What’s Happening Now?

AAP SOCC Small Projects Grant Application for 2015 Opens! - Deadline April 17
by Michael Agus, MD, FAAP, FCCM

We are excited to announce that we are offering small grants for young investigators for the 4th year in a row! These grants are for projects devoted to either:

- Education in pediatric critical care medicine or
- Outcomes of quality and safety initiatives in the pediatric intensive care unit.

For the 2014 application cycle, we received 13 applications and selected 2 awardees: Dr. Katherine Gregersen for her project “Multiplex PCR testing & antibioitc use in the PICU” and Dr. Erin Paquette for her project “Evaluating the effectiveness of a simulation-based training to teach conflict resolution skills to providers in a PICU: a pilot study.” Come to the 2015 AAP National Conference and Exhibition SOCC Scientific & Educational Session to see these projects presented!

As an example of a selected project, Dr. Gregersen’s project is a single-centered, retrospective, case-controlled study using 3.5 years of electronic health record data from the PICU and CICU in the Ann & Robert H. Lurie Children’s Hospital of Chicago. The major goals are to (1) describe the factors associated with the diagnosis and treatment of suspected bacterial co-/super-infection in patients with a positive viral respiratory pathogen(s) on multiplex PCR and (2) determine if antibiotic treatment is associated with shorter time to resolution of respiratory distress in these children using propensity score matching. Dr. Gregersen and her team hope this study will lead to standardization of practice by better informing the decision to initiate and/or continue antibiotic therapy, and thus, enhance antimicrobial stewardship.

In describing the value of the grant support, Dr. Gregersen remarks, “This project has not only been clinically interesting and a sound vehicle for me to learn good clinical investigation skills, but it has also fueled my interest in studying practice variation, its impact on patient outcomes, and specifically, antibiotic stewardship in the ICU.”
Previously awarded projects have covered a breadth of topics. Here’s a list of the 2013 & 2012 awardees and their projects:

- Natasha S. Afonso MD, MPH (2013)
  
  *Novel educational interventions aimed at enhancing adherence to clinical guidelines for pediatric septic shock*

- Christina L. Clifra MD (2013)
  
  *Transforming the morbidity & mortality conference to improve safety and quality in the PICU*

- Paul H. Dahm MD (2012)
  
  *Improving continuity of care of pediatric sepsis patients from emergency department arrival through pediatric intensive care unit admission*

- Jennifer L. York MD (2012)
  
  *Implementation of a comprehensive blood conservation program*

To be eligible for the grant, applicants must be a fellow or junior faculty within 5 or fewer years of completing fellowship. Applicants must also be an AAP Section on Critical Care member at the time of submission. To apply for membership, click [here](#).

Each award is for up to $3000 for one year. The grant is not renewable, cannot be used to provide salary support for the investigator. There are no indirect costs. Travel expenses are allowed but only for travel to present results at the AAP National Conference and Exhibition. Awardees are not eligible for other AAP Section on Critical Care awards in the same year as awarded this grant.

The application may be submitted until Friday, April 17, 2015, 5:00 pm EDT. For grant awardees, funding will start July 1, 2015. Grant awardees are required to present results of their project at AAP National Conference and Exhibition the year following receipt of funds. All applications will receive feedback from reviewers.

For more information & the 2015 AAP SOCC Small Projects Grant application, click [here](#). For questions, please contact Dr. Michael Agus by e-mail or by phone 617.355.5489. We look forward to reviewing this year’s applications!

**UPDATE! Coding & Billing Codes for ECMO Recently Revised**

by Jana Stockwell, MD, FAAP, FCCM

Current Procedural Terminology (CPT) reporting for extracorporeal membrane oxygenation (ECMO) or extracorporeal life support (ECLS) initiation (33960) or ECMO daily management (33961) was recently updated with a cadre of separate codes for patient management (4 codes), and cannula insertion, repositioning, and removal (total of 21 codes).
For the intensivist, multiple aspects of these revisions need clarification:

• ECMO codes now specify veno-arterial and veno-arterial

• Relative Value Units (RVUs) have been adjusted to values

• The ECMO initiation code and the daily ECMO management code may not be billed on the same calendar day. The daily management documentation should include elements relevant to ECMO management & interventions (eg pump flow, circuit pressures, anti-coagulation)

• An E&M code should be billed in addition to the ECMO procedure codes above. The E&M note and appropriate billing code are determined by the complexity of medical decision making for the patient (eg, sedation, analgesia, nutrition, anti-microbials, pressors, fluid balance)

• In most institutions, surgeons will utilize the revised cannula insertion, repositioning, and removal codes

• The Relative-Value Update Committee (RUC) determined that VA-ECMO initiation required more physician work than VV-ECMO, but that on a daily basis VV-ECMO was more physician work. That being noted, the RVU difference is small.

### Who's Advocating How?

**AAP Invites Members to Comment on 2015 ALF Resolutions - Deadline March 4**

For the first time, AAP members can review and share comments on resolutions being presented at the Annual Leadership Forum (ALF). Until now, the opportunity to comment on resolutions in advance of the ALF was limited to AAP leadership and staff attending the invitation-only meeting. The ALF is scheduled for March 12-15.

Please share comments on any of the resolutions. An important aim of the ALF is to incorporate diverse perspectives in the discussion and debate of leading pediatric issues. Comments are important to the AAP leadership and representatives of each member’s district, chapter, committee, council and section who will attend the meeting and vote on resolutions.
All comments will be compiled and shared with reference committee members. They will be posted online by March 11 so ALF attendees can view the report. No comments will be accepted after March 4.

To share a comment on a resolution, click this link: http://www.aap.org/en-us/my-aap/leadershipprograms/alf/Pages/alf-submit-comment.aspx

**Global Sepsis Alliance & World Sepsis Day Meeting at ISICEM in Brussels - March 18**

The [Global Sepsis Alliance (GSA)](http) & [World Sepsis Day (WSD)](http) team invite all representatives of the GSA member organizations and WSD supporters to attend the GSA/WSD Meeting during the 35th International Symposium on Intensive Care and Emergency Medicine, taking place in Brussels from March 17 to 20, 2015. One focus of the meeting will be to update on efforts to get World Sepsis Day recognized by the World Health Assembly/WHO and what can be done at the country level to get national governments involved in achieving this goal. The second focus will be to discuss our activities for World Sepsis Day 2015. The GSA/WSD Meeting will take place on March 18 from 12 Noon to 2PM in room 216 of the SQUARE Congress building.

**Hospital Disaster Preparedness Webinar: Essential Pediatric Considerations - April 2**

The Emergency Medical Services for Children (EMSC) Program is sponsoring a webinar "Essential Pediatric Domains and Considerations for Hospital Disaster Preparedness: Where Do We Begin?" on Thursday, April 2, 2015 from 4:00 pm to 5:00 pm (Eastern). This is a change from the originally scheduled date of Tuesday, March 3. This webinar is planned specifically for hospital respondents to the Pediatric Readiness Assessment though others interested in improving emergency department pediatric and disaster care are certainly encouraged to attend. Additional information about the webinar, including registration requirements, will be forthcoming. The EMSC Program website: [http://www.emscnrc.org](http://www.emscnrc.org)

**READ THIS! AAP Quality Connections Newsletter Now Available**

The winter 2015 issue of “[AAP Quality Connections](http)” is now available. “AAP Quality Connections” is a newsletter from the Council on Quality Improvement and Patient Safety (COQIPS) that communicates timely information and increases awareness of the importance of quality improvement. The newsletter also provides updates on current AAP quality improvement programs and projects.
AAP Helping the Congenital Heart Public Health Consortium Bust CHD Repair Myths

In the United States, approximately 1 in 110 babies per year are born with a congenital heart defect (CHD). Following surgery, the words of “fixed” or “repaired” can lead to false assumptions. Children with CHD are more likely to report worse health overall. Lifelong care is important to address nutritional needs, exercise, developmental delays and many cardiac specific risk factors. Click here to learn more about lifelong care for people living with CHD.

What Opportunities Exist?

Call for 2015 SOCC Distinguished Career Award Nominations – Deadline: February 28

The AAP Section on Critical Care (SOCC) Distinguished Career Award is intended to recognize an SOCC member and senior leader in the field of Pediatric Critical Care Medicine who has contributed to the subspecialty for 15 years or longer for significant career accomplishments. This award is presented during the SOCC program at the AAP National Conference & Exhibition. The award recipient must be a current SOCC member. Past award recipients are not eligible. Self-nominations may be submitted. Nominations will be reviewed and prioritized by the SOCC Nominating Committee, to be chaired by the Immediate-past SOCC Executive Committee chair and a review committee of at least 2 SOCC Members not on the SOCC Executive Committee. A final vote will be obtained from the SOCC Executive Committee and past award recipients, based on review of the CVs for the top 3 candidates identified by the Nominating Committee. These votes will be collected and tallied by AAP staff and communicated back to the Section at large following official approval by Academy leadership. Letters of recommendation are not required.

Submit nominations by February 28, 2015 to Sue Tellez, SOCC Manager, at stellez@aap.org

2015 AAP NCE Abstract Submission Now Open - Deadline April 10

The AAP is now accepting submissions for abstracts to be presented at the 2015 National Conference & Exhibition (NCE). Section and council programs held at the National Conference cover clinical matters or research related to subspecialty or special interest areas. Submissions by AAP members and nonmembers are welcome, with participation open to health professionals in any field. Visit the AAP NCE Abstract webpage for more information.

The AAP Section on Critical Care (SOCC) is also accepting abstracts; submission criteria are posted on the abstract website. Selected abstracts (oral and poster) will be presented during the SOCC’s 1½ day program on October 25-26, 2015, along with educational sessions on pediatric...
septic shock and use of telemedicine in improving care of the critically ill child before, during and after transport. Check out the preliminary SOCC program posted on the SOCC website.

**PREP ICU Q&A**

To subscribe to the PREP® ICU Self-Assessment programs, visit [http://prepicu.aap.org](http://prepicu.aap.org).

**Question**

A 3-year-old girl who has sepsis syndrome has had a pulmonary artery catheter placed. Her laboratory results, invasive catheter measurements, and vital signs include the following: hemoglobin, 7 g/dL (70 g/L); blood pressure, 89/32 mmHg (mean, 50 mm Hg); central venous pressure, 14 mmHg; pulmonary artery pressure, 32/20 mmHg (mean, 25 mmHg); pulmonary artery occlusion pressure, 16 mmHg; and cardiac output, 3 L/min.

Of the following, which MOST accurately reflects this patient’s status:

A. almost all of the pressure decrease along the pulmonary vasculature occurs in the muscular pulmonary arteries and arterioles
B. pulmonary artery occlusion pressure accurately reflects alveolar pressure
C. pulmonary vascular resistance is 3 Wood units
D. pulmonary vascular resistance will decrease with a transfusion of red blood cells
E. the tip of an ideally placed pulmonary artery catheter should be in West zone 2

**Answer**

The pulmonary vascular resistance (PVR) may be calculated according to the equation:

\[ \text{DP} = \text{Q} \times \text{PVR} \]

where DP is the driving pressure and Q is flow; in this case, Q is cardiac output.

In this example, DP is the mean pulmonary artery pressure (PPA) minus the pulmonary artery occlusion pressure, or wedge pressure. The driving pressure is 25 mmHg - 16 mm Hg. When divided by the cardiac output (3 L/min), the answer is in Wood units, which can be converted to dynes × s/cm$^5$ by multiplying by 80. In this case, the answer then is 3 Wood units or 240 dynes × s/cm$^5$. Thus, this child’s PVR appears to be elevated.

Unlike the systemic circulation with its high driving pressure, where the greatest part of systemic resistance is within the arterioles, in the pulmonary circulation PVR is equally divided among the arterioles, capillaries, and veins. Also, well more than half of the total PVR lies with the microcirculation (vessels without muscular walls).
Pulmonary artery occlusion, or wedge, pressure accurately reflects left atrial pressure if the balloon is kept inflated sufficiently long to enable equilibration of the downstream vascular pressure. Pulmonary artery occlusion pressure does not approximate alveolar pressure. PA catheters in extubated patients show positive wedge pressures when the alveolar pressure averages 0 mmHg.

Blood is a non-newtonian fluid, and its viscosity increases with increasing hemoglobin but also varies with the shear rate, which is a function of its linear velocity. This non-newtonian characteristic alters the relationship between flow and pressure. In this patient, the hemoglobin content would suggest a low blood viscosity, which would increase with a transfusion of red blood cells. This increase in viscosity would raise her PVR.

Interpretation of the pulmonary artery occlusion pressure assumes that there is a continuous column of fluid from the tip of the pulmonary artery catheter to the left atrium. The tip of the catheter is best when in West zone 3. West zone classification of the lung refers to the influence of gravity on pulmonary blood flow. The pulmonary circulation is a low pressure system.

Blood flow within the lung depends on the relative magnitudes of 3 pressures within each zone: pulmonary artery pressure (PPA), pulmonary venous pressure (PV), and alveolar pressure (PA). Zone 1 (PA > PPA > PV) has low blood flow because the higher PA is believed to compress collapsible capillaries. This region is one of dead space ventilation with minimal gas exchange. In zone 2, in the midportions of the lungs (PPA > PA > PV), flow rates are determined by the difference between PPA and PA. PV does not influence the flow rate here. Blood flow progressively increases with descent through this zone as PPA increases, whereas PA remains relatively constant. In zone 3 (PPA > PV > PA), the arteriovenous pressure gradient (PPA-PV) determines flow rate, and a continuous column of blood is most likely to exist from the pulmonary artery catheter tip to the left atrium. The PPA increases by 1 cmH2O per centimeter of vertical distance down the lung, so the driving pressure rapidly increases from near zero at the apices to a value greater than the PPA at the bases. Recent data of particularly high resolution show that pulmonary blood flow is in fact fractal in nature and is heterogenous even in isogravitational fields.

Suggested Readings


American Board of Pediatrics Content Specifications

- Know effects of gravity on the distribution of blood flow in the lungs
- Understand concept and calculation of pulmonary vascular resistance
- Understand effects of blood viscosity & vascular caliber on pulmonary vascular resistance
- Know contributions of pulmonary arteries, capillaries, & veins to pulmonary vascular resistance