

# AmSECTOMORROW

## TIMEOUT

A Student Perspective of NRP

**Charting New Territory: A Student Perfusionist's Experience with Normothermic Regional Perfusion (NRP) for Donation after Circulatory Death**



BY: SHAR KAN, MUSC

As a student perfusionist at the University of Rochester, participating in a Donation after Circulatory Death (DCD) abdominal Normothermic Regional Perfusion (NRP) bypass was an invaluable learning experience. It highlighted the complexity of our field and the life-saving impact of our work.

The case itself was logistically challenging. The donor hospital was hours away, requiring our team to carefully prepare and transport all necessary equipment. Even small oversights could delay the procedure or compromise its success. Upon arrival, setting up in an unfamiliar operating room (OR) added another layer of complexity. We had to ensure proximity to the patient while securing essential resources like gas, vacuum, sharps/trash containers, heater cooler, and power sources. This process required cooperation with hospital staff to gather everything needed for the procedure.

The modified bypass circuit involved a reservoir and oxygenator mounted on an IV pole, Rotaflow centrifugal pump, and pump sucker powered by vacuum. Due to the absence of anesthesia support, the pump was primed with paralytics, antibiotics, heparin, steroids, and other drugs to aid in organ preservation. After setup, we ensured that the pump, safety devices, and heater cooler wouldn't trigger alarms during the family's time in the OR. A moment of silence was observed for the donor before the team stepped out, waiting for 5 minutes of asystole after withdrawal of care.

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Prior to cannulation, a bolus of heparin was administered. On bypass, we set sweep gas to 5-10 LPM with 75%-100% FiO<sub>2</sub> to reoxygenate the dark blood. Unlike traditional cardiopulmonary bypass, NRP flow was not based on the patient's cardiac index but aimed at maintaining 2-4 LPM to perfuse the abdominal organs. Every 15 minutes, an arterial blood gas (ABG) and Activated Clotting Time (ACT) were drawn to assess lactate and potassium levels, guiding adjustments in collaboration with the surgeon. Hemoglobin targets were set at 7 gm/dL, but slightly lower levels were acceptable since the focus was on organ preservation rather than systemic oxygen delivery. Additionally, phenylephrine was not administered, prioritizing flow over pressure. After two hours of reperfusion and achieving optimal organ function, bypass was weaned, and the organs were extracted.



**Medtronic Affinity Fusion Oxygenator and Rotaflow Pump System configured for Normothermic Regional Perfusion (NRP) prior to priming.**

# TIMEOUT (CONT.)

## **Charting New Territory: A Student Perfusionist's Experience with Normothermic Regional Perfusion (NRP) for Donation after Circulatory Death**

Reflecting on the experience, I realized how distinct NRP is from conventional cardiopulmonary bypass. While traditional bypass prioritizes systemic perfusion and patient support, NRP centers on organ preservation. The logistical challenges, unique circuit setup, and modified goals underscored the adaptability and precision required in perfusion. This case deepened my appreciation for the complexity of our field and the critical role teamwork plays in life-saving organ donation.

Thank you to Eric Knorrmeir, CCP; Quinn Braithwaite, CCP; Karen Jones, CCP; Dr. Amit Nair, M.D.; and the Perfusion Team at the University of Rochester for the opportunity to take part in this invaluable experience.



**Normothermic Regional Perfusion (NRP) circuit during reperfusion.**

# ANNOUNCEMENTS

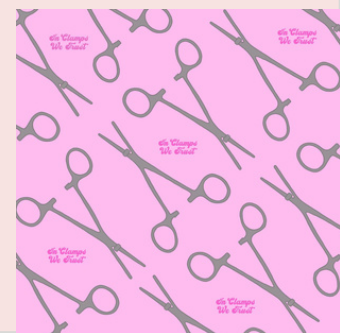
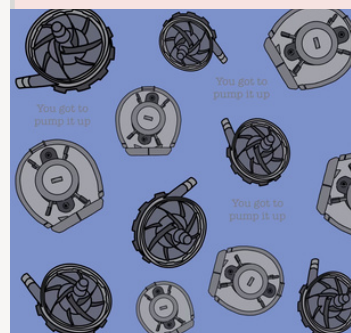
Back in October we held our annual student led Heart Walk. #CruisinforPerfusion was quite a success! See **Page 3** for some pictures from the event!

**The AmSECT Student Council implemented a fun competition for this years Heart Walk. A first year student, second year student, and CCP winner were selected for walking/running the furthest.**

And the winners were.....

- Ruth Garcia (CCP Winner)- 8.04 miles
- Ryan Cruz (Second Year Winner)- 8.32 miles
- Patrick Hood (First Year Winner)- 12.84 miles

**Each winner received a custom scrub cap designed by the Council's own Sophie Celentano!**



# HAVE HEART



The Heart Walk was quite a hit with participation from MUSC, Emory, University of Arizona, & AmSECT Student Involvement Committee's Daniel Nguyen to name just a few!!



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

[https://docs.google.com/forms/d/e/1FAIpQLSci\\_Q1lf-f4PjJnD1kEddjEJRz\\_qSC1\\_62LgAZgTSIOFB6\\_1eg/viewform](https://docs.google.com/forms/d/e/1FAIpQLSci_Q1lf-f4PjJnD1kEddjEJRz_qSC1_62LgAZgTSIOFB6_1eg/viewform)



# PEDIATRIC PALOOZA

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## Mechanical Circulatory Support in Pediatric Perfusion: Berlin Heart Active



BY: SARAH RAMADAN, TJU

My time rotating at the Children’s Hospital of Philadelphia (CHOP) has been nothing short of eventful thus far! We’ve done 2 Berlin Heart implants in the month I’ve been here, in addition to a Centrimag to Berlin Heart changeout. CHOP’s Heart Failure program is one of the busiest MCS centers, and is one of the centers that is trialing the Berlin Heart Active Driver, so I thought I’d share about one of the most exciting developments in the Pediatric MCS space!

### THE BERLIN HEART PUMP

Berlin Heart EXCOR is an external heart pump that can be used as a bridge to recovery, or a bridge to transplant. The Berlin Heart is the only pulsatile pediatric ventricular assist device on the market at this time! It is driven by a piston system and a pneumatic membrane to simulate cardiac ejection.

The EXCOR comes in 6 different pump volume sizes (10, 15, 25, 30, 50, and 60 mL) and is made of clear urethane for easy assessment of pump function and fibrin deposition. The pump has one way valves for inflow and outflow, and are connected to silicone cannulas with velour sheathing for the anastomosis and skin exit sites.

### THE BERLIN HEART ACTIVE DRIVER

The EXCOR pump is connected to an external driver, of which CHOP uses the newer “Active”, which is a lighter and more compact version of the older “Ikus” driver, which uses a louder compressor system.

What makes the Active driver so special is its ability to automatically adjust to patient pressures. The Active driver, unlike the Ikus, has two settings: manual and automatic. Automatic mode will adjust the systolic and diastolic pressures to the least amount necessary to fill and eject, while manual mode will keep the set pressures.

### THE BERLIN HEART ACTIVE SETTINGS

The 4 main parameters that can be changed on the Berlin Heart are as follows:

1. Systolic ejection pressure
2. % time spent in systole
3. Diastole (negative suction pressure used to fill)
4. Rate of pump

The systolic pressure is most of the time initially set to 100 mmHg above the goal patient systolic pressure, 50%.

### BERLIN HEART ACTIVE SPECIAL CONSIDERATIONS

Sometimes with Berlin Hearts, fibrin deposits form. These present as white buildup in the pump, and are easy to spot. Deposits like these can warrant a pump change out, which can be done by replacing the pump itself while leaving the cannulae in place. Patients cannot leave the hospital while on a Berlin Heart, so monitoring for deposits is done quite frequently.

### BERLIN HEART ACTIVE STUDENT PERSPECTIVE

From a student perspective, Berlin Heart implants can be daunting at first. Running the heart lung machine during an implant can be difficult, as these patients are usually quite sick. The weaning process requires careful volume balancing as the pump is equilibrated while weaning off bypass. This requires careful and precise communication with the surgeon.

### ANTICOAGULATION STRATEGY

At CHOP, these patients are usually anticoagulated with Bivalirudin, in addition to a platelet inhibitor such as Plavix or Cangrelor. The concentrations are titrated based on patient needs and planned procedures.

All in all I’m very excited about the new developments in the mechanical circulatory support space, and I’m very excited to be rotating on a team that is at the forefront of it all!



BY: ISABELLE TEASEL, NKU

“Tell me about yourself” is so simple, yet so complex that you may be overwhelmed by how to approach such a question. While the application process and the perfusion program itself are not necessarily comparable, the schooling may have a similar feeling as that common interview question. My fellow students and I will tell you, this is not your undergraduate program. Get ready to study!

My first semester of the cardiovascular perfusion program has been a pursuit of academic aspiration, professional development, school-life balance, and personal growth. You develop the foundational knowledge of the profession through a heavy workload of several credit hours along with the time outside of class. The time you dedicate will be shown through the course’s performance and results. I recommend taking advantage of classroom time, studying with others, and going in on your own time. You will also want to absorb everything from the complexity of concepts to clinical observations, embrace academic or personal challenges, and place yourself outside of your comfort zone to grow.

In the past, I have been hesitant to ask questions during class. However, building a sense of community with your peers for support, advice, feedback, and academic assistance can be empowering. Ask that question without the fear of judgment, because someone else will most likely have the same question. My peers come from various backgrounds such as students, autotransfusionists, medical assistants, nurses, MRI technologists, and more; but we have all completed the same requirements and were seen as capable. One of the most important lessons is don't compare yourself to others and find what works for you. As my director told me, you are your worst enemy just step out of your way.

There will be challenges, frustrations, or times when you will consider wanting to stop; however, you must push forward. Each research paper, exam, evaluation, tough observation case, bad day, or even a wave of homesickness is only temporary. I recommend discovering what drives you to reach your goals along with taking time to reset when necessary. Self-care or an enjoyable activity can help prevent burnout associated with heavy time commitments and personal sacrifices. I found using my ambitions of research and academics beneficial to boost my grit during tougher weeks. Taking time to acknowledge, reflect, and strategize each challenge will help you learn and become more resilient and knowledgeable in the field of perfusion. The culmination of skills collected is going to be useful in the next chapters of the second semester and eventually clinical rotations.

## GOOFS & BLUNDERS

### SUBMISSIONS BY STUDENT COUNCIL MEMBERS

My rotation site doesn’t frequently use vacuum and when we do it’s always a struggle to get the right amount. When applying, the negative pressure shot out of range and triggered an alarm. The surgeon asked what was going on and I explained. He replied “well you suck”, hopefully it was a vacuum pun!

I was tired one morning and forgot that I hadn’t attached my heater cooler lines to anything before turning them on.  
Made an absolute mess.

I can’t always hear the surgeon that well, so when they asked for the LV vent to be clamped, I thought they asked how much I was getting back. Halfway through my detailed response, I was cut off by them saying “off, off, off”. Whoops!

When trickling down a vein graft the surgeon wanted to know how much I was flowing. For some reason the number I saw which was 0.04 LPM didn’t cross over to ml/min in my head. So I said we were flowing 400ml/min instead of 40ml/min. Needless to say I got an odd look and questioned.

## 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](mailto:tobine@musc.edu) to have your goof included in the next issue!

### 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>

### ***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](mailto: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.