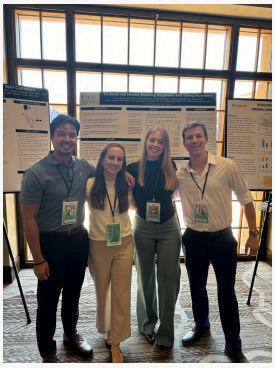
AmSEC*TOMORROW*

TIMEOUT

Student Research Project Focus

Project # 1: Tie Bands and Tension: Exploring Oxygenator Inlet Tubing Securement



By: Ian Villavicencio, Jordan Andrews, Jenna Mehls, & Mitchell Rohr, MUSC

Pictured presenting at the Carolina Perfusion Symposium

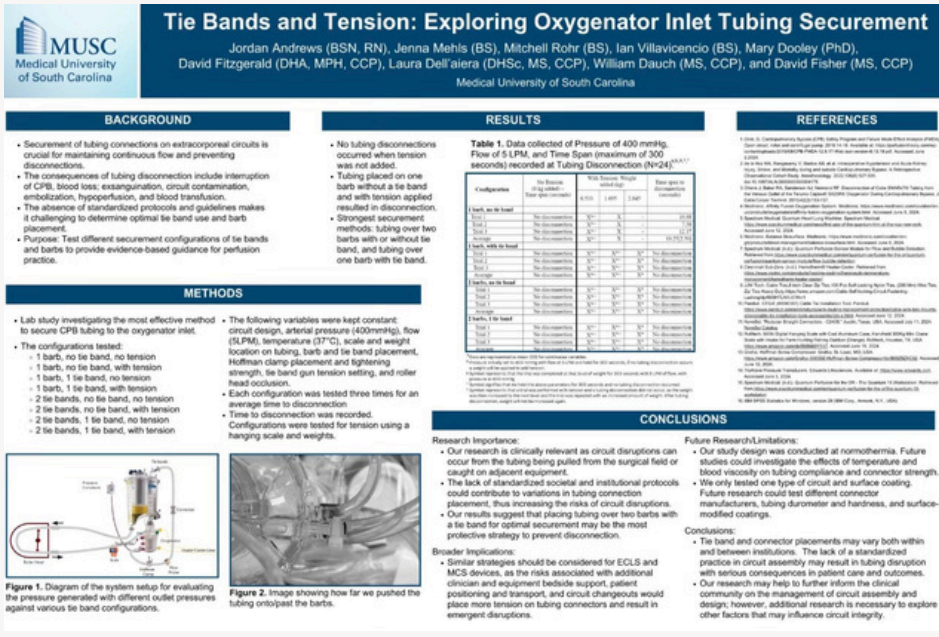
Background: Securement of tubing connections on extracorporeal circuits is crucial for maintaining continuous flow and preventing disconnections that could lead to a multitude of serious consequences. There is limited evidence in the literature regarding why disconnections occur and how to best prevent a disconnection. There is also a wide variation in perfusion practice for tubing securement and use of tie-bands. Our aim is to test different securement configurations of tie-bands and barbs to provide evidence-based guidance for perfusion practice.

Methods: We tested the connection at the oxygenator inlet, which is typically the highest pressure point on a circuit. Our trials consisted of tubing placed over one connector barb with and without tie bands against different tensions on the tubing, as well as tubing placed over two connector barbs with and without tie bands against different tensions. To exclusively test our specified variables and configurations, we kept all other circuit parameters constant for each trial including circuit design, a temperature of 37°C, flow of 5.0 LPM, arterial pressure of 400 mmHg, tie band size, tension setting of the tie band gun, and roller head occlusion. Tubing tension was applied using a hanging scale and weights.

In this Issue:

Results: The only tubing disconnection occurred when tubing was placed over one barb with no tie band, and tension applied to the tubing. All other configurations did not result in tubing disconnection.

Conclusion: The strongest method of tubing securement from our experiment was tubing placed over 2 barbs with or without a tie band, as well as tubing placed over one barb with the tie band. Therefore, we would recommend a practice that includes tubing placed over 2 barbs with a tie band for optimal securement. Future experiments could have focused on other variables, such as duration of pump prime, tubing surface coatings, etc.



Poster presented at Carolina Perfusion Symposium

Timeout contintued...

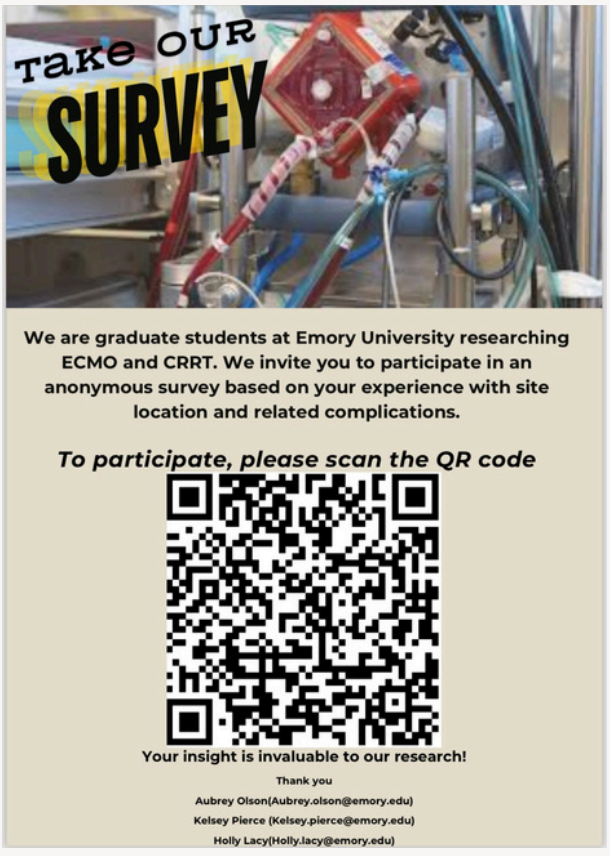
Project # 2: CRRT Placement during ECMO

By: Aubrey Olson, Holly Lacy, & Kelsey Pierce, Emory University



We are Emory University perfusion students and the purpose of our Capstone project is to identify the optimal attachment location of continuous renal replacement therapy (CRRT) in adult extracorporeal membrane oxygenation (ECMO) patients by collecting anonymous REDCap survey results about attachment and return locations of the CRRT device and the complications associated with site location. This research project is significant as it identifies the optimal location for CRRT attachment with the fewest complications in adult ECMO patients. There is no national policy or guideline for CRRT connection to ECMO based on the safest connection site with the fewest complications for adult patients (18 years or older). This study aims to report the safest CRRT location in adult ECMO patients and improve patient safety.

Please use the link below to participate, thank you!
https://redcap.emory.edu/surveys/?s=FDRNHNNKRALXTHWA



ANNOUNCEMENTS

We recently celebrated student appreciation week back in July. This highlighted some of the key contributions and all of the members of student council! See **Page 3** for some pictures from the AmSECT instagram page!

The AmSECT Student Council has chosen new student officers for the 2024-2025 school year. Congratulations to the new student leaders!

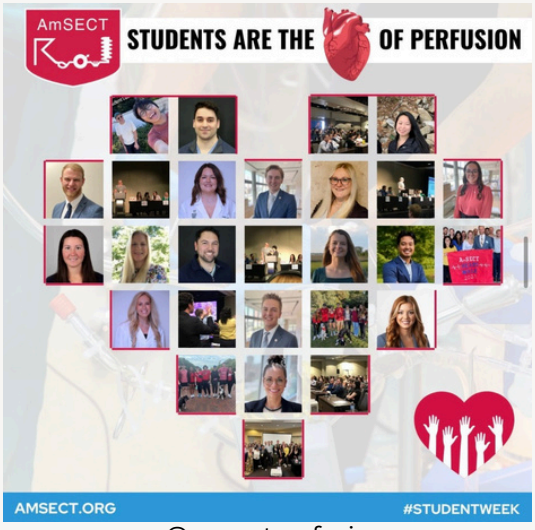
President: Ian Villavicencio
Vice President: Zach Roberts

Officer Positions:
Communications: Anna Cromer
Newsletter: Erin Tobin
Perfusion Bowl: Elizabeth Gibb
Fundraising: Holly Lacey
Events: Aubrey Olson
Pre-Perfusion: Zach Zappa

Special shout out to our 2023-2024 student leaders, this year was amazing! Good luck in your new roles as Perfusionists this year!

HAVE HEART

@amsectperfusion



@amsectperfusion

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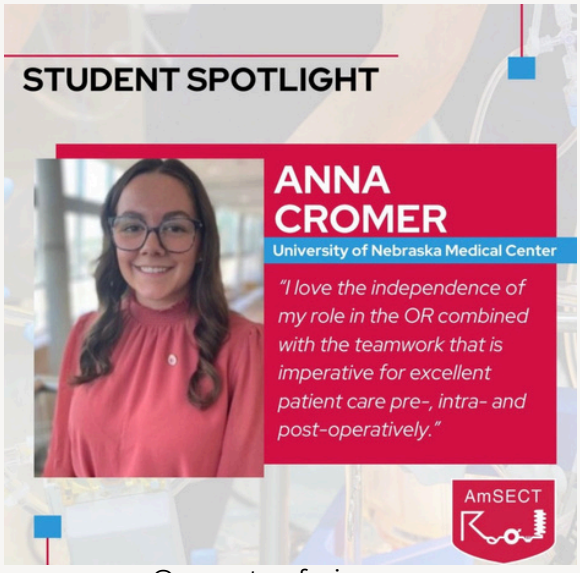
Congratulations to the perfusion students who graduated in May 2024! Share your photos with everyone by using #amsectperfusion



@amsectperfusion

Exciting things are happening in the AmSECT Student Council. Come Join in on the fun!

https://docs.google.com/forms/d/e/1FAIpQLSci_Q1If-f4PjJnD1kEddjEJRz_qSC1_62LgAZgTSI0FB61eg/viewform

PEDIATRIC PALOOZA

BY ERIN TOBIN, MUSC

The ROSS Procedure

What Is the Ross Procedure?

This procedure is used to repair a diseased aortic valve. The patient's aortic valve is removed, and the native pulmonic valve is inserted into the aortic valve position. Then a pulmonary homograft is put in to replace the excised native pulmonic valve.

Indications For the Ross Procedure?

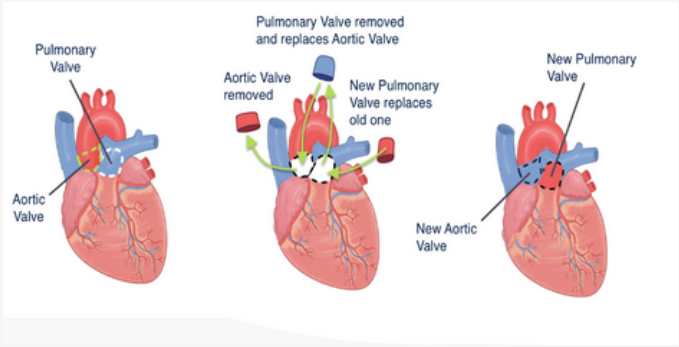
The Ross is very commonly performed for pediatric patients with congenital aortic stenosis. Some other possible indications include: aortic valve endocarditis, aortic valve regurgitation, severe aortic valve disease that is not able to be repaired, thus, a replacement is deemed necessary, and some forms of left ventricular outflow tract obstructions.

Pros And Cons

Since this procedure is largely used in the pediatric population, one of the marked benefits is that a prosthetic valve is not required during the repair. This alleviates the need for lifelong anticoagulation medications and reduces the risk of a child growing out of the prosthetic valve and developing outflow complications. With that said, one of the downfalls of this procedure is that the pulmonary homograft has the tendency over time to become stenotic or develop regurgitation that must be surgically corrected.

When Would This Procedure Not Be Beneficial?

Some contraindications of the Ross Procedure are pulmonary valve disease, Marfan syndrome, and significant mitral valve disease, as these conditions are indicative of higher risk of autograft failure. Lastly, some autoimmune disorders (i.e. Lupus) are contraindicated for fear of acquired cusp disease.



For More Information:

Brown KN, Kanmanthareddy A. Ross Procedure for Aortic Valve Replacement. [Updated 2023 Feb 13]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537249/

UCSF Health. (2023, September 23). Ross procedure. ucsfhealth.org.

Barbara, D. W., Mauermann, W. J., Neal, J. R., Abel, M. D., Schaff, H. V., & Winters, J. L. (2013). Cold agglutinins in patients undergoing cardiac surgery requiring cardiopulmonary bypass. The Journal of Thoracic and Cardiovascular Surgery, 146(3), 668–680. https://doi.org/10.1016/j.jtcvs.2013.03.009

Hage A, Hage F, Valdis M, Guo L, Chu MWA. The Ross procedure is the optimal solution for young adults with unrepairable aortic valve disease. Ann Cardiothorac Surg. 2021 Jul;10(4):454-462. doi: 10.21037/acs-2021-rp-26. PMID: 34422557; PMCID: PMC8339615.

Interested in writing an article for the AmSECTomorrow Newsletter?

Join the student council and meet with Erin Tobin during the student council meeting every 2nd tuesday of the month @ 7pm CST!

CASE CLOSED

BY AMBER HELMS, LIPSCOMB

I recently observed an aortic valve replacement (AVR) and intracardiac cryoMAZE on a morbidly obese adult patient with diabetes mellitus type two, atrial fibrillation, hypertension, and hyperlipidemia. A 34/46 F venous cannula and 24 F EOPA arterial cannulas were used to provide the best drainage for a bloodless field. Excessive blood volume was anticipated due to patient size and increased left ventricle end diastolic pressure (LVEDP) from aortic valve insufficiency. Preparation for this excessive volume included having an extra empty crystalloid bag so that the crystalloid prime volume could be sent to the empty bag and discarded during retrograde autologous prime (RAP). After RAP and upon initiation of cardiopulmonary bypass (CPB), more of the patient's blood volume was sent to a different empty crystalloid bag so the reservoir did not overfill. After reaching a steady state where the volume leveled out, the blood that was sent to the crystalloid bag was dropped into the reservoir. A hemoconcentrator was added into the circuit prior to the procedure so that during CPB volume could be managed when Del Nido cardioplegia was given. Another challenge that was faced during this procedure was maintaining high flow for a cardiac index of 2.4 due to the high body surface area (BSA) of 3.1.

One thing that was taken into consideration is that adipose tissue is not perfused during CPB so the perfusionist did not necessarily need to flow at a cardiac index of 2.4. We decreased oxygen demand by cooling the patient and anesthetic gas was increased to maintain a bispectral index monitoring system (BIS) less than 50. The FiO2 was maintained at 100% the entire case and the PaO2 was monitored frequently in case we needed to add an extra oxygenator to increase supply during rewarming. The arterial blood gasses (ABG), venous saturation, and hematocrit stayed within normal limits throughout the entire case. After the procedure and rewarming was complete, pacing wires were needed as the heart recovered but once the Del Nido cardioplegia wore off they were no longer needed. CPB was weaned slowly and successfully. Being prepared for this amount of volume by displacing prime volume, displacing blood volume, and the use of a hemoconcentrator made it much easier during the case and did not disrupt the flow of the surgeon. Closed loop communication was used throughout the entire procedure if the perfusionist did need extra time or help from anesthesia during displacement of volume. I learned many useful skills during this procedure and hope it helps someone else as well.

GOOFS & BLUNDERS

SUBMISSIONS BY STUDENT COUNCIL MEMBERS

First time I tried to draw up drugs in the OR, I attempted it with the cap still on the bottle.

Didn't realize med bottles are pressurized when manufactured and I took the metal ring off with my clamp before trying to draw it up. The cap bust off and I was covered from head to toe in mannitol during my first week at my new rotation!

In simulation lab I left my RAP bridge open while initiating bypass and overfilled the RAP bag so much it started hissing from the pressure.

During my oxygenator changeout practical, I had the oxygenator outlet line blow off three different times. My partner had to hold the outlet on while I weaned from bypass. I was absolutely drenched in moldy sim lab water!

Was prepping for a case and ran straight into the overhead OR lights. I tried to play it off, but my head and ego were bruised.

My first time having lines handed down to me I contaminated one of the PA's while attempting to grab the sucker line.

Additional Resources:

The AmSECT website has a helpful page with information about different charitable organizations that provide cardiac care: https://www.amsect.org/About/Awards-Designations-Scholarships/Cardiac-Missions/Charitable-Organizations

THE RESERVOIR

AmSECT Student Membership

Student membership is FREE! Register now and become an official part of the perfusion community. https://www.amsect.org/Members/Student-Corner

Have a Perfusion blunder you want to share?

Please email tobine@musc.edu to have your goof included in the next issue!

Before you go...

The AmSECT Student Council exists to promote student involvement within AmSECT. While our current members hail from over 16 different programs, our goal is to have **every** perfusion program in the country represented on the council. Our major projects include an annual fundraising event, the perfusion bowl, and this very newsletter, with multiple opportunities for student leadership!

Our current officer team consists of a president/chief student liaison, vice president, fundraising project lead, communications coordinator, and newsletter editor, pre-perfusion coordinator, events, and perfusion bowl coordinator. The Student Council meets monthly via Zoom for one hour, so the time commitment is designed to be manageable! Don't forget to sign up to come to the annual AmSECT Conference in the spring! It's a great way to network and see the student council in action.

INTERESTED IN JOINING THE STUDENT COUNCIL?

PLEASE EMAIL AMSECTSTUDENTHQ@GMAIL.COM AND BE SURE TO INCLUDE YOUR CONTACT INFORMATION. SHARE YOUR VOICE, DEVELOP YOUR NETWORKING AND LEADERSHIP SKILLS, AND BECOME INVESTED IN THE PROFESSIONAL DEVELOPMENT OF OUR FIELD! WE LOOK FORWARD TO SEEING YOU JOIN OUR TEAM.