



# NEWSLETTER

Editor: Omar Alibrahim, MD

Co-Editor: Kennethia Banks

## Message from the President

For those of you who don't know, one of my favorite hobbies is gardening, and so this is one of my favorite times of year. On a recent walk, it was clear that Spring is here in Atlanta. It is wonderful to see all of the new flowers, azaleas, and trees blooming, and everything flourishing after winter. Many of the winter peas, lettuces, onions, broccoli, and kale that I planted back in late February are thriving and blooming now and I know that good food is coming soon. Within the next week, I'll put in the green beans, tomatoes, okra, strawberries, hot peppers, and sunflowers so that over the next few months both the neighborhood deer, bunnies, and I will eat well.



In a very analogous fashion, ELSO and the medical community is coming out of a long winter as well. Many of the seeds that we have planted during this winter of the last two years are starting to bear fruit. Our ECMO Academy and Adult ECMO practitioner certification programs are up and running. We just had a very successful in person simulation course in Tampa, Florida with almost 120 participants. Conference planning for our ELSO meeting in Boston in September is well on its way, while the EuroELSO conference will be coming up rapidly in the first week of May. Center of Excellence applications are rolling in and evaluations will soon start. Translations of the ELSO guidelines into Spanish are being finalized, with more languages to come. Much of this work (and more!), is the result of careful planning and tending over the past years, and it is wonderful to see it come to life. There are other big projects that are in planning phases now that will similarly bear fruit over the next few years.

I truly appreciate all of the hard work that is being done for ELSO by all of you. While much of this work is being done by the clinicians, I want to take a minute to acknowledge the other group of folks who truly make all this possible – the folks at the ELSO office (and beyond). When I see all they do to make this organization work, I still cannot fathom how Peter was able to do all of this alone for so many years. With our very busy schedules, they are often able to keep projects moving as we move back and forth from the clinical world. As we have grown, and continue to grow, they have become an essential and invaluable piece of our success, and they act as a force multiplier of our efforts.

So as Spring arrives, I'd ask you all to pause, look around, and notice all of the new growth and changes around you, and take a minute to thank those responsible. This works as well at the hospital, as it does in the garden.

Matt Paden, MD  
President, ELSO

## IN THIS ISSUE

- Letter from President 1
- Committee Roundup 2-9
- Research 9
- Bedside with Bartlett 10
- ECMO Around the World 11-13
- CEO Remarks 14

## Committee Roundup

### Registry Committee

The Scientific Oversight Committee (SOC) and Large Dataset SOC meetings are now held monthly with an aim to provide a timely evaluation of any newly submitted data request and study proposal within 8 weeks and latest by 12 weeks. Each data request study proposal undergoes a standardized online pre-evaluation by two or more members of the SOC prior to presentation and discussion in our SOC meetings. Dr. Meng Li (US) has joined in providing biostatistical support for our Large Dataset meetings.

ELSO Registry Database Development Committee Update:

*2022 brings two important upgrades to the main ELSO Registry and the addition of one voluntary Addenda. These upgrades are:*

- Updates to the addition of new equipment, device replacement reasons and associated mechanical complications to resolve and prevent entry of discordant device replacement reasons with run complications
- Updated workflow surrounding patients transferred on ECLS between centers to more succinctly match patients and minimize the potential for confusion at the point of data entry.
- Introduction of a voluntary Trauma Addenda to more completely characterize this sub-set of ECLS supported patient. If you would like to enter case data or have questions about the ELSO Registry Trauma Addenda, please reach out to Justyna Swol, MD PhD at [jswol@icloud.com](mailto:jswol@icloud.com)
- Updated ELSO Registry Form for data collection.

### Improved Data Request Forms & Website

- The Scientific Oversight Committee (SOC) Co-Chairs Aparna Hoskote (UK), Marc Anders (US) and Kollengode Ramanathan (Singapore) have introduced a more streamlined process to evaluate and respond to new data requests and study proposals. This process includes: 1) new data request form for study proposal, 2) a standardized web-based evaluation form with objective scoring criteria for the scientific merit of individual studies, 3) regular meetings of the SOC (every 3rd Wednesday of each month) and large dataset SOC (3rd Friday of each month). Please see the updated ELSO data request webpage.
- (<https://www.else.org/Registry/DataRequest.aspx>) with helpful links, writing tips and tricks and introduction videos (thanks to Erika O'Neil) for writing a sophisticated proposal. We welcome Adeel Abbasi (US), John Priest (US), Kiran Shekar (Australia), Akram Zaaqoq (US), Max Malferteiner (Germany), and Jordi Riera del Brio (Spain) who have joined the SOC and will provide their invaluable expertise. We look forward to seeing more data request proposals and the SOC co-chairs are happy to be contacted for any queries.



Please view the updated ELSO Registry Change Document available at [elseo.org](https://www.elseo.org) for more details on recent Registry updates. These upgrades have been motivated by the goals of increasing ELSO Registry data integrity and value while decreasing confusion at the point of data entry. We welcome any questions or feedback you may have at [registrysupport@elseo.org](mailto:registrysupport@elseo.org)

Thank you for your continued partnership,

ELSO Registry Database Development Committee

---

## Publications Committee

ELSO is busy with many publications across many areas, from guidelines, to the 6th Edition of the Red Book. We are organizing subcommittees by major publication category, as well as the overseeing Publications Committee. If you are interested in being involved, please send an email with a paragraph on your background and areas of interest to [publications@elseo.org](mailto:publications@elseo.org).

Our latest guidelines can be found here: <https://www.elseo.org/ecmo-resources/elseo-ecmo-guidelines.aspx>. We want to thank ASAIO for being our publication partner in guidelines, especially for making these freely available. On our website, you will find a pdf and link for each one. In addition, we are working on translations for each.

The 6th Edition of the Red Book is underway! We look forward to releasing the new version in 2022.

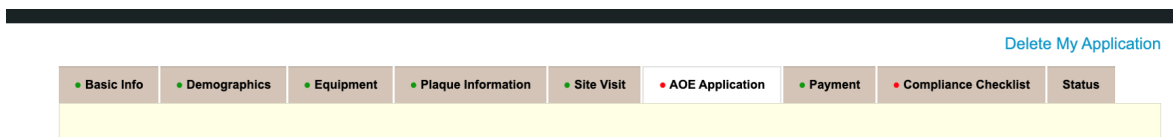
The ECPR and Resuscitative ECMO Monograph is also available for ordering. We are looking forward to releasing more monographs in the near future. To find our publications:

<https://www.elseo.org/Publications.aspx>

---

## Quality Committee

The Award for Excellence in Life Support 2022 deadline is fast approaching! All applications are due by May 27th, 2022 @2359.



If all the tabs at the top of the application form are 'green' and you have validated your form (at the bottom of the application site), be assured that your application is complete and has been received.

For questions or concerns, please email [Award@elseo.org](mailto:Award@elseo.org)



---

## Research Committee

The research committee is in the process of finalizing a survey to help frame research priorities in extracorporeal support that we plan to send to a broad group of stakeholders both within ELSO and without (e.g., funders, regulators, industry, payers).

We are also beginning a series of Research Webinars that will focus on an introduction to clinical research in extracorporeal support - with the first webinar on "How to Conduct Observational Research in ECMO" which will be held on June 2nd. We are excited about launching this series.

Applications for ELSO Research Grants for 2023 to open next month - please check the website for details in May (<https://www.else.org/ecmo-resources/ResearchGrantApplication.aspx>).

We are working with the ELSO Research Task Force to help define overarching and guiding principles for how research will fit within ELSO moving forward.

---

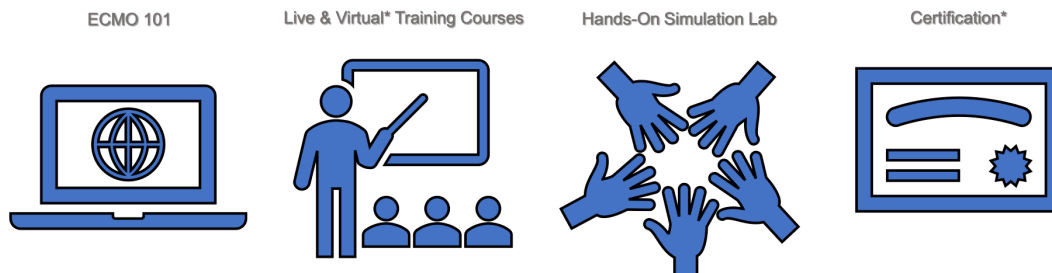
## ELSO AmSECT Liaison Update

The AmSECT leadership team recently had the opportunity to preview the ELSO Foundations course. AmSECT praised ELSO on the creation of professional, accessible, and high-quality content!

AmSECT held a successful 60th International Conference in Phoenix, Arizona in early April. Desiree Bonadonna, MPS FPP CCP was the course director of the pre-conference ECMO symposium. During the main conference Medtronic and LivaNova held hands-on session exploring new innovations in ECLS. Attendees of the Adult ECMO Session on Advancements in Technology and Practice were treated to a debate on VV ECMO cannulation strategies with Dr. Errol Bush and Dr. Awori Hayanga. Linda Mongero, CCP Emeritus and Courtney Petersen, MPS, CCP, LP had a robust discussion on the financial and clinical outcomes of various ECMO staffing models. Amelia Lowell, RRT, RCP reviewed the key parameters in ventilator management for ECMO patients. David Palmer, EdD, CCP wowed the audience in the abstract session with UPMC's creation and simulation of a field ECMO Team. Dr. Barbaro shared ELSO Data and Registry updates and there were multiple presentations on integration of data analytics into clinical practice.

Perfusionists across the world will be celebrating Perfusion Week May 1-7, 2022. Thank you to perfusionists everywhere for your contributions to ECMO!

## ELSO Academy



### The ELSO – Adult ECMO Certification (E-AEC) Exam is now available!

We are excited to announce the launch of ELSO Adult ECMO Certification (E-AEC).

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.

This exam is comprised of National Board of Medical Examiner (NBME)-style questions aimed at helping health professionals, across the continuum of care, enhance and demonstrate their clinical knowledge. ELSO undertook a multi-stage implementation process to ensure we can bring forward a solid knowledge assessment tool for the ECMO community. Our exam development process included several rounds of psychometric analysis, on both expert and novice level ECMO clinicians.

Congratulations to our first E-AEC recipients! They will be receiving their frameable certificates soon.

For additional information, please visit: <https://www.elseo.org/Education/certificationexam.aspx>

#### **ELSO Foundations:**

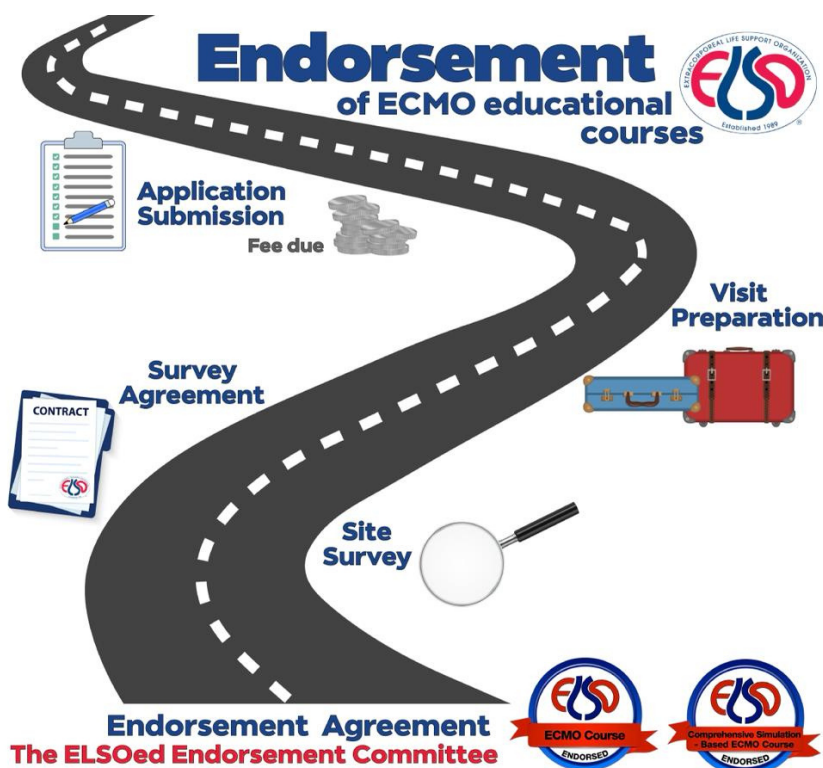
ELSO Foundations: Adult ECMO Training Course is now available. This self-paced ECMO course consists of 53 modules, covering over 80 learning objectives which are anchored in the foundational concepts that will allow practitioners to develop, strengthen, and refine clinical skills related to ECMO patient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

**Registration:** <https://www.elseo.org/education/elseoandelseoendorsedcoursesworkshops.aspx>

## ELSO Endorsed Courses

In an effort to enable global access to a standard approach for education and training, while maintaining local access, ELSO is happy to announce our new endorsed course application process. We want to thank the Endorsed Course Committee for their work in developing a new process that improves capacity and processes.

For more information and to apply, please look here: <https://www.else.org/ecmo-education/EndorsedCoursesApplication.aspx>



### IN CASE YOU MISSED IT:

**Recording:** ELSO Adult ECMO Practitioner Certification Webinar  
If you missed it, you can watch the session [here](#).

E-AEC Info session: All you need to know about the ELSO Adult ECMO Practitioner Certification

Topics covered (ABCDE): application - how to apply for E-AEC; bedside experience and other criteria required to apply for ELSO Practitioner Certification; documentation needed to successfully submit an application; and exam technical details about proctoring system and exam content.

[Click Here](#) To Register for the ELSO – Adult ECMO Certification Exam.



## April 2022 ELSO Simulation Course in Tampa, Florida

ELSO gathered its largest cohort ever in April to relaunch in-person simulation training. 120 students participated in the course. It was wonderful to see everyone that attended and we look forward to having you in the ELSO family.



### Upcoming ELSO In-Person Training Courses

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

Event: ECMO Cannulation Workshop

Date: October 24, 2022 and October 25, 2022

Location: ELSO Headquarters, Ann Arbor, MI

Register here: <https://www.else.org/Membership/Courses/2022CannulationCourse.aspx>

**Announcements on our Fall Simulation Course will be coming soon!**



## Conference Committee

The conference committee is busy planning the 33rd Annual ELSO Conference, to be held in Boston from September 15th – 17th, 2022. This will be our first in person conference since 2019 and we look forward to gathering together again. We are developing an exciting agenda filled with cutting edge educational content relevant to both novice practitioners and ECMO experts. The Conference Committee looks forward to seeing you in Boston!

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

### **Event: 33rd Annual ELSO Conference**

**Location:** Boston Marriott Copley Place in Boston, Massachusetts

**Dates:** September 14, 2022 - September 17, 2022

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

Pre-Conference is September 14-15, 2022. Conference Dates: September 15-17, 2022

### **10th Annual EuroELSO Congress**

**Location:** London, UK

**Dates:** May 4, 2022 - May 6, 2022

[Register Here!](#)

Pre-Conference is May 4, 2022. Conference dates: May 5-6, 2022

### **32nd Annual SEECMO Conference**

**Location:** Nashville, Tennessee

**Dates:** May 20, 2022 - May 22, 2022

[Register Here!](#)

Hosted by: The Monroe Carell Jr. Children's Hospital at Vanderbilt

### **ELSO LATAM Congress 2022**

**Location:** Lima, Peru

**Dates:** November 10, 2022 - November 12, 2022

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





## Coordinator's Corner

Coordinator's Symposiums are currently scheduled to take place quarterly throughout the calendar year 2022. Each Symposium will highlight topics that are important to a large number of centers in the current environment. Symposiums will be co-moderated by two members of the committee and will offer panelists the opportunity to present short topic-based informational presentations. Following the panel presentations, there will be an open forum for group Q&A and discussion. Each Symposium is scheduled to be 90 minutes in duration.

### The schedule for 2022 ELSO Coordinator Symposiums will be:

**Date:** June 8, 2022, 4p PST / 7p EST

**Title:** Ethical Considerations & Moral Distress Within ECMO

**Moderators:** Shayna Amos & TBD **Panelists:** TBD

**Date:** September 14 - September 17, 2022 (Date & Time TBD to Coordinate with ELSO Conference  
In-person during Coordinator Meeting at the 2022 ELSO Conference

**Title:** Navigating Patient, Equipment and Cannulation Strategy Selection

**Moderators:** Evan Gajkowski & Justin Young **Panelists:** TBD

**Date:** December 14, 2022, 4p PST / 7p EST

**Title:** Identifying Creative Operational & Staffing Models During a Period of Scarce Resources

**Moderators:** Wei Ting Chen & Guillermo Herrera **Panelists:** TBD

Webinars will be available on our webinar page, where the first Coordinator Symposium is already available on **Starting a New Program:** <https://www.elseo.org/ecmo-resources/WebinarsVideos.aspx>

---

## Research Alley

My name is Dr. Giunta, and I am a current fellow in neonatology and pediatric pulmonology at the University of Rochester. Dr. Devon Aganga and Dr. Brenda Schiltz from Mayo Clinic and I are conducting a survey to assess provider experiences with awake pediatric ECMO. As awake ECMO is fast becoming a gold standard, we believe that providers are likely to experience new ethical questions related to initiation and withdrawal of this technology. We would very much like to understand issues that have arisen in your practice.

Please consider participating in our survey and also forwarding this survey to both your physician and non-physician colleagues.

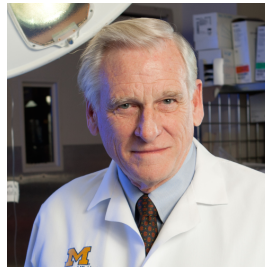
If you provide an email address at the end of the survey, we are happy to send you our study results when available.

Link to Survey: [https://src.co1.qualtrics.com/jfe/form/SV\\_3RhveVluU2AJq85](https://src.co1.qualtrics.com/jfe/form/SV_3RhveVluU2AJq85)

Thank you so much in advance for your assistance!

Dr. Giunta, Dr. Aganga, and Dr. Schiltz

## Bedside with Bartlett



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

### Awake ECMO management

Consultation phone call: I have a 38 year old man on VVECMO for Covid pneumonia. He has been on for four weeks with no lung function. His lung is totally consolidated. He is well supported with arterial saturations from 85 to 90% as long as he is heavily sedated and sometimes paralyzed. When I wean the sedation he becomes anxious , thrashes around, sats drop ,and he has to be re-anesthetized. His hemoglobin runs 8 to 9. He is on Ativan and morphine. Ventilator is set at rest settings and 40% oxygen, but we turn up the FiO<sub>2</sub> and the pressure whenever his arterial sat drops below 85%.

I have heard that other centers maintain these patients awake and ambulating. How can I do that?

**Answer:** We have learned that ECMO patients do not need anesthesia ,sedation, or narcotics.

There are three inter-related steps to managing ECMO patients awake: physiology, medication and airway. All of this patient's gas exchange is taking place in the membrane lung. You are delivering about 250 mL of oxygen per minute (his resting metabolism) When the patient wakes up and moves his metabolic rate doubles. At the current ECMO settings he becomes hypoxic, hypercarbic, and acidotic. You have to provide at least 500 mL of oxygen and remove 500 mL of CO<sub>2</sub> per minute. Increase his oxygen delivery (at max flow) by raising his hemoglobin over 12. Increase the sweep flow to two or three times the blood flow to keep PaCO<sub>2</sub> under 40. Stop the Ativan and morphine. By now he is addicted to both. During withdrawal he will hallucinate. Weaning from benzos can take days. Ask your addiction pharmacologist, for help, but do a quick cold turkey wean maintaining DO<sub>2</sub> 3 times VO<sub>2</sub> (venous sat over 60) The only cause of discomfort is being intubated. The ventilator is doing nothing, so just extubate him. The vent will not help lung recovery; the lung will recover (or not) on its own time. If you think you need airway access, do a trach with spontaneous air breathing. Manage all the gas exchange with ECMO. He will need CO<sub>2</sub> removal after oxygenation improves.

Just do it. Good luck.

---

## ECMO AROUND THE WORLD

### APELSO Updates

John Fraser, MD, APELSO Chairman

#### **There is a power in unity that cannot be achieved alone.**

From all corners of the globe, we have come together to support each other during the COVID-19 pandemic. For some, it seems as though the wave may have passed, but I am continually inspired by my colleagues and peers who give selflessly to help the world recover.

Established even before the World Health Organization declared a pandemic, the COVID-19 Critical Care Consortium has been a safe space for many to weather the storm, and find solace in the darkest days of the pandemic. Together we have established a global alliance of health care professionals whose genuine empathy, commitment and humbleness have revolutionized the way in which medical research will be performed in the future. Together we have contributed more than 260,000 voluntary hours of data entry to the COVID Critical database – now the world's most in-depth source of information on a disease that was previously completely unknown.

This month, COVID Critical welcomes countries from West and North Africa to the study. Of the 200+ prospective new sites, 12 have already commenced onboarding. Countries now represented in COVID Critical include Algeria, Morocco, Egypt, Oman, Iran, Sudan, Jordan, Syria, Libya, Turkey, and Yemen. Thank you to Dr Muhammed Elhadi, University of Tripoli, Libya for introducing us to this new network of collaborators and is leading the onboarding of new sites.

Recently the Consortium had one of the key manuscripts of the project accepted by a leading medical journal. The comparative effectiveness study interprets the 35+ million data points collected by the Consortium to replicate how a randomized control trial of ECMO distribution may have worked. We cannot discuss details until the embargo is lifted but will share more as soon as we can.

#### **COVID Critical in numbers**

60 – Countries with COVID Critical research presence  
390+ – Contributing centres  
260,000 – Hours of Data entry  
19,000+ – Patient records  
11+ – Manuscripts with many more in review



Thank you to Dr Pauline Yeung Ng (Hong Kong) who is leading the APELSO working group to explore new and better ways to collect patient records and make them accessible. Our goal is to make it easier for sites across Asia-Pacific and beyond to be able to enter patient records more efficiently. This will encourage more hospitals to participate in research, resulting in a strengthened collaboration, ultimately benefiting sick patients and the people who care for them.

On behalf of the global APELSO community, I would like to extend my heartfelt thanks to Dr Warwick Butt who, after years of service, hangs up his hat as APELSO Treasurer. Dr Butt has been a steadfast support to the Organization since it was established, and to me personally as President. A warm welcome to incoming Treasurer Dr. Roberto Chiletto who takes up the role shortly.

I look forward to meeting with many of you in the UK at the upcoming EuroELSO Congress. For many of us, this will be our first opportunity to meet in person, shake hands, and share a meal. We are also privileged to present some of the research from the Consortium. Please do get in touch if you are attending the Congress so we can arrange to catch up or visit one of the posters/talks.

---

## LA ELSO Updates

Dr. Rene D. Gomez, LA ELSO Chairman

### These are some LA ELSO Updates happening during 2022.

- The conference Committee of LA ELSO continue the plans of the 5th Latin American ELSO Conference that will take place in person in Lima Peru on November 10 - 12, 2022.
- The LA ELSO education committee has started organizing webinars every 2 months, with interesting topics and the participation of experts in the different ECLS disciplines from most of the LA ELSO countries.
- We started the translation of the ELSO guidelines from English to Spanish and from English to Portuguese, and planning to be uploaded to the ELSO website. They will be available by the second half of 2022.
- We already have the ELSO LATAM website: <https://elsolatam.net/>, which is already available in Spanish and Portuguese and coming soon in English.



## SWACC ELSO Updates

Akram Bary, MD, SWACC ELSO Chair

The SWAAC ELSO Conference 2022 was hosted in Riyadh city, Saudi Arabia under the patronage of the minister of health in February. This was a 2-day hybrid event with a total number of 600 registered attendees. The conference speakers were representative of the SWAAC ELSO region and there were 12 international speakers expert in the field.

SWACC ELSO has elected its next Chair: Dr. Poonam Malhotra. We have a new SWACC ELSO Steering Committee, with several new members joining. Membership is growing: SWACC ELSO had a few new centers from Kuwait and KSA join while in Egypt.

Two new publications have been released featuring the SWAAC ELSO region experience. Please see the articles here:

New ECMO Centers in the Middle East and India During the COVID-19 Pandemic:

<https://link.springer.com/content/pdf/10.1007/s00134-021-06451-w.pdf>

Feasibility and Outcomes in Prolonged VV ECMO Runs in ARDS:

[https://journals.lww.com/asaiojournal/fulltext/2021/03000/beyond\\_frontiers\\_\\_feasibility\\_and\\_outcomes\\_of.19.aspx](https://journals.lww.com/asaiojournal/fulltext/2021/03000/beyond_frontiers__feasibility_and_outcomes_of.19.aspx).

Please visit our website: <https://www.swaaccelso.com/>.

## Chief Executive Officer Remarks

Help for Ukraine: Thank you to our colleagues in Ukraine, Poland, and EuroELSO generally for coming together to develop a several ways to support hospitals in Ukraine in need of medical equipment. Please see details on our home page for how to help, if you are inclined and able. ELSO and EuroELSO are working closely on supporting the region in a meaningful way to provide care and resources for those affected by the war.

An emphasis on our global community continues to be top of mind. As one of very few truly global health organizations, we honor and embrace perspectives and the collective knowledge we share around the world. You will see a world view in how we do our work: participants; publications; guidelines; education and training; and best practices.

Our strategic themes resonate very well for the times we are in:

- Advocate for patients, families, and centers to improve access, quality, and outcomes with ECLS.
- Promote trust and credibility in all our work.
- Provide insight and definitive data for clinical research, quality improvement, and benchmarking for centers, industry, and regulatory agencies.
- Lead as an inclusive, global, interprofessional, and collaborative organization.

As noted by the Research Committee Chair, ELSO will be seeking your advice on our research priorities for the coming years. I hope you will be involved in helping us shape our agenda and scope of practice. As with our strategic planning work, we will soon be sending out a survey for your input.

Our next in person conference will be the EuroELSO conference in London in May. We are grateful to have the second in-person gathering for our ELSO community and look forward to seeing many there. After a two-year hiatus of in-person gatherings, we especially appreciate these opportunities to talk, learn, laugh, and spend time together as colleagues. All conferences can be found [here](#), and of course, we are optimistic that we will see all of you in person, in Boston in September!

April 2022 is a month of change, and not in just the weather. The pandemic continues to change. With all of the fluctuations we have navigated together, we are getting good at change. One thing I have come to appreciate in such a wildly vacillating time is how wonderful it is to work so closely together across the globe to make more possible for our patients and communities. It is inspiring to be part of this organization. I hope each and every one of you feels the same. If not, let us know how we can make ELSO the place worthy of your time and energy.

Looking forward to seeing you soon,

Christine



Christine Stead, MHA  
CEO, ELSO



# 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.



@ELSO.Org



@ELSOOrg



@ELSO

The Extracorporeal Life Support Organization, Incorporated  
3001 Miller Road, Ann Arbor, Michigan 48103

[www.elseo.org](http://www.elseo.org)

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

Copyright © 2021 The Extracorporeal Life Support Organization. All Rights Reserved.