Answers To Questions asked during the WOCOVA: Meet the Experts session of November 24, 2020

Mauro Pittiruti = Mauro
Mathew Ostroff: Matt

Is there any issue between cyanoacrylate and PUR devices?
Matt: I am not familiar with the abbreviation PUR but what I can tell you is that cyanoacrylate has not had any adverse events or issues with any catheter material. With that said, the color can change from clear to a light yellow if the chlorohexidine used to prepare the site is not completely dry, or when placed on a chlorohexidine impregnated catheter.
Mauro: No interaction. See DiPuccio et al. JVA 2018.

How is the experience of using cyanoacrylate in neonates
Matt: Just recently my publication on 82 NICU babies with subcutaneously tunneled femoral CICC’s demonstrated 0% infection rate using glue at the insertion site for protection. The only issue at all is that you have to be extremely delicate when removing the dressing to avoid skin tears just as you would with any dressing on this patient population. But my experience has been nothing but amazing in all populations. We have to remember that a puncture is a WOUND and all wounds should be sealed.
Mauro: We commonly use cyanoacrylate glue to seal the exit site of epicutaneo-caval catheters in neonates.

What is the alternative for cyanoacrylate in preventing bleeding at the entry site?
Matt: There are many alternatives: Gauze, thrombix, stat seal, quick clot, suture, and good old fashioned holding pressure over the site until it stops.
Mauro: Nothing is effective as cyanoacrylate.

No negative interaction between 3rd generation PUR and cyanoacrylate glue in our experience in adults.
Matt: I have not experienced any interactions with cyanoacrylate and my catheters.
Mauro: No interaction. See DiPuccio et al. JVA 2018.

What is the difference between regular superglue available everywhere and medical grade cyanoacrylate?
Matt: This is a great question. If you do some research you will find that there has been an evolution in cyanoacrylates. It is all based on the carbon chains of the Methyls (one carbon chain these are your industrial plastic bonding) and Ethyls (2 carbon chain these are the super glues), to the butyls (is a 4 carbon chain and the earliest topical medixal adhesive, quick drying, rigid/brittle, have some heat released on application, 24 hours until water resistant) and now the octyl blends (this is an 8 carbon chain, longer drying time, higher tensile strength, more flexible, less heat and immediately water resistant).
**Mauro:** Not much difference, but you should use glue specifically registered for medical purposes.

**What do think about this antithrombogeni and anti microbial catheters? Are they effective in preventing occlusion and infection?**

**Matt:** This is a great question. There is no doubt in my mind that the more efforts the clinician makes to prevent a negative outcome, the better the odds are of that outcome not happening but there are so many factors involved in infection, thrombosis and occlusions. While a great catheter may be used to avoid these issues, a great clinician with perfect sterile technique, perfect ultrasound assessment and catheter to vein ratio, and then perfect nursing for care and maintenance should be able to make any catheter have perfect outcomes. Other factors involved in this are the patient themselves and what they are receiving. It is impossible to prevent candida infection from TPN, that is the patients body not the catheter but will result in a blood stream infection and seed the catheter. Without doing a venogram it is impossible to see if there is a stricture in the route your catheter is traveling and no catheter can prevent a DVT when there is restricted flow.

So, my short answer is: if you do the right thing, than your catheter will perform well... if you are experiencing problems re-educate your staff, examine the insertion techniques, examine the care and maintenance. If these factors cannot be controlled, then I would recommend looking into protected catheters.

**Mauro:** At present, there is no convincing evidence that any catheter material may reduce occlusion or venous thrombosis. Coating with chlorhexidine or with minocycline-rifampicin may reduce the risk of infection.

**Should there be concern with needle stick or sharp injury with sutures for securement?**

**Matt:** Of course, there should be concern of needle stick or sharp injury when suturing. There is concern for sharp injury when breaking a glass ampule and even when using your access needle. Cutaneous securement eliminates the risk from sutures, an ampule breaker eliminates the risk from the glass, and a needle safety device eliminates the risk after skin puncture of needle stick. Unfortunately, not all regions of the globe have access to other securement, and our manufacturers continue to provide the sutures taking away the need to seek alternative options.

**Mauro:** You should never use sutures for securement.

**How long will the skin glue last on the skin? Will it last for the life of the line?**

**Matt:** Skin glue has been tested out to 7 days to correlate with a dressing change. It is recommended to be reapplied with each dressing change.

**Mauro:** 7 days

**How would you correct PICC tip placement if it has floated out of a good position and not by physical pulling out of position, and the catheter has a subcutaneous exit site? Would it be more difficult to replace or correct?**

**Matt:** Power-flushing will correct most malposition’s.

**Mauro:** The question is not clear to me!
Have allergic skin reactions to cyanoacrylate been reported?
Matt: There have not been any reported reactions of the octyl blend of skin glue that is available on the market. Dr. Pittiruti can speak to the Butyl glue.
Mauro: Never reported

Tunneled CVC in a pre-school child: any evidence on how long to keep the sutures in transition to relying on the cuff? Would you consider replacing the suture with cyanoacrylate altogether?
Matt: I do not suture my catheters even in my pediatric population, we choose an alternate exit site if removal is a risk due to developmental age or behavior. We use glue and a cutaneous securement device. I would refer you to my presentation on the cuff suture technique which I found very interesting as the suture is placed under the tunneled device and then at the end of catheter placement it is tied to create pressure distal to the cuff but not near the exit site. In the rare instance when I have to place a suture I always place glue over the wound created to protect the suture from causing infection.
Mauro: You should never use sutures for securement.

Do you have any experience with the Relink breakaway iv connectors?
Matt: No experience
Mauro: No experience

For jugular, we still primarily use sutures.
Matt: Do you have other options? And if not I would recommend at least suturing with the catheter turned down to the chest.
Mauro: Very bad. You should never use sutures for securement.

Many countries do not have access to these technologies. Also, in some countries, patients have to buy their own dressings and “add on” appliances.
Matt: This is the point I made in the live question and answer period and why I presented all securement techniques because not all countries have access to the wide variety of securement devices. In these cases, you have to work with what you have as safely as possible. The most economical solution may be the securement dressings.
Mauro: This is not a question

Can glue be used on biliary, nephrostomy, gastric feeding tubes etc. .. and is it difficult to exchange these tubes if glue has been used?
Matt: YES… glue can be used on any puncture site and has been used for decades by surgeons on surgical wounds. An adhesive remover will assist with any removals.
Mauro: I have no experience on glue used to seal nephrostomy or gastrostomy or biliary drains.

How many facilities are doing bedside tunneling?
Matt: Unfortunately, not many in the USA. But I am working hard to demonstrate the need for this option. In the USA it falls under a scope of practice issue and becoming a nurse practitioner or a physician assistant can greatly expedite this process for your programs.

Mauro: In Italy, many hospital have PICC teams that insert tunneled PICC at bedside.

In your clinical practice is catheter dislodgment first complication of COVID-19 patients bearing a CVA as it seems to be for some Italian series?

Matt: This is an excellent question. While we have very few catheter dislodgments with the IV tubing running outside of our rooms, patient movement, being proned, this is my number one concern. I use both cyanoacrylate and cutaneous securement for 2-3-week dwell time and cyanoacrylate and subcutaneous securement for my long-term dwell catheters. The optimal securement would be to use subcutaneous securement device on the COVID 19 patients to secure these lines and prevent the re-exposure to the staff having to replace the line and the life-threatening risks of losing venous access.

Mauro: In Italy, catheter dislodgment is a relevant a frequent complication for COVID patients in ICU, especially if treated with pronation.

Have any experts seen PICC tip coil on flushing PICC?

Matt: I have not seen the tip coil, but the tip can flip up into the jugular vein with vagal responses (vomiting), heavy coughing and CT injections.

Mauro: I did not understand the question

Often I would like to tunnel the catheter to longer distance, well, the line is not long enough (especially in case of inferior vena cava approach and tunneling nearby patella) .... what are the longest catheters available?

Matt: 55-60cm catheters are the longest catheters that I am aware of. I will state that in over 350 femoral approaches, there has been no difference in outcome performance as long as the tip of the catheter has reached the proximal or mid IVC. We also have to remember that in the adult population most emergent femoral access is placed with a 20cm triple lumen catheter. In the USA, we have a large obese patient population and the tip location on many of these catheters is in the iliac vein and they perform without complication in this region.

Mauro: Just use PICCs: they are 55-60 cm long and they can be adjusted even for very long tunneling.

I would like to ask what you recommend for femoral line tip position? What is the most distal entry point you deem acceptable?

Matt: Tip position of FICC may be either in the mid-portion of IVC or in the right atrium, depending on the indication. The exit site of a FICC may be anywhere along the thigh.
Mauro: Funny you should ask this question as I have a paper being considered with JVA on tunneling from the calf region on a severely confused patient in which 5 other options failed. It is all patient specific and circumstantial. Obviously, the simplest solution is the best but not all patients are straight forward. Tip position is by guidelines appropriate in the IVC but by practice triple lumen catheters have performed without incident in the iliac vein for decades. I am working on a paper discussing this very issue so stay tuned.

With tip location, we get accurate placement, we put on the optimal securement. How do we verify the tip remains optimal during dwell? Has anyone used ECG post-insertion? Seems like an opportunity for reducing X-ray exposure.

Matt: Tip location can be assessed at ANYTIME with ultrasound and a flush test eliminating the need for ECG or radiation exposure or accessing the line.

Mauro: Both IC-ECG and TTE are effective method to check that the catheter tip is still in the right position, days or weeks after insertion.

Echographic definition power of wireless probes is poor in the majority of cases for TTE can you comment on that?

Mauro: The wireless probes I use have a very good definition, at least for TTE-based tip location. Probably not for standard diagnostic echocardiography.

Can the USG models used to puncture venous accesses be able to assess the intracavitary position?

Mauro: There is no satisfactory simulator for IC-ECG tip location or TTE-based tip location, at the moment.

Or do you need specific programming?

Great talk, Dr Pittiruti! Our pediatric oncologists tell us that their protocols demand a chest radiograph for tip position. Any comments?

Mauro: Radiology-based tip location is less accurate, less safe, less easy, less rapid and less cost-effective than IC-ECG or TTE tip location.

Do you recommend utilizing the latest technology in tip confirmation instead in having the invasive methods?

Mauro: In 2020, routine tip location should be based on IC-ECG or TTE.

How can we convince for our hospital to buy Cyanoacrylate when they are such a penny pinchers, very frustrating lol?

Matt: Data will prove the necessity for any device or product. It is all about dollars in the USA. How many early dressing changes are performed due to a contaminated dressing and what is the cost of the nursing time and supplies and potential risk of infection due to the exposure of the catheter prior to 7 days... does that offset 6
dollars? In your NICU what product do you use to protect the insertion site from infection or bleeding? The only product that can be used in this population to achieve both outcomes is glue... will that reduce infection and dressing changes and possible skin injuries from early dressing changes on this population? How many laboratories confirmed blood stream infections are there in your hospital? If there is not a central line it is attributed to the PIV or midline, even if the hospital is not penalized for a central line infection, the cost to treat that infection pays for a year of glue. Data and case scenarios are what will get you the products you need and the protection the patients deserve.

**Mauro:** Sealing with glue at the moment of insertion saves money. Dressing change at 24 hrs. is more expensive than a vial of glue.

**Congratulations to excellent presentation. We have difficult with saline ECG. What is the brand of the transducer?**

**Mauro:** The best IC-ECG cable is Vygocard (Vygon).

**How do we address tip malposition on small tributaries like mammary or azygous or intercostal superior veins?**

**Mauro:** Malposition in small tributaries is identified by (1) inability to withdraw blood, (2) no P peak at IC-ECG, (3) no positive bubble test at TTE.

**Matt,** are there available studies on Cyanoacrylate safety for patients with GVHD?

This is a great question that I do not have the answer to. What I can tell you is that this product does nothing but seal and protect. There are no contraindications to its use. Neonatal surgeons even use it on open ostomy sites to help heal the wounds.

**Mauro:** We commonly use cyanoacrylate glue also in GVHD.

**Is there any establishment in oreland (Ireland?) using ECG rather than XRay?**

**Mauro:** Ireland? I do not know.

In the United States we are able to utilize specialized equipment to verify Central line location by identifying peak P-wave. Combination of internal ECG from specialized stylets inserted into catheters. How does that compare to Ultrasound?

**Mauro:** IC-ECG is usually more precise than TTE in adult patients. In children and in neonates, IC-ECG and TTE are equally accurate.

**Here in Spain, we use the ultrasound + intracavitarian ECG technique. In cases of doubt with the P wave, we check with an Rx . Starting today we will try to limit the Rx to the minimum.**

**Mauro:** Good. Please adopt 'modified IC-ECG' in AF patients (see Calabrese et al., JVA 2018) and US-based tip location (see Iacobone et al., JVA 2020) in all patients.

**Dr Ken,** when we see clearly that tip is deeper than CAJ in x-ray but radiologist states CAJ, what should we do?
Mauro: Radiology is not an accurate method for tip location. Adopt IC-ECG or TTE

In many countries, it starts with the government- which discipline is allowed to do what. funding is then another issue

In countries where radiologists are paid by procedure, why would they give up their revenue?
Mauro: Of course not. Money is a great, invincible God

Mauro - please could you share the sterile cable and technique to use these please. Thank you
The best IC-ECG cable is Vygocard (Vygon).

Dr Pittiruti- Did you test various Wifi US probes ( from different companies)? If yes. Which US probes are best.
I tested many wireless probes from four different brands. The best is the one I use (Cerbero, from ATL-Sonostar)