Two dimensional ultrasound guidance in central venous catheter placement; a postal survey of the practice and opinions of consultant pediatric anesthetists in the United Kingdom.

Bosman M, Kavanagh RJ.

1The Royal Alexandra Hospital for Sick Children, Dyke Road, Brighton, UK.

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• CONCLUSIONS: In the UK most pediatric anesthetists placing CVCs in children currently have access to ultrasound guidance. Despite a lack of widespread support for its routine use, most agree ultrasound is a useful tool, and that all pediatric anesthetists should have access and training in the use of this technology.

Dott. Milo Vason
U.O. Anestesia e Rianimazione Ospedaliera
Azienda Ospedaliero-Universitaria S. Anna
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RUOLO DELL’ECOGRAFIA NEL CATETERISMO VASCOLARE E NEI BLOCCHI ANTALGICI PEDIATRICI

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OBJECTIVE:
Ultrasound guidance (USG) for internal jugular cannulation is the best solution in difficult settings where paediatric patients are involved. This is an outcome study on efficacy and complications of the USG for the internal jugular vein (IJV) cannulation in neurosurgical infants as well as an ultrasound study of anatomical findings of the IJVs in infants.

DESIGN AND SETTINGS:
A prospective study conducted in two Academic Neurosurgical hospitals.

PARTICIPANTS:
In 191 babies (body weight <15 kg), anatomical findings were studied. We performed CVC echo guided placement in 135/191 infants (weighting <10 kg).

RESULTS:
After a brief training period, both institutions adopted a common protocol and USG device. We obtained successful cannulation in all patients. Carotid puncture (1.5%) was the only main complication registered and minor complications were poor. Time required for cannulation was 12.5 +/- 5.7 min. Anatomical findings (in 191 patients) were IJV laterality in 34.6% cases, IJV antero-lateral in 59.7% and anterior in 5.7%. A linear relation was found between weight and internal jugular vein diameter even if R(2) = 0.43 and the model cannot be used to predict the exact size of the vein. In 62/135 babies weighting <10 kg, anatomical measurements were done in supine and Trendelemburg position. Trendelemburg position increases significantly (P < 0.001) IJV diameter, but not IJV depth.

CONCLUSIONS:
We considered ultrasound guidance as the first choice in infants because it can enhance IJV cannulation success, safety, and allows one to measure relationships and diameter of the IJV and optimise the central line positioning.

Ultrasound for vascular access in pediatric patients.

Schindler E1, Schears GJ, Hall SR, Yamamoto T.

1 Department of Paediatric Anaesthesiology and Critical Care Medicine, Children's Hospital Asklepios Klinik Sankt Augustin, Sankt Augustin, Germany.

OBJECTIVES:
In pediatric patients vascular access is often more difficult than in adults because of the smaller size of the vessels and the inability of the patient to cooperate without deep sedation or general anesthesia. Therefore Ultrasound has already become an invaluable tool for vascular access, but the full potential of ultrasound has yet to be fully realized.

METHODS AND TECHNIQUE:
The probes used for the vascular access are mainly linear and convex type. Higher-frequency ultrasound provides a vivid image; however, the signals are remarkably attenuated. Therefore, the choice of the probe with appropriate frequency is essential. As blood vessels are relatively easily identified with ultrasound, ultrasound-guided vascular access does not require as sharp images as ultrasound-guided nerve block.

For pediatric vascular access, the linear probe with 5-15 MHz, 2-5 cm depth is ideal and adequate for almost all cases.

Ultrasound-guided vascular access has two main approaches: 'long-axis' or 'in-plane approach' and 'short-axis' or 'transverse approach'. The long-axis approach visualizes the vessel along the insertion pathway and is commonly used to monitor the entire approach of the needle into the vessel. The short-axis approach is easier to show the positional relationship and depth of target vessels, but it is much harder to follow the needle tip within the tissues.

CONCLUSION:
The use of 'real-time' ultrasound has been shown to increase first insertion success, reduce access time, have a higher overall success, and reduce arterial puncture. As the technology continues to improve the use of ultrasound will become as ubiquitous as the lines themselves.


Quality improvement: ultrasonography-guided venous catheterization in organ transplantation.

Sabate A1, Koo M.

1 Department of Anaesthesiology and Reanimation, Hospital Universitari de Bellvitge, IDIBELL, Universitat de Barcelona, Barcelona, Spain.

• PURPOSE OF REVIEW:
Central venous catheterization (CVC) is a procedure, not exempt of risk. Transplantation patients represent by themselves a high-risk group for CVC. Ultrasonography provides us of the exact localization of the target vein and its relationship with artery and nerve structures, detecting anatomic variations and thromboses of vessels. A description of technical skills, a review of the clinical evidence of ultrasonography-guided CVC and basic training guidelines are presented.

• RECENT FINDINGS:
The internal jugular vein is the most common target vein selected because it is easier and safer, therefore it is the target vein recommended for learning the ultrasonography procedure. For subclavian-axillar vein insertion, the more distal (deltoid) access is the preferred approach; the supraclavicular access has been described with high success in paediatric patients. Anatomic variations of the venous system are not uncommon; small size, overlap artery and tissue oedema around the neck are the main causes of CVC failure. Training guidelines for ultrasound-guided vascular catheterization are necessary, and skill maintenance is crucial.
Ultrasound assistance for central venous catheter placement in a pediatric emergency department improves placement success rates.

Gallagher RA1, Levy J, Vieira RL, Monuteaux MC, Stack AM.

1The Department of Pediatrics, Division of Emergency Medicine, Boston Children's Hospital, Boston.

• **OBJECTIVES:**
  The use of ultrasound (US) has been shown to improve success rates and reduce complications of central venous catheter (CVC) placement in adult emergency department (ED) patients. The authors sought to determine if US assistance for CVC placement is associated with an increased success rate in pediatric ED patients.

• **METHODS:**
  This was a retrospective cohort study of CVC placement in a pediatric ED from January 2003 to October 2011. Data were extracted from a procedure log created to record details entered by physicians at the time of CVC placement, including indication, location, complications, and information regarding use of US. All femoral vein and internal jugular vein CVC placement attempts performed by, assisted with, or directly supervised by pediatric emergency physicians (EPs) were included. Characteristics of procedures performed with and without US assistance were compared, controlling for patient and physician factors. The primary outcome was the success rate of CVC placement.

• **RESULTS:**
  There were 168 patients undergoing CVC placement attempts. The proportion of successful placement attempts was significantly higher when using US assistance (96 of 98) compared to those without (55 of 70; 98% vs. 79%), odds ratio [OR] = 13.1, 95% confidence interval [CI] = 2.9 to 59.4). When controlling for patient- and physician-specific factors, success rates remained significantly higher.

• **CONCLUSIONS:**
  Ultrasound assistance was associated with greater likelihood of success in CVC placement in a pediatric ED.
US-guided placement and tip position confirmation for lower extremity central venous access in neonates and infants with comparison versus conventional insertion.

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1Department of Radiology, Children’s Hospital of Philadelphia, Perelman School of Medicine of the University of Pennsylvania, 3401 Civic Center Blvd., Philadelphia, PA 19104. 2Department of Radiology, Children’s Hospital of Philadelphia, Perelman School of Medicine of the University of Pennsylvania, 3401 Civic Center Blvd., Philadelphia, PA 19104, 3Department of Pediatrics, Division of Neonatology, Children’s Hospital of Philadelphia, Perelman School of Medicine of the University of Pennsylvania, 3401 Civic Center Blvd., Philadelphia, PA 19104.

• PURPOSE: To describe experience with the use of ultrasound (US)-guided placement and tip position confirmation for direct saphenous and single-incision tunneled femoral noncuffed central venous catheters (CVCs) placed in neonates and infants at the bedside.

• MATERIALS AND METHODS: A retrospective review of the interventional radiology (IR) database and electronic medical records was performed for 68 neonates and infants who received a CVC at the bedside and for 70 age- and weight-matched patients with CVCs placed in the IR suite between 2007 and 2012. Technical success, complications, and outcomes of CVCs placed at the bedside were compared with those in an age- and weight-matched sample of children with CVCs placed in the IR suite.

• RESULTS: A total of 150 primary insertions were performed, with a technical success rate of 100%. Total catheter lives for CVCs placed at the bedside and in the IR suite were 2,030 catheter-days (mean, 27.1 d) and 2,043 catheter-days (mean, 27.2 d), respectively. No significant difference was appreciated between intraprocedural complications, mechanical complications (bedside, 1.53 per 100 catheter-days; IR, 1.76 per 100 catheter-days), or infectious complications (bedside, 0.39 per 100 catheter-days; IR, 0.34 per 100 catheter-days) between groups.

• CONCLUSIONS: US-guided placement and tip position confirmation of lower extremity CVCs at bedside for critically ill neonates and infants is a safe and feasible method for central venous access, with similar complications and catheter outcomes in comparison with CVCs placed by using fluoroscopic guidance in the IR suite.
Introduction of the use of a pediatric PICC line in a French University Hospital: review of the first 91 procedures.


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PURPOSE:

In order to assess the establishment of a pediatric PICC line service in a University Hospital after the first 91 consecutive procedures.

MATERIALS/PATIENTS AND METHODS:

Retrospective study over a period of 24 months. The criteria analysed were success or failure of the procedure, indication, age when inserted, type of PICC line, mean length of use and development of complications such as accidental removal, venous thrombosis or infection.

RESULTS:

Ninety-one PICC lines were inserted in 74 patients between 4 months and 25 years old (sex ratio: 1.1 girls/boys). The procedure was performed under general anaesthesia in four cases (4.4%) and under EMLA and MEOPA in 87 cases (95.6%). The insertion was ultrasound guided through the basilic (n=63, 70%), humeral (n=18, 20%) or cephalic (n=9, 10%) veins in the non-dominant arm (L in 62 cases, R in 28 cases). The insertion success rate was 99% (n=90). The main indications were starting antibiotic therapy (n=47, 52%), chemotherapy (n=34, 38%) and parenteral nutrition (n=5, 5%). The devices used were single lumen 3F (n=4, 4%), single lumen 4F (n=31, 34%), double lumen 4F (n=2, 2.2%), single lumen 5F (n=12, 13%) and double lumen 5F (n=41, 45%). The PICC line was used for an average period of 45 days (14 to 300 days). The complications found were accidental removal (n=2, 2.2%), catheter fracture (n=2; 2.2%), obstruction (n=5, 5.5%), suspected infection (n=1, 1.1%), and venous thrombosis and pulmonary embolism (n=3, 3.3%). The overall complication rate was 14.4% (n=13) including 4.4% serious complications (n=4).

CONCLUSION:

PICC lines are a future solution in pediatrics. This technique is reliable and has a similar complication rate to studies carried out in adults, most of which can be prevented by careful catheter maintenance and informing the care staff.

Peripherally inserted central catheters in infants and children - indications, techniques, complications and clinical recommendations.

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Venous access required both for blood sampling and for the delivery of medicines and nutrition is an integral element in the care of sick infants and children. Peripherally inserted central catheters (PICCs) have been shown to be a valuable alternative to traditional central venous devices in adults and neonates.

In this study, we therefore review the indications, methods of insertion and complications of PICC lines for children beyond the neonatal age to provide clinical recommendations based on a search of the current literature.

PICCs emerge as a safe and valuable option for intermediate- to long-term central venous access in children both in and out of hospital. Insertion can often be performed in light or no sedation, with little risk of perioperative complications. Assisted visualisation, preferably with ultrasound, yields high rates of insertion success. With good catheter care, rates of mechanical, infectious and thrombotic complications are low and compare favourably with those of traditional central venous catheters.
Peripherally inserted central venous catheters (PICC) have been successfully used to provide central access for chemotherapy and frequent transfusions. The purpose of this study was to assess the feasibility of PICCs and determine PICC-related complications in pediatric hematology/oncology patients in a resource-poor setting.

All pediatric patients (age below 16 y) with hematologic and malignant disorders who underwent PICC line insertion at Aga Khan University Hospital from January 2008 to June 2010 were enrolled in the study. Demographic features, primary diagnosis, catheter days, complications, and reasons for removal of device were recorded.

Total of 36 PICC lines were inserted in 32 pediatric patients. Complication rate of 5.29/1000 catheter days was recorded. Our study showed comparable complication profile such as infection rate, occlusion, breakage, and dislodgement. The median catheter life was found to be 69 days.

We conclude that PICC lines are feasible in a resource-poor setting and recommend its use for chemotherapy administration and prolonged venous access.
Central venous catheters (CVC), used for the management of children with hemato-oncological disorders, are burdened by a significant incidence of mechanical, infective, or thrombotic complications.

The Italian Association of Pediatric Hematology and Oncology (AIEOP) reviewed the pediatric and adult literature to propose the first recommendations for the management of CVC-related occlusion and CVC-related thrombosis in children with hemato-oncological disorders.
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The American Society of Regional Anesthesia and Pain Medicine and the European Society of Regional Anaesthesia and Pain Therapy joint committee recommendations for education and training in ultrasound-guided regional anesthesia.

Sites BD1, Chan VW, Neal JM, Weller R, Grau T, Koscielniak-Nielsen ZJ, Ivani G.

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• Ultrasound-guided regional anesthesia (UGRA) is a growing area of both clinical and research interest.

• The following document contains the work produced by a joint committee from ASRA and the European Society of Regional Anesthesia and Pain Therapy. This joint committee was established to recommend to members and institutions the scope of practice, the teaching curriculum, and the options for implementing the medical practice of UGRA. This document specifically defines the following: 1. 10 common tasks used when performing an ultrasound-guided nerve block, 2. The core competencies and skill sets associated with UGRA, 3. A training practice pathway for postgraduate anesthesiologists, and 4. A residency-based training pathway. In both the residency and postgraduate pathways, training, competency, and proficiency requirements include both didactic and experiential components.

• The Joint Committee recommends that the decision to grant UGRA privileges be based at the individual institution level. Each institution that conducts UGRA is encouraged to support a productive quality improvement process.
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**Regional anesthesia in children is an evolving technique with many advantages in perioperative management.** Although most regional anesthesia techniques are sufficiently described in the literature, the implementation of these techniques into daily clinical practice is still lacking.

**The main problems associated with pediatric regional anesthesia (PRA) include the appropriate selection of blockade, the management around the block, and how to teach these techniques in an optimal manner.**
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Ultrasonography-guided ilioinguinal-iliohypogastric nerve block for inguinal herniottomies in ex-premature neonates.

Lee S1, Tan JS.

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- The ilioinguinal-iliohypogastric (IG-IH) nerve block provides effective opioid-sparing analgesia for inguinal surgeries. A recent retrospective review of 82 ex-premature neonates who underwent inguinal herniottomy at KK Women's and Children's Hospital, Singapore, reported a success rate of 89% for landmark-guided IG-IH blocks.

- All blocks in that study were performed by senior paediatric anaesthetists using the landmark-based technique, which relies on fascial clicks. Ultrasonographic guidance has been reported to improve the success of IG-IH blocks in older children to up to 94%.
• The use of regional anesthesia in children is increasing. Rapid advancement in the use of ultrasound guidance has allowed for a greater ease in performing peripheral regional anesthesia in pediatrics. Successful peripheral nerve blockade provides children with analgesia that will improve their operative
Paediatr Anaesth. 2006 May;16(5):530-7.

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Ultrasound-guided tranversus abdominis plane block for herniorrhaphy in children: what is the optimal dose of levobupivacaine?

1From the Department of Anaesthesia and Critical Care Medicine, Lapeyronie University Hospital (CS, CM, AR, OR, SB, XC, CD), Department of Biostatistics, Epidemiology and Medical Information, La Colombière University Hospital (SB, NM), and Department of Abdominal and Urological Surgery, Lapeyronie University Hospital, Montpellier, France (NK).

• Regional anaesthetic techniques are commonly used for the management of pain following lower abdominal surgery in children. The transversus abdominis plane (TAP) block has shown promise for perioperative analgesia.

• To evaluate the optimal dose of levobupivacaine for successful ultrasound-guided TAP block in children.

• Twenty-seven consecutive children aged 1 to 5 years scheduled for day-case elective herniorrhaphy.

• After induction of general anaesthesia, ultrasound-guided TAP block was performed with a fixed volume of 0.2 ml kg (-1) of levobupivacaine solution. Block failure was defined as a 20% increase in heart rate or mean arterial pressure from baseline. Rescue analgesia consisted of intravenous remifentanil infusion during surgery and intravenous nalbuphine in the postanaesthetic care unit (PACU). Patients were assessed using the FLACC (face, legs, activity, cry and consolability) pain scale, the rescue analgesic consumption in the PACU and day-case unit and the postoperative pain measure for parents score at home.

• CONCLUSION:
As part of a multimodal analgesia strategy, ultrasound-guided TAP block with 0.2 ml kg (-1)of 0.2% levobupivacaine provides successful peroperative analgesia in 95% of children who underwent herniorrhaphy.
TAP Block
(Trasversus Abdomen Percutaneous Block)

ECM Anestesia-Rianimazione, Vol 17, Jan 2012, pag. 1-7

L- Bupivacaina 0.25% 0.3 ml/kg/lato
Semplicemente Grazie!!!
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