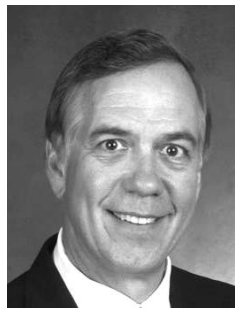
IL1 Emergency Medicine as a Specialty in the United States Over the Last 40 years: The Founding of the Specialty, Clinical Practice, and Research Basis



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The field of Emergency Medicine in the United States of America developed initially in the late 1960's as a group of physician specialists from variety of medical fields including Surgery, Internal Medicine and Obstetrics and Gynecology decided to come together to staff hospital emergency rooms on a full time basis. They founded the American College of Emergency Physicians and began to define the scope of practice for this new specialty of Emergency Medicine. In 1970, the first emergency medicine residency training program was founded at the University of Cincinnati in Cincinnati, Ohio. The University of Cincinnati Emergency Medicine Residency Training Program has grown from a single resident physician in 1970 to now having 56 resident physicians in training over a four year curriculum. There are currently over 130 residency training programs in emergency medicine across the United States with over 25,000 emergency physicians practicing the specialty of Emergency Medicine in 2013. The history of Emergency Medicine and the evolution of residency training programs in this important specialty will be analyzed and discussed.

In 2013, over 120 million patient visits will be seen in emergency departments across the United States. These patients being treated by emergency physicians present not only with life and limb threatening emergencies, but also with chronic disease processes typically treated in less acute care settings than an emergency department. Emergency departments provide not only life saving care but also serve as the safety net for patients without access to primary care physicians or outpatient clinic settings. The importance of emergency departments in the health care reform efforts currently ongoing in the United States will be described.

Emergency medicine research has brought a number of major discoveries over the last 40 years to multiple specialty fields including emergency cardiac care, neurovascular emergencies, trauma, critical care, emergency medical services, and cardiac resuscitation. Discoveries in the field of emergency cardiac care will be emphasized to highlight the collaboration and team work between emergency physicians and cardiologists to care for patients with ST-segment myocardial infarction, as well as non-ST segment myocardial infarction and unstable angina.

Finally, the barriers to developing the specialty of Emergency Medicine in the United States over the last 40 years will be described. In addition, the alliances which have been created with other specialties to expand the reaches of Emergency Medicine will be discussed including areas of emergency cardiac care, emergency neurovascular care, and critical care. The future remains very bright for Emergency Medicine in the United States and across the world during the next decade.

IL2　Emergency Medicine is Changing the Rules for Resuscitation

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There is growing hope and new technologies in the medical efforts to resuscitate victims of sudden death. New therapies and improved systems of care have the potential to save hundreds of thousands of lives currently lost to cardiac arrest across the world. Clinicians can immediately implement programs that will dramatically save lives in nearly all our communities. We are transitioning from an older mindset that focused on the training of an individual toward a new "systems of care" philosophy that emphasizes a "bundled care" approach coupled with dynamic system metrics. Systemic hypothermia has emerged as a life saving therapy for cardiac arrest, however, we are only beginning to understand and take full advantage of the benefits of cooling in most communities. The future evolution of therapeutic hypothermia appears hopeful, especially if we accept that we are only at the very beginning of our understanding. The cooling methods we use today will almost certainly be outdated in the near future by superior technologies. Despite the gaps in our knowledge, novel basic science concepts are emerging that will further extend emergency care in the next ten years. There is growing acceptance that mitochondrial dysfunction and reperfusion injury following prolonged ischemia contribute to tissue injury and clinical death. Thus, mitochondrial targeted agents and new anti-reperfusion injury drug combinations may be able to enhance hypothermia's protection. Newer advanced resuscitation technologies like the rapid use of emergency cardiopulmonary bypass (ECPB) can be combined with hypothermia plus anti-reperfusion injury targeted drugs. This combined approach of ECPB plus cooling plus anti-reperfusion injury agents is under development and preliminary studies demonstrate promise. Ischemia continues to play a central role in the deaths due to a wide variety of emergency conditions. Intervals of ischemia that are now considered "irreversible" may soon be routinely salvageable and treatable with newer approaches. With these new therapies our definitions of life and death will continue to evolve and more lives will be saved.

IL3 World Coalition for Trauma Care: Why we need it; what can we do?

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Trauma remains a major public health problem worldwide. More than 5 million people die every year as a consequence of traumatic injuries. It happens due to a variety of mechanisms of injury in major cities or in the countryside; it does not distinguish between developed or underdeveloped countries. It is the number one cause of death between the ages of 1 and 45 years. More years of life are lost after traumatic injuries than due to cancer and cardiovascular diseases combined. Obviously, it is a major health care burden to any country.

Trauma systems and adequate trauma care led by trauma/critical care/acute care surgeons are needed to fight this epidemic disease. The First World Trauma Congress (WTC) was organized primarily because the concept of trauma as a disease must be disseminated globally. It deserves the same attention and investment in care, research, and prevention, as any other disease. By bringing together different nations, professional organizations, healthcare professionals, and students to learn, discuss, debate, advance knowledge, and increase awareness about this devastating disease we accomplished our initial goal.

However, the work did not end with the conclusion of the first WTC. We felt that a collaborative effort between trauma professional organizations from different countries involved in the first WTC would be a major accomplishment, which would keep the momentum going and the group together. This is how the world coalition for trauma care (WCTC) was born (www.world-coalition-trauma-care.org).

Therefore, the goals of the World Coalition for Trauma Care are:

・To increase awareness of the importance of trauma as a disease worldwide.
・Trauma Education at all levels worldwide.
・Development of trauma systems worldwide?.
・Share resources related to trauma care and systems development.
・Continuation of the World Trauma Congress.

IL4　Surviving Sepsis Campaign 2013

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The Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2012 were published in February of 2013. For the first time the guidelines recommend early screening of patients with potential severe sepsis and a formal performance improvement process in place at hospitals that includes audit and feedback.

The guidelines continue to recommend protocolized quantitative resuscitation of patients with sepsis induced tissue hypoperfusion (defined as hypotension persisting after initial fluid challenge or blood lactate concentration > 4 mmol/L). Goals during the first 6 hours of resuscitation include a central venous pressure of 8-12mm Hg, mean arterial pressure (MAP > 65 mmHg), urine output >0.5 mL/Kg/hr and a central venous oxygen saturation of 65%. The guidelines do not restrict the use of more sophisticated technology to assist decision making in quantitative resuscitation if it is available. For the first time the guidelines suggest the use of elevated lactate levels targeting resuscitation to normalize lactate. At least two sets of blood cultures drawn before antimicrobial therapy that does not induce significant delay greater than 45 minutes is recommended. Emergent source control is recommended to be sought and diagnosed or excluded as rapidly as possible and intervention be undertaken for source control within the first 12 hours after the diagnosis is made, if feasible . A trial of dobutamine infusion up to 20 mcg/kg/min may be administered or added to vasopressor (if in use) in the presence of: (a) myocardial dysfunction; (b) ongoing signs of hypoperfusion despite adequate intravascular volume and adequate MAP. It is suggested that intravenous hydrocortisone not be used as a treatment of adult septic shock if adequate fluid resuscitation and vasopressor therapy are able to restore hemodynamic stability. If this is not achievable, intravenous hydrocortisone alone at a dose of 200 mg/day continuous infusion is suggested. ARDS net strategy protective lung strategy is recommended with 6 mL/kg predicted body weight tidal volume and maintaining plateau pressure < 30 cm H2O.

The guidelines continue to recommend antibiotic therapy administered within the first hour of recognition of severe sepsis and septic shock. Crystalloids are now the first choice for fluid resuscitation. In patients that require substantial amounts of crystalloid the addition of albumin to resuscitation fluid is suggested. The initial fluid challenge in sepsis induced tissue hypoperfusion defined as hypotension or elevated lactate is a minimum of 30 mL/kg of crystalloids (a portion of which may be albumin equivalent). Another major change in the guidelines is the recommendation of norepinephrine as the single first choice vasopressor. If the recommended mean arterial pressure (MAP) target of 65mm Hg cannot be achieved with fluid resuscitation and high dose norepinephrine next steps include either the addition of epinephrine (added to and potentially substituted for norepinephrine) or the addition of up to .03 units/min (low dose) vasopressin. Both of these additional therapies may sometimes be required. Phenylephrine is in general not recommended for use in septic shock; however, there are circumstances in which phenylephrine might be useful, including patients who have a measured very high cardiac output and are requiring high doses of other vasopressors, patients who develop serious tachyarrhythmias with norepinephrine and patients who's MAP target cannot be achieved with other vasopressor agents. Dopamine is not recommended for general use but may be considered in patients that have absolute or relative bradycardia and septic shock.