combinations of each of these learning styles throughout the process or, better still, to develop a curriculum that does this for teaching bronchoscopy.

Any staff member who teaches bronchoscopy can tell from the first time someone handles a bronchoscope if they are going to be good or not. These "gifted" novices are able to move through the airways fluidly and appear to know where they are at all times. This intrinsic skill is part of the neuropsychologic processing of person's brain. Just like running or hitting a ball, some are naturally more talented than others. The art of bronchoscopy is based upon many of these intrinsic skills: relying on the interpretation of two-dimensional data (CT/chest radiography); envisioning a three-dimensional environment (the chest); moving a bronchoscope through the actual three-dimensional space (airways); making those movements while looking at a two-dimensional image (the screen).[3,6] This is the same as looking at a map, picking where you want to go, getting into your car, and driving backward only using your mirrors or back-up camera, and doing this in the dark. Realizing who is skilled with spatial relations and who could use additional training will greatly affect the ability to perform increasingly complex procedures.

To many pulmonologists, bronchoscopy is the procedure that defines them. The time for "see one, do one, teach one" is over. We, as the educators, need to stop looking at the tally at the end of the game in terms of the number or procedures needed to become competent, or what even defines competence—this is different for every person. Instead, leaders and organizations need to make education in bronchoscopy a priority, developing curricula based upon sound educational standards and agreed-upon goals, with appropriate didactic and kinesthetic standards established and met.

References

1. Ernst A, Wahidi MM, Read CA, et al. Adult bronchoscopy training: current state and suggestions for the future: CHEST expert panel report. *Chest*. 2015;148(2):321-332.
2. Frank JR, Snell LS, Cate OT, et al. Competency-based medical education: theory to practice. *Med Teach*. 2010;32(8):638-645.
3. Johnson D, Stewart J II. Use of virtual environments for the acquisition of spatial knowledge: comparison among different visual displays. *Mil Psychol*. 1999;11(2):129-148.
4. Kozhevnikov M, Hegarty M, Mayer R. Revising the visualizer-verbalizer dimension: evidence for two types of visualizers. *Cogn Instr*. 2002;20(1):47-77.
5. Overview of learning styles. Learning-styles-online website. http://learning-styles-online.com/overview/ Accessed on February 26, 2015.
6. Kozhevnikov M, Blazhenkova O, Becker M. Trade-off in object versus spatial visualization abilities: restriction in the development of visual-processing resources. *Psychon Bull Rev*. 2010:17(1):29-35.

Organ Donors

Making the Most of What Is Offered

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> "Do what you can, with what you've got,…"
>
> Theodore Roosevelt[1]

A huge imbalance exists between the number of donor organs and the number of patients on the waiting list for the various solid organs, and this shortfall continues to grow. In 2000, 11,917 donors provided organs for 23,248 transplants while 71,628 patients were actively listed for organ transplantation. By 2012, the number of donors had increased to 14,011 (a 17.6% increase), providing organs for 28,503 transplants (a 22.6% increase), but the number of patients listed for transplantation had increased to 117,040 (a 63.4% increase).[2] On average, 21 people die every day waiting for a transplant.[2]

The available options to satisfy the demands of this growing patient list are to innovate with new therapies for the various forms of advanced organ failure, to develop alternate options for organ replacement (such as xenotransplants and stem cell transplants), or to maximize the currently available donor pool. The latter option represents the lowest hanging fruit at this time since the other alternatives are in the distant future of clinical reality. However, until now, surprisingly little attention has been paid to standardization of donor management as a means to optimize the number and quality of potentially transplantable organs.

This void has been addressed by a consensus statement developed as a collaborative effort by the Society of Critical Care Medicine (SCCM), the American College of Chest Physicians (CHEST), and the Association of

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Organ Procurement Organizations that was published in the June edition of *Critical Care Medicine*.[3] This document is the culmination of > 5 years of work by a multidisciplinary committee of 44 members of varied expertise and disciplines including critical care specialists, neurologists, pediatricians, and transplant physicians. Prior to this document, the only available consensus statement on medical management of organ donors was a 2004 publication by the Canadian Critical Care Society, the Canadian Association of Transplantation, the Canadian Society of Transplantation, and the Canadian Council for Donation and Transplantation.[4] While this document was groundbreaking at the time, it is now more than a decade old and major advances in the field of transplantation have since been made, including expansion of the practice of donation following circulatory determination of death (DCDD) and the development of techniques for ex vivo perfusion to "rehabilitate" marginal donor organs.[5,6]

The current consensus statement holds a wealth of valuable information and should be essential reading for all practicing intensivists. To emphasize this, we highlight four key points from this document:

1. Organ donation starts with you. The process of organ donation most commonly begins in the ICU and requires recognition by the care team that their patient is a potential donor. A thorough understanding of the donation process can ensure that opportunities for organ donation are not squandered. Early involvement of organ procurement organizations allows for discussion of donation with families without time pressure, which in turn may increase the proportion of families consenting to donation.[7] Interestingly, the process of organ donation may serve to ease the bereavement process for families of deceased patients.[8]
2. Commonly considered contraindications may not be contraindications at all. For organ donation to come to fruition, it must be considered in the first place. The consensus statement debunks a number of myths regarding contraindications to organ donation. Examples of suitable donors who may surprise many clinicians include appropriately treated patients with bacteremia or bacterial meningitis and patients with low-grade CNS tumors. Other malignancies including localized colon cancer, prostate cancer, and breast cancer also do not represent absolute contraindications to organ donation.
3. DCDD is here to stay. The majority of organ donations are currently obtained following neurologic determination of death ("brain death"), however, an increasing number of organs are obtained following death from cessation of circulatory function. In this process, a patient or his or her surrogate elects to withdraw life support but pursue organ donation. If the patient has circulatory arrest within a prespecified time period (typically 60 min) from withdrawal of support, then organs are harvested. Approximately 12% of deceased organ donors in the United States are DCDD donors currently, and the number of DCDDs is steadily increasing.[9] The most extensive experience with DCDD is for renal and liver transplantation, although procurement of other organs, including the lungs, pancreas, and even heart, are increasing. It is essential that clinicians familiarize themselves with the DCDD process to provide appropriate counsel to patients and their families and ensure that this option is considered in terminally ill patients. The consensus guidelines include a good synopsis of DCDD for various types of organ transplant and also provide a tool to help clinicians predict the likelihood of death within 1 h of withdrawal of life-sustaining treatment.
4. Intensivist-led donor management improves outcomes. Given their understanding of hemodynamics, volume status, and ventilator management, as well as the complex interaction between patients, their families, and the health-care team during end-of-life care, intensivists are uniquely suited to provide the highest level of care to organ donors. This was demonstrated in a retrospective analysis of donor outcomes before and after implementation of an intensivist-led donor management program. This study demonstrated that the numbers of organs recovered for transplant increased significantly (31.4% before vs 43.8% after, $P = .008$) with the largest increase seen in lungs and kidneys, two organs sensitive to iatrogenic harm during critical illness.[10] Lungs, in particular, are at risk from inappropriate ventilatory strategies. One randomized controlled trial of conventional ventilatory strategy vs a protective ventilatory strategy resulted in twice as many lungs harvested from the latter group (54% vs 27%, $P = .004$).[11] The consensus guidelines also provide detailed how-to instructions on best practices for hemodynamic and ventilator management as well as endocrine dysfunction. In addition, organ-specific issues are addressed, which serves to broaden the utility of this document beyond just intensivists.

In the long-term, innovative strategies will be required to overcome the large and growing organ shortage being faced worldwide. In the meantime, perhaps we can glean something from the advice of our 26th President and "do what we can, with what we have" by appropriately screening and referring all potential donors. Once the

decision is made to pursue organ donation, it is incumbent on us to deliver the same meticulous, attentive care we provide to all other patients. Our donors, their families, and future transplant recipients deserve no less.

References

1. Theodore Roosevelt quotes. The Theodore Roosevelt Center website. http://www.theodorerooseveltcenter.org/Learn-About-TR/TR-Quotes.aspx. Accessed June 11, 2015.
2. Organ Procurement & Transplantation Network: need continues to grow. Health Resources and Services Administration website. http://optn.transplant.hrsa.gov/need-continues-to-grow. Accessed May 21, 2015.
3. Kotloff RM, Blosser S, Fulda GJ, et al; Society of Critical Care Medicine/American College of Chest Physicians/Association of Organ Procurement Organizations Donor Management Task Force. Management of the potential organ donor in the ICU: Society of Critical Care Medicine/American College of Chest Physicians/Association of Organ Procurement Organizations Consensus Statement. *Crit Care Med*. 2015;43(6):1291-1325.
4. Shemie SD, Ross H, Pagliarello J, et al; Pediatric Recommendations Group. Organ donor management in Canada: recommendations of the forum on Medical Management to Optimize Donor Organ Potential. *CMAJ*. 2006;174(6):S13-S32.
5. Nathan SD. The future of lung transplantation. *Chest*. 2015;147(2):309-316.
6. Fondevila C. Is extracorporeal support becoming the new standard for the preservation of DCD grafts? *Am J Transplant*. 2010;10(6):1341-1342.
7. Dickerson J, Valadka AB, Levert T, Davis K, Kurian M, Robertson CS. Organ donation rates in a neurosurgical intensive care unit. *J Neurosurg*. 2002;97(4):811-814.
8. Merchant SJ, Yoshida EM, Lee TK, Richardson P, Karlsbjerg KM, Cheung E. Exploring the psychological effects of deceased organ donation on the families of the organ donors. *Clin Transplant*. 2008;22(3):341-347.
9. Saidi RF, Hejazii Kenari SK. Challenges of organ shortage for transplantation: solutions and opportunities. *Int J Organ Transplant Med*. 2014;5(3):87-96.
10. Singbartl K, Murugan R, Kaynar AM, et al. Intensivist-led management of brain-dead donors is associated with an increase in organ recovery for transplantation. *Am J Transplant*. 2011;11(7):1517-1521.
11. Mascia L, Pasero D, Slutsky AS, et al. Effect of a lung protective strategy for organ donors on eligibility and availability of lungs for transplantation: a randomized controlled trial. *JAMA*. 2010;304(23):2620-2627.