JVA The Journal of Vascular Access

Abstracts 7th World Congress on Vascular Access (WoCoVA) 2022 October 16 -18, 2022

The Journal of Vascular Access
2022, Vol. 23(1S) 1–41

DOI: 10.1177/11297298221129234
journals.sagepub.com/home/jva
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T05.3

COMPARISON OF FEMORALLY INSERTED CENTRAL CATHETERS WITH PERIPHERALLY INSERTED CENTRAL CATHETERS BY PROPENSITY SCORING ANALYSIS

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Introduction: Cannulation of the femoral vein (FV) remains controversial regarding its utility outside of emergency venous access with concerns of increased risk for central line associated bloodstream infection (CLABSI). More recently, studies have proposed femorally inserted central catheters (FICCs) with the exit point mid-thigh to be a safe and viable option when the veins in the upper extremities are not an option for catheterization. Our aim was to assess the outcomes of patients who had received FICCs compared to those who had received peripherally inserted central catheters (PICCs).
Method: Baseline characteristics of consecutive patients that received a FICC or PICC (between October 2014 to July 2020) were compared. Variation in characteristics between the two groups were adjusted before comparison using propensity analysis. Propensity score was calculated as the probability of receiving a FICC versus a PICC adjusted by baseline characteristics such as sex, age, and identified risk factors from hospital medical records such as body mass index (BMI), co morbid conditions, previous central venous access and history of difficult venous access. One-to-one propensity matching was performed using the nearest neighbor approach, outcome comparison of FICCs verses PICCs was then performed using a 1:4 match.
Results: A total of 98 FICCs and 4271 PICCs were inserted during the study period. The propensity score analysis identified 385 (randomly selected) matched PICC patients to the 98 FICC patients for comparison. No difference was found in our data for overall failure (difference: - 0.63, 95% CI -2.32, 1.06) or in confirmed CLABSI rates (difference: 0.13,95% CI -0.36, 0.63). Median dwell was also unremarkable between the groups.
Discussion and conclusion: We have found that the use of FICCs to be as feasible as PICCs for intermediate to long term venous access.

T07.3

THE MENTS CRITERIA – CAN WE APPLY IT IN DIALYSIS ACCESS SURGERY?

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Introduction: Dialysis access surgery, in the UK, is almost always performed in NHS healthboard-run hospitals. During the height of the COVID-19 pandemic, in which access to elective operating theatres became limited, arrangements were made in our vascular access service, to perform some dialysis access surgery in a local private hospital. Patients were selected such that those deemed suitable as day-case and unlikely to require in-patient stay were chosen. A scoring system, 'Medically Necessary Time-Sensitive' (MeNTS) criteria, was proposed recently to assist in such decision-making processes by considering procedural, disease, and patient factors (Prachand et al, J Am Coll Surg.2020). The cumulative MeNTS score ranges from 21 to 105, with a score >65 signifying a 'too high risk to be justified' procedure. The aim of this study was to use MeNTS scores retrospectively to determine whether correct decisions were made in performing dialysis-access operations in the usual NHS university healthboard (UHB) setting vs local private hospital (Spire).
Methods: MeNTS scores were calculated for all patients who underwent dialysis access surgery at both sites between March 2020 – March 2021. Outcomes assessed included patient survival and COVID-19 infection.

Results: 213 Patients underwent dialysis access surgery at UHB and 76 at Spire. Mean cumulative MeNTS scores were 40.03(+/-0.30) and 39.97(+/-0.46) for the UHB and Spire groups, respectively (P=.922). COVID-19 infection occurred in four patients at UHB, and none in Spire (P=.576). Successful dialysis access was achieved in 76.06% and 69.74% in UHB and Spire patients, respectively (P=.287). At 30 days, one UHB patient had died whilst all Spire patients were alive (P>.999).
Discussion and conclusion: Dialysis access surgery can take place safely during the COVID-19 pandemic, with necessary precautions. A modified version of the MeNTS score to make it more renal-specific would allow maximum benefit to be achieved from it in this field.

T07.4

VALIDATION OF ARTERIO VENOUS ACCESS STAGE CLASSIFICATION (VAVASC): STUDY PROTOCOL AND PRELIMINARY RESULTS

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Background: VAVASC study (Validation of Arterio Venous Access Stage Classification) is a multicenter, international, prospective study with the aim to statistically validate the AVAS classification, which describes the vascular status of patients indicated for the creation of arteriovenous access on the upper limb. The aim of the presentation is to describe a study protocol and present the preliminary data.
Methods: Observational, prospective, multicenter, international registered (NCT04796558) study started in March 2021. Basic demographic data, risk factors, vascular mapping parameters and follow up data including AV access patency, failure, complications, and interventions are collected via an online platform. The outcome measures are - class of AVAS, predicted arteriovenous access, final arteriovenous access that has been created, and patency of the arteriovenous access. Predictive models will be used for statistical analysis.
Results: Currently, 353 patients from six centers (Brazil, the Czech Republic, Great Britain, Italy, Poland, and Slovakia) are recruited and undergoing evaluation. The most frequent AVAS stages are 1ABCD (25%), 1CD (26%), 1C (18%) and 1BCD (9%). The most common AV accesses are autogenous radiocephalic fistula (43%), autogenous brachiocephalic fistula (38%) and autogenous brachiobasilic fistula (9%). All involved health care professionals apply the classification system correctly with good understanding and the number of recruited patients is constantly increasing.
Conclusions: Our preliminary data indicate that AVAS classification seems to be a good prediction tool for AV access creation. The study is still open for collaboration with other centers that can register via www.vavasc.com.

T07.5

THE ROLE OF WALL SHEAR STRESS IN VASCULAR ACCESS FOR HEMODIALYSIS

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Introduction: Reliable vascular access (VA), provided by either native arteriovenous fistula (AVF) or arteriovenous grafts (AVG), is essential for efficient chronic hemodialysis (HD). The wall shear stress (WSS) from the blood flow pattern is recently believed to be one of the significant factors of VA failure due to stenosis resulting from IH. Thus, this review aims to clarify the role of WSS on the patency of surgical vascular access creation including AVF and AVG.
Method: A non-systematic review was conducted of studies, published in the PubMed database, investigating the effect of wall shear stress on vascular remodeling after VA creation by computational fluid dynamics.
Results: Several studies based on computational fluid dynamics (CFD) confirmed the damaging role of turbulent flow, compared to the beneficial role of spiral flow in IH. Outward remodeling in response to the WSS by endothelial cells (EC), is needed for efficient vasculature homeostasis to occur. ECs dysfunction plays a significant role in the etiology of IH and the development of stenosis. In the case of AVF, the outward remodeling reduced the WSS in fistula with a large curvature radius, while the WSS decline was seen in fistula with small curvature radius. Also, in patients with brachiocephalic fistula, low WSS was associated with a higher risk of cephalic arch stenosis. About AVGs, the angle of anastomosis changed the blood flow pattern, making WSS an important factor to induce stenosis. The low wall shear stress was found in larger anastomosis angles.
Conclusion: Inadequate outward remodeling and development of stenosis due to IH occurring in response to WSS, are mainly responsible for unsuccessful VA. Although the presented review provided the fundamental understandings to improve the VA outcomes in the future, more computational studies, as well as longitudinal studies, are needed to clarify the relationship between wall shear stress and VA failure.

T09.3

ADVANCED TUNNELING FOR VASCULAR ACCESS: THE "L-SHAPED" AND THE "ARM-TO-CHEST" TUNNELING TECHNIQUES AND BEYOND

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Introduction: Venous port catheters, are now the standard of care in patients requiring long term intermittent intravenous drug administration. Arm VAD placement on the other hand, is a valuable option for vascular access, often complicated or made impossible by the condition and size of peripheral veins.
Method: Both techniques use ultrasound-guided access in the internal jugular vein (IJV) or another appropriate central vein. For the "L-shaped" tunneling technique, we dissect a port-pouch in the deltopectoral groove, in a "far-lateral-oblique" orientation, and then we create a retrograde subcutaneous tunnel between the port-pouch and the IJV venous access site in an "L-shaped" configuration, using a straight metal tunneler, in two stages. For the "Arm-to-chest" tunneling we first create a port-pouch -in case of a TIVAD- or a skin nick –in case of a PICC or a cuffed line - on the inner aspect of the mid-arm. Using a straight metal tunneler, we tunnel the line from the arm to the neck in two stages, externalizing and re-inserting the line at a skin nick made at the deltopectoral groove.
Results: The "L-shaped" configuration, prevents catheter kinking, but also allows us to place the port pouch pocket in a more discreet position, in order to offer a better cosmetic result to our patients. Using our other technique "Arm-to-chest" tunneling we can place an arm VAD, regardless of the condition of the arm veins.
Discusion and conclusion: A lateral oblique port implantation site on the chest, along with the "L-shaped tunneling" technique offers doctors implanting TIVADs a useful alternative for a better cosmetic result. The ACT technique allows us to use larger arm VAD catheters from IJV access, irrespective of the arm veins condition. Thus, this technique has the advantages of arm VAD placement, with the added benefit of saving the arm veins.

T10.3

LONG TERM-SAFETY OF TAUROLIDINE AS CATHETER LOCK IN PATIENTS ON HOME PARENTERAL NUTRITION

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Introduction: Catheter-related bloodstream infection (CRBSI) is a severe complication of home parenteral nutrition (HPN). Taurolidine is recommended as catheter lock solution (CLS) to prevent CRBSIs in the most recent ESPEN guidelines on chronic intestinal failure and HPN. The background for the present report is that despite the proven efficacy of taurolidine to prevent CRBSIs and the general perception that its use seems safe, information on taurolidine-associated adverse events (AE) and the implications thereof remains merely anecdotal.
Methods: This retrospective cohort study comprised all adult HPN patients who used taurolidine as a CLS between 2006 and 2021 who were treated at our national HPN referral centre. Taurolidine-related AEs were analysed using descriptive statistics.
Results: In total, 460 patients used taurolidine during 694.113 catheter days. In 89 (19%) patients, a total of 103 mild to moderate AEs were observed. Six patients developed an anaphylactic-like reaction. The cause for the reported AEs were vascular access device-related problems (group A), taurolidine-related problems (group B), and extra-protocol use of taurolidine (group C) in 53 (51%), 42 (41%) and 8 (8%) patients, respectively. In groups A, B, and C, 51 (85%), 13 (13%), and 8 (67%) patients presented with taurolidine infusion-related pain, respectively. Upon rechallenge, 48 (91%), 5 (12%), and 8 (100%) patients could successfully resume taurolidine locking without remaining complaints in groups A, B, and C, respectively.
Conclusion: In this study, the use of taurolidine as CLS was found to be generally safe. Importantly, 51% of reported AEs indicated vascular access device-related problems (mainly thrombosis and malposition), of which 85% presented with pain. Hence, if patients present with venous access-related pain while using taurolidine, diagnostics for vascular access problems should be performed and, in light of its proven efficacy to prevent CRBSIs and unless anaphylaxis is suspected, a rechallenge should be strongly considered.

T12.3

A UK HOSPITAL PROJECT TO REPLACE SUTURING SECUREMENT OF SHORT TERM CENTRAL VENOUS CATHETERS WITH THE GRIPLOK CVC ADHESIVE SECUREMENT DEVICE

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Introduction: Suturing short term, non-tunnelled central venous catheters (STNT-CVC) is the favoured securement technique in most UK hospitals. This practice goes hand in hand with using ultrasound to cannulate the internal jugular vein as a first choice for placment which has been recommended in the UK since 2002 when national guidelines were introduced. Recent evidence has highlighted the benefits of securing vascular access devices without suturing

to reduce the risk of infection and to move away from the internal jugular as the first vessel of choice for placement.
Method: An observational study by the Vascular Access team has been running since September 2021 in a large UK hospital to evaluate the of Griplok CVC adhesive securement device for STNT-CVC securement compared to suturing. All patients referred for STNT-CVC and renal CVC placment are considered for the Griplok project. Patients whose devices have been secured with the Griplok CVC have been followed up to evaluate the device securement success.
Results: Since September 2021 the VA team placed 21 STNT-CVC and 5 non-tunnelled renal catheters and secured 100% with the Griplok CVC adhesive securement device. Each catheter securement was evaluated after 24hrs, 72hrs then at day 5. Only 1 STNT-CVC needed to be re-secured at 24hrs. 20 of the 21 Griplok's remained in place, securing the catheter at day 5. All 5 of the non-tunnelled renal catheters remained in place after 5 days and after 7days
Discussion and conclusion: The greatest challenge identified was convincing clinicans that this change in pratice is safe. The project identified resistance to change practice from suturing and utilise the axillary vein for placement. We have identified that within the scope of this project, Griplok is as effective as suturing in securing STNT-CVC. The project is ongoing and more data is required.

T13.3

ARTERIAL INSERTION METHOD: A NEW METHOD FOR SYSTEMATIC EVALUATION OF ULTRASOUND-GUIDED RADIAL ARTERIAL CATHETERIZATION

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Introduction: Peripheral arterial catheter insertion is a common procedure for critically ill patients requiring frequent blood gas sampling and continuous blood pressure monitoring. There are clear advantages of ultrasound-guided arterial cannulation, which have shown to be more effective in reducing complications, time to successful cannulation, number of attempts, and overall first-time success rates. Evidence suggests that using palpation alone has a first-time success rate of less than 70% yet is still a widely performed technique. A systematic evaluation may be required to reduce variations in arterial catheterization practices.
Design: The arterial insertion method is a systematic evaluation to aid in arterial catheter insertion with ultrasound guidance, intended to improve the procedural approach. The process of arterial insertion method ensures appropriate choice of zone selection to optimize catheter longevity and performance in patients requiring arterial access. Moving the insertion site proximally 4 cm from the red zone into the green zone may reduce mechanical complications and preserve catheter performance and dwell time.
Conclusion: The standardization of ultrasound guidance in arterial catheterization promotes vessel health and patient safety through device and site optimization. The arterial insertion method systematic evaluation may be utilized to reduce variation in practice and promote the use of ultrasound as a standard for the insertion of radial arterial catheters.

T13.4

INCATIV (INTRAVENOUS THERAPY QUALITY INDICATORS): 12 YEARS' NURSING QUALITY STUDY

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Introduction: Safe vascular access is an important issue in daily nursing practice. INCATIV Index measures vascular access quality. The aim of this study is to evaluate how continuous training and monitoring improve quality care of patients with vascular accesses devices in these 12 years' study developed by INCATIV Health Working Group, a nursing research group from the region of Valencia, Spain.
Methods: Quasi-experimental multicenter study. 34 hospitals participating. Cross-sections are taken periodically every year. A CRD is used by trained observers. Variables such as type and state of dressing, recorded date of insertion, venipuncture origin and inflammation signs, among others, are registered. The intervention consisted of 1-hour

training sessions to hospital nurses to reinforce the INCATIV bundle.
Results: More than 50.000 vascular accesses have been evaluated up to now. Good results were obtained at the beginning of the study. At stage 1, a statistically significant improvement noted in the average of the standard variable after 1 hour training sessions to the nursing staff, ranging from 7.8% to 37.6% ($p<0.001$). At stage 2, a new score was created obtaining a decimal scoring: INCATIV Index grew steadily from 7.744 (SD=1.862) to 9.112 (SD=1179) ($p<0.001$) at secondary hospitals and phlebitis rate decreased from 4.5% to 1.8% ($p<0.001$) from C1 to C10.
Discussion and conclusion: Vascular access care improve positively with training sessions and nurses become more sensitive to proper care when monitoring and comparing their results. Following use of recommended devices at INCATIV bundle, a positive evolution has been noted at using closed intravenous systems from 58.6% to 77.9% ($p<0.001$). Using INCATIV Index is a key element to measure vascular access quality care. Small training interventions, use of proper devices and a continuous monitoring of vascular access care integrated in a safety environment, improve the nursing management of vascular patrimony's patient.

T13.5

CENTRALLY INSERTED TUNNELLED PERIPHERALLYINSERTED CENTRAL CATHETER: OFF-LABEL USEFOR VENOUS ACCESS IN ONCOLOGY PATIENTS

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Purpose: We evaluated the feasibility of centrally placed non-cuffed tunnelled peripherally inserted central catheter in the chest as an alternative to conventional peripherally inserted central catheter.
Method: Patients referred for peripherally inserted central catheter found to have inadequate peripheral venous accessin their arms due to prior chemotherapy, and therefore they were offered placement of the non-cuffed tunnelledperipherally inserted central catheter in the chest. Using internal jugular vein access, BARD Groshongvalved 4Fperipherally inserted central catheter was placed with its tip in the cavo-atrial junction. Proximal end of the catheterwas brought out through the subcutaneous tunnel, so that the exit point of the peripherally inserted central catheterlies over the upper chest. Extra length of the catheter was trimmed, and extensions were attached. The device wasstabilized with adhesive and sutures.
Results: Out of 19 patients, 18 patients were male (4–72 years). Technical success was achieved in 100% cases. Nocatheter-related bloodstream infection was noted within 30 days of peripherally inserted central catheter. Overall,during 1966 catheter days, no catheter-related bloodstream infection was observed. The purpose of peripherallyinserted central catheter was achieved in 15 patients (78.9%) either in the form of completion of chemotherapy (8/15)or maintained peripherally inserted central catheter line till death (7/15). Partial or complete pullout was observed infour patients (20.1%), which required cuffed tunnelled catheter or implantable port. External fracture was noted in onepatient, which was successfully corrected using repair kit. No exit site infection, bleeding, catheter occlusion, catheterdysfunction, venous thrombosis, venous stenosis or catheter embolizations were noted in our series.
Conclusion: Centrally placed tunnelled peripherally inserted central catheter is a promising alternative method, whenconventional arm peripherally inserted central catheter placement is not feasible. It is an easy and safe procedure thatcan be performed under local anaesthesia.

T13.6

EVALUATION OF VASCULAR ACCESS TEAM INITIATIVES THROUGH IN-DEPTH INTERVIEWS: PERSPECTIVES FROM NINE COUNTRIES

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Introduction: The implementation of vascular access teams (VATs) has been shown to improve patient outcomes and reduce vascular access device-related complications. However, VAT-related research is limited to a European study and single-centered investigations. This research aims to explore the global VAT landscape and examine under-evaluated facets of VAT initiatives.
Method: Fourteen VAT members and leaders from nine countries (Australia, Brazil, Canada, China, Colombia, Italy, Sweden, UK, USA) were identified through judgment sampling. Semi-structured in-depth interviews were conducted between October 2020 and January 2021. A detailed questionnaire was developed based on a comprehensive literature review to identify under-researched facets regarding VATs, including team composition, responsibilities, formation and recruitment processes, VAT components and co-initiatives, direct/downstream impacts of VAT initiatives, and the collection/dissemination of VAT-related data.
Results: The most common VAT responsibilities were catheter insertions (n=14) and clinician training (n=12). On a scale from 1 to 7, patient satisfaction (6.5) and institutional costs (6.2) ranked the highest among observed

improvements following VAT implementation. All interviewees (n=14) reported using evidence-based protocols and advanced technologies (e.g., ultrasound guidance) in their practices. Although most institutions (n=9) did not collect VAT-related data, all participants (n=14) emphasized the importance of data collection and dissemination to demonstrate VAT initiative impacts. Time constraints (n=8) and challenges to continuous data collection/simplifying data analyses (n=4) were also reported as major deterrents to data circulation. According to most participants (n=9), the COVID-19 pandemic was associated with increased demands for VAT services.

Discussion and conclusion: Respondents from multiple geographies and with diverse backgrounds overwhelmingly endorsed the benefits of VAT initiatives. Based on the insights collected from nine countries, the findings of this study demonstrate that the formation of dedicated VATs, combined with the use of evidence-based practices and advanced technologies, can lead to significant improvements in clinical, economic, efficiency, and patient satisfaction outcomes.

T15.3

PICC-PORT AND ISPP PROTOCOL: FIRST EXPERIENCE IN SPAIN

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Background: Oncology patients need a central line to complet chemotherapy treatment in safety conditions. In recent years, PICC-ports have become a totally inserted central catheter (TIVAD) new option for these patients. We present the results of the fdirst experience in Spain regarding PICC-port inserted by ISPP protocol.

Methods: From January 2020 to Decembre 2021, prospective date have been collected from all patients undergoing piCC-por t insertion. PICC-ports have been placed by trained nurse in FJD Hospital in Madrid. Ultrasound puncture, microSeldinger technique, intracavitary ecg tip position and cyanoacrylate use are included in the insertion protocol. Indications, complications during insertion, late complications and total duration have been collected.

Results: 84 PICC-port lines (P1H (R)) have been placed. Mostly, patients with breast cancer and colon cancer have been identified has target popolation. Most of them have been puntured in yellos zone and tunneled to green zone. Treatment duration have been from 3 months to more than 1 year (448 days), including therapies with elastomeric pumps at home. Age range have gone from 24 years old to 78. There have been no complications during insertion. Late complications have been thrombosis (3) with no removal of catheter, microextravasation (1), camera extrusion (1), opening of the wound (1), MARSI (1). All complications have been managed by nurse. 2 patients have died with catheter in-situ. Occlusion has been indentified and solved with urokinasa lock.

Conclusions: Compared with chest port or PICC lines, PICC-port are a safe and cost-effectivenes option for cancer patients, if inserted by the ISPP protocol by trainned nurses.

B01.3

INDICATIONS FOR VENOUS ACCESS IN ONCOLOGY - RECOMMENDATIONS OF NATIONAL PROFESSIONAL SOCIETIES AND THE CURRENT STATE IN THE CZECH REPUBLIC

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Introduction: We define the current recommendations of indications of venous access in oncology which reflect the opinions of national and international professional societies. We focus exclusively on the indications of medium-term and long-term venous access devices.

Method: The survey results obtained from a national questionnaire of 24 oncology centers identified the current situation in the Czech Republic. There were evaluated relevant data on the number of and the criteria for the introduction of venous accesses provided by physicians. Comparisons were made between current oncological practice and recommendations provided by evidence-based medicine.

Results: At each center surveyed in the Czech Republic, an average of 130 ports and 80 peripherally inserted central catheters are introduced annually. The ports are increasingly indicated, with over a half of the centers surveyed introducing ports to more than 100 patients a year, with four centers introducing a total 1,600 ports annually. In all centers, the decision for venous access is made by an oncologist. However, most procedures are performed by a doctor of another specialization, most often by a surgeon, radiologist or anesthesiologist. More than a half of the indications for venous access placement result from poor peripheral venous system or complications of parenteral

therapy, not from comprehensive assessment prior to the initiation of the therapy.
Discussion and conclusion: Based on our findings, we developed general indications and recommendations for venous access to cancer patients which represent the consensus of an interdisciplinary team of specialists, predominantly from the committee of professional societies –the Society for Ports and Permanent Catheters, the Working Group of Nutritional Care in Oncology of the Czech Oncological Society and the Society of Clinical Nutrition and Intensive Metabolic Care. The number of introduced venous access catheters remains still insufficient to meet the needs in the Czech Republic.

B03.3

PERFORMANCE EVALUATION OF CENTRAL VENOUS CATHETERS WITH TWO DIFFERENT ANTIMICROBIAL TECHNOLOGIES AGAINST STAPHYLOCOCCUS AUREUS INFECTION

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Introduction: Two different central venous catheters (CVCs) with antimicrobial (AM) and anti-thrombogenic (AT) features were assessed in a clinically simulated sheep model with Staphylococcus aureus (SA) infection for 2-weeks duration.
Methods: Non-AM (Control), Chlorhexidine-Silver Sulfadiazine (CH-SSD) or Poly-hexamethylene Biguanide-Polyethylene Glycol (PHMB-PEG) CVCs were placed into nine sheep for 2-weeks (n=3 per group). Prior to placement, insertion sites were inoculated with SA and then catheters were placed through left jugular vein, so catheter tip stayed at SVC/right atrial junction. Subsequently, explanted catheter, fibrin sheath (FS) and vein tissue were analyzed for microbial presence, fibrin sheath (FS) accumulation and venous thrombosis. Clinical observations (body temperature, weight, blood cultures) were also made through-out the study period.
Results: Viable cell counts recovered from the explanted catheter, sheath and vein ranged between 10^3-10^7 CFU/cm from 3/3 sheep in Control and 3/3 sheep in PHMB-PEG groups, and 0 CFU/cm from 3/3 sheep in CH-SSD group. Fever and SA positive blood cultures confirming CRBSI was observed in 2/3 sheep in Control group and 1/3 sheep in PHMB-PEG group while 3/3 sheep in the CH-SSD group remained healthy. Extended FS, phlebitis, thickened vein wall, and partial to complete venous occlusion was observed in 2/3 animals in Control group and 3/3 animals in PHMB-PEG group whereas 3/3 animals in the CH-SSD group showed normal vein wall and FS limited at the insertion site. Histopathology scores exhibited CH-SSD group with lowest injury scores indicating no bacterial colonization or subsequent injurious inflammatory response compared to PHMB-PEG and Control groups where the scores reflected moderate to severe reaction.
Conclusions: The CH-SSD CVC showed significantly higher reduction in microbial colonization, CRBSI, FS and venous thrombosis. The PHMB-PEG CVC showed some reduction in CRBSI, but extent of fibrin sheath formation, phlebitis and venous thrombosis was significantly higher compared to both Control and CH-SSD CVCs.

B04.3

HOSPITAL SYSTEM VALIDATES UGPIV INSERTION STANDARDIZATION WITH ASEPTIC NON-TOUCH TECHNIQUE (ANTT) AND QUANTITATIVE CLINICAL PRODUCT EVALUATION

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Purpose: The need for ultrasound-guided peripheral intravenous (UGPIVC) insertions continues to increase due to population demographics. Yet significant concerns regarding the lack of standardization in adherence to asepsis and variability of protective supply use among hospital departments were identified in a 2020 survey of more than 1400 clinician respondents. This study evaluated the impact of a transparent barrier dressing on the standardization and efficiency of aseptic insertion of UGPIV catheters in a hospital system.
Methods: A multicenter, prospective, in-vivo quantitative performance evaluation was conducted with a transparent barrier dressing and aseptic non-touch technique (ANTT). Clinical staff at three hospital medical centers collected data using a validated five-scale Likert survey accessed through an online link.
Results: Evaluation of prior practice for ultrasound-guided insertions included insertions with no probe cover, transparent dressing only, sterile cover, gel sterile and non-sterile packets, non-sterile multi-use bottle used in the procedure. Results of 210 responses for the barrier dressing study demonstrated 97% for agree/strongly agree with the major parameters of gel separation, adherence, size, imaging, ease of use, improved aseptic technique, and preference over sterile probe cover. Ninety-nine percent of respondents recommended the adoption of the new dressing and standardized procedure. Substantial cost savings were reported with the barrier dressing. Compared to the sheath probe protocol ($10.54) and complete sterile kit ($13.46), the cost of using the barrier dressing for UGPIVC insertions is significantly lower ($4.47). Incorporating the barrier dressing resulted in a 57% cost reduction post-intervention.
Conclusions: The findings of this study support the use of a standardized ANTT UGPIVC protocol using transparent

barrier dressing to improve the efficiency of application and reduce the risk of infection and overall procedure costs.

B04.4

TALKING ABOUT COST-EFFECTIVENESS AND QUALITY IN THE CARE OF PATIENTS WITH PERIPHERAL VENOUS ACCESS: PIVC VS MINI-MIDLINE

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Up to 69% of PIVCs are withdrawn prematurely due to failure. The new classification of venous access and algorithms are increasingly based on an individualization of the device according to the real need of the patient and in the use of the ultrasound. LPCs have demonstrated to be useful particularly in patients with difficult venous access (DIVA) and in emergency situations, reducing the number of punctures, patient discomfort, as well as the nursing workload.

Aim: To compare PIVC vs LPC, in patients with poor venous access and peripheral intravenous treatment, in terms of satisfaction, reduction in the number of punctures, veins preservation, pain, indwell time and cost. As a piloting project, data from patients who fulfilled criteria for cannulation of LPC were collected and analyzed and compared with the usual practice in our center. Catheters used: Insyte Autoguard of BD and Leader-cath of Vygon. The LPC indwell time observed was 10-12 days, and it could be maintained for a longer time, while the mean for PIVC in our center was similar to that reported in the bibliography. The number of puncture attempts was 1 with LPC and 3-4 with PIVC. The Graphic Rating Scale for the measurement of pain was mild with LPC and severe with PIVC. The average time taken for the effective cannulation was 10 ‘ with LPC and 7.75’ with PIVC finding that the cost associated with the implementation of the LPC was between 14,02€-28,04 € and 26,64€ with PIVC. LPCs implanted by qualified nurses, it allows the venous device to be chosen more wisely. With its quick and effective placement, it is very useful for patients who need a safe venous access and in DIVA, avoiding phlebitis and multiple puncture attempts, it presents a longer indwell time, higher patient’s satisfaction and cost-effective.

B04.5

PICC LINES IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND CANCER: WHAT ARE WE SAVING THE VEIN FOR?

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Background: Vascular access devices (VADs) are vital in cancer treatment for intravenous infusion of vesicant drugs, parenteral nutrition, and blood transfusion. A PICC line is generally not recommended for patients with an eGFR that is lower than 45 mL/min/1.73 m2 with a diagnosis of chronic kidney disease (CKD) stage 3b or higher for the purpose of vessel preservation for possible future AV Fistula need. The study attempts to explore if the competing risk of death or progression to kidney failure among patients with cancer should be considered in evaluating the appropriateness of PICC placement. Method and Result Retrospective study, using an institutional electronic health record (EHR), patients with eGFR <60 ml/min 90 to 180 days before and after a PICC placement from 2018 to June 2021 were selected using CPT codes. Demographics and characteristics of patients were identified including the type of cancer.
Outcome: Proportion these patients died of cancer vs progressed to renal failure requiring dialysis. A total of 55 patients were included in the study, 44(80%) were CKD stage 3, four (7.27%) were CKD stage 4, and seven (12.73%) were CKD stage 2 before PICC insertion. Patients were followed 90 to 180 days after PICC insertion. Of the total 55 patients, 26 (47.3%) died, 20 (36.4%) continued cancer surveillance, 3(5.45%) kept appointments outside, and 6(10.9%) were lost to follow-up. Of the 55 patients, only 4 (7.27%) underwent dialysis after progressing to renal failure. The primary cancer diagnosis of patients who had dialysis and died was diverse which include lymphoma, colon cancer, and sarcoma.
Conclusion: PICC lines should be allowed in patients with cancer and CKD stage 3 and beyond as the risk of ESRD is significantly less than the risk of progression of cancer or death.

B04.6

WHAT IS THE PRACTICAL ESTIMATION IN DETERMINING THE LENGTH OF PERIPHERALLY INSERTED CENTRAL CATHETER (PICC)?

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Introduction: Intracavitary electrocardiogram is a feasible technique to verify tip location of PICC. But there are still many institutions to use classic methods such as measuring and summing anatomic landmarks to estimate the length of PICC before insertion. The aim of this study is to help the latter’s who do not use intercavitary electrocardiogram by practical and simple equation.
Method: 110 Patients who were schedule to insert PICC on their right arm was enrolled and collected the distance of elbow crease to axillar (ECA) as well as height, weight, and catheter length. The location of catheter tip was located carina and verified by helping of fluoroscopy.

Results: The formula for estimated length of elbow crease to carina was determined by regression analysis. The optimal formula was determined to be 21.919 + (-2.046 for female) + (0.962 * ECA) + (0.066 * body weight) which yielded an R2 value of 0.561.
Discussion and conclusion: The simple and practical formular proposed for the length of elbow crease to carina are "43 + (0.066 * body weight)" for male, "40 + (0.066 * body weight)" for female. The distance from elbow crease to catheter insertion point should be subtracted to acquire complete result of catheter length estimation.

B05.3

COMPLICATIONS OF PERIPHERALLY INSERTED CENTRAL LINE (PICC) IN A NURSE-LED CLINIC OF A TERTIARY CARE CANCER CENTRE IN INDIA

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Background: The use of central venous access facilitates delivery of systemic treatment in cancer patients requiring treatment for prolonged period. We report here the complications in patients with PICC of a Nurse led PICC clinic.
Methods: A retrospective study was undertaken. Case record register was analysed. Patients who are admitted for treatment in ACTREC, requiring chemotherapy by PICC and PICC insertion by nurse were included in the study. Patients were assessed weekly and when complained of discomfort. A total of 688 PICCs were inserted over four years and 1month i.e. Dec 2016 to December 2021. Out of the 688 PICC insertions attempted, 684 (99.4%) were successful. All PICCs were placed in the antecubital / upper arm using traditional method. All patients were assessed once a week.
Results: The median age of patient was 42 years {(Range: 1-81 years) (Inter quartile range: 32)}. Majority (54.7%) of patients were males. Total no of line days was 81598 with a median duration of catheter in situ of 118 days. Out of the 688 catheters inserted, 123 PICC catheters were removed. In 62.5% of patients the catheter was used for the intended purpose of treatment and removed after completion of treatment. The remaining 37.5% the PICC had to be prematurely removed because of following reasons: Site rash (0.3%), Infection (3.8%), Phlebitis (0.1%), Thrombosis (0.7%), Dislodged (2.5%), Malposition (1.0%), Expired (10%), shifted to other hospital (0.3%), treatment regime changed (0.3%), lost to follow up (92.8%) and request for removal (2.0%). Median duration from catheter insertion to infection was 37.5 days (4-131 days).
Conclusion: In our centre complications are lower than most published data. We conclude that Nurse led PICC clinics using traditional method, can be successful, especially in low income countries where resources for advanced techniques are not easily available.

B06.3

DIAGNOSTIC ACCURACY, INTER-RATER VARIABILITY AND LEARNING CURVE OF THREE ECHOCARDIOGRAPHIC VIEWS FOR THE TIP LOCATION IN ADULTS: A PROSPECTIVE OBSERVATIONAL COHORT STUDY

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Introduction: Intra-cavitary ECG (Ic-ECG) is the standard of care for tip location of central venous catheters (CVC). However, it is not applicable in patients with active pacemaker or supraventricular arrythmias. Ultrasound-based tip location has been proposed as alternative in these cases. Primary aim of our study is to evaluate accuracy and inter-rater variability of subcostal bi-caval, subcostal 4-chambers and apical 4-chambers window for tip location compared with Ic-ECG.
Methods: Multicenter observational prospective cohort study conducted from June to October 2021. All adult patients undergone CVC insertion and given informed consent were included. The tip location was evaluated with transthoracic echocardiography (TTE) and bubble test using three echocardiographic views compared with the Ic-ECG.
Results: Fifteen patients were enrolled. Only one misplacement occurred. The subcostal 4-chambers view was the most easily obtained (87%), with a steep learning curve and the best agreement. Apical 4-chambers and subcostal bi-caval views were obtained in 80% and 60% of cases respectively. The subcostal 4-chambers also showed the highest sensitivity. At least one of the three echocardiographic views was feasible in all patients enrolled.
Discussion and conclusions: The TTE with bubble test is a safe and accurate bedside method for tip location. It can be easily applicable in most patients, even when IC-ECG cannot be used. The subcostal-4-chambers view seems to be the easiest, especially in ventilated patients. Further sampling will be needed to confirm these preliminary results and to investigate also inter-rater variability.

B07.2

PERCUTANEOUS EXTERNAL JUGULAR VEIN ACCESS IN ONCOLOGY: TECHNICAL AND CLINICAL RESULTS UNDER REAL TIME US GUIDANCE

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Purpose: To demonstrate the technical feasibility and safety of percutaneous external jugular vein access (EJV) for implantable central venous port in adult patients.
Methods and Materials: Percutaneous EJV was attempted under ultrasonography real time guidance in 100 cancer patients, mean age 62.5 years (23-89) in a Trendelenburg position.Oncology pathologies included breast (25%), Genito urinay (20%), brain (20%), lung (15%) and miscellaneous. 83% of patients were staged IV according to TNM classification.40% of patients presented with a BMI >25 (15% had BMI >30) and 10% had BMI <18.5%.20% of patient's therapy included either anti platelet therapy / anticoagulant therapy or anti angiogenesis medication. Technical feasibility and clinical outcomes were recorded.
Results: Technical success rate was 94%. Procedure mean time duration was 23.2mn (19-60), with a mean of 1.3 venous needle puncture attempt (range: 1, 4).55% of ports were left-sided inserted. Procedure related complication was 1% (pneumothorax).Ports remained patent and functional for a total duration of 11810 patient days. Premature port device explantation rate was 9%: sepsis (n=8), skin dehiscence and device occlusion.Mechanical complications included port chamber twist (n=2), catheter occlusion (n=1), EJV phlebitis (n=1), skin dehiscence (n = 1) and subcutaneous catheter loop (n=1).Central venous thrombosis rate was nil. Infectious complication rate was 7%, septicemia (5%) and local sepsis (2%).
Conclusion: EJV post technique is safe and effective. Specific indications for EJV access may include obese patients, patients under anticoagulant/ Anti platelet therapy.

B08.2

INTRODUCING A LONGER-LENGTH PIVC TO SUPPORT IMPROVED OUTCOMESFOR DIFFICULT INTRAVENOUS ACCESS (DIVA) PATIENTS

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Approximately 90% of hospitalised patients require a peripheral intravenous catheter (PIVC) during their stay. Reports indicate that the majority (90%), fail before therapy completion, and that up to 50% can fail within the first 24 hours [1, 2]. Reasons for failure include infiltration, dislodgment or extravasation, and may be more common in patients with difficult intravenous access (DIVA). DIVA patients include those with a high BMI leading to thicker subcutaneous adipose tissue to navigate, and patients with smaller or damaged superficial veins such as those with a history of intravenous drug use or chemotherapy treatment [3]. Multiple failed cannulations have significant implications on our patients, finances and resources; therefore, our Vascular Access Team initiated an improvement strategy including the introduction of a DIVA policy, and the insertion of a longer-length PIVC, Introcan Safety Deep Access (64mm), under ultrasound guidance (USG). To understand the impact of these changes we completed an audit of 159 longer-length cannula insertions for DIVA patients. Overall 46% of longer-length PIVCs were inserted by healthcare professionals newly trained to perform USG cannulation, the remaining 54% by experienced clinicians. First stick success rate was 93%, and 83% remained in situ until therapy completion. The remainder were removed early due to VIP score >1 (3.1%), dislodgement/ removal by the patient (7.5%) or unrelated patient death (6.3%). Median dwell time was between 5-10 days. Here, we report the successful implementation of a DIVA escalation policy using longer-length cannula under USG resulting in a higher first stick success rate and higher therapy completion rate than reported in the literature for DIVA patients [4-6], even with new USG trainees. Following these positive results, we are extending the roll-out of USG insertion training for longer-length PIVC into additional clinical areas to improve patients' experience when the insertion of a PIVC is required for treatment.

B08.3

EXPERIENCE WITH LONG PERIPHERAL CATHETERS

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Introduction: Several types of long peripheral catheters are inserted by our PICC team. The aim of study was to assess the number of catheters inserted on the basis of the following ultrasonography protocol of upper extremities and the associated complications in January-November 2021.
Method: The selected catheter was inserted into a vein, provided that its diameter was not greater than 33% of the venous lumen. According to the depth of the placed vein, the catheter was selected as follows. 1. Introcan 6.4 cm 22 or 20G at a vein depth of up to 0.5 cm 2. Bullpup 8.5 cm 22 or 20G at a vein depth of 0.5 - 1.5 cm 3. Bullpup 9.8 cm 18G at a vein depth of 0.5 - 2 cm 4. Vygon 12 cm 4Fr without a vein depth limtation.

Results: A total of 1156 long peripheral catheters were introduced. Introcan in 346 (29.8%), Bullpup 8.5 cm in 140 (12.1%), Bullpup 9.8 cm in 320 (27.5%) and Vygon in 356 (30.6%) cases. The median of dwell time was 9 days for Introcan, 10 days for Bullpup 8.5cm, 9 days for Bullpup 9.8 cm and 10 days for Vygon (N.S.) Complication due to which catheter had to be removed prematurely occurred in a total of 136 (11.8%) cases. In the case of Introcan at 40 (11.6%), Bullpup 8.5 cm at 18 (12.8%), Bullpup 9.8 cm 38 (11.8%) and Vygon 1 at 40 (11.2%) cases (N.S.) The most common complication was dislodgment – 88 (65%). However there was no significant difference in the frequency of dislodgement or other detected complications among individual catheters.
Conclusion: Based on ultrasonography examination, it is possible to select the optimal long peripheral catheter for each patient with regard to the preservation of the vascular tree and financial cost.

B08.4

THE EXPERIENCE IN THE USE OF LONG PERIPHERAL CATHETER: MINI-MIDLINE

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Introduction: The long peripheral catheter, also called mini-Midlines, are catheters of approximately 8-15cm in length indicated in mid-term therapies with non-irritant drugs. Recently, the literature about this device has emerged differentiating itself from longer catheters. Study objective was to describe the clinical outcomes of the mini-Midlines inserted in patients admitted to a tertiary hospital in Spain.
Method: Observational and prospective design. The sample included all mini-Midlines inserted using accelerated Seldinger technique, guided by ultrasound and positioning the tip in the axilar vein during study period (April 2015-June 2021). Study population met one of the following criteria: a) >6 days long iv therapy with non irritant drugs b) difficult venous access (DIVA). Primary outcomes were the incidence of adverse event (AE) and the proportion of early withdrawals. The follow up period was from insertion date to catheter removal. Incidence rates were calculated using percentages and episodes per 1,000 catheter days.
Results: A total of 1,747 mini-Midline were inserted in 1,466 patients, with a mean age of 72.15 years (SD=16.45). The 90.3% presented DIVA. Successful insertion occurred in 95.2% of the cases. Catheters were used for the infusion of antibiotics (68.9%) and fluid therapy (25.5%). The 4.2% of the mini-Midlines were used for irritant drugs. The mean duration of catheters was12.10 days (SD=13.55) and 74.6% were removed successfully. The accidental removal was the main reason of catheter early withdrawal (10.7%). The incidence of thrombosis was 2.39/1000 catheter days (2.9%) and bacteremia was 0.19/1000 catheter days (0.2%). The use of irritants was not statistically significant in relation to thrombosis (p= 0.103) or bacteremia (p=0.813).
Discussion and conclusion: The mini-Midline could be a safe option of a mid-term catheter, also in patients with DIVA, since it has a low risk of AE and a high percentage of withdrawals at the end of treatment.

B09.3

WHEN ONE IS BETTER THAN TWO: A NEW SINGLE PUNCTURE TECHNIQUE FOR COMBINED PECS 1 AND LOCAL ANESTHETIC HYDRO-DISSECTION FOR TICVAD POCKET CREATION

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Introduction: Total implantable central venous access devices (TICVADs) implantation is a common procedure for oncological patients, and it is usually carried out under local anesthesia that do not fully cover procedural and post procedural residual pain. Pectoral nerves (PECS) blocks are relatively new ultrasound guided plane efficient in controlling procedural pain for patients undergoing port implantation. In fact, placing local anesthetic (LA) between the muscular fascia in the proximity of the nerves, could assure a long-lasting analgesic effect, reducing procedural pain. In procedures which involve the pectoral muscles, the PECS1 block is indicated, which consist in an injection between pectorals major and minor, aiming pectoral nerves. It is important implanting the reservoir of the catheter just above the pectoral muscle, and it can be done without mistake with an ultrasound guided hydro-dissection with local anesthetic. The injection of LA, in fact, could be used to create the pocket in the correct position, reducing pain associated to the use of invasive techniques. We tried to understand if it would be possible to combine these two injections using a single puncture.
Methods: In two consecutive patients we performed PECS1 block between the minor and the major pectoral muscles, injecting 20 ml of ropivacaine 0,375%. After the block, we retrieved the needle reaching the fascia over the pectoral major, and hydro-dissection was made with a 10 ml solution of ropivacaine 0.5% to create the pocket

(Figure 1). Then, the reservoir was positioned in the pocket, without any complication.

Results and conclusion: Procedural pain was under 2 (NRS scale) for both patients. Pain at 4, 8, 12 and 48 hours was always <2. No complications reported. This single puncture technique seems to be effective in reducing discomfort for TICVAD implantation. Studies over consistent number of patients are needed to understand benefits and indications.

B09.4

SURVEY OF NEEDLE PHOBIA: UNDERLYING REASONS, IMPACTS AND MITIGATION STRATEGIES

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Introduction: Needle phobia is an overlooked condition, which significantly impacts patients undergoing procedures including venipuncture, blood donations, and those with chronic conditions requiring frequent injections. The study aims to identify how commonly and to what extent needle phobia is experienced by the general adult population, and its underlying reasons, impacts, and related mitigation strategies.

Methods: A 21-item questionnaire was developed based on a comprehensive targeted literature review that was conducted in the PubMed database, including peer-reviewed manuscripts published between2011-2021 to identify under-researched areas. An anonymous online platform will be utilized to survey2,000 adults representing the general population.

Results: The questionnaire consists of multiple-choice, 11-point Likert-like, ranking, and open-ended questions. Four main sections covering understudied areas include: (i) the prevalence and intensity of needle fear; (ii) underlying reasons and root causes; (iii) the impacts on medical care and overall well-being; and (iv) potential mitigation strategies. Overall, 334 original research articles were reviewed to develop the survey, 163 of which underwent full-text review after the abstract screening. Literature on general adult populations was limited, while the articles primarily focused on pediatric populations and dental settings. The under-researched topics to be explored include the prevalence of needle fear in general adult populations and direct/downstream impacts of needle phobia on healthcare-related behavior. Underlying reasons such as pain and anxiety were not sufficiently studied, and comparative studies were not identified. For various device-related and non-device-related mitigation strategies presented in the literature, the collection of patient perspectives and preferences is warranted.

Discussion and conclusion: Literature demonstrates a substantial need for research regarding the prevalence of needle phobia, underlying reasons, direct/downstream adverse impacts, and potential strategies to alleviate needle fear. Our research will provide a comprehensive understanding of needle phobia and guide the development of approaches to alleviate its effects on patient care.

B11.3

DROPLET DIGITAL POLYMERASE CHAIN REACTION ENABLES RAPID DETECTION AND CHARACTERISATION OF BACTERAEMIA IN CHRONIC PARENTERAL NUTRITION PATIENTS

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Introduction: Patients with chronic intestinal failure (CIF) require a central venous access device (CVAD) to administer (home) parenteral nutrition. Central line-associated bloodstream infections (CLABSIs) are the most daunting complication associated with such CVADs. Blood cultures remain the gold standard to diagnose CLABSIs, but take 1-5 days to become positive and guide antibiotic treatment. ddPCR is a novel culture-independent molecular technique that has been developed to improve and expedite infection diagnostics, yielding results within 4 hours. Here, we compare ddPCR and blood culture characteristics of pathogen detection in whole-blood.

Methods: This prospective single-blind clinical study included adult CIF patients with a clinical suspicion of a CLABSI. Blood cultures were routinely collected. Subsequently, four study samples (two from the CVAD and two from a peripheral venous access point) were taken. Primary outcomes were the sensitivity and specificity of ddPCR to detect pathogens in whole blood compared to blood cultures.

Results: In total, 72 patients with 117 suspected episodes of CLABSIs were enrolled, 78 blood samples were taken from the CVAD and 99 from peripheral veins. Overall, ddPCR sensitivity and specificity were 71% (95%CI 59-82) and 89% (95%CI 82-95), respectively. For CVAD samples sensitivity was 81% (95%CI 65-92), with a specificity of 90% (95%CI 76-97). Peripheral samples had a sensitivity and specificity of 61% (95%CI 42-77) and 89% (95%CI 79-95), respectively.

Conclusion: This prospective study shows that, even in the suboptimal setting where ddPCR samples were taken after blood cultures, this technique enables rapid detection of pathogens involved in bacteraemia. These findings pave the way for clinical exploration of directly combined ddPCR and blood-culture samples to facilitate a more rapid CLABSI treatment and improved patient outcomes.

B11.4

HEALTH ECONOMIC EVALUATION OF GRAVITY-BASED INTRAVENOUS INFUSIONS IN FINLAND: DIGITAL REMOTE MONITORING FREES CAPACITY AND SAVES MATERIALS

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Introduction: Approximately two thirds of intravenous infusions (IVIs) are gravity-based. Serious mistakes can happen easily during standard gravity-based IVIs. The potential economic impact of digital remote monitoring and bedside management of gravity-based IVIs with a novel solution compliant with EU Medical Devices Regulation (MDR) 2017/745 was estimated.
Method: An R-based user interface model with the PICOSTEPS framework was developed for the health economic evaluation. Nurses delivering IVIs in 15 wards (6 hospitals, around Finland) were surveyed. The Monidor solutionCE IV infusion management system (including both Monidrop® and IV Screen™, Monidor Oy, Oulu, Finland) was compared to standard gravity-based IVI management in a counterfactual setting. The one-month undiscounted potential economic capacity freed (OMUPECF, in year 2021 euros) and one-month net return on investment (OMNROI) for the healthcare service provider were the outcomes. IVI-related events and nurse time use (linear regression analysis) were included as effects. A tornado diagram depicted the sensitivity of OMNROI to key parameter changes.
Results: The survey had 216 responses. 56% of nurses reported time savings, and <4% experienced additional time requirements due to the Monidor solution. On average, the Monidor solution was estimated to avoid 2.06 routine patient room visits, detect end of infusion 1.34 times, and free 5.05 minutes per nurse shift. One routine room visit avoided was associated with 2.45 minutes of freed time in the regression analysis. The ward-based OMUPECF was estimated at €1270 per month (50% related to material savings), yielding an OMNROI of 2.6. The OMNROI ranged from 1.5 to 3.7 in the sensitivity analysis.
Discussion and conclusion: Digital remote monitoring and bedside management of gravity-based IVIs with the Monidor solution freed nurse time, saved materials, provided OMUPECF, and resulted in a robustly positive OMNROI in Finland. However, costs between countries can vary, and the results should be confirmed in other settings.

S02.3

EFFECTIVE USE OF EXTENDED DWELL PERIPHERAL INTRAVENOUS CATHETERS IN NEONATAL INTENSIVE CARE PATIENTS

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Introduction: The majority of hospitalized infants require vascular access. The appropriate vascular access device for each infant poses a clinical challenge.
Purpose: We aimed to compare the number of placement attempts, dwell time, benefits, and complications between the standard peripheral intravenous catheters (PIVs) and newer extended dwell peripheral intravenous catheters (EPIVs), as well as to explore the change in PIV use before and after the introduction of the EPIV catheter.
Methods: We conducted a retrospective medical review of catheter use pre- and post-implementation of EPIVs among 92 NICU infants. Demographic characteristics and information on catheter type (excluding PICCs, UACs, UVCs), placement attempts, dwell time, and complications were collected.
Results: EPIVs were implemented according to evidence-based criteria by a vascular access NICU nursing team. Fifteen percent of PIV placements required three or more attempts, compared to just one percent of EPIV placement attempts. EPIVs had a longer median dwell time (3.5 vs 1 day) and fewer complications compared to PIVs ($p<0.001$).
Discussion: Implementation of an evidence-based approach to vascular access by a team of NICU nurses may improve clinical outcomes. EPIVs may be an appropriate alternative device to PIVs due to fewer placement attempts, longer dwell times, and overall fewer complications due to use.
Conclusion: Future vascular access research in the NICU may include a greater focus on innovative placement strategies, optimal maintenance and infection control, and prevention of complications.

S03.3

IMPACTING NEONATAL PATIENT CARE:REDUCING NEEDLE STICKS, WITH AN EXTENDED DWELL CATHETER

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Background: The use and efficacy of extended dwell peripheral intravenous catheters has been described at scientific conferences and in recent literature.

The ramifications of repeated needle sticks, damage to vessels and ultimately the need for more invasive and costly access devices, clearly supports the need for reliable forms of vascular access.

Methods: This quality improvement project spanned four years, from 2017 through 2020, and included 128 patients who required a peripherally inserted catheter as their primary or secondary access site for a prescribed therapy. The extended dwell peripheral intravenous catheter inserted was a 4 cm, 22- gauge catheter, made of thermosensitive polyurethane, inserted using Seldinger technique.

Results: Over the course of 4 years, 128 patients received an extended dwell peripheral intravenous catheter for two or more days, totaling 849 days of therapy. Total insertion attempts were 174 or an average of 1.4 per patient. An estimated number of short peripheral intravenous catheters needed for 849 days would have been 404 with 1,011 attempts. Resultant savings with extended dwell peripheral intravenous catheter is estimated to be a savings of $30,686.

Conclusions: Reducing the number of patient peripheral intravenous attempts while extending the dwell time results in less patient trauma, reliable longer term access, reduced infection risk, reduced supply usage, and savings in terms of nursing time. The ultimate result for preterm newborns is more efficient delivery of care with less cost.

Keywords: Neonate, PIV failure, long PIV, Seldinger Technique, soft polyurethane

S03.4

OUTCOMES OF ESTABLISHING A NEONATAL PERIPHERAL VASCULAR ACCESS TEAM

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Introduction: Intravenous vascular access is essential in neonatal intensive care units (NICU). Short peripheral IV catheters (PIVCs) are the most frequently used short term device. Many unmodifiable and potentially modifiable factors affect the incidence of complications, contributing to the success or failure of therapy. Numerous interventions such as, evidence-based care bundles, innovations in device design and manufacturer are targeted at reducing the incidence and severity of complications. Internationally, specialist multi-professional teams for central venous access are widely established but evidence about the impacts of teams for managing peripheral intravenous access is less evident.

Methods: An observational study, using routinely collect vascular access data between January 2018 and December 2020. The study was performed on the NICU of the Women's Wellness and Research Center, Hamad Medical Corporation, Qatar. Data on all peripheral vascular devices used (n=43,551) was included in the statistical analysis. The aim of this study was to examine the effects of introducing a dedicated neonatal peripheral vascular access team (NeoVAT) on key clinical and organisational quality measures of infusion therapy.

Results: First insertion attempt success rate improved to 68% and overall success rates from 81% to 96% ($p<0.001$). Average catheter dwell time improved from 32 to 36 hours ($p<0.001$). Peripheral intravenous infiltration/extravasation (PIVIE) scores declined from 21% to 13%, ($p<0.001$) indicating a considerable reduction in measures of PIVIE severity. Peripheral line associated blood stream infection (PLABSI) rates per 1,000 device days declined from 1.68 to 0.55, ($p<0.001$), RR 0.47 (0.29-0.77). The impact of greater first-time success and reduced need to replace devices led to cost savings. However, further economic analysis to determine a fuller picture is required.

Conclusion: Dedicated peripheral vascular access teams can positively impact clinically important vascular access quality measures. This information can be used to support their introduction in other units.

S09.4

ULTRASOUND-GUIDED PERCUTANEOUS INSERTION OF BROVIAC LINES IN INFANTS LESS THAN 5KG. PROSPECTIVE STUDY OF 100 CONSECUTIVE PROCEDURES

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Aim: Ultrasound-guided (USG) percutaneous insertion of Broviac lines (cuffed tunnelled silastic central venous catheters, TCVC) has increasingly been adopted throughout the UK. However, vascular access remains a challenge in small babies and in some units is still performed by open cutdown. The vascular access team in our hospital, established in 2004, consists of consultant surgeons, anaesthetists and interventional radiologists, who provide all long term vascular access by the ultrasound guided percutaneous technique (USG). We reviewed the outcome in our last 100 patients under 5kg.

Method: A prospective database of TCVC insertions in patients less than 5kg recorded age, gestation, weight, diagnosis, type of catheter and associated complications within 30 days of insertion. A standardised technique of USG insertion is used by all operators.

Results: One-hundred patients had TCVC inserted between 1/1/2018 and 31/3/2020. Median age

46(range0-316)days, gestation 36.5(23-42)weeks, weight 3(0.66 to 5)kg.
Indication: Parenteral nutrition(75), long term antibiotics(14), cardiac medication(6), chemotherapy(3), other(2). All were tunnelled silicone lines of single 2.7Fr(51) and 4.2Fr(46) or double lumen 7Fr(3). Uncomplicated insertion in 94/100 cases. In 6 patients there were difficulties in cannulating the vein. In 4 cases an experienced colleague assisted; in 1 case a new successful attempt was made on the opposite internal jugular vein, and in 1 the femoral vein was used. No patient required an open cutdown. There was 1 case of line sepsis requiring removal and 1 replacement because of blockage within 28days.
Conclusion: The USG approach in infants<5kg is safe and can be used exclusively for venous access even in the most tiny babies. It is, however, a technically challenging procedure therefore we would recommend establishing a consultant delivered vascular access team to provide this service. Open venous cutdown in a tertiary children's hospital is no longer necessary for the insertion of TCVC and should be abandoned altogether.

S10.3

A PILOT FEASIBILITY STUDY ON THE USE OF DIALKYLCARBAMOYLCHLORIDE DRESSING (DACCD) FOR THE PREVENTION OF EXIT SITE INFECTION IN A PEDIATRIC POPULATION

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Introduction: DACCd is an acetate gauze impregnated with DACC, a fatty acid derivative that has been shown in vitro to bind a number of pathogenic microorganism, including Staphylococcus aureus. The purpose of this prospective study was to evaluate the safety and the efficacy of the DACCd in a pediatric population.
Methods: The study was conducted from September 2020 to December 2021 at the Infermi Hospital in Rimini Hospital. Central venous catheters were placed by a VAT using a bundle for insertion which included 1) pre-operative ultrasound scan; 2) maximal barrier precautions; 3) skin antisepsis with 2% chlorhexidine in 70% isopropilic alcohol; 4) ultrasound guided venipuncture; 5) Ultrasound-based tip navigation 6) Tip location by intracavitary ECG 7) Tunneling of the catheter where needed; 8) Securement by subcutaneously anchored device 9) Cyanoacrylate glue for the closure of the puncture site and for the sealing of the exit site; 10) Use of the DACCd below subcutaneously anchored device 11) Coverage of the exit site with semipermeable transparent membrane. Catheter's dressing was then changed weekly, using the DACCd and the semipermeable transparent membrane
Results: 56 Devices (48 pediatric patients and 8 neonates) were included in the study. Mean age of the studied population was 6.2 years. Mean dwell time was 100 days for a total of 5620 catheter-days. 803 dressings were changed during the studied period. No case of local infection of the exit site and no case of CVC-related infection was registered. DACCd was well tolerated, no case of skin irritation was reported.
Conclusion: DACCd is well tolerated in pediatric and neonatal population. It represents a promising tool as a strategy for infection prevention.

S11.3

ULTRASOUND-GUIDED INSERTION OF THE LONG PERIPHERAL CANNULA IN CHILDREN WITH DIVA

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Introduction: In paediatric patients, obtaining peripheral vascular access (PVA) is more complicated than in adults, requiring repeat insertion attempts. Children are more sensitive to procedural pain, their veins are smaller, and the combination with adiposity makes them more difficult to detect. For better identification of patients with DIVA (difficult intravascular access), we can use some scoring systems e.g. Yen et al. Ultrasound-guided (USG) insertion of vascular access significantly increases the success rate, compared with landmarks technique. Using long peripheral cannulas (LPCs) allows insertion of peripheral intravenous access to more deep located veins and longer tract of the cannula placed inside the vein.
Method: We studied 43 children with ages ranging from 4 months to 18 years (average 6,27 y) admitted to our hospital, required intravascular therapy after more than 2 unsuccessful attempts to achieve PVA or known DIVA patients. In these children ultrasound-guided LPCs (24 G, 3,2 cm or 22 G, 6,4 cm) were inserted into the deep veins of arms or legs, using over the needle technique (OTN).
Results: LPC placement was successful in 100 % (n 43). Dwell time ranged between 1- 30 days (392 catheter days - average 9,11 days). Most catheters were electively removed because they were no longer indicated (n 34 -79,9 % - 350 catheter days – average - 10,3 days). Complications (malfunction, dislodgement, catheter occlusion) occurring in 9 cases - 20,1 % (42 catheter days –average 4,2 day).
Discussion and conclusion: US-guided LPC is a good alternative for installing vascular access in children with DIVA. It is connected with a low rate of complications and a high rate of successful insertion. It could be used in all children without age restriction with beneficial use in chubby toddlers or obese teenagers.

Poster Abstracts

P01

DEVELOPMENT OF NURSING QUALITY INDICATOR OF INTRAVENOUS THERAPY IN THAILAND

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Objectives: 1) To develop nursing quality indicators of intravenous therapy in Thailand; and 2) To measure indicators of intravenous therapy in Thailand.
Research methods: There are 2 processes for conducting this research which are 1) seeking the nursing indicators for intravenous therapy in Thailand; and 2) measuring the quality of the nursing indicators for intravenous therapy in Thailand. The samples in the first process were 19 nurses who were experts in management, operation, and academic. In the second process, 77 samples are selected from nurses involved in intravenous therapy in Klang Hospital and Phramongkutklao Hospital.
Results: The research found that 1) the indicators of intravenous therapy in Thailand consisted of 4 structural indicators, 4 process indicators, and 15 result indicators. 2) The indicators were measured. The results showed that most of them received high or highest ratings except 2 result indicators: catheter embolism and the number of complaints about intravenous therapy which received level.
Conclusion: There are 23 nursing quality indicators of intravenous therapy in Thailand and measuring the quality of the nursing indicators for intravenous therapy most of them received high or highest ratings.
Keywords: quality indicators, nursing care quality, nursing of intravenous infusion patients.

P02

DEVELOPMENT OF A NURSE-LED VASCULAR ACCESS PRE-ASSESSMENT CLINIC

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Introduction: As a team of Advanced Clinical Practitioners (ACPs) working in the field of haematology and oncology, a large part of our clinical workload was centred around inserting Peripherally Inserted Central Catheters (PICCs) and Totally Implantable Vascular Access Devices (TIVADs). We were inserting approximately 5 TIVADs and up to 20 PICCs each week and had noticed an increase in deferrals due to anticoagulation problems/co-morbidities which was causing unnecessary delays in treatment.
Methods: We set up a clinic whereby patients would attend an appointment with an ACP at least 72 hours prior to the CVAD insertion, an ultrasound scan was performed of the upper limbs, relevant history disscussed, explanation of the procedure (including written information) MRSA screening and clotting studies/platelet count were also all checked at this appointment. Patients signed their consent forms at this point and if any issues identified then there was time to liaise with radiology for a fluoroscopy assisted insertion. Patients equally went home with a prescription for decolonisation.
Results: Patient and clinician satisfaction increased significantly. We avoided delays in treatment, were able to make safe decisions surrounding anticoagulation/antiplatelet management; having direct access to the thrombosis consultants aided the process significantly. Patients were equally offered the opportunity to have a TIVAD if they didn't want to have a PICC inserted. MRSA screening results were available in a timely fashion as were all necesary blood tests. We naturally continued to provide a reactive service to our haematology patients who required urgent same day PICCs as well.
Conclusion: Prior to the vascualr access assessment clinic we were deferring 2-3 patients per week due to anticoagulation issues/co-morbidities. Since the introduction of the clinic we no longer have deferrals and are able to proactively liaise with our colleagues in radiology when we require fluoroscopy assisted CVAD insertions.

P03

CLOSED INTRAVENOUS SYSTEMS FOR CENTRAL VASCULAR ACCESS: A DIFFERENCE MAKER FOR CLABSI RATES IN NEONATES?

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Introduction: Infants in neonatal units, by virtue of their pathology and prematurity are susceptible to numerous potential iatrogenic risks. One key area of concern is central line-associated blood stream infection (CLABSI). To ensure patient safety and reduce the incidence of CLABSI towards zero, numerous evidence-based clinical interventions and product innovations have been implemented. Nevertheless, achieving zero CLABSI for sustained periods of time remains a challenge. The purpose of this study was to evaluate the impact on CLABSI rates of introducing an advanced design closed intravenous (IV) administration set in a neonatal intensive care unit (NICU).
Methods: This was a retrospective observational analysis of routinely collected anonymized IV therapy infection data in a NICU. The study period was from January 2019 through June 2020.
Results: The CLABSI rate was 2.87 (per 1,000 device days) in the study period prior to the implementation of the closed IV administration sets (January

2019-September 2019) and 0.22 (per 1,000 device days) after the implementation of the closed IV administration sets (October 2019-June 2020). Zero CLABSIs were observed during the January through June, 2020 time period.
Conclusion: Utilization of an advanced design closed IV administration set was associated with a reduction in CLABSI rates in a NICU clinical setting. The study results suggest that with implementation of the closed IV administration set concurrently with additional evidence-based central line infection control interventions, extended periods of zero CLABSIs may be attainable.

P04

EFFECT OF PERIPHERAL INTRAVENOUS CATHETER TYPE AND MATERIAL ON THERAPY FAILURE IN A NEONATAL POPULATION

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Introduction: In neonatal settings vascular access devices are essential for treatment. However, their use is not without risks. The design and materials of peripheral vascular access devices have been evaluated amongst adult populations, but contemporary studies in neonatal settings are scant. This research describes the prevalence of peripheral intra-venous catheter failure related to three different catheter types with the intent to identify modifiable risks that might be used to evaluate device efficacy, innovate neonatal practice, and support future policy developments.
Methods: This was a retrospective observational analysis of routinely collected anonymized intravenous therapy related data. The study was carried out at the tertiary neonatal intensive care unit (112 beds) of the Women's Wellness and Research Center of Hamad Medical Corporation, Doha, Qatar. Neonates who were admitted to the unit requiring intravenous treatment wherefore peripheral intravenous cannulation was indicated, were included in this study.
Results: The use of different type of catheters resulted in significantly less therapy failures as phlebitis and increased dwell time, compared with the control groups. This remains significant after adjusting for age at insertion, gestational age, birth weight and catheter type.
Conclusions: The study's findings are in accord with international literature concerning adult and pediatric patients concerning the superiority of PUR over PTFE catheters with respect to the risk of phlebitis and longer dwell times. However, the risk of failure of therapy did not differ between catheters. This finding is reassuring and supports practitioner judgment when selecting peripheral catheter devices.

P05

TREATMENT OF A NEONATAL PERIPHERAL INTRAVENOUS INFILTRATION/EXTRAVASATION (PIVIE) INJURY WITH HYALURONIDASE: A CASE REPORT

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Introduction: Intravenous therapy-related injury, its prevention, and treatment are ubiquitous topics of interest among neonatal clinicians and practitioners. This is due to the economic costs, reputational censure, and patents' wellbeing concerns coupled with the possibility of potentially avoidable serious and life-long harm occurring in this vulnerable patient population.
Case description: A term infant receiving a hypertonic dextrose infusion for the management of hypoglycemia developed a fulminating extravasation shortly after commencement of the infusion. This complication developed without notification of infusion pump pressure changes pertaining to a change in blood vessel compliance or early warning of infiltration by the optical sensor site monitoring technology (ivWatch®) in use. The injury was extensive and treated with a hyaluronidase/saline mix subcutaneously injected into the extravasation site using established techniques. Over a period of 2 weeks, the initially deep wound healed successfully without further incident, and the infant was discharged home without evident cosmetic scarring or functional effects.
Conclusion: This article reports on a case of a term baby who postroutine insertion of a peripherally intravenous catheter showed an extreme reaction to extravasation of the administered intravenous fluids. We discuss the condition, our successful management with hyaluronidase, and the need to remain observationally vigilant of intravenous infusions despite the advances in infusion monitoring technology.

P06

PERIPHERALLY INSERTED CENTRAL CATHETERS: EVALUATION OF DILUTED LIPID EMULSION AS LUBRICANT FOR IMPROVED GUIDEWIRE REMOVAL IN A NEONATAL POPULATION

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Introduction: Medical management of neonates is often predicated upon safe and reliable vascular access which

may be related to physiological monitoring, medical treatment, supportive therapy and diagnostic or procedural purposes. For this, peripherally inserted central catheters (PICCs) are deemed safe to provide vascular access and infusion related therapy in the neonatal intensive care setting. PICCs are associated with a reduced incidence of complications compared to short peripheral catheters. Despite a reduced complication rate, the impact for the patient has to be considered severe. Difficult guidewire removal during the insertion procedure is known to cause catheter damage, resulting in leakage or breakage of the catheter itself.

Methods: This was a retrospective observational study and performed on the Neonatal Intensive Care Unit (NICU) of the Women's Wellness and Research Centre, Hamad Medical Corporation, Qatar. The single site studyincluded 507 neonates who required intravenous therapy. The aim of this study was to assess and compare the incidence of therapy failure related to the use of preflush fluids (normal saline or diluted lipid solution) used before PICC guidewire removal.

Results: The results show that the use of a diluted lipid preflush resulted in significantly less therapy failures, compared with the control group. This remains significant after adjusting for day of insertion, gestational age, birth weight and catheter type.

Conclusion: This study is the first of its kind ever published in international literature andsupports the enhancement of guidewire removal by using a diluted lipid preflush. When the requirement for vascular access is most pertinent, using a diluted lipid preflush is a safe and effective method to remove the guidewire in order to facilitate long-term vascular access amongst the neonatal population.

P07

EVALUATION OF UNMODIFIABLE AND POTENTIALLY MODIFIABLE FACTORS AFFECTING PERIPHERAL INTRAVENOUS DEVICE-RELATEDCOMPLICATIONS IN NEONATES: A RETROSPECTIVE OBSERVATIONAL STUDY

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Introduction: Infants in neonatal units benefit from dependable peripheral intravenous access. However, peripheral intravenous access exposes infants to high rates of clinically minor and serious complications. Despite this, little is known about the interplay of risk factors. The aim of this study was to assess the incidence and evaluate the interactions of risk factors on the occurrence of peripheral intravenous complications in a neonatal population.

Methods: This was a retrospective observational study, performed on the Neonatal Intensive Care Unit (NICU) of the Women's Wellness and Research Centre, Hamad Medical Corporation, Qatar as a single site study. This study included 12978 neonates who required intravenous therapy. The main outcome was the occurrence of any peripheral intravenous cannulation failure, leading to unplanned removal of the device before completion of the intended intravenous therapy.

Results: A mean dwell time of 36 ±28 hours was recorded in participants with no complications, whereas the mean dwell time was 31 ±23 hours in participants with an indication for premature removal of the peripheral intravenous catheter ($P<0.001$, $t=11.35$). Unplanned removal occurred in 59% of cases, the overall complication rate was 18 per 1000 catheter days. Unmodifiable factors affecting peripheral intravenous catheter dwell time include lower birth (odds ratio =0.23, 0.20 to 0.28, $P<0.001$) and current body weight (odds ratio =1.06, 1.03 to 1.10, $P=0.018$). Cannulation site (odds ratio =1.23, 1.16 to 1.30, $P<0.001$), the inserted device (odds ratio =0.89, 0.84 to 0.94, $P<0.001$) and the indication for intravenous treatment (odds ratio =0.76, 0.73 to 0.79, $P<0.001$) were modifiable factors.

Conclusions: Most infants experienced a vascular access related complication. Given the high complication rate, peripheral intravenous catheters should be used judiciously, and thought given prior to their use as to whether alternate means of intravenous access might be more appropriate.

P08

PERSISTENT LEFT SUPERIOR VENA CAVA AND THE CORRECT ANATOMICAL INTERPRETATION OF A PERIPHERALLY INSERTED CENTRAL CATHETER TIP POSITION: A CASE REPORT

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Introduction: This article reports on a case of a preterm baby who post routine insertion of a peripherally inserted central catheter (PICC) showed an unusual catheter route and tip placement revealing an unsuspected cardiac variant of persistent left superior vena cava (PLSVC). We discuss the condition our management and its effects on vascular access in this unusual case.

Key points: (1) Persistent left superior vena cava (PLSVC) is a rare cardiac venous anatomical variant that is usually encountered by chance. (2) Examination of peripherally inserted central catheter (PICC) tip position and its vascular route remain the cornerstones of confirmation of correct PICC placement; this interpretation can be complicated by uncommon venous anatomical presentations. (3) Practitioners should be cognisant of unusual anatomical

variations in venous architecture which can complicate PICC placement and tip position interpretation.

P09

ASSESS BETTER BEFORE ACCESS, THE ABBA STUDY FOR PERIPHERAL AND CENTRAL VASCULAR ACCESS IN A NEONATAL POPULATION

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Introduction: Recent evidence from large scale studies in neonatal populations regarding factors influencing vascular access devices is lacking and largely absent. The current study aims to identify and evaluate the relationships between unmodifiable and potentially modifiable factors and Assess the situation and patients Better Before initiating vascular Access (ABBA) resulting in reduced complication rates in the neonatal setting.
Methods: In this retrospective, cross-sectional study, routinely collected anonymized intravenous device is used from January 2019 to July 2020. The outcome of interest was the occurrence of any complication in relation to the use of different type of utilized VAD, consequently leading to therapy failure and the unplanned removal of the device. The study was carried out on the large NICU (112 beds) of the Women's Wellness and Research Centre (WWRC) of Hamad Medical Corporation (HMC), Doha, Qatar.

P10

EFFECT OF A THIN-TIPPED SHORT BEVEL NEEDLE FOR PERIPHERAL INTRAVENOUS ACCESS ON THE COMPRESSIVE DEFORMATION AND DISPLACEMENT OF THE VEIN: A PRECLINICAL STUDY

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Introduction: Peripheral intravenous catheter (PIVC) insertion often fails on the first attempt. Risk factors include small vein size and dehydration, causing vein deformation and displacement due to puncture resistance of the vessel. The authors developed a short, thin-tipped bevel needle and compared its puncture performance with needles of four available PIVCs using an ex vivo model.
Methods: The PIVC with the thin-tipped short bevel needle was compared to four available PIVCs using an ex vivo model which simulated the cephalic vein of the human forearm. The ex vivo model consisted of a porcine shoulder and porcine internal jugular vein, and was used for evaluation of the rate of vein deformation and vessel displacement during needle insertion.
Results: An ex vivo model was created with a vessel diameter of 2.7-3.7 mm and a depth of 2-5 mm. The thin-tipped short bevel PIVC needle was associated with a significantly lower compressive deformation rate and venous displacement compared to the needles of the other four PIVCs.
Conclusion: The thin-tipped short bevel needle induced lower compressive deformation and displacement of the vein than the conventional needles. This needle has the potential to improve the first-attempt success rate of peripheral intravenous catheterization in patients with difficult venous access.

P11

A DECADE OF SECURITY

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A description of a cancer centres experience of using the Securacath; a once only subdermal securement device for all patients having a PICC line inserted for any length of therapy. The Clatterbridge Cancer Centre has used the Securacath since 2012 during which time a reduction in migrated lines has been observed; improved line care has been made possible at the exit site,in addition to the added benefit of improved patient confidence and compliance with their line care. The Securacath was introduced for all patients having a PICC line inserted, from those patients on IV fluids as an inpatient to the outpatient on long term IV chemotherapy regimes. Education and training proved to be the most challenging of the introduction as nurses, patients and other care providers gained an insight to the the new orange contraption. The challenge was heightened by the perception of staff that the device hurts and is impossible to clean, based on assumptions rather than evidence; the love it or hate it concept. As an early adoptor of the device we quickly developed methods for training, dressing management and became adept in giving support from a distance for other colleagues who were unfamiliar with the Orange rebel. In addition to the highlighted patient advantages, the secret benefit has been financial; aiding a reduction in line replacements; less dressing requirements for expensive securement plasters and improved capacity to provide procedures for new patients. Securacath the secret weapon on security.

P12

PLACEMENT OFF-LABEL PERIPHERAL INSERTED CENTRAL CATHETER (PICC) IN UNDERWEIGHT NEONATES. EXPANDING SKILLS OF VASCULAR ACCESS TEAM (VAT) NURSES

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Introduction: Choosing the appropriate vascular access in low-weight infants is a great challenge. When treatment includes TPN, VA optimization involves placing a bilumen catheter. The device available in our environment suitable for both infusion and blood sampling has 2.6F caliber and is designed to be placed in peripheral vein. However, in underweight neonates this device location leads to a high risk of thrombosis. For this reason, our VAT has agreed with the institution and those responsible of the pediatric areas that the placement of these devices should be in the IJV and performed by the VA nursing team. Therefore a clinical protocol has been implemented in those patients. Below we report our experience in those first six cases and seven related implantations.
Method: Retrospective analysis of clinical cases in electronic register and VAT records of CICC's implantation of a catheter designed as PICC in neonatal patients during the last 3 years.
Results: Between January 2019 and October 2021 seven US guided implantations were collected in 6 patients, with the indication of TPN and with basilic veins of size <1.2 mm. All cases were performed with 2.6F bilumen catheter placed in IJV. The implantation was successful in 100% of the cases, with a median of 1 attempt. Discussion and
Conclusions: The placement of the IJV catheter by specialized pediatric trained VA nursing team is a safe option. After the initial cases, the profile of the VA specialized trained nurse for the placement of those devices was defined and an institutional protocol was established to support this procedure.

P13

BEST EVIDENCE FOR PREVENTION AND MANAGEMENT OF CONTRAST EXTRAVASATION ON CT

J. Zhang

Introduction: Although the rate of external leakage in CT inspection is low, once a serious adverse reaction occurs, it can lead to room separation syndrome, severe skin ulceration, and organ damage.

Objective: Through the application of the best evidence of prevention and management of contrast extravasation in CT examination to clinical practice and reduce the incidence of contrast extravasation in patients.
Methods: Evidence was obtained using Evidence-based Nursing，and was implemented in clinical practice after localization, we formulated contrast agent extravasation examination standard during the CT examination, standardize clinical behavior, designed a superficial vein angiographic guard band and a angiographic guard brace, compared the incidence of best evidence application before and after the contrast agent extravasation and judged the effect.
Results: The incidence of contrast extravasation during CT examination was 0.137% in the third quarter of 2020, and decreased to 0.043% in the third quarter of 2021, with statistically significant difference（P=0.005）; Medical staff's classification of blood vessels, analysis of factors related to extravasation of contrast media, prevention and treatment were improved, and the difference was statistically significant.
Conclusion: Evidence-based practice can effectively solve the problems of contrast agent extravasation in CT examination, which can improve the prevention and management level of medical staff, and reduce the incidence of contrast agent extravasation.

P14

VASCULAR ACCESSES USED IN THE ADMINISTRATION OF ANTINEOPLASIC THERAPY IN AN ONCOLOGICAL DAY HOSPITAL

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Introduction: Antineoplasic chemotherapy in intravenous infusion is one of the most common therapeutic modalities in cancer patients. The vast majority of antineoplasic drugs

have an Osmolarity >900 mOsm/l, so its administration must be done through central venous routes. However, the channelling of central routes is limited to patients with difficulty in peripheral venous approach or long-term treatments.

Objective: Describe the vascular accesses used at the University Hospital of La Ribera for the administration of antineoplastic drugs, assess the adequacy of the same and determine if the type of vascular access used varied during the COVID-19 pandemic.

Methodology: A quantitative, observational and analytical cross-sectional study of the vascular accesses used in the administration of antineoplasic therapy in cancer day hospital was carried out. Data collection was carried out through direct observation and consultation of the medical history. The pre-pandemic period was executed from 20 to 21/1/2020(n=125), the pandemic sample from 8 to 12/2/21(n=121).

Results: Although 70% of the drugs administered had the capacity for tissue aggression, the peripheral venous route was established in 69.9% of cases, the forearm being the most frequent anatomical location (n=102) and the peripheral venous catheter the most commonly used device (n=172). The expected duration of treatment was medium-term in 74.8% of patients. The use of central venous routes during the pandemic increased by 30.7%,(p=0.017), being the subcutaneous venous reservoir the one with the highest representation(RVSC 75.5 %, IPCC 24.5 %).

Conclusions: Short peripheral venous catheter was the most used device in the administration of chemotherapy in oncology HDD of the UHLR, even administering drugs with high tissue aggression and establishing a medium duration of treatment, being this an area of improvement in the care of cancer patients. During the pandemic, the use of central routes increased in the administration of antineoplasic treatment on an outpatient basis.

P15

A FULL VASCULAR ACCESS UNIT-ARNAU DE VILANOVA HOSPITAL

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Background: The Vascular Access Unit (VAU) is led by nurses specialized in vascular access. The main unit goal is to guarantee the totally and multidisciplinary coverage to our hospital reference population, as well as providing adequate training for professionals who will have to use and resolute the VADs complications. Being referents and consultants to vascular access in order to preserve the venous capital.

Aim: Assess the UAV's care for patients admitted to the "Arnau de Vilanova" hospital and all the patients that depend on its department from January 2019 to December 2021 - know the number of vascular access devices - Type of VAD - Age, gender - Service that requests it.

Methodology: Retrospective descriptive observational study to describe the work results carried out by our UAV since it was born in 2019 as an independent unit managed by nursing.

Results: A total of 602 DAVs were inserted from August 2019 to August 2021, of which 309 were men and 293 women. The type of VAD were 242 PICCs and 361 Midlines. In the last 5 months of 2019 (August to December), 94 DAV were inserted. In the pandemic year, the VAU was closed during 3 months for space and nursing staff reasons. In this year, 236 DAV were inserted and in the first 8 months of 2021 were inserted 270.

Conclusions: The increasingly frequent use of ultrasound, intracavitary ECG and improved device design allows to get safer and more successful procedures. Many patients currently benefit from early use of short, medium and long-term devices.

P16

VASCULAR ACCESS DEVICES (VAD) AND COVID+19 PATIENS NOT ADMITTED IN THE ICU

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The study of COVID-19 patient's management with vascular access has been very low but a consensus has been reached to improve care in this type of patient. The

importance of care, the proper choice of the vascular access device (DAV), the reduction of adverse effects and the minimization of contagion risks by health personnel are a new axis of study. AIM Highlight the work of the Vascular Access Unit from Arnau de Vilanova Hospital with Covid 19 patients who didn't require admission to the Intensive care Unit.

Methodology: Observational, descriptive and retrospective study by auditing the digitized medical records of 52 patients with medical discharged from the Arnau de Vilanova hospital from March 2019 to December 2021.

Results: The 90% of DAVs were removal at the end of the therapy. In the 100% of the cases the first change dressing was 7 days later the insertion due to the use of cyanoacrylate use at the exit site. The average use was 16 days. 5 devices were remove for malfunction, 12 for exitus and 35 were removed for end of treatment. The average number of days from the time the patient is admitted until the day insertion is requested is 5 days.

Conclusions: The existence of a UAV has meant an increase in patient safety and has allowed to be carried out the therapy for COVID 19 patients who were not included in the ICU The UAV has been able to insert the DAVs at bedside, improving the safety profile of the personnel. The use of new materials such as cyanoacrylate has reduced the workload and the risk of occupational exposure, while also reducing costs.

P17

EFFECT OF A DISINFECTING PORT PROTECTOR ON CENTRAL VENOUS CATHETER ASSOCIATED BLOODSTREAM INFECTION, CLINICAL UTILIZATION, AND COSTS: ANALYSIS OF US PREMIER HEALTHCARE DATABASE

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Introduction: Central venous catheters (CVCs) play a critical role in medical care. These devices, however, can lead to serious complications when bloodstream infections (BSI) occur. Several preventative approaches are available to help lower the risk of infection. This study looked at the impact of using a disinfecting cap on the rate of infection, as well as clinical utilization and costs.

Method: We used the Premier Healthcare Database (Q1 2019 to Q3 2020) and identified 522,863 CVC inpatient cases. Of these, a cohort of 19,435 cases received a disinfecting port protector. We matched this group with a control cohort of CVC cases without a disinfecting port protector recorded in the database who displayed a similar BSI risk profile using propensity score matching. We tested the difference in BSI rates, length of stay, and hospitalization costs between the two cohorts using linear or generalized linear regression models while controlling for additional covariates: number of beds, region, ICU, and method of payment.

Results: The treatment cohort with a disinfecting port protector use recorded had a BSI incidence rate of 0.17% and the control cohort without a disinfecting port protector had a rate of 0.25% with an Odds Ratio=0.55, 95% CI (0.35, 0.88), p=0.01. The treatment cohort also had a shorter hospital stay (1.0 day, p=0.04), and saved about $3,645 per hospitalization with 95% CI ($3,004, $4,286), $p<0.0001$.

Discussion and conclusion: This real-world evidence study indicates that using a disinfecting port protector may help reduce the risk of infectious complications associated with CVCs in an inpatient setting and reduce excessive clinical utilization and costs in the healthcare system. Future research will have a focus on refining BSI related costs and utilization for an economic model to capture possible savings from implementing broadly the use of disinfecting port protectors.

P18

FACE-TO-FACE VS ONLINE TRAINING ON INCATIV'S PROGRAM

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Introducction: During last 12 years, INCATIV Program has been studying vascular accesses quality care and analizing the impact on it after training activities on all hospitals of the region of Valencia. Until 2020, training activities had been face-to-face sessions using different methodologies, but the current pandemic has forced to reinvention, pushing on-line method as a new learning tool. This study aims to determine if the new online training method effect had varied vs classic method and to describe if differences may exist on variables as type of system and used dressing, according to INCATIV bundle.

Methodology: Quantitative observational, analitic and restrospective study with cross-sections. First cross-section (C8: 08-2019) before pandemic was developed after face-to-face training, and second cross-section (C12: 08-2020) during pandemic was developed after on-line training. Items analized were: number of nurses joined to training, type of system and used dressing after training. Data was obtained from INCATIV's platform.
Results: 5448 Nurses were trained during this study, with an increase of 12,27% with on-line training method (Face-to-face n=2546 vs on-line n=2902). 9941 vascular acceses were analized (C8 n=5722/ C12 n=4219). A decreased at using open systems was noted after on-line training (C8 13,75%/ C12 5,54%) ($p<0,001$). In other hand the use of inadequate dressing decreased after face-to-face training (C8 1,15%/ C12 2,42%) ($p<0,001$).
Discussion and conclusion: On-line training is shown as an efficient method in order to transmit knowledge and information to a higher number or nurses. Nevertheless it is on doubt if information transmitted via on-line is succesfully implemented later on real practice.

P19

INSTITUTIONAL INTRODUCTION TO PICC AND MIDLINE

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Introduction: VADs (vascular access devices) as PICC (peripherally inserted central catheter) and midlines are esential in modern medicine. VADs as midline and picc were introduced in our institution (900 beds) in 2018. But until 2021 utilisation was limited. This year (2021) from april to november, we held many educational workshops with live midline/picc insertion (11) and lectures (7) (picture 1). Midline and picc utilisation went up significantly by 1.300%.
Methods: Search in hospital electronic register january 2019 to december 2021 (table 1).
Results: Utilisation of midline and PICC raised in 2021 after education of medical staff 13 times (39 vs. 509 annually) in comparison with same time period in 2020. (table 1) No difference in CICC (centrally inserted central catheter) were observed between 2019 and 2021.
Conclusion: Repeating lectures and workshops especially with live in-hospital insertion of VADs helps in education of personnel and improves utilisation of VADs according to participants feedback. Personnel is more prone to think about VADs before insertion. Proper education raised midline/PICC utilisation and investigators thinks that there is relationship beween lower PVC (peripheral venous cannula) usage in this time period in comparison with year before. (table 2) There is no difference in CICC number of catheters used in year 2019 and 2021, there was drop in 2020 due to covid-19 pandemic.

P20

ANTIMICROBIAL EFFECTIVENESS OF CHLORHEXIDINE-TREATED PERIPHERALLY INSERTED CENTRAL CATHETER AFTER TRIMMING

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Introduction: Peripherally inserted central catheters (PICCs) often get trimmed to achieve patient specific length. Trimming an antimicrobial (AM) catheter leads to a distal tip with exposed surface which may lack antimicrobial protection. The present study compares antimicrobial effectiveness of a Chlorhexidine (CH) treated-PICC with trimmed tip versus intact tip.
Methods: Three samples each of the 4.5Fr non-AM PICC, CH-PICC with intact tip and CH-PICC with trimmed tip were placed in individual 40Fr silicone tubing capped at both ends. One of the caps holding the sample in place allowed the tip end to be exposed to conditioning fluids. Samples were exposed to human serum for pre-conditioning for 30 minutes followed by saline for 30-day soaking at 50 rpm and 37oC. Saline was exchanged 3-times a week. On day 30, saline was replaced with broth containing 10^5 CFU/ml of Methicillin Resistant-Staphylococcus aureus (MRSA), Escherichia coli (EC), or Candida albicans (CA). After 24 hours, adherent organisms were recovered through sonication in neutralizing media which thereafter was serially diluted, filtered, plated on nutrient agar, and incubated for 18-72 hours. Log10 reductions in microbial adherence were based on the initial inoculum concentration.
Results: All three replicates of CH-PICC with trimmed tips maintained similar effectiveness after 30-days as the CH-PICC with intact tips. Average Log10 reduction produced by CH-PICC with trimmed tip and CH-PICC with intact tip against EC were 5.51 and 5.45 respectively; against MRSA were 5.44 and 5.28 respectively; and against CA were 4.84 and 4.68 respectively.
Conclusions: The CH-PICC with trimmed tips maintained AM efficacy for 30-days similar to the CH-PICC with intact tips against all three tested organisms. Therefore, trimming of CH-PICC does not lead to lack of antimicrobial protection at the distal tip with exposed surface and still offer antimicrobial protection against gram-positive and gram-negative bacteria as well as fungal pathogens.

P21

VIRTUAL SEDATIONAS A VALID ALTERNATIVETO PHARMACOLOGICAL SEDATION WHEN PLACING PICCSIN CHILDREN

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Introduction: In pediatric patients, PICC insertion is often performed under sedation to reduce pain and anxiety, which is associated with risks such as laryngospasm, apnea and hypoxia. Furthermore, it requires a pediatric anesthesiologist. We are looking for a valid alternative to pharmacological sedation to reduce those risks and the overall cost.
Methods: We tested a VR immersive experience for ten children requiring a PICC. To achieve this, we runed a software, specifically designed for the pediatric healthcare setting, on a commercially available VR headset. In order to evaluate this new practice, we recorded the following data: • Patient's anxiety before and after the procedure, recorded through a modified numeric rating scale from 0 (no anxiety at all) to 10 (worst anxiety imaginable). • Patient's pain before (e.g. because of preexisting medical conditions) and after the procedure through a Wong-Baker scale. • Caregiver's satisfaction. No kind of active or passive restraint was enforced during the whole procedure, patients had to keep their arms still all by themselves.
Result: Out of the ten patients, only in a single case, we had to interrupt the attempt with the VR technique and let the anesthesiologist perform a sedation. From the immediate beginning said patient had trouble adapting to the virtual environment and tried to remove the headset. In all other cases, we noticed a drop in the anxiety level of the patientand the pain never increased. Globally, caregivers were pleased with the experience and reported an average satisfaction rate of 9.3 out of 10.
Conclusion: Virtual reality seems a valid alternative to traditional sedation in pediatric patients undergoing a PICC placement procedure.Additional studies on larger pools of patients are necessary to assess the benefit from this new approach, as well as its impact on the overall procedure length.

P22

A RETROSPECTIVE DATA ANALYSIS IN A GENERAL ICU POPULATION: ACUTE DIALYSIS CATHETER TYPE AND DIALYSIS EFFICIENCY

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Introduction: Acute kidney injury in intensive care units (ICUs) is often treated with Continuous Renal Replacement Therapy (CRRT). Longer and uninterrupted CRRT sessions benefit patients, providers, and institutions. The impact of acute dialysis catheters on CRRT efficiency has only been evaluated in limited, single-centered Australian studies. This multicenter retrospective analysis examines associations between catheter type and multiple CRRT efficiency-related outcomes in a general ICU population.
Method: CRRT session data from April 2018-July 2020 in two US ICUs were analyzed. Both units replaced three different acute dialysis catheters with a single new catheter in May 2019. Study intervals were divided into pre-/post-change periods, excluding a transition period (April-June 2019). To evaluate the pandemic's effects, the post-change period was further divided into pre-COVID/COVID periods. Outcome measures included treatment stoppage type (elective/non-elective), circuit life, blood flow rate, and frequency of all/vascular access (VA)-related alarm interruptions.
Results: In total, 1,1037 CRRT sessions were analyzed. Compared to pre-change sessions (n=530), post-change period (n=507) had a reduced proportion of unintended stoppages (adjusted OR=0.42, 95% CI 0.28-0.62, $p<0.001$), longer circuit life (adjusted OR=1.31, 95% CI 1.14-1.49, $p<0.001$), increased blood flow rate (adjusted OR=1.03, 95% CI 1.01-1.05, $p<0.01$), and fewer VA-related interruptions (adjusted OR=0.80, 95% CI 0.66-0.96, p=0.014) and all interruptions (adjusted OR=0.95, 95% CI 0.87-1.05, p=0.31). Sessions during (n=340) and before (n=167) the pandemic were statistically similar except for a decreased proportion of unintended stoppages (adjusted OR=0.39, 95% CI 0.22-0.70, $p<0.01$).
Discussion and conclusion: Adopting a different dialysis catheter was associated with longer CRRT sessions with fewer interruptions in the critically ill. Although the efficiency metrics were largely similar before and during the COVID19 pandemic, a notable increase in session volume was observed during the pandemic months. Future studies are warranted to evaluate the clinical impacts of CRRT efficiency and different catheter designs on patients and providers.

P23

LONG-LENGTH PERIPHERAL CANNULAS IN SICKLE CELL TREATMENT: A MORE EFFICIENT AND COST-EFFECTIVE CARE PATHWAY

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Sickle cell (SCD) is a hugely debilitating disease resulting in a range of acute and chronic complications. Sadly, as patients with this disease age, the effects of prolonged

haemolytic anaemia often lead to more severe comorbidities. As a result of such complications, SCD patients are routinely hospitalised, requiring frequent venous access for treatments. This, over time, causes damage to their vessel health, resulting in many SCD patients being classed as having difficult intravenous access (DIVA). In DIVA patients the use of peripheral cannulas (PIVC) often results in unacceptably high failure rates and multiple, painful, insertion attempts. This can result in the need to insert femoral lines into SCD DIVA patients to ensure they receive their planned, essential, treatment. However, femoral line insertion has its own challenges. These include increased complication risks for patients and also an increase in staffing and equipment requirements. Once the femoral vein develops scar tissue this procedure becomes more complex and can require theatre admission, which can at best require more time and staffing and at worst delay critical treatment. Homerton hospital cares for a large number of the UK's SCD patients who often have to complete exchange transfusion therapy once every 4-8 weeks. To overcome the challenges of DIVA patients and femoral line insertion a new pathway of care has been developed. This pathway incorporates the insertion of two long-length PIVC, Introcan Safety Deep Access (64mm), under ultrasound guidance. Here we report that the new long-length PIVC pathway requires less equipment and costs £18 per exchange transfusion, whilst inserting a femoral line costs £80. Additionally, the new pathway requires less staff and substantially removes the risk of escalation to theatres. Importantly, patient feedback reveals that long-length PIVCs are preferred over femoral lines, causing less pain and anxiety for the patient.

P24

EXTRAVASATION OF CYTOTOXIC DRUGS COMPLEX CARE - THE CZECH REPUBLIC NATIONAL RECOMMENDATIONS FOR MANAGEMENT, INSTRUCTIONS FLOW-CHART CARD AND FIRST AID KIT BOX

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Introduction: Extravasation of cytotoxic drugs is severe complication. Although general recommendations and guidelines for the use of optimal venous access are available to reduce the risk of this condition, these complications still occur worldwide. Some rare cases of extravasation were described even the central venous access was provided. Some differences in problem-solving approaches are present among institutions.
Method: As initiated by the Supportive Care Group of the Czech Society for Oncology, cytotoxic drug extravasation local guidelines were obtained from 11 (out of 27) oncology and haemato-oncology centres in the Czech Republic. We reviewed and compared them to guidelines of the European Society of Medical Oncology. A card with flow-chart diagram with instructions was created and distributed to chemotherapy administration sites in the country. A first aid kit with defined content was designed to be used.
Results: Optimal indication and the type of venous access, bundle of care compliance and patient education are necessary issues in prevention of extravasation. 99% dimethyl sulfoxide (DMSO 99%) is recommended for topical application after extravasation of anthracyclines, mitomycin C and cisplatin, dry cold should be applied. Dry heat is to be applied in oxaliplatin, taxanes and vinca-alkaloids. Hyaluronidase injected around the affected area is recommended in the case of extravasation of taxanes and vinca-alkaloids. Dexrazoxane can be used when dealing with extravasation of anthracyclines. The first aid kit includes: instruction card, sterile gloves, gauze, syringes and needles, dry heat or cold bags, antidotes (DMSO 99%, hyaluronidase, dexrazoxane).
Discussion and conclusion: National consensus on chemotherapy extravasation management has been reached in Czech Republic, flow-chart card with instructions distributed and first aid kit designed to help reduce risk of mistakes and delays. We emphasize that the prevention of these complications by using suitable venous access and optimal nursing are crucial!

P25

LONGER LENGTH PERIPHERAL CANNULAS IN SICKLE CELL TREATMENT: A MORE EFFICIENT AND COST-EFFECTIVE CARE PATHWAY

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Sickle cell disease (SCD) is hugely debilitating and patients are routinely hospitalised, requiring frequent venous access. This, over time, causes damage to their vessel health; consequentially many SCD patients are classed as having difficult intravenous access (DIVA). In DIVA patients the use of peripheral cannulas (PIVCs) often results in unacceptably high failure rates and multiple, painful, insertion attempts. This can result in the need to insert femoral lines into SCD DIVA patients to ensure they receive their planned, essential, treatment. However, femoral lines have their own challenges, including increased

complication risks for patients, and increasing staffing and equipment needs. Once the femoral site develops scar tissue this procedure becomes more complex and can require theatre admission, which can at best require more time and staffing and at worst delay critical treatment. Homerton Hospital cares for a large number of SCD patients who often must complete exchange transfusion therapy every 4-8 weeks. Previously, many of these patients received femoral lines for exchange transfusions. To overcome the challenges with femoral lines, in June 2020 a new pathway was introduced for all SCD patients, using two longer-length PIVCs (Introcan Safety Deep Access, 64mm) under ultrasound guidance. An observational audit was conducted on the impact of the introduction of the new pathway. Results revealed, the new pathway reduced equipment and staffing costs (£18 versus £80, and £33 versus £117 respectively) due to a 30 minute saving and one less nurse per procedure. Overall, the new pathway resulted in a saving of £147 per procedure: an annual saving of £1279 per patient. Additionally, the new pathway removes the risk of escalation to theatres. Importantly, patient feedback revealed that longer-length PIVCs are preferred over femoral lines, causing less pain and anxiety. We are now exploring the potential of this pathway for other treatments involving DIVA patients.

P26

THE MANAGEMENT OF PERSISTENT WITHDRAWAL OCCLUSION IN VENOUS PORTS – ONE-YEAR PROSPECTIVE SURVEY IN ONCOLOGY PATIENTS

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Introduction: In our prospective survey, we have focused on persistent withdrawal occlusions (PWO) in venous ports. After eliminating the mechanical cause of occlusion, the most common reasons for difficult wihdrawal are obliteration of the catheter or the presence of fibroblastic sleeve (FS).
Method: During a one-year period, 66 cases of PWO were reffered. We have collected these data - gender, age, diagnosis, ongoing treatment, the type and the site of the vein inserted. We have recorded when the PWO was first detected. All the patients underwent fluoroscopy and the administration of contrast medium if needed. In the case of the fibroblastic sleeve, mechanical desobliteration using a flush with smaller syringe was used first. If unsuccessful, the thrombolysis was performed.
Results: The FS was responsible for PWO in most cases. The average length of the FS was 6,16 cm (1-14 cm). The average period of malfunction detected was 63 weeks after insertion. Only one third of patients was sent to resolve the withdrawal impossibility in the same day of detection, more than one half of cases were sent in an average period of 10 weeks. However, there was a 98% success rate (in 64% with using mechanical disruption of the FS only, in 34% the pattency was resolved when the thrombolytic agent was added).
Discussion and conclusion: All ports were implanted under real time ultrasound navigation, fluoroscopy or I-ECG was used for real time tip location. We have not found the clear evidence for the FS creation, this is to be discussed in our presentation. Well, this phenomenon should be in the center of attention while the suspicion of incorrect administration of drugs with higher risk of complications exist in case the FS is present.

P27

EFFECT OF A TRANSPARENT FILM DRESSING WITH A CHLORHEXIDINE GLUCONATE GEL PAD ON CENTRAL VENOUS CATHETER ASSOCIATED BLOODSTREAM INFECTION, CLINICAL UTILIZATION, AND COSTS: ANALYSIS OF US PREMIER HEALTHCARE DATABASE

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Introduction: Central venous catheters (CVCs) are critical in medical care. However, they can lead to serious complications when bloodstream infections (BSI) occur. Preventative approaches are available to lower the risk of BSI. This study compared the use of a transparent film dressing with an integrated chlorhexidine gluconate (CHG) gel pad versus another CHG containing device on the rate of infection, contact dermatitis, clinical utilization, and hospitalization costs.
Method: We used the Premier Healthcare Database (Q1 2019 to Q3 2020) and identified 522,863 CVC inpatient cases. Of these, a cohort of 17,162 cases received a transparent film dressing with a CHG gel pad. We matched this group with a control cohort of CVC cases in which patients received an alternative CHG containing device and displayed a similar BSI risk profile using propensity score matching. We tested the difference in BSI rates, contact dermatitis rates, length of stay, and hospitalization costs between the two cohorts using linear or generalized linear regression models while controlling for additional covariates: number of beds, region, ICU, method of payment, and history of atopic dermatitis.
Results: The treatment cohort with a CHG gel pad dressing recorded had a BSI incidence rate of 0.87% and the comparator cohort had a rate of 1.60% with an Odds Ratio=0.46, 95% CI (0.37, 0.58), $p<0.0001$). The

treatment cohort also had a shorter hospital stay (1.1 days, $p<0.0001$), and saved about $5,337 per hospitalization with 95% CI ($3,878, $6,796), $p<0.0001$. There was no difference in contact dermatitis, $p=0.89$.

Discussion and conclusion: This real-world evidence study indicates that using a CHG gel pad dressing may be a more effective intervention than an alternative CHG device to help reduce BSI in an inpatient setting. The difference in efficacy may be due to the method of application and compliance and deserves to be further investigated.

P28

IV PASSPORTS: A MULTI – GEOGRAPHICAL/DISCIPLINARY COLLABORATIVE FOR CLEAR COMMUNICATION AND IMPROVEMENT OF PATIENT OUTCOMES

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Introduction: In today's climate, vascular access and therapy spans the whole health economy. In the UK, patients with vascular access devices (VADs) frequently move between primary and secondary care highlighting the need for clear communication between different sectors of the health economy to optimise patient experience and outcomes. IV passports already exist, predominantly where there are established IV teams. However, there is a need for the introduction of a standardised document which can be used and understood by all sectors.

Method: Led by the Infection Prevention Society (IPS), a multi- geographical/disciplinary group was established to develop the passport. The aim for the group was to produce a patient held document to aid communications between all healthcare personnel who care for a patient with a line; for the document to be a standard for line information, communication and on-going care; to assist patient engagement and promote patient centred care. The resulting passport was trialled in 2 hospitals. The trial ran for 8 weeks, and was evaluated using pre and post questionnaires.

Results: Phase 1 Evaluation found that 74% of staff had not used an IV passport before when questioned before the passport was trialled. However, following the trial 92% of staff reported in the post questionnaire that they had found the passport provided them with the information they required.

Discussion and conclusion: There is a great need for an improvement in communication between healthcare professionals. The IV passport will assist in patients being able to take an active role in their treatment. A further, more extensive evaluation (Phase 2) is now underway and the results of this evaluation will be available at the end of February, with a full launch of the passport in spring 2022.

P29

UPDATE OF THE PROTOCOL OF ANTICOAGULANT AND ANTIAGGREGANT MEDICATIONS TO BE FOLLOWED PRIOR TO THE INSERTION OF CATHETERS

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Introduction: In the last few years, the number of anticoagulant and antiaggregant patients has grown significantly. It is estimated that more than 800.000 patients are anticoagulated in Spain. Considering it is a chronic treatment, the patients will likely need a surgical or interventional procedure (PICC/midline) throughout their lives that will require the interruption of the aforementioned medication. The implementation of PICC/Midline is considered a low bleeding risk procedure (those where the hemostasis can be executed properly. A possible bleeding is not a threatening risk, neither does it compromise the result of the procedure and does not require transfusion). Following the case of an anticoagulated patient (analytics with correct hemostasis values) that showed a hemorrhagic complication in the form of a big hematoma, brought the ETI (Intravenous Therapy Team) to check the management of the antithrombotic and anticoagulant medications. In this way, in 2019, a protocol where the ETI previously valued the insertion of the catheter was designed. In 2021, a revision of that protocol has been carried out.

Objectives: Providing ETI the necessary tools for the secure implementation of PICC/Midline to patients on antithrombotic treatment. Reduce the hemorrhagic risk.

Material and method: Continuous review of scientific literature in databases, manuals and consensus documents of scientific societies. Consensus with the Haematology and Anesthesiology teams of our hospital on the elaboration of the protocol.

Results: Elaboration of a recommendations' guideline on the management of anticoagulant and antiaggregant medications in the implementation of PICC/midline, as no solid scientific evidence has been found to help in the decision-making in this regard.

Conclusions: The elaboration of this guide provides security to the ETI during the PICC/Midline implementation in addition to reducing the possible potential bleeding risks. Seeing the scarce scientific evidence, it would be interesting to carry out a study focusing on this issue.

P30

UNCOMMON USE OF PICC AS AN ATRIAL PART OF THE VENTRICULO-ATRIAL SHUNT IN CHILDREN

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Introduction: In paediatric patients, ventriculo-atrial shunt (VAS) is usually implanted as a second-line option for patients with shunt-dependent hydrocephalus, when the ventriculo-peritoneal shunt (VPS) is not an option. VAS in children often (30-94%) required tube revision procedures due to the numerous complications (distal obstruction, thrombosis, infection, patient overgrowing . . .).
Method: Our approach was using 5 Fr power injectable PICC as a distal part of the V-P shunt. To minimize vessel damage we used standard US-guided IVJ puncture technique with micro-puncture set and 5,5 Fr peelable sheath introducer. The optimal depth of the atrial catheter was confirmed by IC-ECG guidance.
Results: We installed 4 VAS in patients, who has had previous VPS dysfunction or infection. Their ages ranged from 3 months to 3 years. In our group, there were 2 VAS infections that resulted in shunt extraction and temporary EVD insertion. A new VAS was installed in the 1-st case. In the 2-nd case, there was VPS installed instead, because of the intra-abdominal space improvement. The malfunction of atrial shunt caused by fibroblastic sleeve was observed in the 3-rd case. It was solved by the exchange of the atrial part with no further complications. In the 4-th case, VAS worked without any complications.
Discussion and conclusion: Original catheter for VAS is risky for thrombotic complications in small children due to his size. Off-label use of PICC as a distal part of V-A shunt may lead to a lower rate of thrombotic complication, due to its lower diameter, using of micro-puncture technique for insertion and using of smaller diameter peelable sheath introducer compared to standard sheath and introducer. IC-ECG helps to insert the tip of the atrial part of the shunt to the right position more precisely compared to fluoroscopy.

P31

EVALUATION OF ELASTOMERIC PUMPS PERFORMANCE

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Introduction: Elastomeric pumps (EP) are medical devices (MD) allowing the infusion of drugs often by home care. The accuracy of the administered flows and volumes can be evaluated in accordance with standard NF-EN-ISO-28620. However, this evaluation method does not make it possible to assess these MD actual conditions of use. Given that it is essential to ensure optimal infusion (Guiffant Gerard et al. 2011), our goal is to develop a test bench with conditions close to the patient's home.
Methods: A test bench was set up to evaluate the infusion by varying the model of EP, the filling volume and the solution infused. Instantaneous and average mass flowrates over the total infusion time were determined from the reservoir mass loss (precision balance XS1203S, Mettler Toledo). These values were compared with the nominal flowrates announced by the manufacturers to evaluate the performance of EP under the different conditions. Two types of EP were used under the conditions of the standard (reference), with minimum filling volumes and then with Tazocilline (piperacillin/tazobactam 80/10 mg/mL). The method reliability was determined by calculating the ratio between the delivered product mass and the sum of the instantaneous mass losses measured throughout the infusion.
Results: Results show that this new evaluation method is more than 96% reliable. Deviation rates of measured mean flowrate compared to the nominal flowrate for the three conditions are shown in Table and Figure attached.
Conclusion: The test bench highlights differences in performance. The graphic analysis of instantaneous flowrates shows that less time is spent in the nominal flowrate zone when conditions are not standard. These first results suggest that several questions can be raised about therapeutic education, the course of care for treatment administration or even MD choice. These questions should be brought to all stakeholders interested in the potential clinical impact.

P32

PREFERENCES FOR POWERED INTRAOSSEOUS ACCESS SYSTEMS AND FEATURES THAT ENHANCE SAFETY, RELIABILITY, AND EASE-OF-USE: RESULTS FROM TWO STUDIES INVOLVING EMERGENCY MEDICAL PROVIDERS

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Introduction: Battery-powered intraosseous (IO) systems offer utility for emergent situations but have received little innovation since their introduction. Here we report provider preferences and satisfaction rankings for the most commonly used (traditional) powered IO system, and a novel powered IO system featuring innovative design elements, including a passive safety needle, snap-securement/skin attachment, and a multi-light battery life indicator.

Method: Two studies were completed using the novel and traditional IO systems. Study One evaluated user preferences for each IO system among emergency department (ED) physicians, and a follow-up study (Study Two) captured satisfaction rankings from various emergency medical services (EMS) providers. In both studies, participants completed an IO-simulation with each system and a post-simulation questionnaire featuring multiple choice and free-text answer preference questions or 11-point Likert-like satisfaction ranking questions. Statistical significances were evaluated using a two-sided Z test or a Wilcoxon signed rank-sum test.
Results: Twenty of the 22 ED physicians in Study One preferred the novel IO system (91.0%, p=0.0001) and cited the system's passive safety needle and snap-securement/skin attachment as top rationales. The majority of ED physicians also preferred the novel IO system's powered driver (92.2%), IO needle with passive safety (81.8%), and snap-securement/skin attachment (77.3%). In Study Two, 42 EMS providers provided significantly higher satisfaction ratings for the novel IO system, including the system overall ($p<0.001$), IO needle safety ($p<0.001$), battery life indicator ($p<0.001$), securement/skin attachment ($p<0.001$), and ease-of-use ($p<0.001$).
Discussion and conclusion: Our findings illustrate that ED physicians prefer a novel IO system with enhanced safety and ease-of-use, and EMS providers are more satisfied with a novel IO system featuring a passive safety needle, multi-light battery life indicator, and snap-securement/skin attachment. Collectively, these results highlight the importance of ease-of-use and safety in powered IO systems and the value of clinician input when evaluating novel medical equipment.

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VORTEX PORTS FOR RED CELL EXCHANGE IN CHILDREN WITH SICKLE CELL DISEASE

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Introduction: Automated red cell exchange (RCEX) for sickle cell disease (SCD) has advantages over manual red cell exchange: it reduces % HbS faster, limits iron accumulation and its effectiveness allows up to 6-weekly transfusion intervals. However, the requirement for repeated venous access can be problematic in the paediatric population. Often peripheral flow rates are not sufficient for blood draw despite being adequate for return. In children with difficult access, we inserted single and double lumen Vortex® ports (AngioDynamics, USA) for chronic automated RCEX.
Method: Retrospective review of operative notes, electronic patient records and NHS Blood Transfusion procedure records at Royal Manchester Children's Hospital. Patients were followed from 1 to 16 exchange procedures over 5 to 22 months performed between 2019 to 2021.
Results: A total of 8 patients with SCD underwent 108 RCEX procedures. The number of single verses double port insertion was evenly split. The mean age of child was 14.7 (range: 9 to 18 years). Of the 8 children, 6 still have devices in situ with a mean dwell time of 21.4 months (range: 17 to 26 months). Only one was removed secondary to occlusion and this patient subsequently required an external double lumen central venous catheter to facilitate bone marrow transplant. The infection rate was 0%. Four procedures were abandoned secondary to pyrexia, low HBs levels and an inability to gain peripheral access.
Discussion and conclusion: Single and double lumen Vortex ports are an effective and viable option for children with SCD undergoing chronic RCEX. These devices are aesthetically more favourable and pose less restriction on bathing and swimming when compared to tunnelled central venous catheters. Our experience suggests that they have low complication rates and are an effective method for RCEX in children.

P34

THE MIDLCLAVICULAR CATHETER: A CLINICAL AUDIT

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Backgroud: Vascular access devices (VAD) are usually divided into two categories: peripheral venous catheters (PVC) and central venous access devices (CVAD). These categories broadly determine where the tips of these devices terminate. Typically, peripheral catheters do not enter the chest and terminate prior to the axillary line (Gorski et al., 2021). Whereas the tips of a CVAD enters the larger central veins of the body, namely the lower superior vena cava (SVC), upper right atrium (RA) or the inferior vena cava (IVC) (Hill, 2019). Globally, controversy and variations exist around the optimal tip positioning of VADS. The midline catheter is a peripheral venous access device and according to most guidance, the tips of these devices should terminate before the level of the axilla (Gorski, 2021). Recently, an alternative tip position for the midline catheter has been described by Pittiruti (2021). This position is within the midclavicular area. A device terminating in this region is called a midclavicular catheter (MC).A clinical practice audit was performed by the author.
Aim: The audit aim was to study the performance of the MC device and to add to the limited body of evidence around this device positioning.

Methodology: From September 2020 to August 2021, 243 polyurethane midline catheters were inserted in paediatric and adult patients with a range of ages and genders and conditions. A modified seldinger technique was used.
Findings: Early audit findings suggest that the MC device is a realiable and safe device for peripherally compatible drugs as the majority of these devices have dwelled for the length of treatment (full data will be available soon).

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IMPLEMENTATION OF VASCULAR ACCESS EQUIPMENT FROM THE INTESIVE CARE UNIT FOR THE ENTIRE HOSPITAL

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Introducction: There is a significant growth in the use of Peripherally Inserted Central Line Catheters (PICCs) as there is an increasing concern for increasing patient safety. This increase and the hospital´s growing concern for improving standards of care quality an patient safety ha led to the creation of a vascular insertion and access team. Until October 2021, the nursing professionals of the intensive care unit of the Hospital Clínico Universitario Virgen de la Arrixaca channelled the requests for central access from the rest of the hospital an these catheters were not subsequently monitored. Therefore, in October 2021, an insertion and vascular access team was creatid which, being attache to the intensive care unit, is solely dedicated to the insertion, care and control of the aforementioned devices.
Objectives: To present the implementation of the vascular insertation and access equipment in the intensive care unit of the Hospital Clínico Universitario Virgen de la Arrixaca ant its results to date.
Material and method: A description of the team´s implementation trajectory and results from 1 Octobre to 15 December 2021 is presented.
Results: On 1 October 2021, the team of two advanced practice nurses and one auxiliary nursing care technician becam operational, and since then 151 PICCs (16 for home hospitalisation) and 27 middle lines have been implemented.
Discussion and conclusions: It has been possible to provide quality insertation and exquisite care in the use of these devides, increasing patient and staff satisfaction. The need to train professionals in the implantation and care of these devices and the inclusion of vascular access equipment in organisations has been highlighted.

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DWELL TIME AND CAUSES OF REMOVAL RELATED TO MINI-MIDLINE AND MIDLINE CATHETERS IN HOSPITALIZED COVID-19 VERSUS NON-COVID-19 PATIENTS

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Objective: Describe and compare dwell time and the causes of removal of midline and mini-midline catheters in two cohorts: COVID-19 and non-COVID-19 patients.
Method: Observational, retrospective and cohort study conducted in the Vall d'Hebron University Hospital in Barcelona, consulting the medical records of patients from March 1 to May 15, 2020 by the venous access nursing team.
Results: 344 Catheters were inserted in 305 patients. In the Covid-19 cohort there were 88 patients and 96 catheters were placed, of which 84 were mini-midline and 12 midline. In the non-Covid-19 cohort, 248 catheters were placed in 217 patients, of which 217 were mini-midline and 31 midline.The mean duration of catheters inserted in the Covid-19 patient cohort was 12 days for mini-midline and midline and 11 days for mini-midline and 12 days for midline in the non-covid group. The main cause of removal in both groups was the end of treatment, significantly higher in non-Covid-19 patients. The second was decease in the Covid patient cohort and catheter occlusion in the non-Covid group, both with a statistically significant difference.
Conclusions: Correct maintenance and care with adequate nursing staff rates might be keys to better preserve midline and mini-midline despite patient related characteristics.
Keywords: Venous catheter related complications; COVID-19; midline catheter; mini-midline catheter; vascular access.

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COMPARISON OF CLABSI RATES OF HOSPITALS USING CLAVE AND COMPARISON HOSPITALS WITH NON-CLAVE NEEDLELESS CONNECTORS UTILIZING CENTERS FOR MEDICARE AND MEDICAID SERVICES AND CLIENT DATABASES

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Introduction: Needleless connectors (NC), while protective against needlestick injury, have long been implicated as a potential risk for central line-associated bloodstream

infections (CLABSI). In some reports, NCs have shown risk reduction of CLABSI events but, these studies are limited to facility/regional scope and without accounting for variations in infection control practices. Debate regarding the selection of a NC with the least risk for CLABSI continues. This evaluation analyzed a national-level repository of publicly reported CLABSI data to determine if hospitals utilizing Clave NCs resulted in decreased relative risk (RR) of CLABSI compared to hospitals utilizing non-Clave NCs.

Method: The Healthcare-Associated Infections national data was accessed via the Centers for Medicare and Medicaid Services database for full-year 2019. This data set was merged with Clave NC client database during 2019 to identify hospitals using the study Clave NC (Clave, MicroClave, NanoClave, Neutron) group versus the group not using Clave NCs (comparators). Two sub-groups of Clave NCs were analyzed: (1) Clave customer and (2) Clave high-volume customer. The RR was determined for each study group, adjusting for care locations, and hospital demographics.

Results: Both Clave user groups showed statistically significant lower RR compared to the comparison NC group. For the Clave customers, the RR of CLABSI was 0.93, signifying a 7% decreased CLABSI rate (p=0.04) and for Clave high volume customers, the RR of CLABSI was 0.81 (p=0.04), representing a 19% decrease in CLABSI rate.

Discussion and conclusion: Implementation of the Clave NC technologies may offer an opportunity to realize a significant decrease in the RR of CLABSI, which may translate into decreased incidence of CLABSI, morbidity and mortality, and related costs. While CLABSI prevention requires a combination of evidenced-based strategies, this data demonstrates that the use of the Clave NCs, in and of itself, is a critical component of CLABSI prevention.

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MISPLACEMENT OF CENTRAL VENOUS CATHETER INTO INTERNAL JUGULAR VEIN THROUGH AXILLARY AND SUBCLAVIAN CANNULATION: HOW CAN HEAD ROTATION AND ARM ELEVATION HELP?

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Introduction: Axillary dan subclavian approaches remain as some alternatives for central venous catheter (CVC) placement. According to our previous study, those approaches had higher tendency for internal jugular vein (IJV) misplacement. Many have proposed techniques to reduce the risk and amend this misplacement. This study aimed to determine the efficacy of head rotation and arm elevation to correct CVC misplacement to IJV.

Methods: This was a retrospective study conducted at Critical Care Unit in Premier Bintaro Hospital, Indonesia. The data were collected from the electronic medical record from January 2020 to October 2021. The inclusion criteria were adult patients, age 18 years old and above, had CVC inserted through axillary vein or subclavian vein, and experienced catheter misplacement to IJV which was visualized by neck ultrasound. When misplacement was found, head rotation and arm elevation were performed to fix this issue. Procedure evaluation through ultrasound and chest x-ray were also recorded to determine the success of this maneuver.

Results: A total of 22 catheter misplacement cases were recorded during the period. Following head rotation and arm elevation maneuver, there were 15 successful cases (68.2%) with no visible wire or catheter on neck ultrasound or chest x-ray afterwards. Conclusion Head rotation and arm elevation maneuver had successfully corrected more than half of CVC misplacement with axillary and subclavian approaches.

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VASCULAR ACCESS AND COVID-19 PANDEMIC IN A QUALITY PROGRAM FOR INTRAVENOUS THERAPY IN SPAIN (INCATIV)

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Introduction: INCATIV is a research program carried out by nurses on 34 hospitals of the Region of Valencia (Spain). This program measures vascular access quality on patients of these hospitals via cross-sections. The objective of the

study is to evaluate the influence of COVID-19 pandemic in the registers of the vascular accesses' quality program.
Methods: Quantitative observational, analytical, and retrospective study of two cross-sections. First cross-section was developed before pandemic (C10: 02-2020) and second cross-section during pandemic (C11: 05-2020). Data was obtained from INCATIV's platform.
Results: Among 34 participant hospitals in INCATIV Program, there was a 100% of participation at C10, collecting 7647 registers of all hospital units included at the program. 4820 vascular accesses were evaluated. Only a 1.22% of them presented signs of phlebitis. 92% of the vascular accesses had the right dressing. At C11, there was a 50% of participation. 3234 registers were collected. Phlebitis rate remains at 1.15%. The use of correct dressing reached at 92% too.
Discussion and conclusion: Data indicate a strong decrease in the number of participating hospitals as on the number of registers of this quality program focused on intravenous therapy, confirming the existence of changes in the trend of the registers, in the absence or presence of pandemic moments. On the other hand, it is observed that there are no statistically significant differences related to the quality of the vascular accesses, showing that two main indicators measured, included at INCATIV bundle, such as type of dressing and signs of phlebitis, remain constant despite being measured at two different pandemic moments. Further studies are necessary about how vascular accesses nursing care has changed only in COVID-19 patients.

P40

OFF LABEL PICC AS A FEMORAL CATHETER IN AN ALMOST NON-CANNULATED PATIENT

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Introduction: 39-year-old patient presented with rapid progressive metastatic (lung,bone) sarcoma. He was in a life-threatening situation on peritoneal dialysis, with cardiomyopathy and ongoing infectious endocarditis. He had multiple cannulations with the introduction of dialysis catheters (jugular, axillary, femoral veins), AV fistulas on both shoulders for hemodialysis followed by calcification of these fistulas and he had tumour thrombosis of the right femoral vein. He should receive chemotherapy, but unfortunately, he tested positive for COVID_19. He developed massive bilateral covid related pneumonia. Subsequently, he fell down and broke his right arm (traumatic humerus fracture with dislocation).
Method: According to the guidelines from GAVACELT, in covid patients, PICC is recommended as a safe and simple central venous access (CVA). This patient needed a safe CVA, because of intravenous application of antibiotics to treat the endocarditis. We were not able to use the upper part of the body to insert the line. In addition, the patient underwent kidney transplantation followed by graft explantation, because of rejection. We did not exactly know, how was the condition of the renal vessels. There was a possibility that venous stenosis would be present in the postoperative area. We decided to use the PICC „off label", to insert from the left femoral vein, the one and only possible vein to insert a line in this patient.
Results: We used ultrasound to guide the cannulation. Through the left femoral vein, we successfully inserted a 4Fr one-lumen tunnelled PICC line without complications. We checked the distal end of the PICC also by X-ray, to ensure the right tip position.
Discussion and conclusion: We managed to cannulate this complicated patient to ensure safe CVA, despite all obstacles. We conclude, that there is no non-cannulate patient. The physician must select the correct procedure and the most suitable vein to insert the catheter.

P41

SAVING THE WORLD, ONE PATIENT AT A TIME, BY DOING THE RIGHT THING FIRST

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Introduction: Approximately 90% of hospitalized patients receive a peripheral intravenous catheter (PIVC). The number of attempts for successful placement ranges from 2.18-2.35 and higher in difficult intravenous access (DiVA) patients. PIVC failure (rate between 35-50%) requires early removal/replacement before completion of therapy. With every additional placement attempt, the likelihood of vein depletion, complications and advancement to a more invasive line increases. The annual cost of premature PIVC removal in the US is estimated at $1.5 billion. The true cost of PIVC failure, especially to patients, remains elusive. A proactive approach to vascular access utilizing evidence-based practice (EBP) is needed to prevent complications, improve patient outcomes and reduce costs. We must stop inadvertent patient harm.
The answer: 24/7 availability of advanced-skilled nurses with vein-visualization equipment and technologically advanced PIVCs at the bedside, the moment access is needed.
Method: In 2017 a 263-bed California hospital piloted an evidence-based protocol for identification of DiVA patients. The protocol included training nurses to perform ultrasound-guided PIVC insertion with guide-wire assisted catheters. The pilot demonstrated higher first-time attempt success, shorter time from call for assistance to successful

placement, increased dwell times and reduced number of devices/supplies needed.
Results: After four years, the program success continues. 44% of emergency department nurses and 12% of registered nurses hospital wide, across all shifts, have received training in ultrasound and insertion of guidewire-assisted PIVCs.
Discussion and conclusion: Healthcare providers must demand a higher standard of care for PIVC insertion. This can be achieved through the adoption of an EBP nurse-driven protocol for early identification of DiVA patients, use of a vascular access device selection algorithm and training clinicians in advanced PIVC placement, focusing on the nurses who work at the point of patient entry. We must change the way it has always been done and do the right thing first.

P42

ELIMINATION OF BLEEDING AFTER TUNNELLED CATHETER REMOVAL BY MODIFIED TECHNIQUE IN PRACTICE

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Elimination of bleeding after tunnelled catheter removal by modified technique in practice Morteza Khavanin Zadeh1 1Associated professor of surgery, Hasheminejad Kidney Center, Iran university of Medical Sciences, Tehran-Iran. mkhavanin@yahoo.com Abstract
Introduction: Sometimes, tunnelled catheters should be removed due to complications in hemodialysis patients1. The current usual method for catheters removal can be result in hemorrhage2, 3. Hemorrhage in this cases is due to chronicity of the time and granulation tissue formation. So, to prevent of hemorrhage after catheter removal, we have reported our experience in this regard.
Method: We pass the 3-0 nylon large needle around tunel and catheter and then tight the suture after catheter removal. We do not use suture in outlet site due to the risk of infection. The study included the analysis of retrospective results of 2795 catheter removal procedures in our center, 2688 of which were performed using the other method, and in 107 cases, the modified technique was applied.
R**esults:** We observed only one bleeding around catheter entry site with this modified technique of catheter removal. While, the other method was associated with 21 cases of bleeding and one exit site infection after catheter removal.
Discussion and conclusion: In our practice, the over-catheter tract suture procedure is the simplest and best method of central vein catheter removal in hemodialysis patients and it can be applied over the world.This study is more confirmed the results of study that was published by Letachowicz et al.1
Video link: https://youtu.be/QDmVAlP9OXg

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TWO VERTICAL MATTRESS SUTURE IS A USEFUL TECHNIQUE TO PREVENT BLEEDING IN TUNNELLED CATHETER INSERTION

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Two vertical mattress suture is a useful technique to prevent bleeding in tunnelled catheter insertion. Morteza Khavanin Zadeh1 1 Associate professor of surgery, Hasheminejad Kidney Center, Iran University of medical sciences, Tehran-Iran. mkhavanin@yahoo.com.
Introduction: The implant of tunnelled catheters, may be associated with some complications such as bleeding after insertion. We aimed this study to present a modified method for catheter insertion to prevent bleeding after procedure1, 2.
Method: The study included the analysis of retrospective results of 5339 tunnelled catheter insertion procedures in our center, 5005 of which were performed using the other method, and in 334 cases, the modified technique was applied.
Results: Applying a ‘’two mattress suture’’ was a safe and easy to apply and useful method for tunnelled catheter insertion in our center. We observed only one bleeding around catheter entry site with this modified technique of tunnelled catheter insertion. While, another old method was associated with 39 bleeding cases.
Discussion and conclusion: In our practice, the two vertical mattress suture procedure is the simplest and best method of central vein catheter insertion in hemodialysis patients and it can be applied over the world.
Video link: https://youtu.be/7tlgrDOVZTE

P44

USE OF A WIRELESS ULTRASOUND PROBE FOR VENOUS LINE INSERTION IN COVID-19 PATIENTS

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Purpose: To report single centre experience with use of wireless ultrasound probe for bedside venous line placement in COVID-19 patients.
Material and method: From October 2020 to September 2021, we performed venous catheter insertions in 209 patients with COVID-19. The procedure was done at the angiographic suite or bedside. One hundred seventy-six patients with COVID-1 9 underwent bedside venous line

placement. There were 115 males and 61 females with average age 74,9 years (from 16 to 96 years). We used two types wireless linear US probes with frequency 4-13 MHz (Clarius) or 7.5-10 MHz (LeapMed). Large 12-inch tablets were used to display the ultrasound image.

Results: The venous line was successfully inserted in 172 (98,9%) patients at the first attempt. Four patients underwent second procedure because of vein dissection in 2 patients and hematoma and vein spasm in 2 patients. All repeated procedures were successful. The most common venous lines we used were midline in 143 patients. The PICC was inserted in 26 patients and central venous catheter (including dialysis catheter) was placed in 7 patients. The ECG was used bedside to verify the tip position of central inserted central venous catheter and PICCs.

Conclusion: The use of wireless US probes is convenient for bedside venous line placement. The main advantage is simple manipulation, preservation of anti-epidemic conditions (even during non-pandemic COVID-19) and easier probe´s dressing with sterile cover, because there is not cable between US probe and tablet (display). The use of wireless US probes makes the insertion of IV catheters in DIVA patients much more accessible and safer.

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A NOVEL TECHNIQUE OF GROSHONG TIP PORT-A-CATH INSERTION UNDER LOCAL ANESTHESIA ON OUTPATIENT BASIS: AUDIT OF 2100 CASES FROM A TERTIARY CARE CANCER CENTER

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Introduction: The most commonly used technique for chemoport insertion is seldinger puncture technique. This utilizes blind puncturing of vein for catheter access and separate incision for subcutaneous pocket for chamber. It carries risks of inadvertent arterial puncture, hematoma, pneumothorax, hemothorax, brachial plexus injuries and increased radiation exposure. These risks can be avoided by our novel technique using Groshong tip catheter.

Methods: This audit includes 2100 patients over last 13 years from a tertiary cancer care center in southern India. All patients underwent Groshong tip chemoport insertion using novel cephalic vein cut down technique under local anesthesia on outpatient basis. We use single incision for catheter and chamber placement. The most common indications for chemoport insertion were cancers from breast, colo-rectal, hematological malignancies, gynecological & stomach.

Results: We could access cephalic vein through this technique in 95% of cases. There were no immediate complications Vis vascular injury, hematoma & pneumothorax. In 5% of patients seldinger technique was used, as cephalic vein was too small for the catheter in 60% & absence of predominant cephalic vein with predominance of branching tiny venous tributaries within delto-pectoral groove in 40%. 2.6% of cases developed port infection, among them 40% required chemoport removal, remaining were salvaged with antibiotic lock. Most common organism isolated was staph-aureus, pseudomonas, ralstonia mannitolilytica. 0.3% patients had catheter break and 0.2% had flipped chamber. 1.2% cases had recurrent seroma at the port site. Long term patency maintained in 96% of the cases.

Conclusion: The main advantage is this technique can be done under local anesthesia with single incision. Direct visualization and catheter placement in cephalic vein makes procedure safe. Single fluoroscopic radiation exposure used to confirm the position of the catheter and no need of post procedure CXR to detect pulmonary complications. Groshong tip helps in long term patency.

P46

"INCATIV-PEDIATRICO INDEX": QUALITY OF INTRAVENOUS THERAPY IN PEDIATRIC POPULATION

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Introduction: Vascular access and its care is one of the most common procedures in pediatric nursing. There is a wide variability at insertion time and nursing management too. The use of indicators to measure the quality of intravenous therapy in patients offers a comparison of variability, as well as assessing and monitoring the interventions used. The objective of this pilot study was to examine the quality of intravenous therapy using the INCATIV-PEDIÁTRICO indicator in 2 hospitals in Spain.

Method: A descriptive cross-sectional study in pediatric areas of two third-level hospitals during November 2021 was done. Sociodemographic and INCATIV-PEDIÁTRICO indicator variables were collected. INC-PED Index ranges from 0 (the lowest quality) to 10 (the highest quality). This score was created by a group of experts using the Delphi method.

Results: 130 Patients were included of which 50% were girls. 77 (59, 23%) of them had any type of vascular catheter. There were 102 catheters with an average of 1,3 catheters per child. The most frequent catheter was the short peripheral catheter (71; 69,61%) followed by the PICC (9; 8,82%) with an average duration of 3,94 days. The main insertion site was the back of the hand (46; 45.1%) and 18 of them were not being used (17.65%). 3 catheters (2.94%) presented some type of local complication, such as phlebitis or pressure ulcers. The subjective rating of the examiners was positive in 73.53% of the cases. The INCATIV-PEDIÁTRICO indicator established an average score of 7.1 (± 1.02) points.
Discussion and conclusion: The score of the INCATIV-PEDIÁTRICO indicator showed that the quality of the intravenous therapy in both hospitals was satisfactory. This score correlated adequately with the subjective evaluation of the examiners.

P47

ECONOMIC IMPACT OF CATHETER MATERIAL FOR COMPLICATION REDUCTION

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Introduction: Peripherally Inserted Central (PICC) and Midline Catheters are key devices for the delivery of intravenous medications. Occlusion and thrombosis are two common catheter complications that add patient risk including the inability to infuse, infection, pulmonary embolism, post-thrombotic syndrome, and diminish vessel availability driving-up costs. Catheter material modifications focused on complication prevention are necessary to promote patient safety. Application of practice changes and material modifications have resulted in a decline in occlusion and thrombosis rates.
Methods: A literature review was performed for catheter occlusion, venous thrombosis, catheter material, catheter coatings, blood adherence, and economic analysis of complications. Definitions for occlusion, superficial and deep venous thrombosis were established as they applied to peripheral veins of the extremities. The impact of catheter material modifications on complications was analyzed.
Results: 133 Publications from 1986-2021 were reviewed. Incidence and relative risk for PICC/Midline catheter occlusion was 15-39% and venous thrombosis 1-73%. Reduced cellular adherence was reported for anti-thrombotic and antiseptic coatings and impregnations, and with hydrophilic catheters. The smoothest surface modifications, less likely for bacterial adherence, were hydrophilic hydrogel materials. Economic analysis of occlusion and thrombotic complications and impact of interventions range from $384-33,000 per episode.
Conclusion: Blood cell adherence occurs within minutes of catheter insertion of polyurethane and silicone catheters. Blood clotting within catheters and veins results in blockage, trapping of bacteria, and impedance of blood flow. Catheter occlusion, thrombosis, and infection are interrelated. Recent catheter material modifications were designed to reduce complications and may extend catheter life. Catheter surface or antimicrobial impregnation modifications have had mixed results on outcomes. Newer hydrophilic catheters may have a higher impact to reduce cellular adherence that can mitigate complications. Catheter material reducing the adherence of blood cells may contribute to uninterrupted treatment delivery, vessel preservation, and reduced healthcare costs.

P48

RETEPLASE FOR THE TREATMENT OF CENTRAL VENOUS ACCESS DEVICE OCCLUSIONS

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Introduction/hypothesis: Thrombotic occlusion of central venous access devices (CVADs) is a common complication in patient care and results in patient discomfort, delays in medication administration, delays in nutrition supplementation, and overall increased cost to the patient and healthcare system. To date, alteplase is the only FDA approved agent for intra-catheter administration for thrombotic occlusion. Reteplase, a plasminogen activator, is similar to alteplase however offers some structural advantages over alteplase that confer potential for better thrombolytic potency and clot penetration. Reteplase has also been studied for CVAD occlusion in small prospective and retrospective studies and is currently being studied in the READY 1 trial. The goal of READY1 is to determine the safety and efficacy of reteplase to alteplase for CVAD occlusions.
Methods: READY 1 is a global, phase 3, prospective, randomized controlled trial (RCT) assessing the safety and efficacy of 0.4 units of reteplase compared to both placebo and standard of care (alteplase 2mg). 841 subjects with dysfunctional CVADs will be randomized at 100 sites in 8 countries. The primary objective of READY 1 is rate of treatment success between reteplase and placebo after single administration and up to a 90-minute dwell time. The study will also evaluate non-inferiority to alteplase after single administration as well as safety, tolerability, and 30-day recurrence of a dysfunctional CVAD.

Results: READY1 is currently enrolling and is seeing increases in enrollment internationally with the goal of study completion by 2022.
Conclusions: READY 1 is designed with regulatory oversight and guidance to support evaluation of reteplase for the management of thrombotic occlusion in CVADs. This large, phase 3 global RCT will assess the efficacy, safety, and tolerability of reteplase in comparison to placebo and standard of care (alteplase) for dysfunctional CVADs with the goal of providing additional insight on managing this common clinical scenario.

P49

IMPACT OF FIXATION AND DRESSING MATERIAL ON CATHETERS' INTEGRITY AND ACCIDENTAL REMOVAL OF TUNNELED CUFFED CATHETERS IN PEDIATRIC SETTING

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Introduction: For 28 years, nurses used a self developed method to protect the insertion site and to safeguard tunneled catheters in children. Compresses were folded around the curled catheter which was kept in place with an adhesive bandage. This was used to protect the catheter from grabbing hands. This study aimed to investigate whether a sterile iv-dressing on the insertion site with a dangling catheter would cause more accidental removals or catheter integrity problems.
Method: Data of children between 0 and 16 years old who received a cuffed tunneled catheter were studied. We compared the number of accidental removals and integrity problems in a group of children who had a 'packed catheter' (2019-2020, group 1) versus a group who had a 'dangling catheter' (2020-2021, group 2). The first 8 weeks the catheter was fixed with a Statlock®.
Results: 47 Catheters were placed in 44 children (group 1). One year later 44 catheters were placed in 36 children (group 2). There was 1 accidental removal and 1 ruptured catheter in de 'packed catheter' group versus 3 accidental removals and 1 ruptured catheter in de 'dangling catheter' group.
Discussion and conclusion: Nurses need to check a possible torsion, especially in 4.2Fr catheters, before flushing a dangling catheter. Nurses need to be well trained to change the Statlock®. They often reported to be more anxious to change the dressing compared to the previous way of working. It was an overall advantage to reduce the number of dressing changes to once a week and to see the insertion site at all times, despite an increased number of accidental removals. Further research, in larger samples, is needed.

P50

PERIPHERALLY INSERTED CENTRAL CATHETER (PICC) RELATED CENTRAL VENOUS THROMBOSIS - A COMPARATIVE STUDY

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Introduction: Catheter related central venous thrombosis (CRCVT) is a well-recognised complication of peripherally inserted central catheters (PICCs). The exact incidence and risk factors remain uncertain; however, some evidence suggests that polyurethane (PU) catheters may have a higher incidence than silicone (SI) catheters. In our institution, Cambridge University Hospitals NHS Foundation Trust (CUHFT), both silicone and polyurethane catheters are used depending on patient requirement. In this study we retrospectively analysed CRCVT rates to determine the incidence and to compare rates between PU and SI PICCs.
Method: All PICCs inserted into adult patients by the Vascular Access Team between January to March 2021 were obtained from electronic hospital records. These were cross checked against hospital ultrasound reports looking for PICC related thrombosis in a central vein (axillary/subclavian, internal jugular or brachiocephalic vein). The data collected were analysed to determine the thrombosis rate and comparisons were made between PU and SI lines (Fisher's exact test).
Results: 1,209 PICC lines were inserted during this period (666 silicone [241 single, 425 dual], 543 polyurethane [91 single, 452 dual]). There were 24 cases of ultrasound confirmed CRCVT (2.0% of insertions) - 42% of CRCVTs were related to silicone PICCs and 58% to polyurethane PICCs. There was no statistically significant difference between the thrombosis rates ($p = 0.2$).
Discussion and conclusion: Based on this retrospective audit, we found a CRCVT thrombosis rate that is consistent with reported rates. We did not find a significant difference in CRCVT rates between silicone and polyurethane PICCs.

P51

INTRACAVITARY-EKG FOR TIP POSITION OF PICC-PORT

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Background: A mandatory condition for any central line before its use is to verify the tip position. PICC-ports are a quite recent central vascular access placed by trainned

healthcare professionals. Even if PICC-port are totally inserted, similar to chest port, PICC-ports are placed in a dedicated room (not necessary OR or fluoroscopy room) and their tip is verified by intracavitary-ecg. We present our experience with PICC-ports and verification of their tip position.

Methods: For the first 28 PICC port lines placed in our facility, we have performed intracavitary-ekg during insertion and chest x-ray after insertion for comparing both techniques. We collected data prospectively. For intracavitary-ekg we have observed maximal intracavitary P wave, no biphasic. The monitor used have been a regular defibrilator and the cable used has been Vygocard(R)(Vygon) in all cases. For supine chest x-ray we have observed tip between 2-4 cm above the tracheal carina. For every PICC-port we have observed both variables in these terms.

Results: In evey case, all 28 PICC-ports have presented maximal intracavitary P wave and radiographic tip position as declared in methods.

Conclusion: The use of the cable fot the intracavitary method is easy, cheo and safe to use, moreover, it can be use with any kind of monitor, not needing a specific intracavitary-technique monitor. The intracavitrary-ecg technique is performed during PICC-port insertion, meaning that secondary malposition is completely eliminated and there is no need to wait for tip verification (chest x-ray) or to radiate patients (fluoroscopy and chest x-ray). Thanks to these findings in our facility chest x-ray for PICC-ports is a standarized technique and radiographic reports are not needed for verifing final tip position.

P52

THE EFFECT OF HEPARIN OR SALINE ON THE BLOCKAGE RATE OF INFUSION PORTS FOR FLUSHING AND SEALING TUBES

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Abstract: With the popularization of the totally implantable venous infusion port (TIAP) in the treatment of cancer patients, nurses seek the safest and most effective way of flushing and sealing tubes in daily infusion port maintenance. Nurses provide patients with the safest and most suitable infusion port maintenance while ensuring the quality and safety. This article will compare the different data on the use of saline and heparin in the maintenance of the infusion port, to find out which of the two has an impact on the catheter blockage rate of the infusion port.

Methods: This study collected the data from October 2020 to October 2021, and compared the effect of different maintenance methods of flushing and sealing solution on the blocking rate. The patients were randomly divided into two groups. The first group was flushed and sealed with 0.9% NS. The method was as follows: 0.9% NS 10ml pulse flushing, followed by saline 10ml positive pressure sealing. The second group used heparin saline to flush and seal the tube, the method: saline 10ml pulse flushing tube, 10ml heparin saline (100u/ml) positive pressure sealing tube.

Results: The first group had a total of 2119 cases of catheter sealing, and 21 cases of incomplete catheter blockage occurred; the second group had a total of 2110 cases of catheter sealing, and 19 cases of incomplete catheter blockage occurred. The rate of incomplete pipe blockage in the first group was 9.9‰, and the rate of incomplete pipe blockage in the second group was 9.0‰. The results of two groups of data show that during the intermittent use of the infusion port, 0.9% NS positive pressure tube sealing and heparin sodium saline (100U/ml) positive pressure tube sealing have no significant effect on the recanalization of the implantable infusion port. Academic significance ($\chi 2=0.093$, $P>0.05$).

P53

REPAIR OF ANEURYSMAL ARTERIOVENOUS FISTULAE: RECOMMENDED CLINICAL APPROACH BASED ON SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives: Aneurysms arising from arteriovenous fistulae are a common finding among dialysed patients and pose a risk of acute bleeding. The aim of presentation is to present clinical approach based on systematic review and meta-analysis evaluating the surgical options for the treatment of aneurysmal arteriovenous fistulae.

Methods: A systematic review and meta-analysis of articles published between January 1973 and March 2019 describing the surgical treatment of arteriovenous fistulae aneurysms.

Results: A total of 794 records were identified. After duplicate and low quality studies were removed, 72 full text articles were reviewed and from these 13 were included in the meta-analysis. The total number of patients was 597. Aneurysms were located in the upper arm in 289 (59%) cases and the smallest diameter of a treated aneurysm was 15 mm. The most frequent indication for treatment was bleeding prevention in 513 (86%) cases. Aneurysmorrhaphy was the surgical method of choice in all 13 studies. The pooled primary patency at 12 months was 82% (95% CI 69%e90%, 12 studies, I2 84%, $p < .01$). The 12 month primary patency rates were similar for aneurysmorrhaphy with external prosthetic reinforcement (85%, 95% CI 71%e93%, two studies, I2 0%, p .33) and

aneurysmorrhaphy performed using a stapler (74%, 95% CI 61%e83%, four studies, I2 0%, p .48) and without a stapler (82%, 95% CI 60%e94%, six studies, I2 92%, p < .01).

Conclusions: Aneurysmorraphy of arteriovenous fistulae is a procedure with acceptable short and long term results, with a low complication and aneurysm recurrence rate.

P54

VASCULAR ACCESS DEVICE SELECTION, INSERTION, AND MAINTENANCE IN PATIENTS WITH COVID-19 IN ICU: A SCOPING REVIEW

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Introduction: Two fundamental supportive invasive interventions in the intensive care unit (ICU) are ventilation and intravenous therapy. Ventilation research has dominated the literature since the pandemic began, with little research on vascular access devices (VADs), despite these interventions existing almost co- dependently. This scoping review aimed to identify the types of evidence available, knowledge gaps and key concepts on vascular access (VA) approaches in patients with Covid-19 in ICU. The main objective was to conduct a systematic search to examine the types of research conducted on VADs during the pandemic.

Methods: Design: scoping review. The Joanna Briggs Institute (JBI) three-step approach was followed to undertake a systematic search using databases and search engines EMBASE, Medline, CINAHL, PubMed and clinical trials registries. Study designs were searched from 2019 to March 2022 limited to the English language. Our data extraction instrument was developed using a template from JBI (Table 1). The PRISMA-ScR checklist was used to report findings.

Results: A total of 5107 results were identified (Figure 1). From this number data was extracted from 67 papers. Among the study designs were: retrospective studies (20), editorials and commentaries (17), case reports (14), prospective cohort studies; observational studies; cross sectional studies (8), conference abstracts (2), quality improvement initiative (2), one survey (1), study protocol (1). Two clinical guidelines from expert groups were identified. No randomised controlled trials were identified. No clinical trials, registered or ongoing, were identified.

Discussion: This review identified that Covid-19 patients are requiring more VADs, over longer periods with an increased risk of mortality. These patients are proned for up to 18 hours a day, reducing access for regular VAD assessment. Well-designed VA research is lacking in COVID 19 cohorts.

Conclusion: The foundation of evidence-based practice depends on the integration of valid research alongside clinical expertise. Despite VA recommendations being in existence, no randomised controlled trials, systematic reviews or meta-analysis exist to support these recommendations. Future research needs to focus on high quality randomised controlled trials. A systematic review and meta-analysis is, at present, unnecessary.

P55

REDUCTION OF ACCIDENTAL EXITS FROM PERIPHERALLY INSERTED CATHETERS.EXPERIENCE OF THE INTRAVENOUS THERAPY UNIT OF THE UNIVERSITY HOSPITAL OF NAVARRA

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Introduction: The increased use of peripherally inserted central vascular access devices (PICC) is a reality. For this reason, in 2018, the Intravenous Therapy Unit (ITU) was created at the University Hospital of Navarra. From this service, clinical nurses from all units of this hospital have been trained in the care and management of these devices. However, the most frequent complication is the partial or complete accidental exit of the device, affecting patient safety and requiring the placement of a new PICC.

Methodology: Retrospective descriptive study. The clinical records of all patients with PICC between November 2020 and March 2021 were reviewed to identify how many of them had accidental exits of this device. These months predate the implementation of a new device with a subcutaneous anchoring system (SecurAcath R). After the implementation of this device, the medical records of PICC patients from September 2021 to January 2022 were analysed to identify the number of accidental exits.

Results: Between November 2020 and March 2021, 48 accidental catheter exits were detected. After the implementation of this new device, this was reduced to 2 accidental exits (September 2021 to January 2022), which were due to patients pulling out the device.

Conclusion: The implementation of the SecurAcathR subcutaneous anchorage system by the UTI in the HUN/NOU has led to a drastic reduction in accidental exit of the PICC as the most common complication. Thus, we have managed to increase safety in the administration of prolonged intravenous treatments by not moving the tip of the catheter from its ideal site.

P56

A NOT SO 'STICKY END' - AN EVALUATION OF TWO DRESSINGS FOR MIDLINE SECUREMENT

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Introduction: Partial dislodgment and accidental removal of indwelling vascular access devices (VAD) is a common issue amongst the paediatric population. Our institutional method of securing devices such as midlines consists of a transparent non-bordered rectangular dressing and wound adhesion strips. We postulated that a notched dressing with a distal securement strip and fabric borders would provide better security for VADs.
Method: Two methods of securement were trialled – wound adhesion strips (Steripstrips, 3M) and a clear rectangular dressing (IV3000 10x14cm, Smith and Nephew) as per institutional protocol and a notched bordered dressing (Tegaderm IV Advanced 8.5 x 11.5cm). A truncated Leaderflex 22G midline (Vygon) was secured to the midforearm of volunteers after skin preparation with CHG2% in alcohol. All ten volunteers trialled both methods of securement. A series of 100g weights (+/-10%) were added to a hook attached to the midline extension. The weight required to completely remove the dressing was recorded for both securement methods.
Results: The average weight required to dislodge the Steristrips and the IV3000 was 535g compared to an average weight of 1760g which was required to remove the Tegaderm IV Advanced. This represents a difference of more than double between the two groups. In 60% of volunteers from the Tegaderm group, the line was dislodged leaving the dressing in place.
Discussion and conclusion: A notched bordered dressing with a distal securing strip provides better VAD security in our volunteer study using static weights. We observed that the trial dressing provided 360-degree adhesion to the skin around the VAD extension. Our method has several limitations and may not reflect real-life forces exerted on a VAD, but provides an objective comparison between two dressings. These findings have led to a change in institutional practise with a cost saving of approximately £1000 per year.

P57

PERIPHERAL INTRAVENOUS CANNULATION. A KNOWLEDGE, ATTITUDES AND PRACKTICES SURVEY IN AN UNDER GRADUATE NURSING AND MIDWIFERY COHORT

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Introduction: In 2022 the education and provision of peripheral intravenous cannulation (PIVC) and venepuncture was introduced in the Irish undergraduate nursing and midwifery curriculum. Available evidence suggests that the knowledge, confidence and skills of students and graduates in vascular access such as insertion and management are lacking1-4. We developed a knowledge, attitude and practice survey for PIVC and venepuncture before clinical competency is achieved. The aim of this research was to evaluate the current training program after its first year and in so doing developing a data informed curriculum for PIVC in our region.
Methods: Following ethical approval, we developed a survey instrument with face and content validity. Survey questions were sent to nurse educators, patient and public involvement members and international vascular access experts for validation. Four individuals completed face validity and six completed content validity. Content validity index (CVI) was calculated and only questions with an item-CVI of 0.80 or above were included in the final scale. The survey, included 15 knowledge, 18 attitude and 17 practice questions with both closed and open-ended questions used. Students were asked to rate their attitudes regarding statements on a scale from 0-10 (0= negative end of the scale / 10= positive end of the scale). The survey was disseminated via an online platform to a group of final year undergraduate nursing and midwifery students in a university in Ireland.
Results and discussion: There was a 47% (n=38) response rate to the survey. The mean knowledge score was 7.2/15 (48%). The mean attitude score was 1 0.2/18 (56.6%). 75.6% answered the open-ended question regarding phlebitis correctly. However, 21.6% gave a valid response to the term haematoma and for infiltration only 13.5% elaborated that the leakage of fluids into the surrounding tissues was in relation to non-irritant fluids with 25.7% noting in regards to extravasation that it was caused by irritant infusates. Students were noted to have negative attitudes in their confidence in performing PIVC (mean score = 5.03) and venepuncture (mean score = 5.42) with even less confidence in performing these skills on the first attempt (mean score PIVC = 4.37 / venepuncture = 4.86). However, they acknowledged positively the importance of performing these skills on the first attempt (mean score PIVC = 8.00 / venepuncture = 7.95).
Although a proportion of students appeared satisfied with their training the majority of students provided suggestions on how the training could be improved. Qualitative data was gathered and these comments were categorised into themes to demonstrate specific areas of focus for improvement, such as “improved simulation” and “more practice opportunities in simulation lab”.**Conclusion:** Data informed curriculum can assist educators in identifying in students training and the PIVC training program can

be enhanced. This can result in areas of potential improvement knowledgeable, competent and confident practitioners.

P58

INTEGRATIVE REVIEW: COMPLICATIONS OF PERIPHERALLY INSERTED CENTRAL CATHETERS (PICC) AND MIDLINE CATHETERS WITH ECONOMIC ANALYSIS OF POTENTIAL IMPACT OF HYDROPHILIC CATHETER MATERIAL

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Objective/background: To identify the incidence of three key complications with Peripherally Inserted Central Catheters (PICC) and midline catheters with their associated cost, and project the potential economic impact of use of catheter hydrogel materials on reduction of catheter related complications.
Methods: A systematic search was conducted for empirical and theoretical publications establishing the pooled incidence of PICC and midline catheter complications for catheter-related thrombosis (CRT), catheter-associated bloodstream infection (CABSI), and occlusion. The economic analysis included ICD-10 complication costs and projected the potential impact of complication reduction associated with a change in catheter materials. Results Of 10,635 abstracts initially screened, 75 studies were included with 36 outcomes, 26 catheter materials, and 13 for economic reporting. The primary review of 36 outcome studies demonstrated the incidence of CRT for PICCs at 3.45% and midline catheters at 2.48%, CABSI PICCs at 2.25%, and midlines at 0.67% (after outlier exclusion), and PICC occlusion 6.4%, and midlines 7.54%. The catheter materials literature reviewed were with polyurethane, hydrophobic and hydrophilic impregnation, coatings, and composite materials. The economic evaluation demonstrated incremental cost of $78,457 USD for CRT, $54,698 for infection, and $51,028 for occlusion. The potential impact savings for reduced cellular attachment and bacterial adherence is $40-82,000.
Conclusions: This is the first systematic review to evaluate the incidence of pooled symptomatic CRT, CABSI, occlusion, catheter materials, and the economic impact of complication reducing materials. Implications of the institution of hydrophilic catheters could result in a significant reduction of complications and cost savings. More clinical research is needed to confirm clinical findings and implications.

P59

SUBCUTANEOUS TUNNEL PICC CATHETERIZATION CAN REDUCE THE UNPLANNED EXTUBATION RATE COMPARED WITH TRADITIONAL B-ULTRASONOGRAPHY CATHETERIZATION IN SOLO CATHETERIZATION

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Introduction: The Solo tube is made of polyurethane, which is easy to cause the tube to fall off. The tube is removed when the catheter is prolapsed by 1cm or more within one month after implantation. In the past, the unplanned extubation rate of Solo tube in our hospital was high, especially in summer and winter.
Method: Subcutaneous tunneling structures the tunnel creation process compared to traditional B-scan Seldinger cannulation. Tunnel implantation is to form a distance in the subcutaneous tissue between the skin puncture point and the blood vessel puncture point, so that the skin puncture point and the blood vessel puncture point are staggered, rather than on the same longitudinal axis level. The data were selected from July 2021 to January 2022, 94 cases with Solo tube placement, and 46 cases in the observation group with tunnel placement. The control group was placed with conventional B-ultrasound Sidinger, a total of 48 cases.
Results: After observation, the detachment rate of Solo tube using tunnel catheterization was 2.5%, and the detachment rate of Solo tube placed by Seldinger under conventional B-ultrasound was 18.6%. It is proved that the use of tunnel cannulation can reduce the decannulation rate of Solo cannula. The incidence of catheter prolapse in the observation group was significantly lower than that in the control group, and the difference was statistically significant ($P<0.05$).
Discussion and conclusion: The skin tissue at the tunnel can fix the catheter and effectively prevent the occurrence of catheter displacement and detachment. When the subcutaneous tunnel is established, the positions of the skin puncture point and the blood vessel puncture point are effectively staggered, so the tube body is not easy to slide inside and outside the puncture point.

P60

A NOVEL PERIPHERAL INTRAVENOUS CATHETER AIMED AT REDUCING EARLY FAILURE RATES: FROM COMPUTER SIMULATIONS TO ANIMAL STUDY

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Background: Despite best efforts by end-users, peripheral intravenous catheters (PIVCs) experience unacceptably high early failure rates. We set out to design a new PIVC, aimed to reduce the early failure rate of in-dwelling PIVCs and tested its efficacy and safety in a large animal model of intravenous access.

Methods: We used computer-aided engineering to design a PIVC with a ramped tip geometry, which directs the infused fluid away from the vein wall; we called the design the FloRamp (Fig1A). We created FloRamp prototypes (test device) and tested them against a market-leading device (BD Insyte; control device) in a highly-controlled setting with five insertion sites per device in four adult pigs. Using a protocol that closely mimics clinical practice, we measured resistance to infusion and visual infusion phlebitis (VIP) every six hours and terminated the experiment at 48 hours. Veins were harvested for histology and seven pathological markers were assessed.

Results: The optimum FloRamp tip reduced maximum endothelial shear stress by 60%, from 12.7 Pa to 5.1 Pa, compared to a typical PIVC tip. After 24 hours, we found that 2/5 of the control devices were occluded, whereas all test devices remained patent and functional. Test devices also exhibited less resistance to infusion (0.73 +/-0.81 vs 0.47+/- 0.50, p=0.06) and lower VIP scores (0.60 +/- 0.93 vs 0.31 +/- 0.70, p=0.09). Histopathology revealed that 5/7 of the assessed markers were lower in veins with the test device.

Discussion and conclusion: Herein we report a novel PIVC design and demonstrate proof of concept with the design translating to an important advantage over a market-leading PIVC (BD Insyte) through decreased device occlusion. The FloRamp can be easily integrated into large volume manufacturing facilities, is straightforward to obtain regulatory approval, and is an important step towards reducing the unacceptable PIVC failure rate.