

MEDICINE ABSTRACTS

American Journal of Obstetrics and Gynecology

J. C. Partridge et al., **Resuscitation of Likely Nonviable Infants: A Cost-Utility Analysis after the Born-Alive Infant Protection Act**, *Am J Obstet Gynecol* 206.1 (January 2012): 49.e1–49.e10 • *Objective*: The purpose of this study was to compare the effects of universal vs selective resuscitation on maternal utilities, perinatal costs, and outcomes of preterm delivery and termination of pregnancy at 20–23 weeks 6 days' gestation. *Study Design*: We used studies on medical practices, prematurity outcomes, costs, and maternal utilities to construct decision-analytic models for a cohort of annual US deliveries after preterm delivery or induced termination. Outcome measures were (1) the numbers of infants who survived intact or with mild, moderate, or severe sequelae; (2) maternal quality-adjusted life years (QALYs); and (3) incremental cost-effectiveness ratios. *Results*: Universal resuscitation of spontaneously delivered infants between 20–23 weeks 6 days' gestation increases costs by \$313.1 million and decreases QALYs by 329.3 QALYs; after a termination, universal resuscitation increases costs by \$15.6 million and decreases QALYs by 19.2 QALYs. With universal resuscitation, 153 more infants survive: 44 infants are intact or mildly affected; 36 infants are moderately impaired, and 73 infants are severely disabled. *Conclusion*: Selective intervention constitutes the highest utility and least costly treatment for infants at the margin of viability.

Chest

T. W. Evans et al., **Critical Care Rationing: International Comparisons**, *Chest* 140.6 (December 2011): 1618–1624 • Every country has finite resources that are expended to provide citizens with social “goods,” including education, protection, infrastructure, and

health care. Rationing—of any resource—refers to distribution of an allotted amount and may involve withholding some goods that would benefit some citizens. Health-care rationing is controversial because good health complements so many human endeavors. We explored (perceptions regarding) critical care rationing in seven industrialized countries. Academic physicians from England, Spain, Italy, France, Argentina, Canada, and the United States wrote essays that addressed specific questions including: (1) What historical, cultural, and medical institutional features inform my country's approach to rationing of health care? (2) What is known about formal rationing, especially in critical care, in my country? (3) How does rationing occur in my ICU? Responses suggest that critical care is rationed, by varying mechanisms, in all seven countries. We speculate that while no single “best” method of rationing is likely to be acceptable or optimal for all countries, professional societies could serve international health by developing evidence-based guidelines for just and effective rationing of critical care.

L. P. Scheunemann and D. B. White, **The Ethics and Reality of Rationing in Medicine**, *Chest* 140.6 (December 2011):1625–1632 • Rationing is the allocation of scarce resources, which in health care necessarily entails withholding potentially beneficial treatments from some individuals. Rationing is unavoidable because need is limitless and resources are not. How rationing occurs is important because it not only affects individual lives but also expresses society's most important values. This article discusses the following topics: (1) the inevitability of rationing of social goods, including medical care; (2) types of rationing; (3) ethical principles and procedures for fair allocation; and (4) whether rationing ICU care to those near the end of life would result in substantial cost savings.

Critical Care Medicine

J.A. Billings, Humane Terminal Extubation Reconsidered: The Role for Preemptive Analgesia and Sedation, Crit Care Med 40.2 (February 2012): 625–630 • Patient comfort is not assured by common practices for terminal extubation. Treatment guidelines suggest minimizing dosage of opioids and sedatives. Multiple lines of evidence indicate that clinicians are limited in their ability to recognize distress in such patients and tend to undermedicate patients in distress. Yet suffering of any significant degree should be unacceptable. For painful procedures, such as surgery, the analogous practice of postponing anesthesia until the patient evidences discomfort would never be tolerated. Waiting for signs of suffering before initiating excellent analgesia and sedation inexorably subjects patients to distress. Therefore, when death is inevitable and imminent after extubation, suffering should be anticipated, concerns about respiratory depression dismissed, and vigorous preemptive deep sedation or anesthesia provided.

K.N. Sheth et al., Autoresuscitation after Asystole in Patients Being Considered for Organ Donation, Crit Care Med 40.1 (January 2012): 158–161 • *Objectives:* A fundamental issue in organ donation after circulatory death is the determination of death. There are limited data regarding the incidence and timing of autoresuscitation after asystole. Prevailing guidelines suggest a 2- to 5-min observation after mechanical asystole before the declaration of death. This study tested the hypothesis that a 2-min observation period after asystole is sufficient for the declaration of death in patients being considered for organ donation after circulatory death. *Design:* Single-center observational study using prospectively collected data. *Setting:* University hospital, Level I trauma center. *Patients:* Those patients identified by the organ donation registry that underwent organ donation after circulatory death from 2000 to 2008, during which time the institutional protocol required a 5-min observation period. *Interventions:* None. *Measurements and Main Results:* Documentation of medical history, serial

Glasgow Coma Scale scores, time of extubation, and time to asystole, hypotension, pulseless electrical activity, and declaration of death were ascertained. Seventy-three patients were identified. The most common mechanism of injury was traumatic brain injury, and eight patients were aged <18 yrs. Patients had a mean Glasgow Coma Scale score of 5 on admission and were taken to organ donation after circulatory death an average of 6.6 days after admission. The average time from extubation to death was 22 mins. No patients exhibited autoresuscitation during the 5-min waiting observation period, including the first 2 mins after asystole. *Conclusions:* The absence of autoresuscitation in our series suggests that a 2-min observation period is sufficient for the determination of death after cardiac arrest, including patients younger than 18 yrs. These data may inform practice guidelines.

R.D. Truog et al., Should Patients Receive General Anesthesia Prior to Extubation at the End of Life? Crit Care Med 40.2 (February 2012): 631–633 • Billings has proposed that any potentially conscious and imminently dying patient who is undergoing withdrawal of ventilator support should be offered general anesthesia to fully protect against suffering. Here we examine whether his proposal is compatible with the doctrine of double effect, a philosophical construct that is generally in accord with the legal requirements for palliative care in the United States. We review the essential elements of the doctrine of double effect, and emphasize the importance of pre-medicating patients before ventilator withdrawal (anticipatory dosing) and of titrating medications to the needs of the patient. The doctrine of double effect requires physicians to balance the risk of the patient suffering against the risk of hastening the patient's death when titrating the medications used to provide comfort. We argue that the values and preferences of the patient should determine how these risks are balanced. We therefore agree with Billings that general anesthesia may be indicated for patients who prefer to minimize the risk of suffering while accepting a greater risk of having their death hastened. This

approach would not be appropriate, however, for patients who place a higher value upon avoiding the risk of hastening death, even when this involves a greater risk of potential suffering.

J. Wind et al., Prediction of Time of Death after Withdrawal of Life-Sustaining Treatment in Potential Donors after Cardiac Death, Crit Care Med 40.3 (March 2012): 766–769 • Objective: Organ donation after cardiac death increases the number of donor organs. In controlled donation after cardiac death donors, the period between withdrawal of life-sustaining treatment and cardiac arrest is one of the parameters used to assess whether organs are suitable for transplantation. The objective of this study was to identify donation after cardiac death donor characteristics that affect the interval between withdrawal of life-sustaining treatment and cardiac death. *Design:* Prospective multicenter study of observational data. *Patients:* All potential donation after cardiac death donors in The Netherlands between May 2007 and June 2009 were identified. *Interventions:* None. *Measurements and Main Results:* Of the 242 potential donation after cardiac death donors, 211 entered analysis, 76% of them died within 60 mins, and 83% died within 120 mins after withdrawal of life-sustaining treatment. The median time to death was 20 mins (range 1 min to 3.8 days). Controlled mechanical ventilation, use of norepinephrine, absence of reflexes, neurologic deficit as cause of death, and absence of cardiovascular comorbidity were associated with death within 60 and 120 mins. The use of analgesics, sedatives, or extubation did not significantly influence the moment of death. In the multivariable logistic regression analysis, controlled mechanical ventilation remained a risk factor for death within 60 mins, and norepinephrine administration and absence of cardiovascular comorbidity remained risk factors for death within 120 mins. The clinical judgment of the intensivist predicted death within 60 and 120 mins with a sensitivity of 73% and 89%, respectively, and a specificity of 56% and 25%, respectively. *Conclusion:* Despite the identification of risk factors for early

death and the additional value of the clinical judgment by the intensivist, it is not possible to reliably identify potential donation after cardiac death donors who will die within 1 or 2 hrs after life-sustaining treatment has been withdrawn. Consequently, a donation procedure should be initiated in every potential donor.

M.J. Young et al., Rationing in the Intensive Care Unit: To Disclose or Disguise? Crit Care Med 40.1 (January 2012): 261–266 • Introduction: Growing pressures to ration intensive care unit beds and services pose novel challenges to clinicians. Whereas the question of how to allocate scarce intensive care unit resources has received much attention, the question of whether to disclose these decisions to patients and surrogates has not been explored. *Key Considerations:* We explore how considerations of professionalism, dual agency, patients' and surrogates' preferences, beneficence, and healthcare efficiency and efficacy influence the propriety of disclosing rationing decisions in the intensive care unit. *Conclusions:* There are compelling conceptual reasons to support a policy of routine disclosure. Systematic disclosure of prevailing intensive care unit norms for making allocation decisions, and of at least the most consequential specific decisions, can promote transparent, professional, and effective healthcare delivery. However, many empiric questions about how best to structure and implement disclosure processes remain to be answered. Specifically, research is needed to determine how best to operationalize disclosure processes so as to maximize prospective benefits to patients and surrogates and minimize burdens on clinicians and intensive care units.

A. Ytzhak et al., Pediatric Ventilation in a Disaster: Clinical and Ethical Decision Making, Crit Care Med 40.2 (February 2012): 603–607 • Introduction: Medical resources may be overwhelmed in a mass disaster situation. Intensive care resources may be limited even further. When the demand for a certain resource, like ventilators, exceeds its availability, caregivers are faced with the task of deciding how to distribute this resource. Ethical dilemmas

arise when a practical decision necessitates ranking the importance of several ethical principles. In a disaster area, the greatest good for the greatest number principle and the goal of equal distribution of resources may take priority over the needs of the individual. Nonetheless, regardless of the interventions available, it is a prime goal to keep the patients' comfort and dignity as much as possible. *Background:* In the mass disaster of the Haiti earthquake of January 2010, The Israeli Defense Forces Medical Corps field hospital was one of the first to respond to the call for help of the Haitian people with surgical and intensive care capabilities. It was the only facility able to ventilate children and neonates in the first week after the earthquake, although this ability was relatively limited. *Special Article:* Five case scenarios that we confronted at the pediatric ward of the field hospital are presented: two children with respiratory compromise due to pulmonary infection, one premature baby with respiratory distress syndrome, an asphyxiated neonate, and a baby with severe sepsis of a probable abdominal origin. In normal circumstances all of them would have been ventilated but with limited resources we raised in each case the question of ventilating or not. To help in the evaluation of each case we used a decision-support tool that was previously developed for ventilator allocation during an influenza pandemic. This tool takes into account several factors, including the illness severity, prognosis, and the expected duration of ventilation. *Conclusions:* Applying ethical priorities to analyze the decision-making problems leads to the understanding that an individualized approach with an ongoing assessment of the patient condition and the availability of resources, rather than a strict predefined decision rule, will give patients a better chance of survival, and will assist in allocating scarce resources.

Human Reproduction

I. Ben-Ami et al., Do Assisted Conception Twins Have an Increased Risk for Anencephaly? Hum Reprod 26.12 (December 2011): 3466–3471 • *Background:* The incidence rates of anterior neural tube

defects, anencephaly and encephalocele appear increased among twins compared with singletons. The current study aimed to evaluate whether the etiology of this phenomenon is related to twinning, assisted reproductive technology (ART), or both. *Methods:* The study cohort consisted of parturient women who were referred to our ultrasonography unit between January 1998 and December 2009 due to suspicion of severe fetal abnormality. The study cohort was divided into two subgroups based on mode of conception: spontaneous and ART (including IVF and ICSI). The subgroups were further subdivided into singleton and multiple pregnancies. We also compared pregnancies diagnosed with anencephaly in the study group to all live births in the Department of Obstetrics and Gynecology. *Results:* Anencephaly was diagnosed in 43 fetuses out of 1154 (3.7%) pregnancies diagnosed with severe fetal anomaly. Anencephaly was diagnosed in 9 out of 78 twin pregnancies (11.5%); of these, 8 of 45 (17.8%) were ART conceived and 1 of 33 (3%) spontaneously conceived. A significant correlation was found between twinning and anencephaly, with an odds ratio (OR) of 3.4 [confidence interval (CI) = 1.3–8.9, $P = 0.011$], while no significant correlation was found between ART and anencephaly. A significant correlation was found between anencephaly and the combination of ART conception and twinning (OR of 6.6, CI = 2.8–15.3, $P < 0.01$). Analyzing the distribution of pregnancies diagnosed with anencephaly in the study group compared with the total number of live births in the department revealed a significant correlation between twinning and anencephaly, with an OR of 11.4 (CI = 4.9–26.5, $P < 0.01$), with no significant correlation between ART and anencephaly. Among all live births, a significant correlation was found between anencephaly and the combination of ART conception and twinning (OR of 24.6, CI = 11.4–53.2, $P < 0.01$). *Conclusions:* Our data suggest that twin pregnancies conceived by ART constitute a high-risk group for anencephaly, due to a possible synergistic effect of twinning and ART.

L. Frith et al., **Conditional Embryo Relinquishment: Choosing to Relinquish Embryos for Family-Building through a Christian Embryo ‘Adoption’ Programme**, *Hum Reprod* 26.12 (December 2011): 3327–3338 • *Background*: Currently, there is little evidence about conditional relinquishment of frozen embryos to others for family-building. This paper begins to address this gap by reporting findings from a study that investigated the experiences of couples who chose to relinquish their embryos conditionally through an embryo ‘adoption’ programme. *Methods*: An exploratory qualitative study was conducted between September 2008 and December 2009. Participants were recruited from a Christian embryo ‘adoption’ programme in the USA. Forty-three people (18 couples and 7 wives) participated in in-depth email interviews. *Results*: The data show that the following factors contributed to the participants choosing an embryo ‘adoption’ programme: how they conceptualized their embryos; dislike of alternative disposition options available; conceptions of their parental responsibility towards their embryo and a desire to have an ‘open’ relinquishment with (varying) degrees of information-sharing and contact arrangements between themselves and recipient couples. *Conclusions*: This study identifies a diversity of views on embryo relinquishment and some couples’ wishes for elements of conditional relinquishment that are offered by embryo ‘adoption’ programmes. A range of disposition options should be available to enhance choice for those with unused embryos so that they can relinquish in ways that are both morally and practically acceptable to them. The current polarized debate concerning the language of embryo ‘adoption’ detracts attention from the practical considerations of formulating ‘best practice’ in this area. These considerations are better addressed by the use of less politically charged terminology such as ‘conditional relinquishment’.

G. B. Kröger and D. Ejzenberg, **The Fiscal Outcome of Artificial Conception in Brazil: Creating Citizens in Developing Countries**, *Hum Reprod* 27.1 (January 2012):

142–145 • *Background*: Infertility is an important health issue, but only a small fraction of the affected population receives treatment in Brazil, because it is not covered by the government or private health insurance plans. We developed a generational accounting-based mathematical model to assess the direct economic result of creating a citizen through IVF in different economic scenarios, and the potential economic benefit generated by the individual and his/her future offspring. *Methods*: A mathematical model analyzes the revenues and expenses of an IVF-conceived individual over his lifetime. We calculated the net present value (NPV) of an IVF-conceived citizen, and this value corresponds to the fiscal contribution to the government by an individual, from birth through his predicted life expectancy. The calculation used discount rates of 4.0 and 7.0% to depreciate the money value by time. *Results*: A 4.0% discount rate represents the most favorable economic scenario in Brazil, and it results in an NPV of US\$ 61,428. A 7.0% discount rate represents a less favorable economic reality, and it results in a debit of US\$ 563, but this debt may be compensated by his/her future offspring. *Conclusions*: The fiscal contribution generated by each IVF-conceived citizen can justify an initial government investment in infertility treatment. Poor economic times in Brazil can sometimes result in a fiscal debt from each new IVF-conceived child, but this initial expenditure may be compensated by the fiscal contribution in the next generation.

Journal of the American Geriatrics Society

A. Caroline et al., **A Call for Guidance in the Use of Left Ventricular Assist Devices in Older Adults**, *J Am Geriatr Soc* 60.1 (January 2012): 145–150 • Left ventricular assist devices (LVADs) are approved as “destination therapy” (permanent use without plans for transplantation) in individuals with advanced heart failure who are not candidates for a cardiac transplant; as such, these devices are increasingly being used in older adults. Although LVADs have been shown to increase quality of

life and survival, the associated treatment burdens and complications deserve careful consideration. The current study illustrates myriad clinical challenges that can arise during long-term mechanical support using an older adult case history. Current data on LVAD use in older adults is reviewed, and a discussion of relevant points to consider before LVAD implantation in older adults, including advance care planning, assessment of gait and cognition, and the potential for substantial caregiver burden, is undertaken.

Pediatrics

D.J. Miracle et al., Contemporary Ethical Issues in Human Milk-Banking in the United States, Pediatrics 128.6 (December 2011): 1186–1191 • Donor human milk has been used in the United States for >90 years, but recent advances in human milk

science and laboratory techniques have led to increasing use of this resource. Pediatricians began using donor human milk in the 1900s in response to anecdotal observation that premature infants had better health outcomes when receiving their own mothers' milk. Since then, a formalized human milk-banking system developed in the mid-1980s and distributed >1 million ounces of pasteurized donor human milk in 2008. Despite growth in the use of pasteurized donor human milk, there is little discussion in the medical literature regarding the ethical considerations of collection and use of this resource. Key ethical considerations include issues surrounding medical decision-making and informed consent, increasing the limited supply of human milk, how ethically to allocate this scarce resource, and concerns linked to the marketing of a human milk.