



Editor: Kennethia Banks



### Message from the President

The end of the year is always a time for reflection, and especially this year as I complete my time as ELSO president. In looking back over the goals I set out for myself and the organization in January of 2020, I failed miserably - completing only two of the ten.

However, at the time none of us knew what was heading our way. A dramatic pivot was needed and all work now revolved around pandemic response. Our accomplishments together during this time greatly exceeded my wildest expectations. The last two years has brought out the best in the ELSO community – not only in clinical care and research, but also in care for each other through some dark times.

The support that I saw you give each other – whether clinical in nature by sharing experiences and research, or just commiserating together over shared struggles – will be some of my fondest memories of this time. ELSO truly reflected its global nature when you look at the collaboration and research that was so rapidly assembled. Early in the pandemic, what was learned in Japan one day was being implemented in Italy the next. As experience and evidence accumulated, ELSO's global members worked to get it to the rest of the world by the traditional means of publications, but also by countless group video conferences, webinars, messaging applications, and virtual conferences. While we all were physically separated by quarantine, we in many ways were even closer than usual and we grew stronger as an organization. These highly successful collaborations all had a common, ultimate goal – improving patient outcomes – and many lives were saved because of it.



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As we have come out of the worst days of the pandemic, it has been wonderful to see many of these structures and relationships persist and thrive. Being back together and seeing many of you in London, Boston, and Lima during 2022 has been wonderful and signals what I am hopeful is a return to normalcy. It has been an honor and privilege to serve in this role for the last two years, and I look forward to the global responsibilities of the past president office and continuing to watch the amazing accomplishments of this community.

Matthew Paden, President, ELSO





## Committee Roundup

### Registry Committee

The ELSO Registry continues to grow with new members joining subcommittees. The Scientific Oversight Committee is evolving their processes; this includes a new focus on the relevance of the proposal in the scoring process, and the addition of a new process to obtain high level epidemiologic data from the ELSO Registry with a more expedited internal review for investigators looking to describe limited outcomes at an aggregate level for publications. The Development committee is in the process of implementing a new Neonatal Respiratory diagnosis tool to help those entering data identify an accurate primary diagnosis and associated diagnoses in a facilitated way. The output from this will increase data accuracy with regard to diagnoses, and will also facilitate analyses by generating relevant diagnostic categories for Neonatal Respiratory conditions, in addition to the raw ICD codes.

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The Trauma Addendum in the ELSO Registry has been open for data entry since the beginning of 2022. Over 40 centers have agreed to participate in entering trauma patients into the optional addendum. We are inviting you to join them adding patients who suffered trauma and were supported on ECMO.

The addendum is intended to be filled out only when trauma is the underlying reason for ECMO indication.

Some examples:

- A patient involved in a motor vehicle collision is diagnosed with multiple long bone fractures and blunt abdominal trauma, and now has developed respiratory failure due to abdominal compartment syndrome.
- A brain injured patient develops ventilator induced lung injury due to high tidal volume mechanical ventilation as a consequence of targeted pCO<sub>2</sub> for increasing intracranial pressure.
- A patient with blunt injury of the chest and abdomen who requires cardiac support to restore circulation prior to bleeding coagulopathy.

All resources for submission of patient data to the ELSO Registry can be found at:

<https://www.else.org/Registry/DataDefinitions,Forms,Instructions.aspx>

ECMO Trauma Addendum Form:

<https://www.else.org/Portals/0/Files/PDF/ELSOTraumaForm1.0%202022.pdf>

Trauma Addendum Data Definitions:

<https://www.else.org/Portals/0/Files/PDF/ELSO%20Database%20Trauma%20Addendum%20Definitions%202022.08.15.pdf>

Please do not hesitate to contact Justyna Swol at [jswol@icloud.com](mailto:jswol@icloud.com) with any questions or comments.



## Conference Committee

### Virtual Conference - available thru January!

**Event:** 33rd Annual ELSO Conference - Virtual Program - Available thru January 2023; CME is still available for MD/RN roles (3x the in person CME equivalent)

Please visit our Conference Site here: <https://cvent.me/m7xbVy>.

**Event:** SWAAC ELSO 2023

Location: Punjab , India

Dates: March 11-12, 2023

**Event:** EURO-ELSO 2023

Location: Lisbon, Portugal

Dates: April 26-29, 2023

**Event:** AP ELSO 2023

Location: Seoul, South Korea

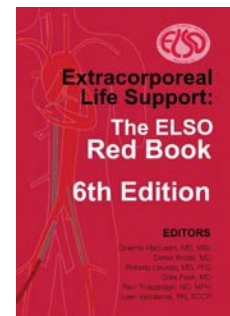
Dates: November 2-4, 2023

The latest information on ELSO & Collaborative Meetings can be found [here](#).

## Publications Committee

The ELSO Red Book 6th Edition was officially launched at our 33rd Annual Conference.

The book is currently available for purchase via the publications page on the [website](#).



ELSO will soon have two new Monographs available:

- Neonatal and Pediatric Simulation Scenarios by Lyndsay Johnston, Lillian Su, and Catherine Allan.
- Post-Cardiotomy ECLS and other Temporary Mechanical Circulatory Supports in Adult Patients, with Roberto Lorusso as Senior Editor and a robust team of international authors.

The ECPR and Resuscitative ECMO monograph, edited by Zach Shinar and Jenelle Badulak, is available on ELSO's Publications page: [www.else.org/publications](http://www.else.org/publications).



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## Nominations & Membership Committee

The Nominations & Membership Committee has heard the requests from many of you to have focused community conversations readily available. We are excited to be launching those through WhatsApp. More information coming soon on how to sign up on [www.elseo.org](http://www.elseo.org), as we will need your contact information to participate. Please let us know other communities you would like to have from the following:

- Directors
  - Coordinators
  - Starting a New Program
  - Award of Excellence
  - Respiratory Failure
  - Cardiogenic Shock
  - ECPR
- 

## Perfusion Updates

AmSECT Meeting will be March 24-26, 2023 in Orlando, Florida International Conference

International Conference - AmSECT

AmSECT National Headquarters 330 N Wabash Ave, Suite 2000 Chicago, IL 60611

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## The Award of Excellence Committee

All awards have been mailed out to the 2023 Center of Excellence Award Recipients. If you have not received your center's award please contact Kennethia Banks at [kbanks@elseo.org](mailto:kbanks@elseo.org) for assistance.

The Award of Excellence Committee will be reviewing 2023 applications the first week of March 2023. Please note that the application deadline is back on its pre-COVID schedule and **CLOSES March 1st at 23:59 EST**. Now is a great time to get started on your 2023 application! The award application period is opened from 10/15/22 through 3/1/23.

Don't forget to download the Award Evaluation and Improvement Tool or the Pathway to Excellence Readiness Tool before you fill out your online application.

The Quality Committee has added some new members to our team! Please welcome Archana Dhar, Darryl Abrams, Donna Tanner, Craig Rackley, Simon Finney, and Dinis Reis Miranda. This group will be working as partners with the Registry Committee looking at quality measures.

Have questions? Contact: [Award@elseo.org](mailto:Award@elseo.org)



## Education Committee/ELSO Academy

### The ELSO – Adult ECMO Certification (E-AEC) Exam

ELSO has outlined standardized educational criteria and launched an online application process via ELSO Academy for ECMO clinicians who have demonstrated satisfactory completion of criteria listed on our website. This journey is designed to be inclusive of the entire ECMO interprofessional team. Certification is valid for three years; upon which time a renewal can be pursued to maintain certification. For additional information, please visit:

<https://www.else.org/Education/certificationexam.aspx>

### Congratulation E-AEC Providers!



#### ELSO Foundations:

ELSO Foundations: Adult ECMO Training Course is a self-paced ECMO course consisting of 53 modules, covering over 80 learning objectives which are anchored in the foundational concepts that will allow practitioners to develop, strengthen, and refine clinical skills related to ECMO patient care skills. ELSO is pleased to announce the **Spanish translation** is available now!

**Registration:** <https://www.else.org/ecmo-education/elseo-ecmo-academy.aspx>



## Expanding Global Access

### Train the Trainer (TTT)

Learn how to design your courses to meet ELSO standards. More TTT courses will be announced soon for 2023.



## Upcoming ELSO In-Person Training Courses

We will be announcing more new courses soon. Don't miss anything by checking [here](#).

### Event: ELSO Extracorporeal Membranous Oxygenation (ECMO) Simulation Course at SCCM

Dates: January 19 - 20, 2023

Location: Hilton San Francisco Union Square

Address: [333 O'Farrell Street, San Francisco, California, 94102, USA](#)

**REGISTER NOW >**



### Event: ELSO Neonatal and Pediatric ECMO Training Course

Dates: April 4, 2023

Location: Virtual

Register: <https://www.else.org/ecmo-education/2023aprilneopedscourse.aspx>

### ELSO Simulation Courses for 2023

Location: ELSO Headquarters, Ann Arbor, MI

Dates: April 12-13; April 14-15; November 8-9; and November 10-11

Register: <https://www.else.org/ecmo-education/endorsed-ecmo-courses.aspx>



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## Research Committee

The research committee is still working on the Research Task Force survey (how ELSO should be engaged in research) and the Research Priorities Survey (what are the important questions in the field that should be answered first?) and planning the next Research Webinar for the new year.

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## Coordinator's Corner

We look forward to providing more coordinator's symposiums in 2023. The committee members are currently discussing dates, topics and times for 2023. These symposiums will highlight topics that are important to a large number of centers in the current environment. The symposiums will be co-moderated by two members of the committee and will offer panelists the opportunity to present short topic-based informational presentations.

If you have any topics that you would like the committee to review for discussion email: [newsletter@elso.org](mailto:newsletter@elso.org)

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## Research Alley

Author: Salma Elkholy

### Analgesia and Brain Death Determination Practices

I'm Salma Elkholy, a M3 student at Cooper Medical School in USA. I'm currently working on a project with my mentor to better understand analgesia and brain death determination practices around the world in ECMO patients.

This activity should take less than 5-8 minutes to complete.

Survey link is: <https://s.surveymonkey.com/Gm6TVimO>



Thank you so much in advance for your assistance!

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## Announcements:

January 10, 2023 - Deadline to submit data for inclusion in upcoming Registry Freeze

January 15, 2023 - Registry Closes





## Bedside with Bartlett



*Robert Bartlett, MD  
Founder, Board of Directors Emeritus, ELSO  
Professor Emeritus of Surgery, University of Michigan*

### Case Study

A 55 year old man is on VAECMO via the femoral vessels for cardiogenic shock. After two hours the left ventricle is not ejecting despite inotropic drugs. What will happen? When and why?

The left atrium and ventricle will gradually become distended. Left atrial pressure will reach 20-25 over a few hours resulting in pulmonary edema. This is because of bronchial blood flow from the aorta to the LA. It is about 5% of the cardiac output. A PA catheter should be placed to measure pressure, preferably before cannulating for ECMO. When the PA diastolic or wedge pressure reaches 15, the left side should be vented via a larger cannula in the PA, via a LV to aorta pump like the impella or a VAD, or by creating an atrial septal defect draining the LA to the RA.

Do you have an alternative approach or if you would like to submit a case study for the newsletter email: [newsletter@elso.org](mailto:newsletter@elso.org)



## Bedside with Bartlett: An Alternative Approach

*This addition to "Bedside with Bartlett" was developed for medical professionals to offer alternative methods of treatment for patients in previously cases presented by Dr. Bartlett. If there is case that you would like to submit or a response you would like to issue, email: [newsletter@elso.org](mailto:newsletter@elso.org).*

### **Vascular access in newborn infants**

#### **October 2022 Case**

A 3 kilogram newborn with a left sided diaphragmatic hernia is hypoxic and hypercarbia after birth. The oxygenation index is 40 and the decision is made to go on ECMO support. Veno arterial access through the neck vessels is standard practice, as is veno venous access with a double lumen cannula through the jugular vein. Someone suggests recent research showing success with venovenous access via the femoral vein and jugular vein. What is the best vascular access?

Veno arterial access (jugular to carotid) has been the standard vascular access for any newborn respiratory or cardiac failure for 40 years. Venovenous access with a double lumen cannula via the jugular vein has been standard practice for respiratory failure for 25 years.

Vascular access using the femoral vessels in infants was studied extensively many years ago. Although it is technically feasible, the difficulty of access and potential complications caused us to recommend against it. This idea has been studied again recently, with a small series of cases demonstrating that veno venous support can be done with the femoral vein and jugular vein. However, the risk of damage to the femoral and retroperitoneal vessels is significant and this does not exist with access via the neck.

The reason that jugular to carotid is successful is that those are the largest extrathoracic vessels in newborns and infants. Ligating the carotid sounds dangerous but carotid flow is quickly established via collaterals when the carotid is ligated low in the neck. Simply avoiding the carotid is not a reason to use venovenous access. Femoral vessels are large enough for routine cannulation when children are walking, around age 4 or 20kg. My advice is that all extrathoracic vascular access in children up to age 4 should be via neck vessels, usually VA via the jugular to carotid. (Double lumen VV has more cannula complications than VA). In children from 4 to adolescence neck vessels are fine, but femoral access is possible.

Diaphragmatic hernia runs are long and double lumen cannulas need frequent tending and positioning. VA access is the best option.



## An Alternative Approach to: Bedside with Bartlett

### October 2022 Case Study: Vascular Access in Newborn infants

A 3 kilogram newborn with a left sided diaphragmatic hernia is hypoxic and hypercarbia after birth. The oxygenation index is 40 and the decision is made to go on ECMO support. Veno arterial access through the neck vessels is standard practice, as is veno venous access with a double lumen cannula through the jugular vein. Someone suggests recent research showing success with venovenous access via the femoral vein and jugular vein. What is the best vascular access?

#### An Alternative Approach Contributors

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Dr Jon Lillie is a paediatric intensivist and ECMO lead at Evelina London Children's Hospital, performing approximately 20 neonatal and paediatric ECMO runs annually with respiratory disease supported by VV ECMO. He believes that we should question everything as much of what we do is based on dogma rather than evidence.

His training included a fellowship at Starship Hospital, New Zealand and experience across five London paediatric critical cares. Post-COVID, his only trips abroad have involved visiting VV ECMO centres, albeit in beautiful cities-Budapest and Genova.

#### Response

Rather than ask "is it VV or VA for respiratory failure?" we should be asking, "how can we deliver VV?"

Multiple studies have shown harm with VA ECMO(1),(2) and there are additional advantages of VV apart from avoiding cannulation of the carotid artery. Potential benefits include: no increase in afterload for an impaired ventricle, delivering oxygenated blood to pulmonary and coronaries arteries and the ability to cease oxygenation of the ECMO circuit, without reducing flow, for considered assessment prior to decannulation.

The decline in use of VVDL has been due to ongoing concerns with these cannulae rather than belief that VA has become safer (3). Traditional VVDL cannula are still utilised (4) and a new mid-atrial cannula has offered promise (5) but other potential cannulation configurations should be considered. We can only find opinion (6) rather than evidence that prescribes a limit at which femoral vein cannulation is safe.



We would suggest that using two cannulae are simpler to place and provide flows that are more stable for neonatal VV ECMO. Blood is accessed from the mid atrium via a RIJ cannula and returned to the IVC via the femoral vein- Vj-Vf. The Evelina case series demonstrates that adequate ECMO could be delivered to babies as small as 2.1kg with a median inotrope score of 50 (equating to receiving 0.5 mcg/kg/min of epinephrine (7)) Flows were stable, delivering median oxygen saturations of 94% on ECMO. There was acute venous leg congestion with common femoral vein ligation in all patients but two year outcomes showed no clinical deficit with all children walking.



Two other centres have adopted this configuration and improved Vj-Vf cannulation by using a percutaneous approach with success. This avoids a surgical procedure and hopefully reduces the risk of bleeding, infection and thrombosis. While all neonates surgically cannulated at Evelina had post-procedure thrombosis, only one out of six neonates suffered thrombosis when the femoral cannula was placed percutaneously (Southampton/ Heim Pal unpublished data). Prior to using this ECMO configuration, one centre had never delivered VV ECMO (Southampton) and the other had not offered neonatal ECMO (Heim Pal). We would suggest that centres trial Vj-Vf with the percutaneous approach potentially reducing complications further.

## References

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5. Gray B. Experience with Avalon mid-atrial cannula. Oral presentation. ECMO and The Advanced Therapies for cardiac and Resp failure, 38th Annual Children's national symposium. 2022
6. Barbaro RP, Brodie D, MacLaren G. Bridging the Gap Between Intensivists and Primary Care Clinicians in Extracorporeal Membrane Oxygenation for Respiratory Failure in Children: A Review. *JAMA Pediatr.* 2021 May 1;175(5):510–517. [doi: 10.1001/jamapediatrics.2020.5921](https://doi.org/10.1001/jamapediatrics.2020.5921)
7. Lillie J, Pienaar A, Budd J, et al. Multisite Veno-Venous cannulation for neonates and Nonambulatory children. *PCCM* 2021;22:692–700. [doi:10.1097/PCC.0000000000002753](https://doi.org/10.1097/PCC.0000000000002753)



## ECMO AROUND THE WORLD

### EURO ELSO Updates

We have had a great year, clearly a very successful congress in the Spring. We have developed educational collaborations with the European Society of Intensive Care Medicine, European Society of Cardiology, the International Society of Heart Lung Transplantation (European Chapter) and the European Society for Organ Transplant. We have held a successful ECPR course in Prague, led by Jan Belohlavek. We have developed working groups to allow us to focus in particular areas, including ECPR and EISOR. We are looking forward to our congress in April 2023 and Lisbon where an international faculty will meet to discuss the latest advances in all aspects of ECMO.

<https://www.ccrp.org.au/news/kemri-welcome-visit-nov-2022>

### LA ELSO Updates

We had an excellent scientific agenda and great international speakers at the 5th ELSO Latin American conference in Lima Peru on November 10th to 12th, 2022. More than 470 attendees to the conference and 268 attendees to the pre-conference workshops from all Latin American countries. We were able to observe a great growth in extracorporeal therapies in the last 2 years, especially during and after the pandemic. We share scientific experiences, camaraderie and a lot of collaboration between the ELSO centers of LATAM!

See you at the 6th LA ELSO conference in Buenos Aires, Argentina, November 2024!





## Chief Executive Officer Remarks

At the close of every year comes transition and gratitude. Matt Paden has served as ELSO's President during a global pandemic. He brought calm and responsiveness to ELSO. Matt will continue to serve ELSO as Past President. Mark Ogino completes his Board service to ELSO, where he helped ELSO rise to meet the needs of our community during the start of the pandemic. We've been fortunate to have their counsel and leadership. We also want to thank Omar Ibrahim for serving as the Editor of the Newsletter for the past few years; a special thanks to him for making improvements. Kennethia Banks will be leading us as Editor going forward.

2023 brings new leadership to ELSO: our first International President in Graeme MacLaren; Thomas Mueller from Germany, and Ryan Barbaro after serving as Registry Chair. Looking ahead, we have exciting new initiatives to focus on together - all of which support our mission: quality initiatives, new publications, expanding education and training opportunities, and needed guidelines. We will also be growing our community through tools that help us share knowledge in real time.

I hope everyone has some well-deserved time with family and friends during this holiday season and start to the New Year. The gift of time is the most important one we can offer the people we love. I hope you can find the time to spend with your loved ones.

Happy Holidays from all of us at ELSO!

Christine



Cusco, Peru



# The Extracorporeal Life Support Organization

## Our Mission

Providing global leadership in extracorporeal life support through innovation, advocacy, and advancing knowledge.

## Our Vision

ELSO will be the premier organization for the advancement of extracorporeal life support throughout the world.

## Guiding Principles

### Innovation

Seeking to identify and promote advances for the application of extracorporeal therapies.

### Expertise

Bringing together world leaders in the care of critically ill patients for collaboration to advance quality of care through education and publication.

### Clinical Support

Maintaining a comprehensive registry of data to assist in reducing morbidity and improving survival of patients requiring extracorporeal therapies.

### Community

Fostering communication and collaboration among professionals who apply advanced technologies in the treatment of refractory organ failure.



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For editorial concerns related to this newsletter, please contact [newsletter@elseo.org](mailto:newsletter@elseo.org).

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