VINCENT’S HURRICANE SENSE

In the eye of today’s social hurricane, perception wavers. This month’s issue liquidates the cyclonic pattern by offering a serene movement for change. Erin Wells discusses leadership during a flood of fears, while Monica Horn empathizes with diverse perspectives. Contributions from Jill Giordano, Kathryn Carpenter and Dawn Christensen reveal the storm-lashed issues involving the social work “Expectrum,” as Evgenij Potapov and Schmid Daners forecast fresh wind cross shore. Kirsten Diegel radars the use of albumin and prealbumin, and Melissa Cousino shows the microburst of an at-risk population during transition.

As we look to Nice without staring into an eclipse, we prepare for the mistral winds that lay ahead.

NEWS & ANNOUNCEMENTS

ISHLT 2018 Call for Abstract Submissions

The ISHLT 2018 Abstract Submission Site is NOW OPEN

Deadline: October 24, 2017 11:59PM EST

The ISHLT 2018 Call for Abstracts is available in two electronic formats:

2018 Call for Abstracts PDF Brochure
2018 Call for Abstracts Flipbook
IN THE SPOTLIGHT

Leadership in Tough Times

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"Find your voice and inspire others to find theirs” – Stephen Covey

The recent weeks and months have certainly been a challenging time for many communities around the world. We are being inundated on a daily basis with messages of divisiveness, fear and intolerance. We find ourselves struggling to remain positive and focused as many of us are working with an increasingly culturally diverse and medically complex patient population.

I had an idea for a completely different article topic, but found myself coming back to the quote above and the events that have unfolded in the United States and around the world recently. The make-up of our multidisciplinary teams is reflective of the wonderful diversity we see in our patients. As a nursing leader, I never imagined I would be having the kinds of conversations that I have had the last few weeks in the wake of the Charlottesville tragedy. For myself and so many on my team, there was such a profound, initial wave of raw emotion that we were struggling to deal with as we all came back to work on that following Monday. There were thoughtful discussions around free speech vs hate speech, how far we have come in regards to diversity and equality, as well as how far we still have to go. There was also a lot of discussion and some tears around how do you try and explain any of this to our kids.

At its core, I believe that leadership is fundamentally about making people feel valued and appreciated for all that an individual brings to the table. In order for this to occur, people need to know they have a voice and that what they have to say matters. I was incredibly impressed by how open, respectful and supportive everyone was despite how challenging and at times uncomfortable these conversations were to have. It gave me a great deal of hope that these positive ripples can extend beyond our office walls as we all learn together how to stand in our truths more confidently.

Disclosure statement: The author has no conflicts of interest to disclose.
NEWS & ANNOUNCEMENTS

ISHLT Call for Nomination to the Board of Directors

Maryl Johnson, MD, Chair of the Governance Committee, invites the nomination of qualified ISHLT members to serve as Directors on the ISHLT Board of Directors. There are four open positions for Director on the ISHLT Board of Directors. Completed nomination packets must be submitted to the ISHLT HQ Office by **5:00 PM US Eastern Time on Friday, September 15, 2017.**

Nominees desiring to be favorably considered for a Director position should have had significant involvement in and service to ISHLT. Additionally, nominees should have demonstrated ability to think strategically, work effectively within a collective decision-making body, and have knowledge of or experience with organizational governance.

The Governance Committee will give priority to evidence of the following criteria when evaluating nominations:

1. Leadership experience and abilities
2. Ability to work collaboratively among peers with different needs and interests
3. A commitment to help ISHLT make progress towards its strategic goals and objectives
4. Experience in one or more of the following areas: finance, advocacy, fundraising, leadership development, and/or organizational governance
5. Prior service in a leadership position for ISHLT, such as Chair of a Council or Committee; Workforce Leader of a Council; Chair or Project Lead for an ISHLT activity (academy, standards and guidelines project, registry, monograph, etc.)
6. A commitment to set aside time to devote to active engagement in ISHLT leadership and oversight responsibilities
7. A willingness to engage in self-evaluation as well as in the evaluation of and feedback to other volunteer leaders
8. A minimum of 5 continuous years of membership in ISHLT

A completed Nomination Application and two letters of reference detailing the nominee’s abilities as outlined above are required for each nominee.

- One of the letters must be from an ISHLT member in good standing describing the contributions that the candidate has made to ISHLT.
- One of the letters must be from one of the candidate’s administrative superiors, must address attributes 1, 2, and 6 listed above, must include specific examples that demonstrate those attributes, and must indicate the institution’s support of the candidate’s commitment to ISHLT leadership.

Letters commending the nominee’s professional stature, research, and/or clinical accomplishments, etc., are less helpful. The letters of reference will be given close attention by the Governance Committee.

Individuals who serve as an Officer on the Board of a related medical professional society are not eligible for simultaneous service on the ISHLT Board. Nominations of individuals who serve as a
Director on the Board of a related medical professional society will be considered on a case by case basis. Note that ISHLT Officers and Directors may not simultaneously serve as officers of any ISHLT Scientific Council nor as Project Leads/Chairs for any ISHLT activity (standard/guideline, new registry initiative, Academy, etc.). Officers and Directors may serve as ISHLT Committee Chairs.

ISHLT has become a large and complex organization. Board members are responsible for governance, policy setting, and decision-making from the perspective of the Society as a whole rather than from the perspective of their particular professional specialty, geography, or other demographic attribute.

The Board focuses on mission, strategic direction, organizational priorities, programs, and financial oversight. The Board of Directors undertakes ISHLT business via three face-to-face board meetings a year (2 days each) as well as regular, interim conference calls. Between Board meetings/calls, the Executive Committee (the 5 officers) meets every other week via conference call to undertake business that does not require a Board vote.

Board members are assigned to serve as Board liaisons to one of ISHLT’s Committees or Scientific Councils. The Board liaison is expected to participate on all Committee / Council conference calls, serve as a conduit of information between the Board and the Committee / Council, and provide oversight of / guidance to the Chair. Board members may also be assigned to serve on various Task Forces. An expected turn-around time of between 2 and 5 days for email correspondence and email votes is the norm, depending on the urgency of the matter. Given the demands of Board service, nominees are asked to provide a description of how they will allocate the necessary time for Board service in light of their work demands.

Members elected to the ISHLT Board of Directors provide an invaluable service to the organization and its future. The Governance Committee appreciates your participation in the nomination process and in identifying individuals who will continue to strengthen the ISHLT. Self-nominations are both welcomed and encouraged.

Your Nomination Packet must include the following:

1) Nomination Application completed by the nominee
2) 2 letters of reference as described above

NOTE: If you submitted a nomination packet last year, your letters of reference from that packet will be added by ISHLT to your nomination packet this year. Additional /updated letters of reference are welcome but not required.

Applications and all attachments must be submitted by 5:00 PM US Eastern Time, September 15, 2017. Upon its completion, a copy of the applications will be automatically sent to megan.barrett@ishlt.org.

Late Nomination Packets or Packets that do not contain ALL of the required documents will not be accepted.
Call for ISHLT Links Editor Applications

DEADLINE: October 2, 2017

The International Society for Heart and Lung Transplantation (ISHLT) is seeking an enthusiastic, creative and innovative individual to become the new Editor of the monthly ISHLT LINKS newsletter.

After 7 years of exceptional and dedicated service as Editor, Vincent Valentine’s term will be expiring in April, 2018.

Applicants for the Editor position must be members in good standing of the ISHLT and should submit a letter of interest by October 2, 2017. The letter of interest should include the following:

- the reason the applicant is interested in this volunteer position
- previous experiences (managerial, leadership, editorial, etc.) that speak to his/her qualifications for the position
- a statement of the applicant's vision for the newsletter

The ISHLT LINKS Editor position will be a three-year appointment, with the option of being renewed for additional years up to a five-year maximum. The Editor will have the ability to appoint associate editors as needed. The Editor’s primary responsibilities will be to:

- implement the strategic vision for the newsletter
- determine the theme for each issue, proactively identify and solicit its content, and task the appropriate individuals to deliver that content
- provide editorial guidance to the associate editors and other contributors
- work with the ISHLT staff to produce the newsletter
- work with the Board of Directors to ensure that the newsletter meets the communications goals and objectives of the Society
- work with the Program Committee, media consultants, and staff to identify writers for and develop the content for the Daily LINKS Newsletter at the Annual Meeting
- meet tight deadlines
- respond rapidly to evolving issues

The Board’s goal for the LINKS is that it serves to keep the Society membership abreast of ISHLT programs, activities, and emerging opportunities. The LINKS is a vital means by which the Board meets the Society’s strategic goals of 1) enhancing membership value, 2) engaging our community worldwide, 3) improving science and driving innovation.

Accordingly, the Board expects the LINKS to include content such as the following:

1) Regular, scheduled updates from the President and Program Chair/Committee
2) Board news (including new policies or procedures, finance information, governance updates, important deadlines, new programs and services)

3) Education Committee news (new educational offerings)

4) Registry news (including new registries, new additions to our registry participants, new data of interest)

5) Standards and Guidelines news

6) Scientific Council news

The Board also desires to use the LINKS to enhance international engagement, perhaps by sharing information about upcoming co-sponsored or endorsed activities and collaborations, or even with stories from our newer members and centers in emerging programs. The International and Intersociety Coordinating Committee (I2C2) can be helpful in this regard.

Further, the Board believes that the third strategic imperative (improving science and driving innovation) could be boosted by 1) highlighting upcoming or recent JHLT articles and 2) inclusion of Grants and Awards announcements, grant opportunities, and reports about award recipients and innovation driven by those individuals ISHLT has supported through grants.

Additionally, the current directed sections with pearls from senior faculty or inclusion of historical events related to advanced heart and lung disease or the Society continue to be valuable in making the connections between ISHLT, its members, and our clinical/scientific focus.

In recognition of the commitment and time involved, the Society will award an Honorarium of $500 per issue to the Editor or Associate Editor assigned primary responsibility for the given month’s edition, when published on time.

Please send all letters of interest to Megan Barrett (megan.barrett@ishlt.org) by October 2, 2017.

The ISHLT Board of Directors will consider applications and come to a decision in early 2018. Responsibility for the newsletter will begin with the June 2018 issue.

Andrew J. Fisher, FRCP, PhD
ISHLT President
FOCUSING ON NURSING, HEALTH SCIENCES & ALLIED HEALTH

From the Transition Trenches: Working with an At-Risk Transplant Population

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As a pediatric psychologist working in solid organ transplantation, I was thrilled to see the Journal of Heart and Lung Transplantation recently highlight the important topic of transitioning from pediatric to adult transplant care with thoughtful recommendations for practice as described by Putschoegl and colleagues [1]. Across other solid organ transplant populations, transition to adult care has been found to be associated with adverse health outcomes, including increased graft loss and mortality [2,3]. This underscores the value of transition-focused clinical programs with concurrent study of their efficacy [1].

However, it is important to highlight that it may not simply be the physical transfer to adult care that poses the greatest risk. Transplant recipients within the transitioning age range represent a high-risk population. Non-adherence to the treatment regimen is strikingly high among this group [4]. Rates of mental health problems, such as anxiety and depression, also increase in adolescence/young adulthood and can significantly complicate care during this vulnerable time period. Among our own sample of adolescent/young adult pediatric heart transplant recipients, parents endorsed clinically significant patient emotional/behavioral problems in 23% of the sample during routine psychosocial screening. Young people commonly struggle with identity formation, body image/self-esteem issues, peer relations and separation from parents – all of which may impact treatment adherence. Risk-taking behaviors such as substance use are also greater during this developmental period [5].

Thus, in some cases, health education/knowledge and a coordinated hand-off to an adult transplant provider is inadequate for a successful transition. I have been helping to expand our transition-focused transplant clinics and intervention services --- readiness assessments, checklists, and transfer documentation have been helpful to our work, but not sufficient for our higher-risk patients. I regularly encounter cases such as these:

A medically stable young adult presents for routine post-transplant, transition-focused care. Her medication and health-related knowledge are deemed to be excellent. She effortlessly rattles off all medications, their dosing and functions. She uses a pillbox for organizing medications (which she brought to clinic) and phone alarms to assist with medication timing. She has demonstrated ability to independently manage appointment scheduling, communication with medical team, transportation and insurance. She informs us that she has a full-time job with plans to enroll in college courses this year. At the last clinic visit, she met with a member of the adult transplant
team. By various ‘transition-readiness’ metrics, she is a great candidate for transfer of care. However, she also has a history of major depressive disorder with suicidal ideation with plan (i.e., stop taking medications) and emerging personality disorder traits. At times, she engages in high-risk behaviors, including self-injurious cutting and unprotected sex (despite awareness of possible teratogenic risks). Eager to please, yet slow to trust providers, these notable risks to her treatment adherence, long-term graft survival and overall health are likely to go undetected during routine medical visits or on readiness-assessment screeners. Prior to transitioning this patient, established cognitive behavioral therapy and psychopharmacologic treatment targeting mood and adherence will be imperative to her overall health and post-transplant care.

As this case demonstrates, psychosocial functioning must be routinely assessed as part of transition-focused care. Collaborative care provided in partnership with pediatric and adult mental health care clinicians with expertise in the evidence-based treatment of non-adherence to medical regimes and comorbid mental illness should be strongly considered when designing and implementing transition-focused programs.

Disclosure statement: Dr. Cousino does not have a financial relationship with a commercial entity that has an interest in the subject of the submitted article or other conflicts of interest to disclose.

References:
Albumin and Prealbumin, Caution Before Use

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As a transplant Registered Dietitian my role is to optimize a patient's nutritional status before, during and after their transplant. In fact, nutrition plays a role in whether or not a patient can be listed for lung transplant. Currently, the International Society of Heart and Lung Transplantation (ISHLT) guidelines for lung transplantation identify Class II or III obesity (body mass index [BMI] ≥35.0 kg/m2) as absolute contraindications to lung transplant and “Class I obesity (BMI 30.0–34.9 kg/m2), particularly truncal (central) obesity and progressive or severe malnutrition” as relative contraindications to transplant [1]. While ISHLT does not specify which parameters to use to identify progressive and/or severe malnutrition, I find that physicians and surgeons focus their attention on serum albumin and serum prealbumin levels as an indicator of nutritional status.

Unfortunately, serum albumin and serum prealbumin are not good indicators of nutritional status. Historically, physicians have used serum albumin and more recently serum prealbumin as markers of nutritional status; however, this practice was established prior to the understanding of the inflammatory processes associated with both acute and chronic illness [2]. It is now understood that both albumin and prealbumin are negative acute-phase proteins meaning they decrease in response to inflammation, but not always predictably so. Research has found that malnourished individuals will likely exhibit normal visceral proteins (ASPEN slides) and that "literature available on adults comparing intake and albumin levels has shown inconsistent results" [3,4].

Currently, there is no single laboratory value that can accurately identify a suboptimal nutritional status. For a laboratory value to be effective at identifying malnutrition it must be sensitive only to changes in nutrition intake and the change in its value should happen over a short time period4. Serum albumin and prealbumin do not fit any of those criteria. It should be noted however, that research has found that serum albumin levels do correlate well with areas that should be considered in relation to transplant outcomes.

Preoperative serum albumin is associated with morbidity, mortality and surgical outcomes. Hypoalbuminemia has been linked to increased morbidity, mortality and increased surgical complications in some populations [5,6].

Clinicians should recognize that serum albumin and prealbumin are not indicators of nutritional status, and therefore, will not necessarily improve with nutritional interventions. Clinicians should use the following laboratory values as indicators of how ill a patient is, and to determine preoperatively whether a patient is at an increased risk for complications, morbidity and mortality following surgery.
Take Home Points for Clinicians

| Hepatic serum proteins in patients with inflammatory conditions are not related to nutritional status and should not be used a marker for such |
| Preoperative serum albumin has been found to be related to morbidity, mortality, and surgical outcomes |
| Hepatic serum proteins are related to disease severity |
| An effective nutrition marker should be: |
| - Only sensitive to changes in nutrition intake only |
| - Change in level should happen in a short time in relation to change in nutrition status |
| - Level should be directly related to adequate or inadequate intake |
| Nutritional status should be based upon assessing the patient's intake, a physical examination, and obtaining and tracking accurate, dry weight |

Disclosure statement: The author has no conflicts of interest to disclose.

References:

The position of the Social Worker (SW) on the multidisciplinary team (MDT) is mandated by the Centers for Medicare & Medicaid Services (CMS) for Medicare-approved transplant centers. Similarly, The Joint Commission designates the SW as a necessary team member. The role of the SW on the multidisciplinary heart failure treatment team is to provide comprehensive social work services to patients and families across the spectrum of advanced therapies—from the date of initial referral, through hospitalization, and then during the lifespan of the patient and their support network. According to our professional organization, the Society of Transplant Social Workers (STSW), define this specialized role as “...providing patient education and emotional support, responsible for referrals to community agencies, coordinates patient care with other team members and assists with concrete services.”

Social workers specializing in the care of heart failure patients requiring advanced therapies hold a Master’s degree from a graduate school of Social Work accredited by the Council on Social Work Education. Social Workers also maintain professional licensure in their respective state of practice. Unlike the episodic care delivery model unto the inpatient social work role, our clinical work as part of the MCS/Transplant MDT is one of chronic care. We are tasked with assisting the MCS/Transplant team in determining a patient’s psychosocial readiness for the demands and stresses associated with MCS/Transplant preparation, surgery, recovery, rehabilitation and lifestyle changes.

CMS and The Joint Commission designate the SW as a crucial part of the MDT in the care of these complex patients. There are numerous articles that reference patients with appropriate (or an abundance of) psychosocial resources/support showing improved outcomes over those with little or no psychosocial resources/support. Therefore, the SW role, while often overlooked on the MDT, provides critical support to our patients and caregivers.

The SW “Expectrum” is a term pointing out the large variation in role and responsibilities across teams and centers for SW specialists. Our psychosocial assessment includes a structured, comprehensive and evidence-based assessment of the patient’s overall quality of life including, but not limited to, their physical, behavioral, psychological, social and spiritual functioning. The psychosocial evaluation contributes to the overall advanced therapies evaluation and helps establish patient-specific care plans to maximize optimal recovery and rehabilitation and ensure the best
possible outcomes while reducing the impact of known psychosocial risk factors. MCS/Transplant social workers also contribute to patients, teams, and furthering of the specialty by:

- Providing advance care planning
- Linking to resources in the community for consistency of care and increasing successful outcomes
- Facilitating patient/caregiver access to grants, housing, transportation, and food/food stamps
- Organizing, facilitating, and maintaining support groups, center specific, regional and national
- Mental health/substance abuse counseling (i.e. smoking cessation, etc.)
- Counseling caregivers during pre- and post-advanced care interventions to improve coping, prepare for lifestyle changes across the continuum of care and prevent caregiver burnout.
- Add scholarly research to the medical, nursing, and psychosocial literature to further improve assessment techniques, support and ultimately improve patient outcomes

While the Expectrum may be daunting, these specialist SWs proudly add to the richness of their respective MDTs. Understanding the specialist SW role and abilities on the MDT may further add to the enhancement of patient/caregiver outcomes in this complex population as well as the strength of the teams in which MCS/Transplant SWs play such a critical role.

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Perspective

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Recently, a colleague shared that during a heart transplant information session a family member of a transplant candidate exclaimed in frustration, “You medical people just don’t understand how this feels!” Such expressions of despair may happen at any time throughout the transplant process: at the time of a devastating diagnosis of a life-threatening condition for which the only intervention left to offer is transplant, while waiting many months for a donor organ, during surgical procedures or when dealing with complications of “transplant life” in spite of strict medical adherence. The distress can be overwhelming. Transplant teams must have the resource structures to reach out with supportive care and therapeutic direction for transplant families to develop the skills to navigate the twists and turns of life.

As medical and nursing professionals, we all realize our own families have no immunity to medical problems either.

Mitchell was born March 24, 2006. He seemed like a beautiful normal baby with an older brother and two loving, caring parents, Marnie and David. Having an episode of viral bronchiolitis at 17 days of age, he developed a chronic cough with wheezing unresolved by steroids and bronchodilators at 6 months of age. A chest x-ray showed cardiomegaly, so an echocardiogram was obtained which showed a shortening fraction of 15%. Mitchell’s mother, a pediatrician, knew all too well what this meant as they began further medical investigation.

The baby was admitted to a pediatric hospital near his home by a cardiologist for heart failure support, and began a workup and treatment for myocarditis. Within a week with some of his workup studies still pending, his heart failure support was increasing, so he was transferred to Children’s Hospital Los Angeles and listed for heart transplant for dilated cardiomyopathy on November 21, 2006. He underwent more testing including a cardiac catheterization to assess his pulmonary vascular resistance, during which he had several episodes of supraventricular tachycardia requiring adenosine administration.

The next day was Thanksgiving Day in the ICU marked by careful fluid management, enteral nutrition optimization and heart failure medication adjustments. Comfort measures were attempted frequently for heart failure associated liver enlargement, diaphoresis and feeding intolerances.
Christmas Day was a Monday. The cardiologist rounded noting multiple inotropic infusions and a diuretic drip as well.

A fever marked New Year’s Day 2007, another Monday. Cultures were drawn and empiric antibiotics started. When his blood pressures began to dip a bit, an epinephrine infusion was added. His PICC line was changed.

By mid-January, he had been intermittently febrile with increasing tachycardia and tachypnea and periods of “semi-duskiness” and cool extremities. The PICU and his family had seen two other patients receive heart transplants while they also waited for a suitable donor. Days and nights were filled with the family’s efforts to provide as much comfort as possible for their baby to cope with the extreme discomforts of heart failure, paired with the fear of the possibility of not receiving a donor heart in time.

On February 6, 2007 with four inotropic infusions supporting him, a suitable donor was finally identified! Vaughn Starnes, MD and his team performed the heart transplant surgery. Within about three weeks after transplant, Mitchell was discharged home at last!

This year, 2017, marked Mitchell’s 10 year heart transplant anniversary! He has been quite active as seen on his “Heart Day” anniversary card photo collage.

Coincidentally, around the time of Mitchell’s 10-year celebration, his uncle, a cardiac surgeon, was called away to work to perform a heart transplant.

Along with our career and personal experiences, our perspectives may also mature. Much has been published about promoting clinical empathy while limiting self-disclosure in our interactions with patients. Whether or not we share small parts of our life experiences with others, empathy will not only make us better people, but also allow us to be better medical and nursing professionals in our daily practice...because we actually do understand.

Disclosure statement: The authors have no conflicts of interest to disclose.
FOCUSING ON MECHANICAL CIRCULATORY SUPPORT

A New Format for MCS Continuing Education

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How do you document mechanical circulatory support (MCS) specific continuing education for the members of your MCS team? Is there anything out there providing an interactive environment designed to challenge both novice and experienced MCS providers? How do we make this type of continuing education available to more MCS providers?

These are questions that should be part of each program’s review process; whether for regulatory review or quality improvement. MCS specific continuing education traditionally consisted of two options: training sessions provided by, and most likely promoting, a manufacturer’s specific device, or conference attendance - spending endless hours sitting in a large-scale lecture type environment with relatively little audience interaction. Neither option focuses on the critical thinking skills necessary to appropriately care for an MCS patient. This is the gap in educational opportunities that the ICCAC set out to address with the creation of the MCS Proficiency Verification Course (MPV). This past June marked the second time the MPV course was offered in conjunction with the ASAIO annual meeting. It will also run in September in Vienna in conjunction with the ESAO annual conference.

The MPV course is designed as a small group (no more than 12 per group), interactive case scenario discussion, constructed using Problem Based Learning (PBL) theory. We have loosely described it as “ACLS for VADs.” Participants are presented with real patient scenarios developed by program faculty and are asked to treat the patient. Diagnostic testing, x-rays, cath results and scans are provided in raw form and participants are guided through reading and interpreting the information they receive to make clinical decisions. As the scenario progresses, participants are given choices and feedback about their decisions through direct interaction with course faculty comprising internationally known experts (Surgeons, Cardiologists and VAD coordinators) in the field.

This June the MPV course involved scenarios including HVAD, HeartMate II, HeartMate 3, Centrimag, Syncardia TAH and Berlin Heart Excor pediatric scenarios. Participants were able to move through different scenarios throughout the day to customize their experience according to their needs. Participation verification was provided online via a printable certificate after completion of an online evaluation form.

June’s MPV program consisted of participants including cardiologists, anesthesiologists, VAD coordinators, perfusionists, surgeons and engineers from around the world. Feedback from the evaluations was overwhelmingly positive including comments such as “Faculty were able to answer my questions and there were more cases and critical thinking scenarios provided than last year’s
course,” “I was able to concentrate on the device most commonly used in our hospital. The in-depth discussions with other MCS professionals were extremely valuable,” and “Great opportunity to meet with other MCS professionals to discuss problems and solutions.”

The first two MPV courses have given us a lot of feedback related to format and value of this type of educational offering. ICCAC hopes to be able to work with all of our partnering organizations to be able to provide additional course offerings in conjunction with their annual meetings. The overall vision is to increase availability of the MPV course internationally to provide a higher level of continuing education focused on direct care, critical thinking skills and decision making at the individual provider level.

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Fresh Wind Cross Shore

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Today, there is only a small number of main players who dominate the LVAD market and develop new devices, or rather improve existing devices, and promote their implementation in clinical practice. The most important papers in the area of LVAD research are comparisons of the two main types of devices from studies supported by larger companies. However, no breakthrough devices have been presented for a long time and the clinical results of the new devices are not remarkably better than those of the previous models. We are sure that the companies are interested in new developments, but such changes only slowly find their way into clinical practice, as we see in the example of transcutaneous energy transfer.

How can we improve this situation? In the pediatric VAD field, a solution envisaged was the Pumpkin project supported by the US government. So far, after over 10 years, no real clinical results have been presented.

Now the Zurich Heart Project offers a different approach to overcome the current problems and creates an environment for young researchers in the VAD field. The Zurich Heart Project was born in 2012. The initiative, started by University Medicine Zurich (www.hochschulmedizin.uzh.ch/en/projekte/zurichheart), has brought together up to 20 research groups with over 75 researchers. Novel and unconventional ideas are pursued in close collaboration among the University of Zurich, the associated hospitals in Zurich and the Swiss Federal Institute of Technology Zurich (ETH Zurich) as well as the German Heart Center Berlin (DHZB) and the Swiss Federal Laboratories for Materials Science and Technology. This large consortium aims to revolutionize mechanical circulatory support therapy, and address the drawbacks of current devices and challenges of long-term VAD therapy per se.

The research topics range from pump flow adaption, entire device implantability and transcutaneous energy supply to membrane development, pump geometry improvements and surface structure. It is expected that the increased hemocompatibility will result in a decrease in the number of thromboembolic and bleeding events. Further, the need for freedom of movement and continuous support adjustments are accounted for. Not only left ventricular support is in focus, but also heart valves, Mechanical Fontan Assist and total artificial hearts. Synergies among the groups help to foster new and creative ideas, such as combustion-powered actuation for a soft total artificial heart.
One of the projects is the development of physiological pump adaptation. The physiological controller envisaged will work collaboratively with biocompatible pressure and/or volume sensor devices that are under development in the consortium and are intended to be integrated into the novel pump. *In-vitro* and *in-vivo* tests have shown that the developed physiological controllers reliably avoided suction and ventricular overload conditions caused by pre- or afterload changes.

To reach the goal of a fully implantable mechanical circulatory support device, the pump geometry, the rotor design, the actuation and the bearing principle need to be reconsidered, beside the need for a transcutaneous energy transmission system. The latter development has already demonstrated very promising results. Pump geometry adjustments and rotor configuration changes have shown great influence on the hydraulic pump efficiency and hemocompatibility.

Additionally, the high risk of thromboembolic and bleeding events can be addressed by novel surface structures that allow cell adhesion to be promoted or demoted at the luminal pump-to-blood surface. The microstructuring at the interface with specifically engineered gratings enables endothelial cell migration and adhesion under flow, and yields full coverage by a differentiated and functional endothelium. The same is true for a structured hyperelastic hybrid membrane that guarantees full hemocompatibility when entirely covered by endothelium. In a bioreactor, the endothelial cell layer was tested under a variety of flow conditions and membrane deformations that correspond to representative loads that are present in a pulsatile pump. This approach may foster the development of pulsatile devices again.

We believe that the Zurich Heart Project, with its constructive and ambitious spirit, has the know-how and financial potential to create novel ideas that will dramatically change mechanical circulatory support therapy in the future as well as lead a cohort of talented young scientists for biomedical engineering and in particular, future VAD technology.

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SPECIAL INTEREST

Update from MCS Academy 2018

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Co-Chairs, ISHLT Academy: Core Competencies in Mechanical Circulatory Support

The Core Competencies in Mechanical Circulatory Support (MCS) began in 2012 under the leadership of David Feldman, Andreas Zuckermann and Jeffrey Teuteberg. Since then and due to continuous positive feedback from conference participants, the academy has been an extraordinary source for education. Traditionally, the academy takes place one day prior to the ISHLT meeting. This course provides a concise review of clinical knowledge and outlines the essential professional skills for candidate assessment and longitudinal support for mechanical circulatory support patients. The course is primarily designed to be of benefit for clinicians and allied professionals who are in the early stages of their careers. The course also, provides an update on the current state of the field for more established providers.

The MCS academy in 2017 was chaired by Jennifer Cowger, Palak Shah and myself. A tremendous amount of effort was put into coordinating an excellent program with world leaders in the field. I really enjoyed working with Jen and Palak and I personally learned substantially under Dr. Cowger’s tutelage. Last year the 234 participants of the MCS Core were surveyed for feedback on the educational experience. In the participants who responded: 9.3% were from Asia, North America 62.5%, Europe 15.6% and 9.4% from South America. Twenty-eight percent were mid level (5-10 yrs), 28% were recent graduates (1-5 yrs) and 15% were either student / trainees or in post-grad training. Further, 34% from responders were cardiologists, 16% cardiac surgeons, 10% thoracic or vascular surgeon, 9% research fellows, 3% anesthesiologist, 3% nurses and 3% infectious disease staff. Almost every participant gave the course a 4 or 5 on a 5 point scale. Interestingly, the more senior the attendees, the more they were satisfied with the case/didactic balance of the course. Based on the feedback we obtained, we can summarize that the majority of the participants enjoyed the meeting.

In 2018, I have the privilege of chairing the MCS core academy with Palak Shah and Jennifer Cook. The basic program will remain similar, however we will welcome some new speakers. Just like this year, we are planning to involve world leaders in the field to provide the most up-to-date knowledge on mechanical circulatory support. We promise to maintain the high quality of the academy and exceed the expectation of academy participants. We are looking forward to seeing you in Nice!

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SPECIAL TRIBUTE: To All Inundated by Mother Nature

It’s the Water, Not the Wind

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We can all remember Hurricane Katrina that rocked the Gulf Coast in August 2005. With winds nearly 125 mph and a category 3 rating, the storm brought catastrophic damage as predicted. Massive flooding caused many families to be relocated leaving their homes, jobs, friends – life-behind. There was a record of over 1,800 deaths from lack of food, water and medical care. Despite this tragedy, many were unprepared for the sudden blow of Hurricane Harvey that hit over 6 million people in Houston, Texas August 2017, exactly 12 years later. This category 4 Hurricane was conceived in the largest medical industrial complex in the United States, yet the response to rescue and assessment of medical practice has been thunderstruck.

Many patients are unprepared for the treatment and diagnosis they receive when they enter a hospital. For patients, the circumstance can spring up like a hurricane causing a downpour of worry and uncertainty. So, how do you prepare for the unpredictable?

With practice and experience, it is the clinician’s responsibility to detect and determine a patient’s management and treatment of care. Additionally, they prepare for the unpredictable by caring for patients with high risks and complex diseases. As clinicians, we must know how to care for our patients in the hospital as well as in the eye of the storm. Like astronomers Copernicus and Kepler, we must learn in a trajectory that allows our experiences to grasp reality and the future. As clinicians, we have to be in the know, and prepared for the unthinkable.

Like a recent solar eclipse, this cataclysm too shall pass. But for me another scar from a hurricane.

"Out of suffering have emerged the strongest souls. The most massive characters are seared with scars." – Khalil Gibran
EDITOR’S CORNER

The Discovery of Carbon Dioxide and Oxygen

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In the Editor’s Corner of the last two issues, we moved 300+ years into the 18th Century as Natural Philosophy evolved during the Renaissance. The Great Thinkers Copernicus, Kepler, Galileo and Newton challenged Aristotelian and Ptolemaic thoughts as well as the Catholic Church compelling us to gaze beyond the outer limits and into the heavens. From Newton to Werner with truly an international effort, though a bit Eurocentric, with many others not mentioned; the foundations of science and chemistry were laid as earlier scientists look away from the sky to describe the laws of nature and study the earth and its crust. This spawned the evolution of science, particularly chemistry and its separation from alchemy. In this issue, we will be further enlightened by the great discoveries and the importance of such discoveries for patients of the ISHLT from leading figures from Europe, especially France and England as we peer inward and down to the elements. The focus here is carbon dioxide and oxygen.

From the August Issue, Georg Stahl of Germany and his “fiery substance” was mentioned. He called this “imponderable substance,” phlogiston believed to be released during combustion, respiration and calcination. When charcoal burned, it lost its phlogiston – a mysterious substance, weightless and imperceptible – escaped into the air, leaving behind “dephlogisticated” ashes. Before moving on, let’s look back to Stephen Hales who shaped the evolution of French Chemistry. This English cleric and natural philosopher was curious about the fumes produced when various substances were heated in a flask. Initially, the only gas known in the 1700s was atmospheric gas. When Hales and others encountered foul-smelling fumes, the atmospheric air was thought to be polluted. Hales observed the release of fumes from burning plants. His theory was that air had somehow fixed in a plant and that burning set it free, thus air produced from burning plants was “fixed air.” This theory was expanded to solid substances. What became important to Hales was the amount of fixed air bound up in various substances. He brought up this first step of experimental study on specific airs, a subject that later became known as pneumatic chemistry. Speaking of pneumatic, Hales was the first to measure blood pressure and invent a ventilator with a large bellows to improve air quality. But again, the important point was weighing the “fixed air” released from a reaction.

Now think about it. It seems quite troubling today that at times we cannot/do not weigh patients, their urine, their feces and be as precise as we should, especially at critical times when hospitalized in critical care units. But back to the matter at hand in the early 1700s, investigators were uninterested in the air or gas produced in a chemical reaction, but rather the rough amounts released from burning for example. Now meet Joe Black.
Joseph Black held chairs in anatomy, botany, chemistry and medicine in the Universities at Glasgow and Edinburgh, Scotland. Black was studying the importance of magnesia alba (magnesium carbonate) as an antacid. He quoted, “it mildly loosens the bowels” especially after overeating the wrong things. His thesis, *De humore acido a cibis orto et magnesia alba* (of the acid humor produced by food and of magnesia alba) was printed in June 1754. Black observed that the exact same weight loss occurred in two different experiments with magnesia alba. In one, he added an acid to this substance, air was given off and a residue remained, residue1 (R1). In the other, he heated it. An air was released and a different residue remained, residue2 (R2). Again, magnesia alba lost the same amount of weight in both instances. After Black observed this and concluded that the air released in both cases fixed in the magnesia alba was the same. Therefore, he examined the properties of this fixed air. He confirmed that this air was the same, but different from ordinary air. For example, you put a lit candle in magnesia alba air, it was immediately extinguished. One of his students showed that an animal forced to breathe this air would die. Black concluded that this was a different gas, not ordinary air, with its own properties. Black appropriated Hales’ generic, “fixed air” for this specific new gas, today known as **carbon dioxide**.

From this point on, chemists used “fixed air” to identify Black’s new gas. This revolutionized the idea that there may be other gases to be discovered. Also, Black thinking outside the box made the following novel rationalization:

1) \( \text{Magnesium alba} + \text{acid} = \text{R1} + \text{“fixed air”} \)
2) \( \text{Magnesium alba} + \text{heat} = \text{R2} + \text{“fixed air”} \)

Black applied algebra to these chemical equations by subtracting equation two from equation one yielding: \( \text{acid} - \text{heat} = \text{R1} - \text{R2} \). Because he believed heat did not weigh anything, he ignored it. This leaves us with: \( \text{acid} = \text{R1} - \text{R2} \). By adding \( \text{R2} \) to both sides of the equation, Black surmised that \( \text{acid} + \text{R2} \) would result in \( \text{R1} \). He proceeded with this experiment and found by adding acid to \( \text{R2} \) did indeed resulted in \( \text{R1} \). All of this was accomplished by his astute attention to the weights. By the late 18th century, weighing things was very important.

Now we have the English clergyman, Joseph Priestly, a very successful gas chemist interested in the chemistry of combustion. Priestly was a believer of the phlogiston theory of combustion and applied it to explain his experiments. By the way, he was intrigued by Benjamin Franklin’s experiments with electricity when Franklin visited England. Priestly wanted to understand how charcoal burns to ash, how metal changes to rust and how humans survive by breathing air. From the phlogiston theory, rusting of metals resulted from the loss of phlogiston from the metal. Then adding phlogiston back to the calx by reducing the calx or heating it the metal would return. The source of phlogiston was the problem. Phlogiston might come from charcoal burned to reduce the calx back to metal. With the invention of the large burning lens or magnifying glass, Priestly used such a lens to heat mercury calx and reduce it back to mercury metal. He was astonished when he was able to reduce the mercury calx back to a metal by superheating the calx with the sunrays from a lens without phlogiston. Then Priestly noticed that a gas was produced which was no surprise to him, but it was the nature of this gas. The most obvious property of this gas was that it readily supported combustion. Place a candle under a jar with it, the candle burned brightly. Also, this gas sustained a mouse for a long time under a jar. Eventually, the candle and mouse would
die. Priestly, called this gas dephlogisticated air. Air with no phlogiston in it, therefore readily absorbs phlogiston.

Now we have, Antoine Lavoisier, a French lawyer, tax collector and chemist who invited Priestly to visit his private laboratory in Paris in 1774. Lavoisier had heard about Priestly’s puzzling results. Lavoisier today, is considered the Father of Chemistry. Lavoisier had previously reduced mercury calx to mercury without charcoal. Lavoisier, after spending time with Priestly and his puzzling results, repeated the experiment with particular attention to the gas that strongly supported combustion. Lavoisier had incorporated Black’s focus on measuring weights. He had been pondering over the question why metals gained weight when they rusted. With that, he began to question the phlogiston theory to explain the process of calcination and rusting. He noted the inconsistency of this theory simply based on the idea of metals gaining weight as they rusted. Lavoisier began to suggest that metals were fixing air as they rusted. But how can they do so and lose phlogiston at the same time. Stahl’s Phlogiston theory did not support Lavoisier’s new line of reasoning. Lavoisier had also observed that when one burns phosphorus a vapor was released. If one collects this vapor and condenses it, the result is an acid. The weight of the acid is always greater than the weight of the consumed phosphorus. Lavoisier rationalized that phosphorus was fixing air into itself. It was possible that the weight was coming from the water vapor in the air. He repeated this experiment. This time he poured out the acid, then filled beaker with water to the same level where the acid had been. He weighed the water. This weighed less than the acid. He subtracted the weight of the water from the weight of the condensed acid. Now he had the weight of the condensed acid without the condensed water vapor. This weight was still more than the original phosphorus. Rationale – phosphorus was indeed fixing air when it burned. When Priestly, explained his findings to Lavoisier, Lavoisier was prepared for the notion that combustion involved the fixing of air into the substances that burned. After Priestly and Lavoisier discussed these points, Priestly repeated his experiments by reducing the mercury calx back to mercury with a burning lens and a charcoal fire. This time he paid closer attention to the gases produced. The resulting gases from these two different experiments were different. The gas produced from reducing the mercury calx back to mercury with the burning lens supported combustion. But, the gas produced from reducing the mercury calx with the charcoal fire did not support combustion. The candle in a jar with this gas when out immediately. The gas from the lens experiment was insoluble in water. The gas from the charcoal experiment easily dissolved in water. Lavoisier had known that the gas from the charcoal experiment was Black’s “fixed air.” He concluded that the air from using the lens was “pure” common air, because like common air, it supported combustion, but better. Lavoisier presented this to the French Academy in the Spring 1775 – when metals like mercury rust to form a calx, their gain in weight is due to the addition to the metal of the purest part of the air we breathe. At the same time in England, Priestly had figured out a way to make clear that the gas produced with a lens was a new gas, not common air. When Lavoisier reported his findings to the Academy, Priestly felt insulted. This gas was not named, and he believed it to be a new gas. After all it was Priestly who first observed that the gas from the lens experiment was not pure common air, but a new gas – yet it was Lavoisier who named the new gas oxygen. He named it in 1777 because Lavoisier thought of it as the cause of acidity – oxygen – acid maker. In retrospect, this was an error, this name should have been given to hydrogen, the real acid maker.
The real advance where Lavoisier truly deserves credit is with the idea that matter can neither be created nor destroyed, but can be transformed from one kind into another which is known today as the law of conservation of matter. For bringing this law into the chemistry, he has been revered as the Father of Modern Chemistry. He dispensed with the imponderable substance of phlogiston by rationalizing that combustion was the fixing of oxygen and not the release of phlogiston. Still, a persistent problem remained at this time, which was the belief that heat was a weightless substance. Lavoisier believed that heat was a weightless element that combined with air.

This is an example of change in scientific rational thought that takes time with many trials and tribulations repeated from a variety scientists and reasonable thinkers. Major changes often do not occur suddenly from a single person’s insight where everything becomes clear. In the quest for the truth, it can be messy and never easy. Breakthroughs occur after many investigators contribute to a complex sequence of events over time that eventually result in a consensus which for that matter is no different than today. Thus we have oxygen and carbon dioxide, its applicability today in life, to the ISHLT and for the world is obvious.

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