have to keep in mind the very serious cutaneous side effect when choosing the insertion site to a breast cancer patient with skin metastases.

20.
PROSPECTIVE CLINICAL EVALUATION OF A SAFETY HUBER NEEDLE POLYPERF SAFE IN CANCER PATIENTS

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Introduction: Totally implantable central venous access devices (TIVADs) are widely used for intravenous therapy in cancer populations. By withdrawal of the Huber needle, the non-dominant hand is vulnerable to a 'rebound' stick. The PolyPerf Safe (PS) Huber needle (Laboratoires Pérouse, Ivry-le-Temple, France) is developed to increase safe use by health care professionals. We conducted a study to evaluate the safety and user-friendliness by end-users.
Methods: A prospective descriptive study carried out at the University Hospitals Leuven (Belgium). Five hundred PS needles were evaluated on an individual basis in cancer patients. Different aspects of the PS were assessed: packaging, needle insertion and needle removal. Nurses indicated if they inserted or removed the needle for the first time or not. Comparison with the standard Gripper® needle was assessed only in terms of 'safety' and 'ease of use and training'.
Results: Three hundred sixty-six forms were analysed. No statistical difference was found between first and non-first users. Packaging and access evaluations were scored in general positively except for two aspects: (1) needle stability and (2) ease of dressing. The 'ease of removal' was scored unsatisfactory in up to 22.4% of the registrations. Pain at insertion was recorded in about one in five registrations and blood contact in 2.5% of non-first users. The safety aspect was scored good however the 'ease in use' and 'ease in training' scored in 25.4 to 43.8% less than the Gripper®.
Discussion and conclusions: Nurses evaluated the PS in general positively with exception of 'needle stability'; 'ease of dressing' and 'ease of removal'. No needlestick accidents were recorded. Aspects of 'ease in use' and 'ease of training' scored less compared to the Gripper® in up to one-third of the registrations.

21.
EMOTIONAL PROBLEM IN PATIENTS WITH TOTALLY IMPLANTED CENTRAL VENOUS ACCESS

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Purpose: The use of PORT is now considered a common practice in oncology, for continuous infusion schedules, best supportive care or when peripheral venous integrity is compromised. The aim of this study is to evaluate emotional implication of this clinical practise in a homogeneous oncologic population receiving chemotherapy for advanced disease of gastrointestinal apparatus.
Patients and methods: 32 subject, with a mean age of 59.9 yrs (15 men, 17 women) affected by gastroenteric tract cancer and with the implant of a PORT for a minimum time of 12 months were evaluated with the following instruments: Hospital Anxiety and Depression Scale (HADS), EORTC QLQ C30, Visual Analogue Scale for the measurement of their satisfaction about cares (VAS), Mini Mental Adjustment to Cancer (Mini MAC) to investigate the patients' coping style, semi-structured interview on the PORT acceptance degree and possible changes of adaptations occurred in some daily habits after at least 12 months from the system implantation.
Results: 3 patients out of 32 were lost for follow-up (drop out). Results of HADS scale evidenced a high level of anxiety and a sub-threshold level of depression; EORTC and VAS scales showed a subjective good quality of life level; Mini MAC scores suggest an extensive use of negation coping strategies.
Conclusions: in our population levels of anxiety and depression are according to literature data. However, a lot of patients demonstrate anxiety and depression scores near pathological ranges and these patients are in a higher risk for development of a clinical depression/anxiety. The presence of PORT is related with a major "medical presence" in the life of patients, with a relevant risk of dependency anguish (from both doctor and disease) but is not significantly related with lifestyle limitations, as sleeping and self-care. PORT is a useful tool for oncologic patients and sanitary operator, in terms of safety and comfort, but every aspects of its employment has to be carefully examined (biological, emotional and psychological) for real "global approach" to the neoplastic patients

22.
SINGLE-CENTER, FIVE- YEAR EXPERIENCE WITH 168 PLEURAL IMPLANTABLE PORTS IN THE OUTPATIENT MANAGEMENT OF RECURRENT MALIGNANT PLEURAL EFFUSION

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Purpose: Malignant pleural effusion (MPE) has a very poor prognosis, raises problems of medical management and impairs quality of life. The authors report their experience of a pleural implantable port for the treatment of recurrent symptomatic MPE.
Description: Prospective follow-up of 137 patients between 20/8/2005 and 1/01/2010 in a single center. 168 pleural implantable access system were placed in 137 patients (100 patients with breast cancers) (26 bilateral placements, three cases of replacement and two ipsi-lateral placements) under sedation following the decision of a multidisciplinary meeting. Mean age was 62 (range 16-92) years. Evaluation: No placement failures were observed in this series and no procedure-related morbidity. All patients except three obtained partial or complete relief of their dyspnea. 12 patients (16 ports) were lost to follow-up at the time of placement. 56 of the 125 other patients (44 %) were receiving chemotherapy. 46 patients (36.8 %) underwent pleurodesis after a maximum of 2 months. 26 patients (20.8 %) died during the first 30 days, 14 in a palliative care unit without returning home. 36 patients survived more than 6 months. 71 patients (58 with breast cancer (81 %)) survived more than 2 months, 36 with pleurodesis, 35 without pleurodesis and iterative thoracentesis. 30 of the 36 (83 %) and 23 of the 35 (65 %) were receiving che-

motherapy. The overall median survival time was 180 days in the group without pleurodesis and 300 days in the group pleurodesis (p= 0.01). But, when adjusting with chemotherapy, the overall median survival time was 290 days without pleurodesis and 310 days in the group pleurodesis (p=0.045). Several patients developed loculation of the pleural cavity making further thoracentesis ineffective. Four infectious complications (1 infectious pneumonia , 1 skin infection over the puncture site, 1 catheter-related infection (E. Coli) and 1 empyema (S. aureus)) and three mechanical complications (1 expulsion of the port and 2 disconnections between the port and the catheter) were observed and easily treated. No case of permanent obstruction was observed, and pain during puncture was easily avoided by anti-nociceptif agents. The diffusion of innovation was very quick: 5 ports and 19 thoracoscopy in 2005, 25 ports and 10 thoracoscopy in 2006, 25 ports and 5 thoracoscopy in 2007, 42 ports and 8 thoracoscopy in 2008 and 44 ports and 6 thoracoscopy in 2009.
Conclusions: The pleural implantable access system is an interesting alternative in terms of efficacy and safety for the outpatient management of malignant pleural effusion. It is an alternative for difficult thoracentesis (for patients or for the physician). It has to be considered in all patients and probably as the first line treatment for patients with trapped lung, bilateral effusions and compressive effusion. It presents a number of advantages in terms of comfort and infectious risk compared to tunnelled pleural cath.

23.
TOTALLY IMPLANTABLE VENOUS ACCESS PORTS SYSTEMS AND RISK FACTORS OF COMPLICATIONS: A ONE YEAR PROSPECTIVE STUDY IN A CANCER CENTRE: 815 NEW PATIENTS

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Introduction: Venous access is a concern for patients receiving prolonged courses of cytotoxic therapy for solid cancers. It is a common practice to place a Totally Implantable Access Port System in patients beginning a course of chemotherapy to improve venous access reliability and to avoid potential peripheral venous and external central venous accessing problems. However TIAPS is associated with a number of complications. Our aim was to access the risk factors of these complications. A prospective study was undertaken with 815 patients who needed a TIAPS.
Patients and Methods: This was a consecutive and prospective study in one cancer centre. Between 2nd of May 2006 and 30th of April 2007, we included 815 patients who had a TIAPS. The placement of the TIAPS was surgical. The venous access were external jugular vein, cephalic vein, internal jugular vein, femoral vein and subclavian vein. We reported all preoperative, per and post operative data during one year. Results The global morbidity was 16.1% during one-year follow up (131/815) (Table 2). Port devices were removed because of complications in 55 patients (6.8%) In our study, the most significantly predictive factor of morbidity was the time between insertion of TIAPS and the first use. Indeed, using TIAPS within seven days following the insertion increases infection rate (17% vs 2%, p<0.001) and as a consequence increases the removal rate of the port (8.5% vs 4.9%, p<0.05).
Conclusion: To decrease infection and port expulsion, we recommend respecting a delay of 7 days following TIAPS insertion.

24.
AN OBSERVATIONAL STUDY OF CLINICAL OUTCOMES WITH DOUBLE LUMEN CENTRAL VENOUS PORT SYSTEMS IN CANCER PATIENTS USED FOR CONCOMITANT ADMINISTRATION OF CHEMOTHERAPY AND PARENTERAL NUTRITION

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Introduction: To evaluate the clinical benefit of low-profile double lumen port catheters in patients receiving simultaneous chemotherapy and parenteral nutrition (PN). Advantages, complications and the time-ratio for simultaneous to single use of the catheter were assessed.
Method: At a university teaching hospital 10 patients received a double lumen port catheter (5 men, 5 women; mean age 61.5 ± 12 years). In all cases, both chemotherapy and PN were indicated. All port implantations were performed under ultrasonographic and fluoroscopic guidance in the radiological interventional suite. Procedure related immediate, early, and late complications were recorded until removal of the device, patient's death or reached follow-up period.
Results: No immediate complications were observed. First use of the port system for chemotherapy was within 12 d (± 25 d, range 0 - 84 d) and within 17 h (± 22 h, range 0 h - 72 h) for PN on average. During the application of PN no delay or interruption of the chemotherapeutic treatment was observed. The port catheter was used for the simultaneous application of chemotherapy and PN for a total of 1216 h. The time-ratio for simultaneous use to single use was 1:17.21 h. One port catheter had to be removed after 30 days due to port infection.
Discussion and Conclusion: Central venous double lumen port systems can offer the best patient care for simultaneous chemotherapy and parenteral nutrition with a low complication rate.

25.
PROSPECTIVE STUDY ON SATISFACTION AND QUALITY OF LIFE OF ONCOLOGICAL PATIENTS HAVING BENEFICIATE OF TOTALLY IMPLANTABLE VENOUS ACCESS DEVICE PLACEMENT

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Introduction: Totally implantable venous access devices (TIVAD) are easy and safe systems for infusion of chemotherapy in patients with cancer. The easiness of use and the guarantee of the preservation of the quality of life (QoL) make it the reference for the long-term venous access although poor data are reported in the literature about the QoL of patients who underwent TIVAD placement. The aims of this study were to evaluate the satisfaction and the QoL of oncological patients having beneficiate of TIVAD placement.
Method: Prospective study including exclusively oncological patients who underwent TIVAD placement under local anaesthesia. The questionnaire used was derived from the QoL EORTC questionnaire. The questionnaire was anonymous and evaluate the esthetical satisfaction (scar aspect and position), the pain during and after TIVAD placement, information before and during TIVAD placement and various aspect of the impact on daily life (discomfort, port position,…). Chi square tests were used for statistical analysis (independance of qualitative value).
Results: 289 patients participated to this study. There were 232 F (80%) and 57 M (20%). 92 % of patients had no or little discomfort; 87,6% had no or little pain; 76,33% were very satisfy or satisfy by the port location; 89,32% were very satisfy or satisfy by scar location; 72,60 were very satisfy or satisfy by the esthetical results; 24,55% felt pain or pain more than expect. Preoperative information and intraoperative information were respectively excellent or satisfactory in 72,64% and 75,91%. Immediate pain was higher in patients <45y (p<0,0154), in patients with insufficient pre/intra-operative information (p<0,0001) and in female(p<0,0001). Late postoperative pain (>1w) was higher in patients<45y (p<0,0008), in patients with insufficient pre-op information (p<0,0002) and in female (p<0,0383). Discomfort were higher in patients with insufficient information (pre/intra-operative). Esthetical satisfaction were lesser in patients <45y (p<0,0203) and in patients with insufficient pre/intra-operative information (p<0,0003).
Conclusions: Pre-operative information has a major impact on the intra/post-operative pain, discomfort and esthetical results. Female of <45y are more sensitive to scar location, port location and esthetical results.

26.
BRACHIAL ARTERY-JUGULAR VEIN JUMP GRAFT: A SALVAGE PROCEDURE FOR VASCULAR ACCESS

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Introduction: Stenosis or chronic occlusion of the axillary or subclavian vein is a problem with a difficult solution in patients in whom a permanent vascular access is mandatory for hemodialysis. In such a situation and on other occasions such as failure of multiple previously placed fistulas, arm and cephalic vein exhaustion due to multiple fistula placement or thrombosis, and severe congenital upper limb hypoplasia we used the external or internal jugular vein for venous drainage, a procedure using PTFE grafts to connect the brachial artery to the external or internal jugular vein under local or regional anesthesia.
Method: A prospective analysis was made on 11 patients who received a brachial artery-external/internal jugular Polytetrafluoroethylene (PTFE) jump graft for hemodialysis access. The procedure was chosen due to exhaustion of the veins in the upper extremity because of previous multiple failed fistulas or grafts. Results: In 2 patients the procedure failed after several months. 6 patients retained functioning grafts for more than 18 months after shunt construction. 3 patients are still under observation and they have a functional graft after 3 months.
Discussion & Conclusion: We believe that the brachial artery- external/internal jugular vein jump graft is a salvage procedure that can be used for vascular access when all upper extremity veins including the subclavian or axillary veins cannot be used.

27.
RELATIONSHIP BETWEEN VESSEL DIAMETER AND TIME TO MATURATION OF ARTERIOVENOUS FISTULA FOR HEMODIALYSIS ACCESS

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Introduction: Dialysis Outcomes Quality Initiative Clinical Practice Guidelines, sponsored by the National Kidney Foundation, reflect general consensus that native arteriovenous fistulas (AVF) represent best vascular access. The objective of this study was to determine the correlation between diameter and maturation of vessels in radiocephalic AVF.
Patient and Methods: In this cross-sectional study, 96 hemodialysis patients from Hasheminejad Kidney Center participated and all of them had radiocephalic AVF. We completed the data collection form for each; we collected data about their vein and artery diameter, and time to fistula maturation according to their records. Results: The mean of age was 54.70 (SD=17.17) years. Mean artery diameter was 2.57 (SD=1.09) mm. Mean vein diameter was 2.40 (AD=0.79) mm. Also the mean maturation period was 38.60 (SD=42.13) days. In this study, vein diameter was correlated with maturation period of radiocephalic fistula (P=0.04).
Conclusions: According to our data the vein diameter is correlated with maturation of fistula, but no correlation was seen with diameter of the arteries. There is much discrepancy between times to maturation in various reports. In a metanalysis article the average time for fistula maturation is reported to be 2-3 months but in our study, it was 38/6 days. In some other surveys there was a direct relation between maturation of fistula with both age and gender. This was not seen in our study. Future studies should be performed with more samples to evaluate these factors and also other factors which can decreases the period of fistula maturation.

28.
USE OF TESIO CATHETERS IN INFANTS AND CHILDREN RECEIVING CHRONIC HEMODIALYSIS

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Introduction: Tesio Catheters (TC) were first used in adults as a dual-catheter system with two independent single-lumen catheters into the right internal jugular vein. TC have been associated with improved Qb compared with other catheter types and recirculation rates less than 5%. The recent availability of pediatric-sized TC has further expanded the hemodialysis catheter options available for children. We report the experience with TC survival rates, complications and effect on dialyisis adequacy in a series of children on HD of a single pediatric hemodialysis center.
Method: From January 2003 to March 2010, 43 children underwent chronic hemodialysis for ESRD: 21 (15 boys) of them (48.8%) received TC as central vascular access; mean age 3.1 years; range 0.5-11.9 years. Primary renal diseases that caused ESRD were: Focal Segmental Glomerulo Sclerosis (6), Renal HypoDysplasia (6), Oto-Branchio-Renal Syndrome (1), Wolff-Hirschon Syndrome (1), Middle Aortic Syndrome (1), Atypical Haemolitic Uremic Syndrome (2), Oxalosis (1), Diffuse Mesangial Sclerosis (3). Indications for central venous catheter use in these patients included: low body size (weight range: 5 to 19 Kg) (n=13); main neurological complications (n=4); need for daily hemodialysis (n=1); periferal venous vessel exhaustion (n=3).TC were inserted with ultrasound guidance into the right internal jugular vein on general anesthesia by vascular surgeon in our institution.
Results: Four patients received a single TC-10,5 F, in them hemodialysis was performed with a double alternate blood pump; in the remaining 17 patients twin single lumen TC 6.5 F and 10 F, in 15 and in 2 patients respectively, were inserted. Only in one case a mild right pleural effusion developed as complication. Until now 26 interventions in 21 children have been performed: 5 patients needed of removal with replacement of TC because of a) increase of body height with relative shortness of TC (n=2); failure because of thrombosis (n=2); dialysis inadequacy (n=1). Our procedure for the management of TC includes disinfection of the exit site weekly, oral warfarin and in situ urokinase and heparine to maintain lumen patency, without side effects. No episode of TC and/or tunnel and/or exit site sepsis occurred over 23 months mean follow up (range: 3-82 months). Monthly single poolKt/V was > 1.5 in all patients indicating adequate dialysis. Due to lack of pain related to venipuncture and the confidence in one's movements, patient and parents compliance was very good.
Discussion and Conclusion: Use of TC in children on chronic HD is very limited, our excellent experience also in children weighing less than 10 Kg is unique. We conclude that TC are a reliable, effective in term of dialysis adequacy and low infection long term vascular acces in infants too.

29.
VASCULAR ACCESS PROFESSIONAL ORGANIZATIONS: A MULTI-DISCIPLINARY APPROACH

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The traditional role of healthcare professional organizations is to advocate on behalf of the profession, individual members, and the patient population being served. Benefits to members include professional and educational resources, introduction to emerging information and technologies, and opportunities to meet, communicate with, and learn from colleagues with similar interests. Throughout its 25 year history, the Association for Vascular Access has been and remains unique among healthcare professional organizations: it is first and foremost, a multidisciplinary membership – comprised of physicians, nurses, pharmacists, radiology technicians, researchers, engineers, and industry professionals, among others. AVA maintains collaborative partnerships with industry, fostering research, invention, innovation, application of

technology and knowledge-building to promote patient safety and comfort in the delivery of vascular access care and services. As the vascular access specialty continues to advance technologically and vascular access use expands throughout the world to high and low-resource regions, professional association affiliations can provide critically important assistance in knowledge and skills building, proper device and product selection and their safe application. This abstract presentation provides an overview of considerations, strategies, challenges, and opportunities for creating and sustaining vascular access professional organizations in a variety of vascular access care settings. The multi-disciplinary approach AVA employs is advantageous, reflecting the multi-disciplinary team model of care provided in clinical settings, and the blend of professionals facilitates interdisciplinary communication. Direct access between clinicians and industry professionals provides opportunities for product and service planning, development and implementation. Organizational leaders represent membership. A multi-disciplinary board of directors and committee structure leads AVA. Staff and the board collaborate on strategic planning to establish goals and formulate plans for reaching short- and long-term goals. Board agendas and committee activities are based upon the strategic plan. Despite the benefits of the multi-disciplinary structure, it also presents challenges. Continuing education offerings must meet educational needs of all disciplines, and offering discipline-specific continuing education credit creates financial and logistical challenges. Marketing, member recruitment and benefits to varied targets are significant challenges. Vascular access is an essential component of acute and long-term health care in a multitude of settings; yet vascular access education has been traditionally minimized for most healthcare professionals. The opportunity exists for professional organizations specializing in vascular access to advance healthcare professional expertise and patient outcomes.

30.
GUIDE-WIRED: AN INTRANET-BASED GUIDE TO CENTRAL VENOUS CATHETER IDENTIFICATION AND CARE

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Introduction: Chart audits and routine performance improvement checks revealed a need to implement education regarding central venous catheter access devices (CVC). Nurses at our facility were able to implement evidenced-based, best practice measures by utilizing state-of-the-art technology, current computer documentation process, and links to a newly created educational website while at the patient's bedside.
Method: Several of the IV Therapy leadership staff from within our multi-hospital organization, collaborated and reached a consensus as to the extent of education required to provide safe patient care. Our informatics nurses incorporated existing software programs to create the electronic website framework. Nursing opinion was solicited to accurately assess their needs via phone, email and an anonymous on-line survey. Based upon those findings the intranet-based website was designed. Our corporate legal team provided support and direction for this project. Written copyright permission was obtained from all entities solicited, including those that supply products to our facilities, to use photographs of their specific catheters, products and educational materials on our website entitled: Vascular Access Services and can be accessed at: https://teamport.medstar.net/ fshvascularaccess.
Results: The draft TeamPort site was introduced to our hospital staff on January 25, 2010, at the "Vascular Access Open House", which included: emergency care of CVCs; flushing guidelines; infection prevention; PICC care; CHG application; and dressing changes. Additional requests to add educational information to the website regarding peripheral IVs; pediatrics; when to use heparin; and priming IV pumps have been received. Within 60 days of the initial introduction of the draft website, a positive interest in utilizing this website has grown to encompass all nine hospitals within our organization as evidenced by a 90.47 % positive response rate from the anonymous survey.
Conclusion: Increased best practice awareness leads to consistent identification; and care and maintenance of central venous catheter access devices; contributing to a decrease in catheter related complications. The results of the first quarter anonymous survey revealed: • 57.5 % knew what action to take in the event of a central line emergency. • 74.6 % were able to differentiate between the types of CVCs. • 93.3 % would use this specific educational website dedicated to improving patient safety. The initial CVC education was provided by the Vascular Access Nurses (VAS). Second quarter comparison of random CVC reports generated, detailing the unit nurse's identification of the patient's CVC with the VAS nurse's identification of the same CVC, revealed a 100% accuracy rate. Ongoing monitoring of staff behaviors leads to a downward trend of CVC infections as evidenced by a 0% PICC infection rate for 2010 and 100% compliance of VAS nurses utilizing a central line checklist with PICC insertions.

31.
CENTRAL VENOUS CATHETER INSERTION BY CLINICAL NURSE CONSULTANT OR ANAESTHETIC MEDICAL STAFF: A SINGLE CENTRE OBSERVATIONAL STUDY

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Objective: To compare clinical outcomes of elective central venous catheter (CVC) insertions performed by either a clinical nurse consultant (CNC) or anaesthetic medical staff (AMS).
Design: Prospective audit of a convenience sample for consecutive CVC insertions from July 2005 to October 2007. Setting: Metropolitan University affiliated hospital providing acute, chronic and outpatient services. Participants: Out-patients and inpatients requiring a CVC for both acute and chronic conditions. Main Outcome Measures: Number of CVC lines inserted, patient groups, complications during and after insertion.
Results: There were 245 CVCs inserted by AMS and 123 by the CNC over a 28 month period. The most common indications for CVC placement in both groups were for the treatment of oncology and autoimmune disorders (61%) and for antibiotic therapy (27%). Parenteral nutrition (PN) (2%), and other therapies (10%) accounted for other indications. There was no significant difference in complications on insertion between groups. Anaesthetic medical staff failed to obtain access in five attempted procedures compared to one by the CNC. The rate of CVCs investigated for infection was twice as high in the AMS group compared to those placed by the CNC (19% versus 8%).Confirmed catheter related blood stream infection was 2.5 per 1000 catheters in the AMS group and 0.4 per 1000 catheters in the CNC group (p=0.04).
Conclusion: Both the AMS and CNC had favourable insertion outcomes. Infection outcomes differed between the AMS and CNC with a higher rate of CRBSI in the AMS group.

32.
PERIPHERALLY INSERTED CENTRAL CATHETHERS (PICC) IN ONCO-HEMATOLOGIC PATIENTS: A CENTER'S EXPERIENCE

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Objective: To evaluate the success rate of insertion of peripherally inserted central catheters (PICCs) and their duration and the short- and long-term complications in an onco-hematological setting.
Study design: We started a prospective collection and analysis of the data of the patients who underwent PICC placement from January 2008, with a total of 122 PICCs insertions. A well-trained team of nurses supervised by medical doctors has been in charge of insertion and management of PICCs. Data regarding type of catheter, site of catheter placement, reason for catheter removal, duration of use of the catheter and the rate of complications have been collected.
Results: The success rate of PICC insertion was 85%, with no acute or late complications. The mean duration of PICC treatment has been 54 days (range 1±222). PICCs have been removed or not correctly inserted in 15% of the

patients, because of local bleedings for multiple vein punctures or arterial punctures (9% and 1% respectively) and because of mechanical occlusions (23%). The PICC infection has been assessed by positive blood cultures and its rate has been 2%. The PICC correlated vein thrombosis rate was diagnosed in 4 patients (8%).
Conclusion: Our initial experience confirms that PICCs are easily inserted and convenient with an important vascular saving in onco-hematologic patients, in whom peripheral drip or central venous catheter insertion is not possible. The percentage of prematurely removed catheters seems acceptable, after a mean period of 2 months. Our data seem to suggest the need of a randomized trial of PICCs and conventional CVCs in hospitalized patients requiring central access especially because of a growing trend in many hospital hematology and oncology services to switch from use of cuffed and tunnelled CVCs to PICCs.

33.
ESTABLISHING A NURSE-LED CENTRAL VENOUS CATHETER INSERTION SERVICE: A PROCESS EVALUATION

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Background: Health care systems promote care models that deliver both safety and quality. Nurse-led vascular access teams show promise as a model to achieve hospital efficiencies and improve patient outcomes.
Objectives: The aim of this paper is to discuss the process of establishing a nurse led central venous catheter (CVC) insertion service in a university affiliated hospital using a process evaluation.
Method: Archival information, including reports, communications and minutes of departmental meetings were reviewed. Key stakeholders involved in establishing this nurse-led service at the time were interviewed.
Results: A nurse-led CVC insertion service was first established in 1996 and has increased in service provision over 13 years. Initially there was scepticism from some medical practitioners about the feasibility of a nurse performing a traditional medical procedure. The service currently provides central venous access across the hospital including critical care areas. The service places up to 500+ catheters per annum.
Conclusions: Establishing a nurse-led CVC insertion service has increased organisational efficiencies and provided an infrastructure for support of best practice. The support of senior management and medical practitioners was crucial to the successful implementation of this model of care.

34.
BEST PRACTICE – SAFE PRACTICE "THE FIRST IRISH HOSPITAL TO ADOPT A COMPLETELY CLOSED PERIPHERAL VASCULAR CATHETER SYSTEM"

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This is the journey of one general hospital in Co Sligo, Ireland as the Nurse Practice Development Unit (NPDU) led out on a 'Best Practice Initiative' for management and care of Peripheral Vascular Cannulae (PVC). As stated by Peterson (2002) the majority of patients admitted to hospital will become a recipient of a vascular access device at some time, the staff in SGH wanted this to be the safest, least invasive, most comfortable experience for the shortest time possible. In 2008 nurse practice developers carried out a literature review of best practice initiatives for care of PVC and infusion fluids and an audit of the Intravenous Infusion Policy of the hospital: specifically 1) Documentation in use. 2) Phlebitis and Infiltration scoring/recording. 3) Length of time that PVC were in situ. 4) Reporting/Risk management practices. The audit took place in surgical, medical and oncology units Patients were observed to detect if an IV device or infusion were present. Documentation was reviewed to determine if the time and date of the cannula insertion was recorded. Staff were questioned regarding observation of cannula sites for signs of infection and actions taken. Methodology Practice developers consulted with infection control staff, nurse managers and the local drugs & therapeutics committee. A nurse led pilot was proposed to develop new documentation for the insertion and maintenance of IV cannulae and to research safety cannulae and existing systems in the hospital. The hospitals intravenous policy was reviewed concurrently. An Intravascular Device Assessment Record (IVDAR) was developed incorporating the RCN (2007) phlebitis and infiltration scale. Only one closed system that met the group criteria was found. The costing was compared with existing safety cannula and 'add on' needle free extension sets currently used within clinical areas. After comparison, an overall cost reduction was predicted for the hospital. The system was phased in hospital wide with training led out by the NPDU clinical facilitators and supported by BD trainers over a three months in 2009.
Results: Multidisciplinary Education for nurses, NCHD's medical and nursing students resulted in wide compliance with the IVDAR, and the BD 'NEXIVA' closed IV catheter system; however, on re-audit there were still some units that did not meet the compliance standards. Overall, the adoption of an all in one cannula and combined extension set reduced cost to the hospital and increased compliance with the closed system to 85% hospital wide. The reporting rate for grade 2+ phlebitis rose however, this was regarded to be due to the utilisation of the IVDAR and increased reporting after education.
Conclusion: This nurse led initiative led to SGH being the first hospital in Ireland to adopt a completely closed, safety PVC system. The roll out of the IVDAR presented a standard for the unit to audit practice and to introduce PVC care bundles to clinical areas, which is ongoing.

35.
EVALUATION OF AN EDUCATIONAL PROGRAMME IN MANAGEMENT AND CARE OF CENTRAL VENOUS ACCESS DEVICES

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Introduction: Long-term central venous access devices (CVAD), mainly central venous catheters (CVC) and implanted ports, are frequently used in patients with hematological malignancies. They are highly needed in order to administer chemotherapy, stemcell infusion and support therapy during the acute aplastic period. There is a further need in chronic phase. However, their use implies a serious risk of bloodstream infection that could become life-threatening for the neutropenic patient. Evidence consistently demonstrates that the risk of catheter related infection declines following standardisation of aseptic care and educating staff in aseptic practices. The aim of the study was to evaluate an educational programme in management and care of CVADs by comparing adherence to practices in recommended evidence-based guidelines between nurses that had participated in the educational programme and those who had not.
Methods: Structured observations of adherence to the guidelines were performed using a checklist from a previous study. Specified behaviours of hygiene precautions, aseptic care and antisepsis were defined to be observed when a nurse changed a CVC dressing or accessed a port by inserting a needle. Observational data from 46 nurses in the educational group and 41 nurses in the comparison group were analyzed statistically.
Results: The results show that the nurses who had participated in the educational programme had significantly fewer deviations (mean 0,8) from the recommended guidelines than the nurses who had not participated (mean 3,5). The deviations in the comparison group had the character of incomplete performance in the various behaviours.
Conclusions: The nurses that had participated in the educational programme carried out the procedures in close adherence to recommended evidence-based guidelines which in turn implies decreased risk of catheter related infection.

36.
USE OF INTRAVENOUS ANTIBIOTHERAPY AT HOSPITAL AT HOME SERVICE

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Introduction: Outpatient parenteral antimicrobial therapy (OPAT) has been proven to be safe and effective on patients with several infection conditions. Hospital at Home Services are capable of attending all kind of pathologies, both medical and surgical. OPAT is one of the main activities of our Hospital at Home Service. The patients need in many cases intravenous antimicrobial therapy, either to complete the antimicrobial therapy initiated during the stay at the hospital or treatment initiated during the permanency with us. The aim of this work is to show our series of antimicrobial therapy administered at Home Service during 2009.
Patients and methods: Electronic information review about patients undergoing intravenous antimicrobial therapy in the home setting during 2009 The following aspects were analyzed: age, diagnosis, therapy indicated, administration type, intravenous access, complications with the catheters, and early discharge scheme. When we consider intravenous treatment at home will be very important to the choice of venous access depending on: the patient's clinical condition, age, state of venous access, diagnosis, type and frequency of antibiotic administration, mode de administration (traditional or ambulatory infusion pump, length of treatment. Tables are designed to recommend the choice of catheter depending on the antibiotic to be administered, the duration of treatment and mode of administration.
Results: 797 OPAT were indicated to 688 patients with a mean age of 67, 49. Infections were more commonly found in skin and soft tissues (27, 32%), intraabdominal (22, 96%), respiratory (20, 80%), bacteremia (11, 72%), urinary (6, 78%), bones and joints (4, 52%), other infections (5, 90%) A wide variety of antibiotics was used: 36,38% Ertapenem, 16,06% Piperacilina-Tazobactam, 7.02% Daptomicina, 5,77% Teicoplanina, 3,76% Ceftazidima, 3,76% Levofloxacino, 2,38% Cloxacilina, 24,87% other antibiotics 27, 73% of antibiotics were undergoing by mechanical infusion pumps, 72, 27% as monotherapy or intermittently. 1097 intravenous catheters were used, 86,69% peripheral catheters, 6,84% were central catheters, 4,28% were central catheters with peripheral insertion and 2,19% Port-a-cath. The overall incidence of phlebitis was 9,48% , 14,31% flow back, 2,73% lost of catheter 0,73% catheter obstruction , 0,36 % associated bacteremia, and 0,09 break of catheter The intravenous treatment lasted a mean of 11, 35 days which represents a decrease of 8,524 hospital stays.
Conclusions: The intravenous antibiotic administration at home is effective and safe. This method of treatment satisfies the patient and permits hospital stays to be reduced thus improving the use of hospital

37.
PERIPHERALLY INSERTED CENTRAL CATHETERS AND MIDLINE CATHETERS AS ALTERNATIVE VASCULAR DEVICES IN CHILDREN SUBMITTED TO HEMATOPOIETIC STEM CELL TRANSPLANTATION FOR THALASSEMIA

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Thalassemia is an inherited bone marrow disease requiring chronic long-life transfusions to treat the anemia caused by enhanced red blood cell destruction; this leads to progressive iron overload followed by organs deterioration. The only radical cure is haematopoietic stem cell transplantation (HSCT), which can give a very high rate of survival and disease-free life expectancy (1). To do this, patients submitted to HSCT need a specific central vascular access where all intravenous drugs and blood samples are given. In our institution, we perform at least three allogeneic bone marrow transplants monthly, all in pediatric patients coming from the Mediterranean areas in which thalassemia and some other haemoglobinopathies are endemic; given this, there is suggestion for choosing the best catheter to be used for those patients, with a wide variety of vascular devices which can improve the care and management of the patient himself, his quality of life, and which may support the best practice for nurses and physicians. To date, the review of the literature shows the benefits given by ultrasound technique for the positioning of a central venous catheter, which can be inserted also by peripheral access, and illustrates how this procedure can be performed by anyone who has the specific know-how(2-5). Peripherally inserted central catheters and midline catheters could ensure a valid access for patients who are under treatment during pre and post-transplant period; they are also progressively becoming an alternative choice in the use of traditional tunnelled catheters, but there aren't still enough data for this kind of patients in the literature. Our experience, started on February 2008, is ongoing to evaluate the efficacy, referring to best quality of life, the expected lower rate of infections and replacements of the above mentioned devices, and the cost-effectiveness. For this reasons we decided to adopt a new strategy in administrating drugs, blood and platelets transfusions, parenteral nutritions, in performing blood samples both in charged and discharged patients, to observe if these devices give advantages in the management of these pediatric patients waiting for HSCT. We hope that the use of these devices will carry on advantages to improve care, management and quality of life of the patients, supposing evidences could come from easy availability of ultrasound technique, easy possibility to perform the insertion bed-side, respecting all warnings in terms of patient's and operator's security, and easy acquisition of the specific required know-how, with the aim to reduce waiting time for the insertion.

38.
THE ADEQUATE INDICATION OF A VASCULAR ACCESS IN THE ONCOLOGICAL PATIENT

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The adequate indication of a vascular access in the oncological patient Introduction The oncological patient, more than any others, requires vascular access to be completely safe while under antineoplastic therapy. The need of a continuous approach to this patient vascular system, entails an important deterioration of his/her venous anatomy, besides patient insecurity, suffering, and an overload of work in therapy units, and the unsecurity felt by the nursing professionals who frequently feel overwhelmed, due to the lack of suitable strategies for these problems. The use of intravascular catheters has become a basic tool in hospital clinical practice and in oncological patient management, so that it becomes essential to follow a suitable praxis regarding the election of the most appropriate vascular access for each case. It is also of great importance to implement an appropriate education of the sanitary personnel, both at the patient evaluation phase as at the phase of already-inserted catheter maintenance. For all these reasons, it is of vital importance to achieve full compliance of the CVC with the purpose and characteristics of the prescription, both for substance administration as for blood sample extractions, what constitutes one of the essential requirements in order to minimize patient suffering as well to provide him/her with better comfort. In the case of chemotherapy applications, priority must be given to a non-peripheral administration of this. This bad practice gives place to an important life-long loss in venous patient health, with the subsequent diminishment in his/her quality of life. Method The election of the suitable device is directly related to therapy duration and to whether there is going to be a need of continuous vascular access or not. Patient safety will always be the priority so that the less damaging system will be chosen. It also will be taken into account the patient way of life and to what extent he/she is able to take care of his/her vascular access device. In the context of an acute process, which entails a long hospitalization time, this would give place to an indication of an external or percutaneous system, with one or two lumens, depending on whether the use of Parenteral Nutrition will be required or not. Once the acute process has been overcome, and depending on patient prognosis, it will be assessed whether to switch to a subcutaneous system might be advisable or not. Conclusions None of the different existing devices for vascular access are the perfect choice. Units must count with all the alternatives and must be well informed of all the advantages and disadvantages of the use of each

one of them, depending on the clinical features of each patient. All systems potentially entail an additional risk, and health professionals should aim to minimize this risk by implanting the prescribed venous access as soon as possible, and by ensuring previous education of both the health professional and the patient.

39.
FACTORS COMPLICATING PERIPHERAL VENOUS ACCESS IN CHILDREN

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Introduction: Potential risk factors for difficult venous access (BMI and a young age) are well known from experience, but literature evaluating these risk factors is sparse. In this study we evaluate predictive factors for single puncture rate and time of cannulation at four departments in a university children's hospital.
Methods: In a prospective cohort study, venous punctures were measured in pediatric patients at the operating room (OR; n = 1080), the daycare outpatient clinic (n = 178), the outpatient phlebotomy station of the laboratory (n = 267) and children who were referred to the pediatric anesthesiologist, because their treating physician was unsuccessful in gaining intravenous access (n = 81). Time to successful venous access, single puncture rate (percentage of patients in whom the first puncture was successful) and potential risk factors (age, gender, skin color, BMI or weight-to-age z-score, anesthetized or not, grade of performer and type of surgery if applicable) were measured. A logistic regression analysis for single puncture rate was performed to determine predictive factors for difficult peripheral venous access.
Results: Mean time of cannulation was 123 s. Single puncture rate was 76%. Single puncture rate was lowest at the recovery (59%) and highest at the phlebotomy station (92%). The logistic regression showed that age, profession of the performer and type of surgery were predictive for single puncture rate at the OR (P<.001) and could explain 8.5% of the variance. A younger age, a profession other than anesthetic nurse and being scheduled for ophtalmology, maxillofacial surgery, neurosurgery and general surgery had a higher risk for an unsuccessful first attempt. At the phlebotomy station, a younger age and a dark skin color had a higher risk (P<.001) for an unsuccessful first attempt however, these factors only explained 7.4% of the variance. Age was also predictive for patients referred to the pediatric anesthesiologist (P=.002) and could explain 11.6% of the variance. No predictive factors were found for the daycare outpatient clinic. Contrary to general assumptions, the BMI or weight-to-age z-score was not found to be related to difficult venous access.
Conclusions: Age and not BMI is a predictor for difficulties in gaining peripheral venous access. The present study shows that peripheral venous access is difficult in about a quarter of the patients and that cannulation is not very well predictable by easy accessible patient characteristics.

40.
RELATIVE FREQUENCY OF RISK FACTORS FOR CHRONIC RENAL FAILURE IN 224 END STAGE RENAL DISEASE (ESRD) PATIENTS, REFERRED FOR CATHETER INSERTION

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Introduction: Chronic Kidney Disease (CKD) is defined as progressive loss of renal function, most often leading to ESRD. CKD has been classified into 5 stages. The last stage in which the glomerular filtration rate (GFR) declines below 15ml/min/1.73m^2 is known as ESRD. The present study assesses the frequency of different risk factors of CKD in the ESRD patients in order to emphasize on the relative importance of each risk factor to suggest a risk score for predicting the likelihood of developing ESRD and also calls on further studies to assess a causal relationship between the identified risk factors and ESRD.
Patient and Methods: Design: retrospective, cross-sectional study
Setting: Patients referred to Hasheminejad Kidney center from year 2007 to 2008 .224 patients with ESRD were included. 61%of the patients were male and the rest (39%) were female. The following information was collected for all these patients: BMI, sex, presence of HTN, DM, PCKD, type of kidney disease: obstructive kidney disease, glomerulonephritis, malignancy and coronary artery disease (CAD). The frequency of each risk factor was determined separately. The data were statistically worked up.
Results: The frequency of causes of CRF is as follows: DM, the most frequent cause (79.3%), HTN (64.5%), unknown causes (20%), obstruction(22%), PCKD(5%), GN(3%), malignancy(3%), CAD(9%), overweight (32%), obesity(9%).
Conclusions: In this study we examined a wide variety of risk factors, such as DM, HTN, BMI, CAD, malignancy, cystic kidney disease, age and sex. Overweight was interestingly a significant risk factor for CRF and ESRD. On the other hand, CAD was not found to be a significant factor, most probably because Hasheminejad Kidney Center is a specialized for kidney diseases. The same reason may be the cause of high prevalence for obstructive kidney problems in our series. The major limitations were unidentified risk factors of CRF and co- presence of multiple risk factors. However, this is a first step toward the development of a sketch to predict the likelihood of developing ESRD to be applicable to individuals with abnormal or even normal kidney function, such as potential kidney donors. In addition, the study adds to an accumulating body of evidence that risk factors other than just diabetes and hypertension, such as obesity may be causal in CKD. Future studies should examine the probable contributary mechanisms of those novel risk factors to CKD, and perhaps even test possible preventive measures.

41.
A MULTICENTER PROSPECTIVE EVALUATION OF THE CLINICAL PERFORMANCE OF A 2% CHLORHEXIDINE GLUCONATE ANTIMICROBIAL TRANSPARENT IV DRESSING

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Introduction: The density of skin flora at the catheter insertion site is a major risk factor for CLABSI. The majority of CLABSI originate from the patient's own skin flora. Among the strategies found to be successful in reducing CLABSI, the use of chlorhexidine has been included in the top five performance indicators (recommendation CDC). Transparent dressings protect the insertion site and act as a barrier to external contamination, but allow visual inspection without removing the dressing. A new product has been developed that combines the benefits of a transparent dressing and chlorhexidine gluconate (CHG): a transparent dressing with an integrated gel pad which contains 2% CHG. The primary aim of this study was to evaluate the performance indicators of the CHG antimicrobial transparent dressing (Tegaderm™ CHG) in clinical settings among skilled nurses: ease of dressing application and removal, adhesion and wear times, fixation and security of the catheter, protection of the CVC site.
Method Study Design: A multicenter prospective study design was used. During a minimum 14 day period, nurses used the antimicrobial transparent absorbent gel dressing to cover the IV site instead of their current used dressing. Only adult patients with CVCs were included in the study. Outcome Measures: Primary endpoints: nurse evaluation of overall dressing performance. Secondary endpoints: ease of applying over IV Site, intuitive to use, time required to apply dressing, ability to visualize the IV site, ability to absorb fluid, ability to conform around and fixate the catheter, ease of removal from skin and catheter, patient skin condition after removal and overall adherence and wear time. The new dressing was compared with the current used baseline dressing using a five point Likert scale (1 to 5; much worse to much better). Facilities and Participants: 62 evaluators from 15 hospitals in 10 countries participated in the study (ICU, Dialysis, Oncology, General ward). 257 antimicrobial dressings were applied and evaluated.
Results • 88.89% of the evaluators rated the overall performance of the 2% CHG antimicrobial transparent gel dressing as better or much better. • 89.09% of the evaluators rated the wear time of the 2% CHG antimicrobial transparent gel dressing as better or much. • 94.12% of evaluators would

recommend the 2% CHG antimicrobial transparent gel dressing.
Discussion and Conclusion: The overall performance of the 2% CHG antimicrobial transparent gel dressing was rated significantly better than their currently used baseline dressing. Physicians and nurses participating in this study were willing to replace their current dressing with the dressing under study. The 2% CHG antimicrobial transparent gel dressing was rated as better or much better in all of the specific performance comparison parameters.

42.
PROTECTING THE PUBLIC THROUGH CERTIFICATION IN VASCULAR ACCESS: DEVELOPMENT OF A CREDIBLE CERTIFICATION EXAMINATION PROGRAM

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Introduction: In the United States, certification among health care professionals is designed to protect the public by identifying individuals who have certain knowledge and skills, most often in a defined specialty area. Certification programs are closely scrutinized and monitored by a number of voluntary organizations, but in general, certification criteria include a combination of education, experience requirements and examination. Though certification is voluntary, licensing entities and employers may choose to make it mandatory. Development of a customized credential occurs, among other reasons, because new technologies and procedures mandates a new scope of practice or body of knowledge: Such is the case in the vascular access arena.
Method: Vascular access professionals have demanded a certification process specific to the vascular access specialty for over a decade. Benefits of creating a recognized certification program to an existing association include enhanced visibility and recognition for the specialty, prestige, and a potential source of income for the association. There are also substantial economic and legal risks that make it imperative that credentialing organizations develop and implement programs in a credible fashion that minimizes liability. Developmental steps include: 1) Needs assessment 2) Business Plan 3) Testing Company Selection Process 4) Job Task Analysis 5) Job Task Analysis Survey 6) Develop test blueprint 7) Item Writer Selection, orientation and training 8) Item Writing Workshop 8) Test Item Analysis 9) Test Development 10) Beta testing 11) Cut Score Analysis 12) Test 13) Test analysis Results: This presentation provides an overview of certification program development undertaken in preparation for the launch of the first vascular access certification examination in December 2010.
Discussion and Conclusion: Discussion topics include challenges, opportunities, strategic and business planning legal issues, consideration of intrinsic and extrinsic motivators of potential certificants.

43.
THE IMPACT OF USER-FRIENDLY NURSING PROCEDURES ON UTILISATION OF A DEDICATED IV ACCESS TEAM

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Introduction: The IVI Team is a team of registered nurses who insert non-urgent intravenous cannulae (IVC) and peripherally inserted central catheters (PICCs) in a major metropolitan teaching hospital in Australia. Because of their expertise, nurses on the IVI Team are consulted on various aspects of peripheral and central venous catheter care. The number of consultations have increased over time, which reduces the time available for IVC & PICC insertion. Many of the consultations were for procedures that, with appropriate education, could be undertaken by all bedside nurses e.g. CVC dressings, unblocking a CVC, and repairing a Groshong PICC line. It was clear to members of the IVI team that a different approach from small group sessions was needed to reach larger numbers of nurses to increase their skills in CVC management. It was felt that visual procedure guides attached to dressing trolleys in every ward would make these procedures accessible and easy to follow.
Methods: A small group of nurses developed the hospital's written procedures into essential steps and determined the necessary images to accompany the text. Photos were taken of each step. Draft photoguides were developed and distributed to key stakeholders for comment. Costings were obtained to produce colour laminated photoguides. Photoguides were attached to trolleys in each ward and the IVI team conducted information sessions on their use. The success of the photoguides was assessed evaluating the number of consultations for related problems pre and post implementation, the number of staff attending education on the guides, and the condition and number of the guides still in place 3 months after implementation. Results The photoguides were rolled out to all wards in February 2010. Over the two month period following the implementation, there was an 80% reduction in the number of consultations for unblocking a CVC, a 37.5% reduction in consults for repairing a Groshong PICC, and 71% reduction in consults for CVC dressings. At the end of March 2010, 84 nurses had attended education sessions, and feedback at these sessions has been overwhelmingly positive.
Discussion & Conclusion: Today's hospitals have a high patient turnover with a shorter length of stay, with only very acutely ill patients treated as inpatients. This increased activity means that nursing staff have less time to wade through traditional procedure manuals. By introducing photoguides attached to dressing trolleys, we have taken the procedure manual to the bedside where they are needed. We have shown that visual based procedures can be well accepted and reduce demands on a specialist IV access team.

44.
PERIPHERALLY INSERTED CENTRAL CATHETER IN PEDIATRICS A CONTRIBUTION TO CARE!

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Introduction: Most children admitted to our hospital need vascular access for the administration of medication, fluids or TPN. Until recently the options were a peripheral venous catheter or a central venous line (CVL). Many children require repeated venapuncture due to small veins, length of therapy and/or administration of irritating fluids. This leads to anxiety and tissue damage. The alternative for repeated venapunctures is insertion of a CVL (jugularis, subclavian, Port a Cath, Hickman) often inserted by a surgeon or anaesthetist under general anaesthesia. We describe the introduction and implementation of the peripherally inserted central catheter (PICC) which can be inserted under local anaesthesia. It can be used for short- to intermediate- term administration of irritating fluids, medication and blood withdrawal.
Method: We initiated a project to introduce and implement the PICC. The project was financed by the University Medical Centre, with funds allocated for innovation in care. The aim was to use PICC's in children where indicated. A dedicated team was assigned and a training program started. The project coordinator was responsible for training and education. She developed and implemented protocols and she can be consulted for further advise. PICC's are inserted on the ward or in the treatment room of the daycare centre. Ultrasound-guided placement of PICC's using the Modified Seldinger Technique makes it possible to insert the PICC in the upper arm (vena basilica). This location gives maximal range of movement. Indications, procedure and complications are registered.
Results: In September 2009 the PICC team was formed. The team consists of two pediatricians, an anaesthetist and a PICU nurse (project coordinator). By January 2010 we were operational, at first under supervision and for a selected patient group (over 10 years of age). Four months after take off we insert approximately 3 PICC's a week. In the next months we expect this number to increase due to lowering the age of indication. A PICC line instead of frequent venapunctures with the above mentioned disadvantages means a better and safer quality of care. In some cases hospital admission was avoided or early discharge facilitated. Furthermore, we managed to achieve a reduction of the number of central venous lines placed under general anaesthesia, which enhanced the cost effectiveness of our project Way of insertion, reliability,

and device comfort in addition to patient and staff satisfaction have led to the popularity of PICC's.
Discussion & conclusion: We describe an innovative project; introduction and implementation of the PICC in a Children's Hospital. There was a perceived need for PICC lines in our hospital but a lack of expertise and experience to insert them. Our hospital is the first hospital in The Netherlands to introduce a dedicated team for PICC insertions in children. This has contributed to a higher quality of patient care.

45.
TOTALLY IMPLANTABLE VASCULAR ACCESS DEVICES FOR CYSTIC FIBROSIS: EXPERIENCE OF AN ITALIAN CVC-SERVICE

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Introduction: Totally implantable vascular access devices are indicated and used in patients with cystic fibrosis to provide venous access for therapeutic administrations. The use of long-term central venous catheters (LT-CVC) is reported to be associated with thrombosis (5-20%), infection (10-15%) and mechanical complications (10-30%). The reported incidence of early complications (pneumothorax) has been reported to be 0.03-0.04/catheter placement, and for late complications about 0.400-0.500/1,000 catheter-days, with thrombosis and infections prevalence (0.100-0.200/1,000 catheter-days). Ultrasound guidance has been suggested to reduce both early and late complication in LT-CVC positioning. Here we show our experience of 5 years of LT-CVC implantation in cystic fibrosis patients.
Methods: The study was carried out by the Referral CVC service of the Careggi Teaching Hospital (Florence, IT) from 2004 to 2009 in collaboration with the Referral Center for Cystic Fibrosis of Meyer Paediatric Hospital (Florence, IT). The following devices were implanted during the course of the study period: Titanium Dome Implanted Port (Bard Inc., Salt Lake City, USA) connected to 8 french Groshong® single lumen catheter. Implantation procedure was conducted under direct vessels visualization with ultrasound portable devices (Site-Rite II-V, Bard, Pittsburgh, PA). Full aseptic conditions were observed according to operating-room protocols and asepsis was obtained with a 2% chlorhexidine solution. The ultrasound probe was covered with a sterile latex-free ultrasound transducer cover kit. Local anesthesia (2% lidocaine) was used to provide local anesthesia (vascular access, subcutaneous tunnel and pocket). The follow-up for catheter survival ended on March 1, 2010.
Results: A total of 14 patients with cystic fibrosis underwent to Port positioning. Mean age of patients was 31 years old. The total number of catheter-days for all catheters was 10,700, with an average in situ catheter duration of 822 days. LT-CVC were all implanted in right internal jugular vein, and no perioperative complications (pneumothorax, hematoma, arterial puncture) occurred. Among late complications, one patient developed deep venous thrombosis within the first month after implantation. Other two patients underwent to catheter removal due to candida infection and catheter tip dislocation. Incidence of thrombosis and infection was 0.093/1,000 catheter-days. The overall rate of complications was 0.280/1,000 catheter-days.
Conclusions: In our series, no early complications occurred using US-guidance placement in cystic fibrosis patients, and also incidence of late complications in LT-CVC positioning resulted lower than previously reported. This observation might be ascribed to the ultrasound-guided implantation procedure. No gram-negative infection occurred in our case series.

46.
VENOUS ACCESS PORT

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Introduction: Our hospital is renowned for its many years of work within both diagnosis and treatment of different types of cancer. The radiology department has contributed much to the efficiency of some of the procedures, for example relieving the anaesthetic and surgical departments of all venous access port implants. Indications for venous access port implantation are repeated intra- venous administration of chemotherapy, antibiotics, anti-viral drugs, parenteral nutrition, blood sampling or transfusion. The patient group are primarily breast cancer, gynecological cancer patients and various types of sarcoma.
Method: The radiographer prepare lab and equipment prior to exam, positions patient, ensures EKG equipment and pulsoximeter are correctly in place and assist the radiologist during the procedure. First choice of catheter position are vena jugularis interna dxt. because technical it's easier to puncture as it's more superficial and larger then the left one. Our section implants 220 ports per year.
Results: There are two main advantages of using the radiology department for the venous access port procedure: 1) Using ultrasound and fluoroscopy: patients no longer need narcosis, instead the procedure only requires local anaesthetic. 2) The use of these methods also increase accuracy in the location and placing of the catheter and reduces complications such as pneumothorax, air embolism, catheter disconnection or fragmentation, catheter rupture and haemothorax.
Discussion and Conclusion: We experience less complications such as infections, fibrin sheath formation, catheter occlusion and pinch off since using vena jugularis interna instead of vena subclavia. - We experience only 1 or 2 port migrations each year. Our choice of catheter is the 8.5 F silicone catheters as they tolerate certain contents of the chemotherapy better than polyurethan catheters. Silicone catheters can also be rinsed with ethanol if occlusion occurs. Most common complications today are badly placed venous access port needle, no back-flow, infections. However, we have few complications as a result of good routines, procedures and internal training.

47.
TRAINING OF NURSES IN HIGH FLOW PICC CATHETER MANAGEMENT BASED IN OUTCOME INDICATORS

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Introduction: 90% of hospitalized patients have IV device. According to several studies, catheters are the most common cause of nosocomial infections (Crnich, 2005; Maki, 2006), because of its high prevalence it translates into longer median hospital stays, higher costs and 3% mortality rate (Gomez Luque, 2002), representing the 1st cause of death in cancer patients (Volkow, 2000). Today, experts and the Center Disease Control (CDC) recommend the creation of vascular access specialized nurse teams (category IA) as an effective way to reduce these infections. Created in the U.S.A., IV Team or Intravenous Therapy Team (ITT) are composed of nurses experienced in the management and care of IV lines, trained in the insertion of peripherally inserted central catheter (PICC), with the support and coordination of the Vascular Radiology Department .
Objective: To train and educate the intravenous Therapy Team nurses of the Hospital Clínico San Carlos in the placement / management and care of high flow PICCs, based on outcome indicators, demonstrating its cost effectiveness / utility.
Methodology: In 2009, High Flow PICCs were introduced to allow access to peripheral veins with a simple insertion technique using a microintroducer (micropuncture), our target were chronic patients dependent on central venous catheter or prolonged vesicant IV therapy. Although the project was presented for the first time in 2006 the creation of our I.V Team and its train-

ing, was delayed due to pending evaluation of the health care impact and cost of this new technique. We designed outcome indicators to evaluate clinical care, activity, educational and costs.
Results. Of a total of 45 catheters implanted, 30% of the patients achieved a positive response, eliminating repeated venipuncture, preserving their veins, increasing safety and welfare. 33% were removed after death, and 9% of patients were transferred to other centers and / or palliative care units and 4.2%. lost in follow up. A 3% withdrawn due to infection. The average survival time of implanted catheters was 25.58 days. Furthermore, PICCs translate into an inmediate saving of 161 € and 303.83 € with respect to Hickman catheters and ports. There is also an increase in saving over the peripheral catheter after 90 days of implantation and 77 days with respect to CVCs, while helping reduce hospital stays and costs. Finally, 43% of the Oncology Unit Nurses (9 of 21) have been trained in the implementation, management and care of PICC's.
Conclusions: The creation of Intravenous Therapy Team in our hospital has shown to be cost-effective utility, reporting advantages and benefits to patients, health care professionals and the hospital itself. It also represents an improvement in the care and management of our resources.

48.
A COMPARISON OF NURSE VERSUS PATIENT / CARER ADMINISTERED HOME IV THERAPY

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Introduction: The Out & About IV Therapy Program provides home IV therapy (HIVT) for paediatric and adult patients in the Hunter Region, NSW, Australia. The majority of patients referred for HIVT require long term intravenous antibiotic therapy for serious infections. This HIVT is usually administered through a central venous catheter (99%) and over 85% of patients receive continuous infusions. Suitable patients and carers have the option to decide if they want to self-administer their HIVT. We studied whether patient / carers who self-care have equivalent outcomes to health care worker administered IV therapy.
Methods: Data are entered into a computerised database in real time commencing with admission to the HIVT service. Patients were divided into two groups: selected patients or carers who elected to administer their own infusions or bolus injections and patients who had their HIVT administered by a health care worker, usually a visiting nurse. Readmission and early discharge rates and catheter complications that led to catheter removal were compared. Survival analysis techniques were used in Stata10.1 software. P-values were calculated using the Peto-Peto-Prentice test. Hazard ratios and 95% confidence intervals were calculated using Cox regression.
Results: 3316 admissions involving 74,124 patient days, were complete and included in the analysis. In the patient/carer (PTC) group there were 1221 admissions (27,360 patient days), compared to the health care worker (HCW) group: 2095 admissions (46,764 patient days). PTC were less likely to be discharged early due to a complication (p=0.075). There was no difference in the rate of readmissions to hospital between both groups (p=0.85). The risk of developing a catheter-related phlebitis, thrombosis or accidental line removal was greater in the HCW group (Tab. I). There was no difference in the risk of catheter blockage or suspected line infection between both groups. The PTC group had a greater risk of definite line infection than the HCW group. This is entirely accounted for by a single patient with 4 infections.
Discussion / Conclusion: Patients and their carers are able to administer home IV therapy with equivalent or better patient outcomes and lower complication rates than healthcare worker administered HIVT. This reflects a high standard of selection and training provided by an experienced team, and also the potential for there to be a heightened sense of responsibility when caring for one's own catheter. The advantages of patient/carer provision of HIVT are that it involves the patient actively in their own care, provides them with more flexibility of when HIVT is administered, and saves the cost of HCW time. This option should be considered for all services providing HIVT.

Catheter-Related Complication (Total events PTC + HCW groups)	Hazard ratio - HCW Managed Lines (95% confidence interval)
Phlebitis (91)	2.06 (1.3 – 3.3)
Blockage (94)	1.06 (0.7 – 1.6)
Thrombosis (28)	2.8 (1.07 – 7.5)
Accidental Removal (25)	4.5 (1.34 – 15.2)
Suspected line infection (17)	0.95 (0.36 – 2.5)
Definite line infection (11)	0.13 (0.03 – 0.63)

49.
OUTCOME ANALYSIS IN 3,160 IMPLANTATIONS OF RADIOLOGICALLY GUIDED PLACEMENTS OF TOTALLY IMPLANTABLE CENTRAL VENOUS PORT SYSTEMS

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Introduction: Retrospective analysis of success and complication rates after radiologically assisted catheter port implantation.
Method: Between 4/26/2000 and 11/3/2008, 3,160 port catheter systems were implanted in our interventional suite. The final follow-up deadline was 12/31/2009. The indication for port implantation was impending chemotherapy. All interventions were image guided - the puncture of the internal jugular vein (IJV) was sonographically assisted and the catheter tip position was controlled with fluoroscopy. Catheter indwelling time and complication rates of peri-procedural, early and late complications were evaluated.
Results: 922,599 catheter days (mean, 292 days) were documented. The implantation was successful in 3,153 (99.8%) cases. A total of 413 (13.1%) adverse events were recorded. Of these, 42 (1.33%) were peri-procedural complications, of which 34 were treated successfully. 103 (3.3%) early and 268 (8.5%) late onset complications occurred after port implantation. The most common complications were blood stream infection=134 (4.2%), catheter-induced venous thrombosis n=117 (3.7%), catheter migration n=41 (1.3%) and fibrin sheath formation n=20 (0.6%). No pneumothoraces were recorded. A total of 194 (6.1%) port explantations were required.
Conclusion: An ultrasound guided puncture technique, a central venous access via the internal jugular vein and radiological guidance of the procedure contribute to low peri-procedural complication rates after port implantation. Typical complications associated with the surgical technique, such as pneumothorax or pinch-off phenomena were not observed. We hereby conclude that an image guided implantation technique should be regarded as the method of choice for this procedure.

50.
THREE UNCOMMON COMPLICATIONS OF CENTRAL VENOUS CATHETER INSERTION

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Introduction: The Vascular Access Unit performs over 600 Vascular Access-related procedures a year, in an outpatient setting, under local anesthesia and fluoroscopic guidance. We report three uncommon late complications of central venous catheter insertion.
Case 1: A 56 year-old female diagnosed with breast cancer metastatic to the pleura, liver and bone was referred to the Vascular Access Unit for recent catheter malfunction. The patient had a totally implanted port at the left subclavian vein placed two years previously. Prior to catheter removal we performed chest x-ray that revealed grade III Hinke pinch-off sign. We reviewed the patient's previous x-rays and found lower grade pinch-off sign that had been unnoticed. The catheter fragment was removed by endovascular procedure.

Case 2: A 19 year-old female with relapsing Acute Myeloid Leukemia was sent for placement of a short-term Vascular Access Device for induction chemotherapy. After placement of a double lumen catheter at the right internal jugular vein she developed miosis and ptosis on the same side. The cervical CT scan showed correct catheter positioning and no hematomas, so the treatment was infused through the catheter with no further complications. There was gradual spontaneous resolution of the Claude Bernard-Horner syndrome in six months.
Case 3: A 52 year-old male tongue cancer patient with multiple cervical e supra-clavicular node metastasis needed a long-term Vascular Access Device for palliative chemotherapy. Due to non progression of the guidewire, it was impossible to catheterize the right subclavian and right internal jugular veins and the totally implanted port was placed at the left subclavian vein. Two months later the patient was referred to the Vascular Access Unit for a subcutaneus infiltrate surrounding the port. At surgical exploration a milky exsudade was found, with minimal inflammatory signs. The biochemical analysis of the fluid showed triglyceride count of 203 mg/L that prooved it was a lymphocutaneous fistula. There was spontaneous closure of the fistula after catheter removal. Discussion: Catheter fracture that may lead to embolization is due to mecanichal stress from compression between the clavicle and first rib. It occurs in under 1,5% of patients. It can be prevented by detection of earlier pinch-off grades through chest x-ray. The Claude Bernard-Horner syndrome has been associated with central venous catheter insertion and is attributed to local anesthetic block of the cervical sympathetic chain or to its compression by hematoma, and it is usually self-limited. Lymphocutaneous fistula is a rare complication of central venous catheter insertion. It is due to iatrogenic disruption of the thoracic duct in patients with lymphatic or superior vena cava block.

51.
ACCIDENTAL PUNCTURE ACCIDENT REDUCED BY INTENSIVE IMPLANTATION OF CENTRAL VENOUS ACCESS IN A GENERAL HOSPITAL

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In our hospital there are 27 divisions with 850 bed. Many on these are dedicated for high specialist medical and surgical tratment, so often endovenous drugs are used. Nurses are employed to give therapy and so theyr activity often request needle use. From 2006 we start to implant PICC catheter in patients needing medium and long term therapy. Our hospital monitors constantly accidental needle puncture in nurse and physician. real number is unknown because no all accidents are rightly indicated on clinical data. In 2007 we implanted 589 central venous access with 236 PICCs. In 2008 the activity growth and arrived at 728 central venous access with 389 PICCs. In the same period we observed 96 accident for 2007 and 61 accidents for 2008. The increment of 23% for the central venous access in general and 64% for PICCs are correlated with a reduction of the number of accidental needle puncture of 36,5%. In our experience we can confirm that intensive use of PICC could reduced risk for working medical and nursing personal and could reduce time spent for every patient. Otherwise cost of procedure and device must be evaluated to obtain right indication for PICC placement at beginning of hospital stay.

52.
IN VITRO COMPARISON OF ANTIMICROBIAL PROPERTIES OF TETHERED AND ELUTING BIGUANIDE CENTRAL VENOUS CATHETERS (CVCS)

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Introduction: Catheter Related Blood Stream Infections (CRBSIs) cause considerable healthcare impact. Staphylococcus aureus (SA), Candida albicans (CA) and Pseudomonas aeruginosa (PA) are significant gram positive, fungal and gram negative pathogens associated with CRBSIs. Antimicrobial CVCs have demonstrated promise in reducing CRBSIs by inhibiting colonization of catheters by pathogens. This study compared the abilities of two different biguanide-based antimicrobial coatings to resist microbial adherence in vitro.
Method: The antimicrobial catheters tested were a 7 French chlorhexidine and silver sulfadiazine (CHX/SS) coated CVC (Arrowguard Blue Plus®, Arrow International) and a 7 French chemically bonded polyhexamethyl biguanide (PHMB) CVC (Certofix Protect®, B. Braun). An untreated polyurethane (Control) CVC was used as a positive control. The method of Hanna et al. was employed to assess microbial adherence. Briefly, the catheters were aseptically cut into segments, presoaked for 24 hours in human plasma, then subjected to microbial challenge for 24 hours followed by recovery and enumeration of viable adherent organisms. Recovery was by sonication in neutralizing broth followed by serial dilution and plating on agar. Enumeration was performed by colony counting following 24 hours of incubation.
Results: Microbial recoveries for the three different catheters are presented in the Table below. Testing was performed in triplicate and individual replicates as well as mean recoveries are presented:

	Control (CFU/mL)	Mean (CFU/mL)	PHMB (CFU/mL)	Mean (CFU/mL)	CHX/SS (CFU/mL)	Mean (CFU/mL)
S. aureus	3.3 E+6	4.8 E+6	7.3 E+6	5.3 E+6	0	0
(ATCC 33591)	6.9 E+6		4.5 E+6		0	
	4.3 E+6		4.1 E+6		0	
C. albicans	4.8 E+4	5.1 E+4	1.2 E+4	8.9 E+4	0	0
(ATCC 10231)	8.4 E+4		6.3 E+4		0	
	2.0 E+4		9.0 E+4		0	
P. aeruginosa	1.2 E+6	3.8 E+6	2.4 E+6	3.6 E+6	0	0
(ATCC 27853)	7.1 E+6		3.0 E+6		0	
	3.0 E+6		5.4 E+6		0	

(where CFU/mL = colony forming units per milliliter; E+4 = multiplied by 10,000 and E+6 = multiplied by 1,000,000).
Discussion and Conclusion: The CHX/SS coated catheter has been extensively studied. The antimicrobial agents elute from the coating to the surface of the catheter. The agents are known to have antimicrobial activity against the three pathogens studied here. The PHMB treatment is reported to be covalent (chemical) attachment to the catheter and forms a non-eluting antimicrobial surface. Results of the antimicrobial challenges show that the tethered PHMB was essentially ineffective in reducing microbial adherence of SA, CA and PA in this study. Soluble PHMB is reported to have antimicrobial activity against all three pathogens tested.

53.
SURVEY ON 1.010 SKIN TUNNELLED CENTRAL VENOUS CATHETERS (HICKMAN-BROVIAC) IN 840 CHILDREN IN A PEDIATRIC HAEMATO-ONCOLOGY UNIT

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Objectives: To identify retrospectively benefits and problems of tunnelled central venous catheters in children (0–17 year) treated for cancer and haematological disorders.
Methods: Since 1991, data concerning type of device, number of catheter days and reasons for removal were recorded. Standard nursing procedures concerning external fixation, flushing and management were introduced.
Results: In 840 children 1.010 catheters were implanted, 70% of the patients received 1 catheter and 14,5% had 2 catheters. A total of 1002 were single lumen, 57 with an internal diameter (ID) = 0.7 mm, 945 with an ID = 1mm. Mean age at time of implant was 5.8 years (SD = 4.7). The total number of catheter days was +/- 256.000 days; 174 catheters remained or are still functional for more than one year. At the moment of the survey (april 2009) 45 catheters were still in situ, one of them for more than 11.5 years. For removed catheters (n=965) the length of stay was 245 days; 776 catheters (80.4%) were removed as planned, at the end of treatment. The reason of removal for the rest (n=189) was: accidental removal (2.9%), occlusion (1.6%), infection (9,2%), leakage

(1.2%) or a combination (4.7%). The latter catheters were nevertheless functional for about 200 days. The durability of small catheters (< 1mm ID) was unfavourable compared to the group of 1mm ID (p = 0,0001). Only 49% stayed in the patient until end of therapy. The mentioned reasons for early removal were twice as high. In contradiction with a previous survey (1991-1999, n=365 catheters), trends were similar except for accidental removal which no longer occurred in small children (0-4y) shortly after insertion.
Conclusion: Nursing standard procedures for management of Hickman-Broviac catheters seem to be effective as 80.4% remain in situ as planned. Small catheters (< 1mm ID) should be avoided as much as possible. Nursing standard procedures will be adapted for small catheters.

54.
IN VITRO COMPARISON OF ANTIMICROBIAL PROPERTIES OF THREE SILVER-BASED CENTRAL VENOUS CATHETERS (CVCS)

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Introduction: Catheter Related Blood Stream Infections (CRBSIs) are responsible for significant morbidity and mortality in hospitals. Attachment and proliferation of microorganisms on catheter surfaces are generally seen as a prerequisite for bacteremia. Staphylococcus aureus (SA), Candida albicans (CA) and Pseudomonas aeruginosa (PA) are significant gram positive, fungal and gram negative pathogens associated with CRBSIs. Several antimicrobial CVCs containing silver are presently available in Europe that promise to reduce CRBSIs by interfering with the pathogen attachment and colonization process. This study compared the abilities of three different commercially available antimicrobial coatings containing silver to resist microbial adherence in vitro.
Method: Three commercially available silver-containing antimicrobial CVCs were evaluated: one coated with chlorhexidine-silver sulfadiazine (Arrowguard Blue Plus®, Arrow International denoted CS), one containing nanocrystaline silver (Logicath Agtive®, Medex denoted S1) and one containing a silver-zeolite complex (Multicath Expert®, Vygon denoted S2). An untreated polyurethane (Control) CVC was used as a positive control. The method of Hanna et al. was employed to assess microbial adherence. Briefly, the catheters were aseptically cut into segments, presoaked for 24 hours in human plasma, then subjected to microbial challenge for 24 hours followed by recovery and enumeration of viable adherent organisms. Recovery was by sonication in neutralizing broth followed by serial dilution and plating on agar. Enumeration was performed by colony counting following 24 hours of incubation.
Results: Microbial recoveries for the three different catheters are presented in the Table below. Testing was performed in triplicate and individual replicates as well as mean recoveries are presented (Tab. I).
CFU/mL = colony forming units per milliliter; E+5 = multiplied by 10,000, E+6 = multiplied by 1,000,000 and E+7 = multiplied by 10,000,000.
Discussion and Conclusion: The CS coated catheter has been extensively studied and completely inhibited attachment of viable organisms in this study. Silver sulfadiazine and chlorhexidine elute to the surface of the catheter and have antimicrobial activity against the three pathogens studied here. The S1 and S2 treatments eluting silver ions alone displayed a very slight inhibitory effect towards SA and CS and did not inhibit attachment of PA. Inhibitory concentrations have been reported for silver ions against all three organisms; however, the inhibitory concentrations increase significantly when organic materials are present.

55.
SENSORY PERCEPTIONS OF ONCOLOGY PATIENTS UNDERGOING SURGICAL INSERTION OF A TOTALLY IMPLANTABLE VENOUS ACCESS DEVICE: A QUALITATIVE EXPLORATORY STUDY

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Introduction: This study aimed to explore and document subjects' descriptions of sensory perceptions experienced during the course of a totally implantable venous access device (TIVAD) insertion under local anesthesia.
Methods: A qualitative exploratory study was conducted in which semi-structured open-ended interviews were performed with 20 respondents who experienced a first time TIVAD insertion under local anesthesia. Immediately after the procedure, patients were asked to describe perceived sensory perceptions regarding hearing, sight, touch, smell and taste. Descriptions of respondents were documented in a Sensory Information Grid. This grid was composed of the 4 phases of a TIVAD insertion and the 5 human senses. Verbatim descriptions of patients were labeled using a descriptive coding process supervised by an expert panel concerning surgical TIVAD insertion and nursing research.
Results: This study demonstrated that patients experience a lot of sensory perceptions during surgical insertion of a TIVAD. Most sensational perceptions were experienced during the preparation of the patient and surgical equipment until covering the patient with sterile drapes (phase 2) and the TIVAD insertion until uncovering the drapes (phase 3). Patients experienced less sensations concerning smell. No perception of taste was mentioned.
Conclusions: Patients report a lot of sensory perceptions during surgical TIVAD insertion under local anesthesia. Utilization of a sensory information grid to explore and document patients' sensory perceptions emerged to be a suitable methodology. Reported descriptions could be used to develop a questionnaire to quantitatively assess sensory perceptions or could be implemented in preparatory sensory information to prepare patients for the upcoming surgery.

TABLE I

	Control (CFU/mL)	mean (CFU/ml)	S1 (CFU/mL)	mean (CFU/mL)	S2 (CFU/mL)	mean (CFU/mL)	CS (CFU/mL)	mean (CFU/ml)
S. aureus	3.3 E+07	2.2 E+07	1.2 E+07	1.5 E+07	1.8 E+07	1.4 E+07	0	0
ATCC 33591	2.0 E+07		1.8 E+07		9.5 E+06		0	
	1.3 E+07		1.5 E+07		1.5 E+07		0	
C. albicans	7.3 E+05	6.8 E+05	8.5 E+05	6.1 E+05	4.3 E+05	5.9 E+05	0	0
ATCC 10231	8.3 E+05		6.8 E+05		3.5 E+05		0	
	4.8 E+05		2.9 E+05		1.0 E+06		0	
P. aeruginosa	2.0 E+07	1.2 E+07	2.7 E+07	2.3 E+07	1.1 E+07	1.9 E+07	0	0
ATCC 27853	7.6 E+06		1.5 E+07		1.2 E+07		0	
	8.4 E+06		2.6 E+07		3.3 E+07		0	

56.
USE OF CENTRAL CATHETERS AT HOSPITAL AT HOME SERVICE

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Introduction: OPAT is one of the main activities of our Hospital at Home Service. The patients need in many cases intravenous antimicrobial therapy, either to complete the antimicrobial therapy initiated during the stay at the hospital or treatment initiated during the permanency with us. Good choice of catheter will determine the success of the administration of intravenous antibiotics, preventing complications and preserving the patient's venous capital. For the administration of certain antibiotics by their characteristics vesicant or irritant, it is essential to use a central venous line. The channeling of PICC is a technique still very new in our environment, but it can be done by nurses and ensuring a safe and reliable venous access. During 2009, we have started to insert PICC catheter in our Hospital at Home Service, so we do not have to resort to other professionals for the insertion of central catheters. The aim of this work is to show how many central catheters have been used at Hospital at Home Service during 2009 and complications detected.
Patients and methods: Electronic information review about patients undergoing intravenous antimicrobial therapy in the home setting during 2009. The following aspects were analyzed: Number and type of antibiotics administered during 2009, intravenous access, complications with the catheters. When we consider intravenous treatment at home will be very important to the choice of venous access depending on: the patient's clinical condition, age, state of venous access, type of frequency of antibiotic administration, mode of administration traditional or ambulatory infusion pump, length of treatment. Tables are designed to recommend the choice of catheter depending of the antibiotic to be administered, the duration of treatment and mode of administration
Results: 797 OPAT were indicated to 688 patients. 1076 intravenous catheters were used, 86,71% peripheral catheters, 13,29% were central catheters, of them (3,83% were subclavian, 1,62% femoral, 1,30% jugular, 2,73% Drum, 1,52% PICC, 2,29% Por-a-cath .143 antibiotics were administered through central venous line 10,49% Ertapenem, 17,48% Piperacilina-Tazobactam, 13,28% Ceftriaxona, 9,79% Daptomicina, 11,19% Cloxacilina, 11,19% Vancomicina 4,20% Cefepima 4,90 Ceftacidima 4,20% Teicoplanina 13,28% other antibiotics The intravenous treatment lasted a mean of 13,90 days. The incidence of complications was 5,6 % , 2,79% catheter lost , 0,70% phlebitis, 0,70 flow back, 1,41% fever.
Conclusions: The use of central venous catheters is the best vascular access for administration of antibiotics at home, is safe and effective, with a low number of complications, Despite our still limited experience with PICC ,we believe which may be the best central venous access for our patients ,it can be inserted by nurses, providing safety and quality in our daily practice.

			TYPE OF CATHETER	ACCORDING ACCESS	AND TREATMENT DAYS			
	< 1 week	< 1 week	1-2 weeks	1-2 weeks	3-4 weeks	3-4 weeks	> 4 weeks	> 4 weeks
ANTIBIOTIC	INFUSION PUMP	TRADITIONAL	INFUSION PUMB	TRADITIONAL	INFUSON PUMP	TRADITIONAL	INFUSION PUMP	TRADITIONAL
Aciclovir	CM	CCCO	CM	CM	CM	CM	CC	CC
Anfotericina B		CM		CC		CC		CC
Amikacina	CM	CCO	CM	CM	CM	CM	CC	CC
Amoxi-clavulánico		CCO		CM		CM		CC
Ampicilina	CM	CM	CM	CM	CC	CC	CC	CC
Caspofungina		CM		CC		CC		CC
Cefepima	CM	CCO	CM	CM	CM	CM	CC	CC
Cefotaxima	CM	CCO	CM	CM	CM	CM	CC	CC
Ceftacidima	CM	CCO	CM	CM	CM	CM	CC	CC
Ceftriaxona	CC	CCO	CM	CM	CM	CM	CC	CC
Ciprofloxacino	CM	CM	CC	CC	CC	CC	CC	CC
Claritromicina		CM		CM		CC		CC
Clindamicina	CM	CCO	CM	CM	CM	CM	CC	CC
Cloxacinlina	CM	CM	CC	CC	CC	CC	CC	CC
Daptomicina		CCO		CM		CM		CC
Ertapenem		CCO		CM		CM		CM
Fluconazol		CM		CM		CM		CC
Ganciclovir	CM	CM	CM	CM	CC	CC	CC	CC
Gentamicina	CM	CCO	CM	CM	CM	CM	CC	CM
Imipenem		CCO		CM		CM		CC
Levoflozacino		CCO		CM		CM		CM
Linezolid	CM	CCO	CM	CM	CM	CM		
Meropenem		CCO		CM		CM		CC
Metronidazol	CM	CCO	CM	CM	CM	CM	CC	CC
Penicilina G	CM	CM	CC	CM	CC	CC	CC	CC
Sodica Piperazilina-Tazobactam	CM	CCO	CM	CM	CM	CM	CC	CC
Teicoplanina		CCO		CM		CM		CM
Tigeciclina		CCO		CM		CM		CC
Tobramicina	CM	CCO	CM	CM	CC	CC	CC	CC
Vancomicina	CM	CM	CC	CC	CC	CC	CC	CC
Voriconazol		CCO		CM		CM		CC

CC: Central Catheter
CCO: Short Catheter
CM: Midline
No se usa este acceso