ECCO$_2$R: It Takes an Interprofessional Team

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Disclosures

• I have no relevant financial disclosures

• My technical experience with ECCO$_2$R is limited to the Alung® device (Hemolung® RAS)

• Everything I know about ECCO$_2$R, I learned in the last year

"Your fear of being publicly exposed as a fraud is a stress-related disorder called 'Imposter Syndrome.' It's common among people in high-profile authority positions, and, of course, in actual phonies, like you."
Objectives

• To describe our approach to planning and implementing a targeted ECCO\textsubscript{2}R program to support participation in an international research study
• To describe the interprofessional competency framework that supported our work
• To discuss our real-time team experience with ECCO\textsubscript{2}R delivery in the intensive care unit
• To present a family perspective on the importance of teamwork related to ECCO\textsubscript{2}R delivery
SUPERNOVA

• Pilot feasibility and safety study of low-flow extracorporeal CO\textsubscript{2} removal in patients with moderate ARDS to enhance lung protective ventilation

• Funded by ESICM

• 2 Canadian Sites
  • St. Michael’s and UHN

• Registered on clinicaltrials.gov as NCT02282657

Primary outcome is reduction of tidal volume to 4ml/kg keeping PaCO\textsubscript{2} within 20% of baseline measurements
ECCO$_2$R?

“It’s respiratory dialysis ... It can be learned over lunch”

“It’s mini-ECMO ... Leave it to the experts”

http://www.gambro.de/en/global/Products/Acute-Care/Acute-Monitors/Prismaflex/index.html

Audience Poll

- Are you **CURRENTLY** using ECCO$_2$R in your institution?
- Are you **PLANNING** to use ECCO$_2$R in your institution?
Things to Consider

- **Planning**
  - Steering group, strategy, and scope
- **Development**
  - People and equipment
- **Implementation**
  - Care model, education/training, and competency evaluation
- **Sustaining**
  - Maintaining skills
- **Evaluation**
  - Data collection and review
- **Moving forward**
  - Research and innovation

Gordon E. Dynamics 2009;20:14-17
Guerguerian AM et al. Ped Crit Care Med 2013;14:S84-S93
Forming the Team(s)

• We started with our research team
  • *Investigators, research fellows, and research staff*

• Then we added a ...
  • Steering committee
    • *Investigators, administrators, physicians, educators, clinical specialists (RN, RT, perfusion)*
  • Curriculum working group
    • *Investigators, fellows, educators, clinical specialists (RN, RT, perfusion)*

• And reached out to as many experts/sites that we could
Acknowledgements

• St. Michael’s Hospital ECCO₂R Curriculum Working Group
  • Carolyn, Gyan, Hilary, Karen, Kurtis, Laurent, Marg, Melissa, Michael, Puff, Orla, Pam, Shannon

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• St. Michael’s Hospital SUPERNOVA research team

• Drs. Jordi Mancebo, Eddy Fan, and the SUPERNOVA investigators

• Drs. Danny McAuley and James McNamee from the REST trial

• Jane Heath (Lakeridge, Oshawa), Jo-anne Fowles (Papworth Hospital NHS Foundation Trust, England), Niki Murphy (Gold Coast University Hospital, Australia), and Stephen Walls (NHS Lothian, Scotland)

• Alung® and Bomimed
The Philosophy

Individual commitment to a group effort – that is what makes a team work, a company work, a society work, a civilization work.

- Vince Lombardi

Interprofessional Competencies

Role clarification

Collaborative leadership

Team functioning

Interprofessional conflict resolution

Patient/client/family/community centred care

Interprofessional communication

Team members understand their own role and the roles of those in other professions, and use this knowledge to establish and achieve goals.

Team members actively engage self and others to constructively manage and resolve disagreements and conflict effectively.

Team members understand and can apply leadership principles that support a collaborative practice model.

Team members from different professions communicate with each other in a collaborative, responsive, and responsible manner.

Team members seek out, integrate and value, as a partner, the input and engagement of the patient/client/family/community in designing and implementing care/services.
Implementing ECCO$_2$R

- Introduction to ECCO$_2$R sessions (15 minutes)
- Hemolung® RAS training video viewing sessions, followed by Q & A periods, to identify staff questions and concerns about ECCO$_2$R technology (30 minutes)
- Device naming contest
  - *The winner:* ROCCE
- Hemolung® RAS and SUPERNOVA workshop (4 hours) for RNs *(with RRT certification)* and RTs (> 2 years experience), including didactic and interactive content
  - Quiz
  - Competency checklist
- Physician training focused on study protocol and procedures, and cannulation and decannulation techniques
- Training and reference manual, with detailed procedures
- Bedside support materials
Training Objectives

• Describe how ECCO$_2$R works and the purpose of ECCO$_2$R in the context of SUPERNOVA

• Clearly identify roles and responsibilities of different members of the team, and the team as a whole, related to the SUPERNOVA study and ECCO$_2$R therapy

• Demonstrate the ability to **work together** to follow the SUPERNOVA protocol and manage the care of the patient on ECCO$_2$R including, but not limited to, the following phases:
  • Priming
  • Catheterization
  • Anticoagulation
  • Ventilation
  • Weaning, discontinuation, and decannulation
  • Troubleshooting
# Roles and Responsibilities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilator and sweep gas adjustments</td>
<td>RT in consultation with MD</td>
</tr>
<tr>
<td>Prime circuit</td>
<td>RN and RT</td>
</tr>
<tr>
<td>Catheterize</td>
<td>MDs with RN/RT</td>
</tr>
<tr>
<td>Prepare, administer, and monitor anticoagulation</td>
<td>RN in consultation with MD</td>
</tr>
<tr>
<td>Start therapy and adjust blood flow</td>
<td>MD, RN, and RT</td>
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<tr>
<td>Seal flush change (daily)</td>
<td>RN and RT</td>
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<tr>
<td>Vacuum canister change (daily)</td>
<td>RN and RT</td>
</tr>
<tr>
<td>Catheter maintenance (daily and PRN)</td>
<td>RN</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>RN, RT, and MD</td>
</tr>
<tr>
<td>Discontinue therapy</td>
<td>RN, RT, and MD</td>
</tr>
<tr>
<td>Decannulation</td>
<td>MD with RN/RT</td>
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Training Program Feedback

• Five workshops presented from April – June 2016
• 29 RTs and 28 RNs were certified
  • 25 RTs (86%) and 26 RNs (93%) completed the workshop evaluation
• Some had viewed the manufacturer’s training videos online before participating, with 84% agreeing the videos contributed to their learning about ECCO$_2$R
• On a 0-10 scale, satisfaction with the workshop was 9.5
• In open text feedback, staff stated:
  • “The content was interesting and I'm excited to be exploring this new avenue for patients.”
  • “I quite enjoyed the multidisciplinary learning and interaction that occurred today. Everyone was very knowledgeable and resourceful about this research.”
  • “Good that there was lots of hands on case studies.”
<table>
<thead>
<tr>
<th>Statement</th>
<th>% Agreed</th>
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<tbody>
<tr>
<td>Workshop was relevant to practice</td>
<td>100%</td>
</tr>
<tr>
<td>Workshop increased my knowledge</td>
<td>100%</td>
</tr>
<tr>
<td>Workshop suited my learning style</td>
<td>100%</td>
</tr>
<tr>
<td>Workshop was structured logically</td>
<td>100%</td>
</tr>
<tr>
<td>Presenters were enthusiastic</td>
<td>100%</td>
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<tr>
<td>Training materials were useful</td>
<td>100%</td>
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<tr>
<td>Procedures were clearly presented</td>
<td>100%</td>
</tr>
<tr>
<td>Excited to participate in learning and clinical use</td>
<td>100%</td>
</tr>
<tr>
<td>Content and format supported IP collaboration</td>
<td>98%</td>
</tr>
<tr>
<td>Roles and responsibilities are clear</td>
<td>98%</td>
</tr>
<tr>
<td>I would recommend workshop to my colleagues</td>
<td>98%</td>
</tr>
<tr>
<td>Workshop provided sufficient hands-on time</td>
<td>94%</td>
</tr>
<tr>
<td>I feel prepared to care for a patient on ECCO₂R</td>
<td>88%</td>
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</table>
Here we go ...

• First eligible patient identified on a Wednesday morning
  • Flagged for attending MD and investigator
• By Wednesday afternoon, the patient had improved and was no longer eligible
• Thursday morning, PF ratio remained >200
• Friday morning, PF worsened
• Patient eligible
• Family agreeable
• Was the team ready to go?
  • Doctors
  • RNs
  • RTs
Team Execution

- Initial interprofessional team huddle to map out roles and timing of events
  - Sedation and neuromuscular blockade
  - Ventilator adjustment, respiratory mechanics, ultrasound
  - Circuit preparation
- 2nd team huddle
  - Catheter insertion
  - Anticoagulation
  - Connect and commence ECCO₂R
  - Respiratory mechanics, ultrasound at lowest Vt
- Daily huddle(s) while on ECCO₂R
  - Staffing
  - Patient response
  - Weaning and discontinuation
- Shift safety checks
- Regular family updates
- Post-ECCO₂R team debriefs
Bedside Tools and Supports

- Pre-packaged supply kits (priming, daily checks, discontinuation, and decannulation)
- Training and reference manual
- Information on the device and study protocol attached to the controller, placed at the bedside, and/or included in the chart
- Targets for tidal volume and CO$_2$ documented on:
  - RT flowsheet
  - Bedside sign
- Start-of-shift checklist for RN and RT completion
- Members of the research team, and the curriculum working group, available 24/7 to answer any questions or concerns about ECCO$_2$R
- Representative from the manufacturer available 24/7 via telephone to assist with device troubleshooting

Team Evaluation

- To date, 13 clinicians have completed a bedside evaluation after caring for a patient on ECCO$_2$R
  - On a scale of 0-10 (not at all confident – very confident), confidence in caring for a patient on ECCO$_2$R improved from start to end of shift
    - 5.6 vs 8 (p=0.04)
  - 100% agreed they enjoyed managing the patient on ECCO$_2$R and that the team worked together
  - 62% agreed that caring for a patient on ECCO$_2$R increased their workload

- In open text feedback, staff stated:
  - “I enjoyed learning new modalities and the ability to help patients. Good multidisciplinary collaboration. Great team work and lots of support.”
  - “Excellent interprofessional dynamics to the initiation process. Calm environment lent to decreased stress in a stress situation. Felt supported by my co-workers and the team.”
“When we were saying goodbye before they inserted the giant catheter, we were really scared and emotional. H happened to be part of the team that night and put her arm around me and comforted me. That had nothing to do with her as an RT but everything to do with her as a person and it meant a lot.”
The Family Perspective

“Teamwork was tremendously important during ECCO$_2$R treatment, and is probably the key ingredient in a successful overall ICU experience. Each member of the team clearly had a unique role and had particular components of my dad's care, and our wellbeing, in mind. Dr. B. was the leader and we took comfort in his expertise and trusted his decisions. The RTs were all over the vent settings and helpful in explaining to us, no matter how many times we needed it, the potential benefits of lower tidal volumes. The nurses were a constant reassuring presence, monitoring seemingly everything. And the social workers were there for emotional support.”
The Family Perspective

“We also knew that the proning during ECCO$_2$R literally required a trained team working together and that their communication and coordination was key to keeping the proning process as safe as possible. “

https://pbs.twimg.com/media/CZB_XoCW8AAYlog.jpg
Closing Thoughts

• Designing and implementing an ECCO$_2$R program is an exciting opportunity to leverage interprofessional expertise and interest in innovative patient care
• Engaging stakeholders early and often is important to obtaining and sustaining buy-in, generating enthusiasm, and proactively identifying challenges and risks
• Multiple approaches to raise awareness and provide education can facilitate successful adoption in practice
• Real-time clinical supports are critical to support team comfort, confidence, and competence
  • **Keyword: HUDDLE**
• Remember to include the family as part of the team
Individual and team capacity and competency to manage the delivery of ECCO$_2$R are critical to effective and safe care.

THANK YOU