

Table of Contents

General Information

Educational & Learning Objectives

Agenda

Faculty

Registrants

Exhibitors

Commercial Support & GSA Staff

Lecture Content

CME Credit Instructions

GSA Mission Statement

It is the mission of the Georgia Society of Anesthesiologists, Inc. to associate and affiliate into one organization all physicians and others in Georgia who are engaged in the practice of, or otherwise especially interested in, anesthesiology and its subspecialties; to encourage specialization in this field; to raise the standards of the specialty; to safeguard the professional interests of its members; and in all ways to develop and further educate within the specialty of anesthesiology for the general elevation of the standards of medical practice and patient safety.

Adopted by Board of Directors, Winter Meeting, January 15, 1999

Ratified by General Membership, January 17, 1999

General Information

Welcome

The 2016 GSA Summer Meeting is jointly sponsored by the American Society of Anesthesiologists and the Georgia Society of Anesthesiologists. As a convenience to GSA members and guests, this continuing education conference is structured as a two-day event. The meeting offers up to 11 *AMA PRA Category 1 Credits*[™] with content derived from educational survey feedback and post-meeting evaluations over the last few years. The educational focus will inform attendees on current issues in anesthesiology and updates across multiple disciplines. The Ritz-Carlton Lodge at Lake Oconee, is an excellent venue for the conference. We hope that you enjoy the educational portion of the meeting and receive appropriate business and government affairs information during the GSA General Business Meeting, which will be held Sunday from 7:00 - 7:30 a.m.

Registration Fees

The GSA member rate is \$450 for physicians, \$175 for residents, \$275 for AAs, \$200 for retired physicians, and \$50 for students. The non-member rate is \$575 for physicians, \$225 for residents, \$375 for AAs, \$200 for retired physicians, \$50 for students, and \$575 for CRNAs. Educational seminars, breakfasts and breaks are for the REGISTRANT ONLY. A \$100 late fee will be applied to all registration forms received after Monday, July 18, 2016. This late fee applies to both on-site and online registration. Guests are welcome at both Friday and Saturday evening receptions.

Accreditation

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American Society of Anesthesiologists and the Georgia Society of Anesthesiologists. The American Society of Anesthesiologists is accredited by the ACCME to provide continuing medical education for physicians.

Credit Designation

The American Society of Anesthesiologists designates this live activity for a maximum of 11 *AMA PRA Category 1 Credits*[™]. Physicians should claim only credit commensurate with the extent of their participation in the activity.

This year's evaluation and CME certificate process is completely electronic. In order to access the course, claim your CME credits, complete the program evaluation and print your CME certificate, you must log in to the ASA Education Center at the following link: <http://education.asahq.org/>

Cancellation Policy

Cancellations and/or changes in registration or participation in all or any portion of the meeting must be received at GSA headquarters by Monday, July 18, 2016, to qualify for refund. Absolutely no refunds will be issued for changes received at GSA headquarters after Monday, July 18, 2016. The cancellation policy and late registration fee will be strictly enforced.

Evening Hospitality

All registrants, faculty, exhibitors and guests are invited to enjoy evening hospitality events offered Friday and Saturday. Badges are required for participation in all receptions. Please register your guests so that a badge can be produced.

Questions

Please visit the registration desk for more information or clarification on any of the meeting elements, schedule or CME verification.

Disclaimer

The information provided at this CME activity is for continuing education purposes only and is not meant to substitute for the independent medical judgment of a healthcare provider relative to diagnostic and treatment options of a specific patient's medical condition.

Educational and Learning Objectives

2016 GSA Summer Meeting

July 22 - 24, 2016

Ritz Carlton Lodge at Lake Oconee

CME Activity Co-Directors

Tanna Boyer, MD & Vikas Kumar, MD

Augusta University

Timothy G. Buchman, PhD, MD

Emory University

Atlanta, GA

Error, Competencies and Standards in Critical Care

At the conclusion of the presentation, the learner should be able to:

1. Describe a taxonomy of error in conception and delivery of critical care.
2. Discuss the evolution of competency-based training in critical care.
3. Compare the training strategies of aviation and critical care.
4. Contrast the use of competencies and standards in evaluation of aviation and of critical care professionals.

Timothy G. Buchman, PhD, MD

Emory University

Atlanta, GA

Cheryl Hiddleston, MSN

Emory Healthcare Inc.

Atlanta, GA

Tele-ICU: Past, present and future for Georgia and the nation

At the conclusion of the presentation, the learner should be able to:

1. Review the history of ICU telehealth.
2. Discuss the evolution of for-profit and not-for-profit ICU telehealth delivery system.
3. Critically evaluate prior reports of tele-ICU clinical and financial performance.
4. Analyze the tele-ICU component of the Emory CMS Healthcare Innovation Award with respect to clinical and financial performance.

Heather Byrd, MD

Augusta University
Augusta, GA

J. Drew Prosser, MD

Augusta University
Augusta, GA

Update on Sleep Apnea in Children – Anesthesia Perspectives

At the conclusion of the presentation, the learner should be able to:

1. Define pediatric OSA and discuss associated comorbidities.
2. Differentiate between adult and pediatric OSA.
3. Discuss pathophysiology related to pediatric OSA.
4. Discuss anesthetic implications of pediatric OSA and tonsillectomy.

J. Kenneth Byrd, MD

Augusta University
Augusta, GA

J. Drew Prosser, MD

Augusta University
Augusta, GA

Head and Neck Surgery: The Difficult Airway

At the conclusion of the presentation, the learner should be able to:

1. Recognize challenging airway scenarios in patients with head and neck disorders.
2. Formulate an airway plan based on anatomical factors in head and neck surgery.
3. Recognize understand the surgeon's perspective in head and neck disorders

Miguel Cobas, MD

University of Miami Miller School of Medicine
Department of Anesthesiology
Miami, FL

Monitoring Physiologic Principles of the Critically Ill

At the conclusion of the presentation, the learner should be able to:

1. Assess physiology parameters useful in management of septic patients.
2. Review common tests and limitations in the ICU.

Barriers in implementing the Perioperative Surgical

At the conclusion of the presentation, the learner should be able to:

1. Identify the characteristics that make anesthesiologists good candidates for perioperative physicians.
2. Discuss some of the challenges that make it difficult for an anesthesiologist to fully participate in PSH.

James Rawson, MD

Chairperson of Radiology

Augusta University

Augusta, GA

Payment System Reform, How will this affect your practice?

At the conclusion of the presentation, the learner should be able to:

1. Review current models of reimbursement.
2. Review proposed models of reimbursement.

James Rawson, MD

Chairperson of Radiology

Augusta University

Augusta, GA

Waste, Lean, and Opportunity in Healthcare – learn how to save \$ in your health system

At the conclusion of the presentation, the learner should be able to:

1. Review waste and inefficiency in healthcare
2. Review Tools of Lean
3. Discuss opportunities for improvements

Nitin Anand, BA, MD

Assistant Professor of Anesthesia

Augusta, GA

Opportunity for Improvement

At the conclusion of the presentation, the learner should be able to:

1. Outline several Lean based quality improvement projects.
2. Discuss the process of developing and designing a Lean based improvement project.
3. Discuss the Lean tools best suited to different projects.
4. Outline the difficulties and common errors made during the process.

Vikas Kumar, MD
Augusta University
Augusta, GA

Shvetank Agarwal, MD
Augusta University
Augusta, GA

Mohamed Gaber, MD
Augusta University
Augusta, GA

PSH Ultrasound Workshop

At the conclusion of the presentation, the learner should be able to:

1. Perform transthoracic and transesophageal echocardiograms.
2. Understand different views of cardiac ultrasound with a plethora of pathologies.
3. Perform abdominal FAST exam and basics of lung ultrasound.

GSA 2016 Summer Meeting Schedule

The Ritz Carlton Lodge
Lake Oconee, GA
July 22 - 24, 2016

Friday, July 22, 2016

- 3:00 - 7:00p** Registration - **Salon III Pre-Function**
- 4:00 - 9:00p** Exhibitor Set Up - **Salon III**
- 5:00 - 7:00p** Board of Directors Meeting - **The Boardroom**
- 7:00 - 8:30p** Welcome Hospitality with the Exhibitors – **Salon III**
- 8:30p** *Dinner on your own with family and friends*

Saturday, July 23, 2016

- 6:00a** Exhibitor Set Up - **Salon III**
- 6:30 - 7:20a** Registration/Breakfast with Exhibitors - **Salon III & Salon III Pre-Function**
- 7:20a** *Welcome - RCBR Salon I & II*
Heather Dozier, MD - GSA President
- Introductions - RCBR Salon I & II*
Vikas Kumar, MD & Tanna J. Boyer, DO, MS
Summer Meeting Activity Co-Directors
- 7:30 - 8:30a** *ASA Update - RCBR Salon I & II*
Jeff Plagenhoef, MD
- 8:30 - 9:30a** *Monitoring Physiologic Principles of the Critically Ill - RCBR Salon I & II*
Miguel Cobas, MD
- 9:30 - 10:00a** Break with Exhibitors - **Salon III & Salon III Pre-Function**
- 9:30 - 12p** Resident Section Meeting - **Starling**
- 10:00 - 10:30a** *Waste, Lean, and Opportunity in Healthcare – learn how to save \$ in your health system - RCBR Salon I & II*
Jim Rawson, MD
- 10:30- 11a** *Opportunity for Improvement - RCBR Salon I & II*
Nitin Anand, MD
- 10:00a** *GAAA Board of Directors Meeting- The Boardroom*

- 11:00 - 12:00p** *Update on Sleep Apnea in Children – Anesthesia Perspectives - RCBR Salon I & II*
Heather Byrd, MD & Drew Prosser, MD
- 12:00 - 1:00p** *The Difficult Airway in Head and Neck Surgery - RCBR Salon I & II*
J. Kenneth Byrd, MD & Drew Prosser, MD
- 1:00p** **Meeting Adjourned/Lunch with family and friends**
- 1:00 - 4:00p** Perioperative Surgical Home Ultrasound Workshop including TTE, TEE, Lung, Abdomen/FAST with pathologies on simulation - **Starling**
Vikas Kumar, MD
- 1:00 - 4:00p** NYSORA Regional Workshop – **Reynolds Ballroom**
- 1:00 - 4:00p** Resident and Medical Student Poster Session - Salon I & II
- 1:00p** 16th Annual GSA Golf Tournament (pre-registration required)
- 4:00 - 5:00p** 12th Annual Family Ice Cream Social (Sponsored by the GAAA) - **Tupelo**
- 6:30 - 8:00p** Evening Reception – **Linger Longer Ballroom**
- 7:30 – 9:00p** MCG Alumni Dinner – **Tupelo**

Sunday, July 24, 2016

- 6:30 - 7:30a** Registration/Breakfast with Exhibitors - **Salon III & Salon III Pre-function**
- 7:00 - 7:30a** General Business Meeting for GSA Members - **RCBR Salon I & II**
- 7:30 - 8:30a** *Payment System Reform, how will this affect your practice?* - **RCBR Salon I & II**
Jim Rawson, MD
- 8:30 - 9:30a** *Error, Competencies, and Standards in Critical Care* - **RCBR Salon I & II**
Timothy Buchman, MD, PhD
- 9:30 - 10:00a** Break with Exhibitors - **Salon III & Salon III Pre-Function**
- 10:00 - 11:00a** *Tele ICU: Past, present and future for Georgia* - **RCBR Salon I & II**
Tim Buchman, MD, PhD & Cheryl Hiddleson, MSN, RN, CCRN-E
- 11:00a - 12:00p** *Barriers in implementing the Perioperative Surgical Home* - **RCBR Salon I & II**
Miguel Cobas, MD
- 12:00p** **Meeting Adjourned**

Note: Opportunities for Q&A will be provided at the conclusion of each presentation.

Program and Education Committee

A special thanks to the Program and Education Committee for reviewing lecture materials to ensure lectures meet learning objectives and do not exhibit biased content. Members of the Program and Education Committee are as follows:

Brian Thompson, MD, Co-Chair

Gautam Sreeram, MD, Co-Chair

Heather Dozier, MD

Kirk Edwards, MD

Korrin Scott Ford, MD

Tanna Boyer, MD

Gina Scarboro, CAA

Disclosure and Resolution of Conflicts of Interest

The American Society of Anesthesiologists remains strongly committed to providing the best available evidence-based clinical information to participants of this educational activity and requires an open disclosure of any potential conflict of interest identified by our faculty members. It is not the intent of the American Society of Anesthesiologists to eliminate all situations of potential conflict of interest, but rather to enable those who are working with the American Society of Anesthesiologists to recognize situations that may be subject to question by others. All disclosed conflicts of interest are reviewed by the educational activity course director/chair to ensure that such situations are properly evaluated and, if necessary, resolved. The American Society of Anesthesiologists educational standards pertaining to conflict of interest are intended to maintain the professional autonomy of the clinical experts inherent in promoting a balanced presentation of science. Through our review process, all American Society of Anesthesiologists CME activities are ensured of independent, objective, scientifically balanced presentations of information. Disclosure of any or no relationships will be made available for all educational activities.

Planner, Faculty and Staff Disclosure

All Faculty, including editors, authors, reviewers, and staff for the GSA 2016 Summer Meeting reported they have no relationships with commercial interests.

Planners:

Brian Thompson, MD, Co-Chair

Gautam Sreeram, MD, Co-Chair

Heather Dozier, MD

Kirk Edwards, MD

Korrin Scott Ford, MD

Tanna Boyer, MD

Gina Scarboro, CAA

Vikas Kumar, MD

Jet Toney, GSA Executive Director

Brooke Cain, GSA Meeting Planner

Presenters:

Jeff Plagenhoef, MD

Miguel Cobas, MD

Jim Rawson, MD

Nitin Anand, MD

Heather Byrd, MD

Drew Prosser, MD

J. Kenneth Byrd, MD

Vikas Kumar, MD

Timothy Buchman, MD, PhD

Cheryl Hiddleston, MSN, RN, CCRN-E

Meeting Registrants

(as of July 14, 2016)

Nitin Anand, MD
1318 Hickman Rd.
Augusta, GA 30904

Robert Arasi, MD
3135 Huntbury Lane
Milton, GA 30004

Carolyn Bannister, MD
13762 Windsor Crown Ct West
Jacksonville, FL 32225

Fathi Bashir, MD
1018 Micah terrace
Evans, GA 30809

Robert Baumann, MD
4571 River Bottom Drive
Norcross, GA 30092

James Beeson, MD
7821 Metcalf Road
Thomasville, GA 31792

Timothy Beeson, MD
3715 Sapphire Dr
Martinez, GA 30907

Nathan Brandon, MD
3525 Greenway Dr.
Evans, GA 30809

Amanda Brown, MD
203 Westchester Dr
Macon, GA 31210

William Buntin, CAA
2407 Pendleton Street
Albany, GA 31721

Tia Clements, MMSc
1411 Druid Oaks NE
Atlanta, GA 30329

Kelli Corless, CAA
1395 Ridgefield Drive
Roswell, GA 30075

William Daniel, MD
1116 Weatherstone Drive NE
Atlanta, GA 30324

Jaiwant Avula, MD
125 Woodchase Drive
LaGrange, GA 30240

Ralph Dapaah, CAA
4892 Patterson Ln
Gainesville, GA 30506

Nerlyne Dhariwal, MD
1451 Briarcliff Rd. NE
Atlanta, GA 30306

Cayetano Dizon, MD
1150 St. Andrews Drive
Macon, GA 31210

David Draper, MD
1231 Skip Wells Ct
Tallahassee, FL 32312

Wiley Drury, MD
2 Plantation Circle
Valdosta, GA 31605

Peggy Duke, MD
3530 Piedmont Road Penthouse 3
Atlanta, GA 30305

Abimbola Faloye, MD
2160 Boyce Circle
Marietta, GA 30066

Robert Gantt, MD
60 Highlands Ridge Lane
Oxford, GA 30054

Maurice Gilbert, MD
156 Peachtree East Shopping Center Suite 153
Peachtree City, GA 30269

Stephen Golden, MD
4110 Thunderbird Drive SE
Marietta, GA 30067

Ashley Hamilton, MD
1080 Peachtree St. NE Apt 2416
Atlanta, GA 30309

Julius Hamilton, MD
1845 Piedmont Ave. NE, Unit #448
Atlanta, GA 30324

Rickard Hawkins, MD
670 Briarleigh Way
Woodstock, GA 30189

Eric Heil, C-AA
167 Grady ave
Athens, GA 30601

Lauren Hinds, MD
4330 Ridge Cliff Dr.
Augusta, GA 30909

Chuck Hufstetler, C-AA
3 Orchard Spring Drive
Rome, GA 30165

Chuck Hufstetler, C-AA
3 Orchard Spring Drive
Rome, GA 30165

Natalie Jenks, S-AA
534 Briarhill Ln NE
Atlanta, GA 30324

Keith Johnson, MD
1060 Woods Road
Waycross, GA 31501

Gary Kao, MD/(Resident)
680 Greenwood Ave NE #303
Atlanta, GA 30306

Alan Kaplan, MD
3155 Northpoint Parkway Suite 100
Alpharetta, GA 30005

Thomas Kessinger, MD
2071 Luxuria Ct
Tucker, GA 30084

Matthew Klopman, MD
930 Edgewater Ct.
Sandy Springs, GA 30328

Emily Kurokawa, MD
147 Gustav Court
North Augusta, SC 29860

William Lane, MD
151 Gleneagles Circle
Macon, GA 31210

Florence LeCraw, MD
222 12th St #2007
Atlanta, GA 30309

Leslie Lester, DO
GRU
Augusta, GA 30912

Christopher Ma, MD
1044 Emory Parc Place
Decatur, GA 30033

Cory Mansour, MD
4461 Galway Drive
Evans, GA 30809

Charles McMillon, MD
1014 Nottingham Lane NE
Atlanta, GA 30319

Steffen Meiler, MD
787 Sparkleberry Road
Evans, GA 30809

Jefferey Mills, MD
660 Ralph McGill BLVD #3109
Atlanta, GA 30312

Jefferey Mills, MD
660 Ralph McGill BLVD #3109
Atlanta, GA 30312

Katherine Monroe, MMSc, PhD
2549 Oak Crossing Drive
Decatur, GA 30033

Fletcher Moore, MD
2131 McDowell St.
Augusta, GA 30904

Amjad Najim, MD
5302 Grenada Lane
Augusta, GA 30909

Emily Natarella, MD
345 Broadmoor Dr
Fayetteville, GA 30215

John Neeld, MD
3025 River North Parkway
Atlanta, GA 30328

Isaac Osei, MD
403 Lakeshore Drive
Monroe, GA 30655

Marvin Palmore, Jr., MD
8550 Valemont Drive
Atlanta, GA 30350

Krupa Patel, MD
3777 Peachtree Road NE #322
Atlanta, GA 30319

Hardik Patel, MD
936 Broad St. Unit 207
Augusta, GA 0

Matthew Rabito, MD
923 Peachtree St NE Unit 1125
Atlanta, GA 30309

Ellen Richter, MD
2887 Elliott Circle
Atlanta, GA 30305

Michelle Romej, MD, MBA
1676 Bristol Drive NE
Atlanta, GA 30329

Joy Rusmisell, CAA
243 Hines Terrace
Macon, GA 31204

Joseph Schneider, MD
30 Lakeview Dr. NE
Atlanta, GA 30317

Robin Schwartz, MD, MBA
4040 Glenside Ln.
Aiken, SC 29803

Robin Schwartz, MD, MBA
4040 Glenside Ln.
Aiken, SC 29803

Korrin Scott, MD
1705 Johnson Rd NE
Atlanta, GA 30306

CarieAnn Sirmon, MD
423 Clairemont Ave Apt 11
Decatur, GA 30030

Michael Smith, MD
7205 Renaissance Way NE
Atlanta, GA 30308

Kathryn Stack, MD
6200 Mountain Brook Lane
Atlanta, GA 30328

Steven Sween, MD FCCP
240 Marchand Court, NW
Atlanta, GA 0

Harsha Tanguturi, MD
468 Harold Ave ne
Atlanta, GA 30307

Kristine Tindol, CAA
112 Winterberry Dr
Savannah, GA 31406

Andy Truong, M.D.
147 Gustav Ct.
North Augusta, GA 29860

Paul Turk, M.D.
111 Field Springs Court
Macon, GA 31210

Claire Wainwright, CAA
1110 Ballpark Lane Apartment 2301
Lawrenceville, GA 30043

Steven Walsh, MD
53 Fowler Avenue
Roswell, GA 30075

Oliver Ware, MD
212 Legacy Ct
Birmingham, AL 35242

Shaun Williams, Md
4528 Ivy Wood Drive
Fortson, GA 31808

Igor Zhukov, MD
1336 Nalley Cir
Decatur, GA 30033

Exhibitors

(as of July 14, 2016)

MedPro Group

Grifols

Pall Medical

Georgia PHP

Teleflex

Pfizer

Medtronic

3D Systems

QGenda

GE HEALTHCARE

Mallinckrodt Pharmaceuticals

Atlanta Capital Group

HEINE USA Ltd

Merck & Co., Inc

Cumberland Pharmaceuticals

PharMEDium Services, LLC

Intermedix

MAG Mutual

Mylan, Inc.

Pacira Pharmaceuticals, Inc.

GSA Staff

James E. “Jet” Toney

Executive Secretary

LeAnn Johnston

Financial Services

Brooke Cain

Meeting Planner

Morgan Pitts

Summer Government Affairs Intern

Stephanie Bowen

Member Services & Government

Relations Manager

The Georgia Society of Anesthesiologists is headquartered at the offices of Cornerstone Communications Group, Inc.

1231-J Collier Rd. NW
Atlanta, GA 30318
404-249-9178

For more information about the GSA, go to www.gsahq.org.
For more information about Cornerstone Communications Group, go to www.cstone1.com.

Commercial Support Acknowledgment

The Georgia Society of Anesthesiologists gratefully acknowledges the commercial support of the following companies:

MAG Mutual

Un-restricted educational grant

CAE

In-kind donation of 1Vimedix Ultrasound Simulator

3D Systems

In-kind donation of 1 Mentor Ultrasound Simulator

Saturday, July 23

General Session

Curriculum Vitae

Jeffrey Scott Plagenhoef, M.D.

Address: Home: Business:
2221 Dominic Court 100 Hillcrest Medical Blvd
Waco, TX 76712 Waco, TX 76712
Cell (334)790-9648 (254) 202-5835
jsplag@aol.com

Date/Place of Birth: May 7, 1960
Kalamazoo, Michigan

Marital Status: Married - Deborah Linn Plagenhoef, MD
Children - Nicholas Graham, October 22, 1990
Madelin Maris, February 11, 1993
Alexander Braden, April 24, 1994

Education: Augusta College
Augusta, Georgia
September 1978 - June 1979

Michigan State University
East Lansing, Michigan
September 1979 – August 1983
B.S. – Psychology, High Honor graduate

Medical College of Georgia
Augusta, Georgia
September 1983 – June 1987
Medical Doctor

Internship: Transitional
Lloyd Noland Hospital
Birmingham, Alabama
July 1987 – June 1988

Residency: Anesthesiology
University of Alabama at Birmingham
Birmingham, Alabama
July 1988 – June 1991
Chief Resident, January 1991 – July 1991

Board Certification/
Licensure: Diplomat, American Board of Anesthesiology, 1992
Diplomat, National Board of Medical Examiners, 1988
Alabama Medical License #14175, July 1988

Professional Society
Memberships: American Society of Anesthesiologists
Medical Association of the State of Alabama
Alabama State Society of Anesthesiologists

Houston County Medical Society
International Anesthesia Research Society

Professional Service:

American Society of Anesthesiologists (ASA):

ASA President Elect, 10/2015- present
ASA VA Nursing Handbook Response Campaign Chairman, 1/2016 - present
AQI BOD, 10/15 - present
ASA 1st Vice President, 10/2014 – 10/2015
Chairman, Ad Hoc Committee on NACOR Assessment and Business Plan Development, 11/14 – 10/15
ASA Ad Hoc Committee on Teaching Regional Anesthesia, 2014
ASA Ad Hoc Committee for Children's Surgical Care, February, 2014 - 2015
Ad Hoc Committee for the Maternal Quality Improvement Partnership between ACOG and ASA, January, 2014 – present
ASA Strategic Planning Committee, November, 2012 - present
Participant ASA 2013 Future Education Summit, Chicago, IL November, 2013
ASA Subspecialty Society Steering Committee, October, 2013 - present
Ad Hoc Committee on Governance Efficiency and Effectiveness, 2013-2014
Administrative Council (AC) Ad Hoc Committee on Data Governance, 2013 -2014
Ad Hoc Committee on Approval of CEO Selection, 2012
ASA Assistant Secretary – 10/2012 – 10/2014
Chairman, ASA Section on Representation, 10/2012 – 10/2014
Member, Section on ASA Board Administrative Affairs, 10/2012 -10/2014
ASAPAC Independent Expenditure Unit, 2011-2014
Member, ASA Ad Hoc Committee on State Component Society Advocacy and Funding Assistance, 2011-present
ASA Assistant Secretary, October 17, 2012 – present
ASA Administrative Council, October 17, 2012 – present
ASA Ad Hoc Committee on Approval of CEO Selection October, 2012 -1013
ASA Ad Hoc Committee on Data Governance 10/2012 - present
ASA Committee on Professional Diversity, 10/12 - present
ASA Ad Hoc Committee on State Component Society Advocacy and Funding Assistance, Member, March 2011 – present
ASA Ad Hoc Committee on Health Policy Research, Member, November, 2010 – 2011
ASA Ad Hoc Committee on Electronic Health Records (AIMS), Member, January, 2011 - present
Chairman BOD, ASA Quality Institute and National Anesthesia Clinical Outcomes Registry (NACOR) 2/2009 – 10/2012
Founding BOD Member, ASA Quality Institute and National Anesthesia Clinical Outcomes Registry (NACOR), 10/2008- 10/2012
Recipient 2008 ASA Excellence in Government Award
ASA Committee on Finance, 10/2007 – present
ASA Board of Directors/Director AL, 10/2005-present
Chairman, ASA Committee on the Anesthesia Care Team, 10/2005-10/2010
ASA Political Action Committee, Executive Board Member, 10/2004- 10/2010
ASA PAC, Executive Board Secretary, 10/2009 – 10/2010
Alternate Director, Alabama Component Society ASA, Nov. 2002—2005
ASA House of Delegates, Member, 1996-present
ASA Southern Caucus, Secretary/Treasurer, 10/2004-2008
ASA Anesthesia Care Team Committee, member, 10/2004 -10/2011
ASA Task Force on Payment Methodology, member, 2004 & 2005
ASA Task Force on Anesthesia Assistant Education, member, 2004-2005

American Society of Anesthesiologists®

ASA – working for YOU and the Common Good of ALL!

Georgia Society of Anesthesiologists Annual Meeting
Reynolds Plantation, Lake Oconee, GA
July 23, 2016

Jeffrey S. Plagenhoef, M.D.
Chair, Baylor Scott & White Hillcrest
ASA President Elect

asahq.org

Disclosures

- ❖ Nothing

© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 2

GSA's ASA Director and Alternate Director

- ❖ Howard Odum, M.D.
- ❖ Tim Beeson, M.D.

Thank you, thank you, thank you!!!

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 3

GSA's Officers

- ❖ Heather J. Dozier, MD – President
- ❖ Justin Ford, MD – Secretary

Thank you, thank you, thank you!!!

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 4

GSA Lobbyist and AAAA Ex Dir

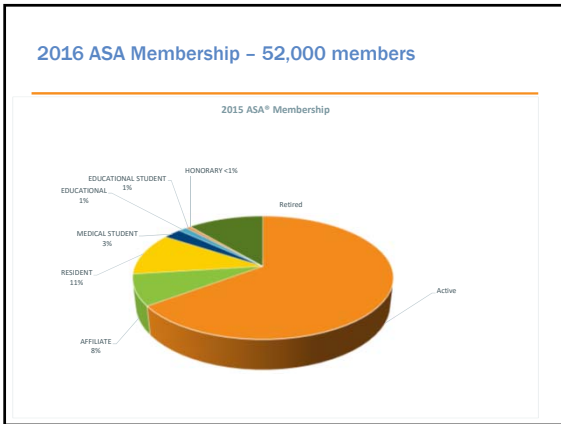
JET TONEY!

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 5

GSA Leading in ASA

- ❖ Steve Sween, M.D. – ASA Speaker of the HOD and Chair Special Board Comm on Expert Witness Testimony
- ❖ John Stephenson, M.D. – Chair, ASA Com on Anesthesia Care Team
- ❖ Howard Odum, M.D. – Chair, ASA Com on AA Ed and Practice

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 6



YOUR Professional Citizenship

Is CRUCIAL to our future!!!

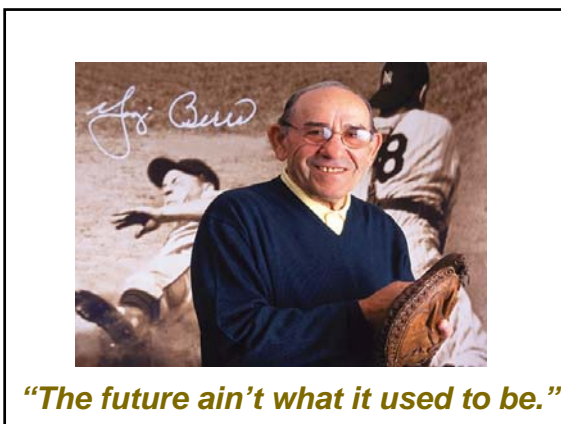
© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS

American Society of Anesthesiologists®

Why should we all be thankful for GSA and ASA?

Selling membership value proposition should be very easy when put into the framework of threats and challenges.

asahq.org



ASA is passionately committed to maintaining relevance of the profession and to the membership

Disruptive Public Policy	Mergers & Acquisitions	Employment Models	Mega Groups
Workforce	Delivery Models	CHANGE – slow & abrupt	Apathy & Complacency
Value Proposition	APRN Consensus Model	Disruptive Technology	Payment → Quality
MACRA → APM&MIPS	VANH	PSH → Population Health	Patient Rights & Engagement

The Changing Marketplace impacts BOTH Your Practice and the ASA

- ❖ Hospital employment
- ❖ The Mega Group – positive Vs negative impact?
- ❖ Academic & private blend
- ❖ ASA **VERY** AWARE!

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 13

Benjamin Franklin - July 4, 1776

“We must, indeed, all hang together, or assuredly we shall all hang separately!”


© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 14

American Society of Anesthesiologists®

Education

asahq.org


ASA Education Center and My Learning App



Current courses on the app:

- 2015-16 ACE & SEE
- 2015-16 Journal CME
- SAM-Pediatrics
- SAM-Obstetrics





Track all CME and MOCA credit in one place



© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 15

ASA Self-Assessment Programs

- Anesthesiology Continuing Education (ACE) Program
- Self-Evaluation Education (SEE) Program
- Self-Assessment Modules (SAM), developed w/sub-specialties
 - Critical Care, Pain Medicine, Pediatrics (Current)
 - SAM-Obstetrics (Fall 2016)







© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 17

ASA Supports Quality and Patient Safety

ASA activities approved for Patient Safety MOCA 2.0 requirements

- Fundamentals of Patient Safety
- Patient Safety Highlights
- MRI Advisory
- Cardiac Arrest and Spinal Anesthesia
- Cardiac Tamponade
- Intraoperative Awareness
- Smoking Cessation in Surgical Patients
- Neuromuscular Blockade




Fundamentals of Patient Safety
Epidemiology: The How and Why of Adverse Events

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 18

ASA Programs for MOCA 2.0 – Part IV Credit

- Simulation Education Network (SEN): a network of ASA-endorsed simulation programs for training physician anesthesiologists.
- 46 Endorsed Simulation Centers currently available for Diplomates across the nation to receive MOCA Part IV credit.



© 2016 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 19

American Society of Anesthesiologists

Advancing Quality

Patient Safety is Our Top Priority!

asahq.org

YOUR Professional Citizenship Is **CRUCIAL** to our future!!!

© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 21

Quality Initiatives – major value!

- ❖ Anesthesia Quality Institute “AQI”
- ❖ National Anesthesia Clinical Outcomes Registry “NACOR™”
- ❖ Qualified Clinical Data Registry “QCDR”
- ❖ A major overhaul is concluding!
- ❖ Standards, Statements and Guidelines
- ❖ Many committees’ work product

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 22

AQI Preferred Vendors



© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 23

AQI's Key Focus Areas in 2016 cont.

- As of June 30 successfully transitioned NACOR to ArborMetrix's cloud-based software platform
- They will manage:
 - Technical operations; data intake & hosting
- ArborMetrix improvements allow:
 - Scalability to manage growth
 - Reporting capability
 - Data integrity
- AQI will continue to manage NACOR's registry business operations and support ASA members conducting clinical research.

© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 24

American Society of
Anesthesiologists®

The Maternal Quality Improvement Project (MQIP) Brief Update



asahq.org

The Problem Demanding Address

- ❖ The reported incidence of maternal mortality in the US is among the worst in high-resource countries (we currently rank #47)
- ❖ NO national system for reporting maternal complications and collecting necessary data
- ❖ If you aren't/can't measure it, you can't improve it either

What is MQIP?

- ❖ The Maternal Quality Improvement Project - joint partnership ASA and ACOG to collect outcomes data on the clinical course of childbirth in the US.
- ❖ Steering Committee /Advisory Group - content experts from obstetrics, anesthesiology, quality measurement, healthcare policy, and perinatal nursing, helped put together a data dictionary on which to base the data collected.
- ❖ Alpha site, Univ. of Rochester Medical Center w/Epic, (Epic plans to incorporate this into their foundation system for future sites) URMCC has made their build tools available

American Society of
Anesthesiologists®

Advancing Health Policy

Patient Safety is Our Top Priority!

asahq.org

ASA Depart. Of Health Policy Research – est. 2010 Thomas R Miller, PhD, MBA



© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS

Health Policy Research Resources


- ❖ Peer-Reviewed Articles
 - Anesthesia Opt-Out Policy
 - Physician Group Concentration
 - QZ Billing Modifier
 - Perioperative Surgical Home
- ❖ Trend Analyses
 - Anesthesia, Surgical and Hospitalist Workforces
 - Procedure Volumes in the United States



© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS

Health Policy Research Resources

- ❖ Policy Briefs
 - History of Anesthesiology
 - Critical Access Hospitals
 - Health status of VHA patients
- ❖ Critical Reviews of Research
 - Health Affairs Study
 - Silber Study
 - Duke Nurse Economic Impact Study
 - Talking points for all key scope-of-practice studies




© 2016 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 31

Fierce Healthcare, June 1, 2016

- ❖ "It's interesting that the same doctors who argue that they need to be involved in the care of our military veterans don't insist on being assigned to the front lines during military actions to care for soldiers horribly injured during battle, leaving this up to CRNAs to handle," **said AANA President Juan Quintana in the statement.** "Somehow, in their view, that's less complicated than caring for veterans stateside. That's an affront to any man or woman who has ever worn a uniform in service to this country."
- ❖ <http://www.fiercehealthcare.com/author/pminemyer>

© 2016 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 32



Advancing the Perioperative Surgical Home


Patient Safety is Our Top Priority

asahq.org

PSH-Why

- ❖ Quality & Safety
 - Decrease complications
 - Decrease readmissions
 - Decrease mortality
- ❖ Improve Operational Efficiency
 - Cost
- ❖ Strategically Positions our Specialty
- ❖ Aligns with Alternative Models of Payment

The PSH Learning Collaborative 2.0 June '16



Brought together organizations from across the country to learn from each other and subject matter experts to prepare for PSH implementation or to optimize post-implementation performance, including:

- ❖ Increased adherence to evidence-informed guidelines & pathways
- ❖ Improved quality and safety of perioperative care
- ❖ Reduced complications and readmission rates
- ❖ Reduced surgical costs and superior value
- ❖ Enhanced patient and family experiences

© 2016 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 33

YOUR Professional Citizenship is **CRUCIAL** to our future!!!

© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 35

American Society of
Anesthesiologists®

Your *Comprehensive Advocacy Core*

- Educational – ASA members and public
- GME Funding
- Scientific
- Regulatory
- PR/Marketing/branding
- Health Policy
- Payment - billing, payment, amounts
- Legislative
- Political

asahq.org

Research Funding

- ❖ **Anesthesiology research opportunities.**
 - Research funding for Anesthesiology from NIH is less than 1% of total NIH budget.
 - Research will help to demonstrate the specialty's value.
 - Opportunities - scientifically and clinically - to do "new and better things" in specialty.
- ❖ **Goals:** Identify consensus priorities of potential problems and opportunities to address based on impact to the specialty, patients and ability to make significant progress. Develop White Paper. Engage ASA Advocacy apparatus to pursue priorities at federal funding agencies and in Congress.
- ❖ **Resources:** Research Summit 2016: White Paper, ASA physician leaders and staff, & external expertise.

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 38

MIPS/APMs – Huge Changes in Payment!

- ❖ **Implementation of Medicare Access and CHIP Reauthorization Act of 2015 (MACRA)**
 - Permanently repealed the existing sustainable growth rate (SGR) physician payment update mechanism.
 - Implements a new payment system based upon physician participation in two pathways, the Merit-Based Incentive Payment System (MIPS) and Alternative Payment Models (APMs).
- ❖ **Goals:** Develop necessary tools to prepare ASA members for the new system. Engage CMS and Congress to shape implementation of MACRA to be favorable to physician anesthesiologists.
- ❖ **Resources:** ASA Ad Hoc Committee on Physician Payment Reform, ASA physician leaders and staff, external expertise.

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 39

ASA Leading the Fight Against Opioid Abuse

- ❖ **National Crisis**
- ❖ **Goals:** Support implementation of a multipronged strategy to reduce the misuse, abuse, and diversion of prescription opioid medications. Collaborate with stakeholder on solutions.
- ❖ **Resources:** ASA Ad Hoc Committee on Prescription Opioid Abuse. ASA physician leaders and staff, Pain Care Coalition, AMA Task Force to Reduce Prescription Opioid Abuse.


© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 40

ASA Leading the Fight Over Out-of-Network Billing & Payment

- ❖ **A national issue that is a HUGE threat to patients and your practice**
- ❖ **Primary problem is inadequate insurance coverage**
 - **NARROW and TIERED Networks** created unilaterally and sold non-transparently to patients
 - **Huge unaffordable deductibles and copays**
 - **Lack of transparency by Insurers and HR departments**
 - **Legislators and consumer protection groups AND PHYSICIANS want to protect patients from surprise inadequate insurance**
 - **Insurance industry being dishonest and driving false narratives about the real causes of "surprise bills"** Significant media coverage to issue of "surprise bills." They have been way ahead of physicians
 - **Significant state and federal level legislative and regulatory activity**

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 41

Out-of-network payment – NOT just a state level issue!



Fiscal Year 2017 Budget in Brief
Health Policy, Health and Education for All Americans

U.S. Department of Health & Human Services
HHS-16-001

Transparency
In an effort to promote transparency in price, cost, and billing for consumers, the Budget supports the standardization of billing documents and eliminating surprise out of network charges for privately insured patients receiving care at an in network facility.

Eliminate Surprise Out of Network Health Care Charges for Privately Insured Patients
Some patients incur surprise bills of network charges when they receive health care services at an in-network hospital. These surprise charges arise because, while the hospital is in network, certain off-network who provide services for the patient during the episode of care are not part of the network. Therefore, the provider often charges patients the out of network cost sharing and bills the consumer but only expect to be paid for those specific services. The proposal requires hospitals and providers to work together to ensure that consistent treatment of in-network facilities do not drive out of network charges from out of network practitioners that serve the interests of the patient. Hospitals would have to take reasonable steps to notify individual patients with providers that are contracted by network for their plan. Furthermore, all physicians who regularly provide services to health plans for that plan. Furthermore, all physicians who regularly provide services to health plans for that plan. Furthermore, all physicians who regularly provide services to health plans for that plan. Furthermore, all physicians who regularly provide services to health plans for that plan.

H. R. 3770

A BILL

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 42

ASA Leading a New Strategy of Attack

- ❖ New ASA Committee (payment, legislative & PR)
- ❖ Goals:
 - Redefine and change the narrative
 - Create a multi-specialty leadership coalition
 - Create consensus principles and legislative strategy
 - Create resource allocation plan to support ASA work and state component societies
 - Create "Tool Box" for states – PR and legislative
- *GA SR 974 – enacted "Senate Surprise Bill Study" 2/2016

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 43

American Society of Anesthesiologists

Advocacy
Public Relations

asahq.org

Public Educational Endeavor: "When Seconds Count"

When Seconds Count... **PHYSICIAN ANESTHESIOLOGISTS SAVE LIVES™**

Navigation: Anesthesia 101 | Patient Safety | Stories

Everything you need to know about surgery, anesthesia and the health care professionals who work together to provide optimal patient care. **LEARN MORE**

Patient safety is our top priority. Understand the risks associated with anesthesia and surgery and the steps you can take to make sure you receive the highest quality care. **LEARN MORE**

Watch and read personal stories from patients and physician anesthesiologists about crucial moments when physician-led anesthesia teams worked together to overcome the difference between life and death. **LEARN MORE**

Icons: Education, Research, Practice, Storytelling

Research Told Us...

- ❖ Majority of the public and many policymakers unaware that anesthesiologists are physicians.
- ❖ Even fewer know how physician anesthesiologists save lives when emergencies occur.
- ❖ Quality of care is the No. 1 concern of Americans and policymakers.
- ❖ On issues of quality of care, physicians have almost unimpeachable levels of credibility.
- ❖ People want a physician in case of an emergency.

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 46

When Seconds Count® Toolkit

EDUCATION | **TRAINING**

Some Things Just Don't Compare

Physician anesthesiologists have 28 times the hours of critical training and practice the education of other professions. That's a no comparison. A nurse cannot replace a physician who is you were providing your life in an emergency!

When Seconds Count... Physician Anesthesiologists Save Lives.™

Learn More at: www.asahq.org/WhenSecondsCount

Tips for Telling Compelling Stories
"If you don't feel it, you won't remember it." – Bob Dickman

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 47

So we're talking about comprehensive advocacy,

But...

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 48

The Advocacy Engine Needs Fuel!

- ❖ Reasonable Professional Citizenship = giving ANNUALLY to fund advocacy – local, state and national levels
- ❖ A “Plagenhoef-ism”
“Political contributions are a necessary part of the American system and are the volume control knobs on politicians’ hearing aids.”

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 49

ASAPAC and the “Alabama Cup” Competition

- ❖ State Society competition – 3 award categories
 1. Total Dollars
 2. Percentage giving
 3. Exemplary performance in current year (4 - average dollar amount of donation)
- ❖ Resident Competition – to be 100%, all give \$20
 - ❖ HUGE impact over time!!!
- ❖ AA student competition
- ❖ AAAA outperforms many state component societies

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 50

Why each anesthesiologist should be giving always

- ❖ Supporting patient safety and quality of care
- ❖ Supporting physician-led team-based care
- ❖ Leveraging the power of unity and size

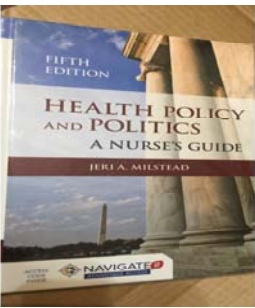
© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 51

ASA Alabama Cup “Residency Program Competition”

- ❖ Initiated 2006 at UAB – cont’d 10 years straight!
- ❖ Addresses *“Einstein’s Definition of Insanity”*
- ❖ All residents expected to give \$20 annually to ASAPAC
- ❖ Goal: 100% of residents support ASAPAC EVERY year
- ❖ Expected that all residents are taught about the crucial value of advocacy for our patients and our medical specialty
- ❖ In the last several years 38-40 programs have achieved 100% - >5,000 residents now “get it”
- ❖ The SAD REALITY = ~80 residencies are never at 100% and likely aren’t pushing advocacy education at all (ACGME requirements compliant???)

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 52

What’s in Your Library?



© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 53

ASA Alabama Cup “Student AA Competition”

- ❖ All SAAs expected to give \$20 annually to ASAPAC
- ❖ Goal: 100% of AAs support ASAPAC EVERY year
- ❖ Expected that all AA students are taught about the crucial value of advocacy for our patients and our specialty

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 54

Compare your Professional Citizenship to NAs and AAs

- ❖ AA training programs at 100% donation rates to ASAPAC
- ❖ AAAA has outperformed over 20 state components
 - *% that give to ASAPAC
 - *Avg \$ amount donated
- ❖ AANA members outperform ASA members

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 55

FSA's ASAPAC Support History

Year	# Members	# ASAPAC Donors	% Members Giving	Total Dollars Raised	Average Contribution
2010	1794	535	29.8%	\$145,070	\$271
2011	1776	670	37.7%	\$157,350	\$235
2012	1886	794	42.1%	\$199,804	\$252
2013	1857	679	36.6%	\$170,332	\$251
2014	2002	707	35.3%	\$180,991	\$256
2015	1907	590	30.9%	\$168,286	\$285
National Averages 2015			21%		\$249

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 56

ASSA's ASAPAC Support History

Year	# Members	# ASAPAC Donors	% Members Giving	Total Dollars Raised	Average Contribution
2010	429 (FL 1794)	271	63.2%	\$144,698	\$534
2011	447 (FL 1776)	284	63.5%	\$159,285 (FL\$157,350)	\$560.86
2012	464	244	52.6%	\$117,362	\$480.99
2013	457	279	61.1%	\$133,5934	\$478.83
2014	470	269	57.2%	\$141,850	\$527.32
2015	483	257	53.2%	\$135,743	\$528
National Averages 2015			21%		\$249

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 57

GSA's ASAPAC Support History

Year	# Members	# ASAPAC Donors	% Members Giving	Total Dollars Raised	Average Contribution
2011	785	191	24.3%	\$ 53,191.00	\$ 278.49
2012	845	205	24.3%	\$ 51,090.40	\$ 249.22
2013	882	189	21.4%	\$ 47,052.14	\$ 248.95
2014	1060	158	14.9%	\$ 46,786.29	\$ 296.12
2015	873	170	19.5%	\$ 41,004.69	\$ 241.20
2016	894	83	9.3%	\$ 21,351.90	\$ 257.25
National Averages			21%		\$249

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 58

SAA's Alabama Cup

- ❖ 2012 AA Programs at 100%
CWRU (Cleveland, Houston, DC), UMKC, South University, Nova Ft Lauderdale
- ❖ 2013 AA Programs at 100%
CWRU (Cleveland, Houston, DC), UMKC
- ❖ 2014 AA Programs at 100%
CWRU (Cleveland, Houston, DC), UMKC
- ❖ 2015 AA Programs at 100%
CWRU (Cleveland, Houston, DC), UMKC

**Do you see the Emory program anywhere? Why not???*

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 59

***2016 Update ***

8 Residency Programs at 100% Support of ASAPAC Now

- Brigham and Women's Hospital * Achieved in 2 days!
- Georgetown University
- Mayo Clinic Arizona
- Ochsner Medical Center
- University of Arkansas
- University of Chicago
- University of Texas, San Antonio
- West Virginia University

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 60

Georgia Residency Programs at 100% ASAPAC Participation

- ❖ MCG – 2013 only!
- ❖ Emory – NEVER!

Really?

© 2016 AMERICAN SOCIETY OF ANESTHESIOLOGISTS. 61

Let's Review this – THIS IS IMPORTANT TO GET!

- ❖ ASA Residents' Competition and the big push for comprehensive anesthesiology resident education in advocacy ever since 2006
- ❖ Two anesthesiology residencies in Georgia
- ❖ One of the two programs achieved 100% one year out of 10 years and the other one never has.
- ❖ Why?
- ❖ Divide between UAB and Emory and MCG → the Chatahoochee River & 150 and 300 miles, respectively
- ❖ You tell me what is missing.

© 2016 AMERICAN SOCIETY OF ANESTHESIOLOGISTS. 62

A Great Example: Louisiana in 2015

Unprecedented LSA Leadership – the Joe & Kraig Show!

- ❖ All 4 LA Anesthesiology residencies @ 100 for residents AND also attendings!!!
- ❖ LSA doubled ASAPAC support level in one year
 - 2014=23%
 - 2015=46%
- ❖ Now, in 2016, they introduced the new **"LSA Ambassador's' Program"**

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS. 63

Engagement and support is VITAL to our future!

*"History will be kind to me
for I intend to write it."*

Winston Churchill

Will YOU be helping to write the future history of our specialty???

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS. 64


PAC Reps

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS. 65

The "APRN Consensus Model" Learn it!!!

- ❖ The VA's pro-nursing action→ straight from this House of Nursing's SOP advancement play book!
- ❖ You would be wise to enlighten your awareness of reality by "Googling" this topic
- ❖ ASA cannot win SOP battles without YOU doing your part too!

© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS. 66



Department of Veterans Affairs

The VANH

#1 ASA Advocacy Focus

- ❖ Mandates independent practice for ALL APRNs
- ❖ Supersedes state scope laws and local Dept. Chiefs
- ❖ Do NOT fear to speak the truth about the value we deliver to safety & quality, and the difference between physicians and nurses in anesthesia care
- ❖ What's ASA doing about it?
- ❖ www.safesafecare.org You + 5 = "1+5Plan"!

Take Action Now!!!

PROTECT 
SAFE VA CARE
 VETS EARNED IT & DESERVE IT

www.SafeVACare.org

Even Football coaches have it right!

"The only place success comes before work is in the dictionary."

Vince Lombardi

ASA State Components with Most Total Comments Submitted Opposing the VANH

1. Texas
2. California
3. Florida
4. New York
5. Michigan
6. Georgia!

Your VA Advocacy Performance Compared to Similar Sized States

State	Total Comments	Total Membership	Percentage of Membership
fds	1353	990	137%
Virginia	2042	939	217%
Georgia	2239	910	246%
Indiana	1001	891	112%
Maryland	1008	886	113%

ASA State Components with Most Total Comments Submitted as % of Membership

- #1. Oklahoma
- #2. Louisiana
- #3. New Hampshire
- #4. Georgia!
- #5. Kansas

What the GSA MUST DO NOW

❖ *Redouble every effort made thus far!*

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS 73

NURSE ANESTHESIA • SAFE ANESTHESIA



Heard about the "Sundown Rule"?

After sundown, many anesthesiologists typically go home to their families and enjoy a good night's sleep in their own beds, while nurse anesthetists handle the hospital's anesthesia needs during the wee hours.

Happens all the time.
Amazing how directing nurse anesthetists isn't a priority when it isn't convenient for the anesthesiologists.

Support the HCFA Rule on Anesthesia Care.
Support H.R. 804/S. 866, and Oppose Poison Pill Riders.

For more information, call 202-484-8400, or visit www.asa.org

What do rural Americans, low-income families, unlisted persons, and expectant mothers have in common?

- They rely on nurse anesthetists for their anesthesia care.
- They are often treated like second-class citizens by anesthesiologists.
- They comprise a large voting constituency across the country.
- They could become victims of limited access to anesthesia care if the anesthesiologists can delay or overturn the Health Care Financing Administration's (HCFA) proposal to remove physician supervision of nurse anesthetists and defer to state law.

All of the above.

Certified Registered Nurse Anesthetists (CRNAs) are the sole anesthesia providers in most of the nation's medically underserved rural and inner-city hospitals, places typically shunned by anesthesiologists. CRNAs have served on the front lines in all 50 states since World War I, and most military anesthetists have remained safely behind the lines. And CRNAs routinely give residents the laboring women in the early hours of the morning, while some anesthesiologists have actually turned applicants to laboring patients who couldn't pay or find with each.


Access to safe, high-quality anesthesia care is a serious issue. Allow HCFA to implement its rule and defer to state law.

Support H.R. 804/S. 866, the "Access to Anesthesia Services Act."

For more information, contact the American Association of Nurse Anesthetists at 202-484-8400

NURSE ANESTHESIA • SAFE ANESTHESIA

NURSE ANESTHESIA • SAFE ANESTHESIA




Which ones are the anesthesiologists and which are the nurse anesthetists?

CAN'T TELL?

It's just as hard to tell the difference between their anesthesia education, the way they administer anesthesia, and their safety records.

Support the HCFA Rule on Anesthesia Care.
Support H.R. 804/S. 866, and Oppose Poison Pill Riders.



For more information, call 202-484-8400, or visit www.asa.org

NURSE ANESTHESIA • SAFE ANESTHESIA

WHAT IS SUPERVISION?



OPERATING ROOM 1




OPERATING ROOM 2



OPERATING ROOM 3




OPERATING ROOM 4



CRNA vs MDA. Who wins?

Register & Find Answers Today



Dec 28 by TheNextCRNA 0

Comprehensive comparison of lengths of education and training

CRNA: 4 years for a BSN followed by 1-2+ years as a tele/medsurg followed by 2+ years in the ICU followed by 2.5+ years in the crna program. In Total: 12 years +

Anesthesiologist: 4 years for BS degree, 4 years med school, 4 years residency. Total 12 years

In-conclusion, it takes the same length of time if not longer for nurse anesthetists and yet "most" anesthesiologists earn twice as much (comparing avg salaries 150K vs 300K), are higher on the totem pole when making authoritative decisions (they supervise crnas and have more say in the hospital cases), and **IRONICALLY** the crna's are the workhorses while the MDAs are slacking.

What gives?



nurse practitioner

brain of a doctor

heart of a nurse

♥

AANA Rally on Capitol Hill – April 21, 2015



"We know that with CRNAs...we are going to expand access, **we are going to get better quality**, and we are going to make health care affordable."

Cathy Hurwit, Chief of Staff, Rep. Jan Schakowsky (D-IL)

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS

79

Our messaging – SUPER important!

- ❖ What are YOU going to do in order to counter that narrative? Not GSA, not ASA, **YOU!**

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS

80

YOUR Professional Citizenship

Is CRUCIAL to our future,

And the ASA needs YOUR specific, individual help!!!

© 2014 AMERICAN SOCIETY OF ANESTHESIOLOGISTS

81

Be the contributor that WE need you to be!

Thank you very much,

Jeffrey S. Plagenhoef, MD
ASA President Elect
Cell: (334)790-9648
j.plagenhoef@asahq.org
jsplag@aol.com

© 2015 AMERICAN SOCIETY OF ANESTHESIOLOGISTS

82

Monitoring Physiologic Principals of the Critically Ill

Miguel Cobas, MD

University of Miami Miller School of Medicine

Department of Anesthesiology

Miami, FL

At the conclusion of the presentation, the learner should be able to:

1. Assess physiology parameters useful in management of septic patients.
2. Review common tests and limitations in the ICU.

University of Miami Curriculum Vitae

1. *Date:* March 2016

I. PERSONAL

2. *Name:* **Miguel A. Cobas, MD, FCCM**

3. *Home Phone:* 305-593-0201

4. *Office Phone:* 305-256-5267

5. *Home Address:* 5444 N.W. 94th Doral Place
Doral, FL 33178-2029

Mailing Address: Jackson South Community Hospital
Dept. of Anesthesiology
9333 SW 152nd. Street
Miami, FL 33157

6. *Current Academic Rank:* Associate Professor of Anesthesiology

6a. *Current Track of Appointment:* Clinical Educator Track

7. *Primary Department:* Anesthesiology, Perioperative Medicine &
Pain Management, Miller School of
Medicine, University of Miami.

8. *Secondary Appointment:* DeWitt Daughtry family Department of
Surgery, Miller School of Medicine,
University of Miami.

9. *Citizenship:* American

10. *Visa Status:* N/A

II. HIGHER EDUCATION

11. Institutional

- Sept. 1985-Nov. 1992 Universidad Central de Venezuela
Dr. José María Vargas School of Medicine
Degree: Medical Doctor
- Sept. 1979-Sept. 1984 Colegio San Ignacio de Loyola, Caracas, Venezuela
Degree: Bachelor in Science

12. Non-Institutional

- July 1999- Sept. 2000 Harvard Medical School
Critical Care Medicine Fellowship
Massachusetts General Hospital
Brigham and Women's Hospital
- June 1996- June 1999 University of Miami/Jackson Memorial Hospital
Anesthesiology Residency
Department of Anesthesiology, Perioperative
Medicine and Pain Management
- June 1995- June 1996 University of Miami/Jackson Memorial Hospital
Internship, Department of Internal Medicine

13. Certifications and Licensure:

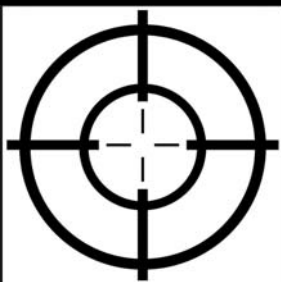
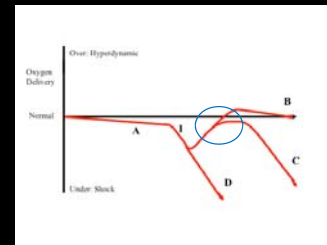
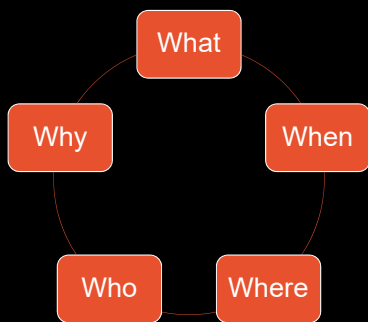
- 2012-2022 Re-certification, Critical Care Medicine
- 2002-2012 Subspecialty Certification, Critical Care Medicine,
American Board of Anesthesiology, Certificate
#33046
- 2010-2020 Re-certification, American Board of Anesthesiology
- 2000-2010 Certification, American Board of Anesthesiology,
Certificate #33046
- 1999 Massachusetts Medical License #158366
- 1998- present Florida Medical License ME 76886
- 1995 Certification, Educational Commission for
Foreign Medical Graduates #0-525-142-6

Monitoring Physiologic Parameters in Sepsis

MIGUEL COBAS, MD, FCCM
ASSOCIATE PROFESSOR, UNIVERSITY OF MIAMI

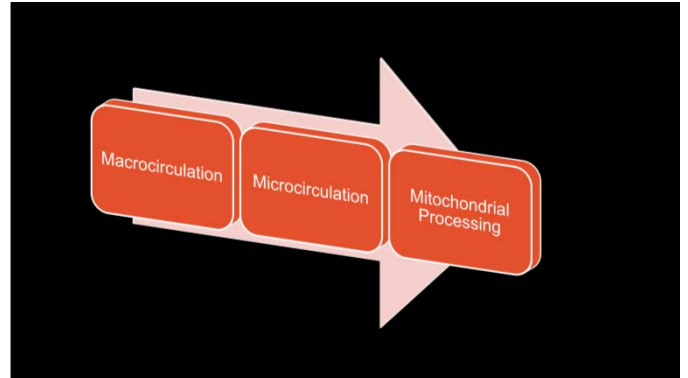
DISCLOSURE

I have no financial relationships with commercial support to disclose.

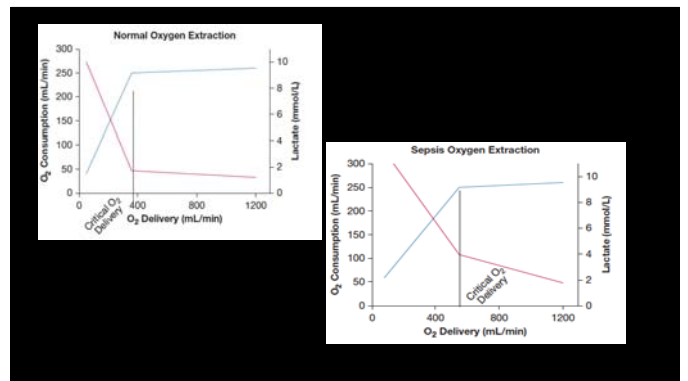
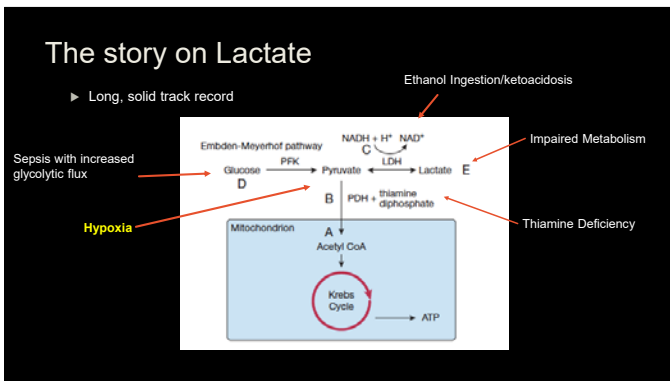


If it was that easy...





- ▶ CVP
- ▶ Mean Arterial Pressure
- ▶ Cardiac Output/Index
- ▶ Lactate
- ▶ SVO_2 / $SCVO_2$
- ▶ Dynamic Indexes



Blood lactate levels are better prognostic indicators than TNF and IL-6 levels in patients with septic shock

Recommendations: Initial Resuscitation and Infection Issues*

A. Initial Resuscitation

1. Prone-laid, quantitative resuscitation of patients with sepsis-induced tissue hypoperfusion (defined in this document as hypotension persisting after initial fluid challenge or blood lactate concentration ≥ 4 mmol/L) Goals during the first 6 hrs of resuscitation:
 - a) Central venous pressure 8-12 mm Hg
 - b) Mean arterial pressure (MAP) ≥ 65 mm Hg
 - c) Urine output ≥ 0.5 mL/kg/hr
 - d) Central venous oxygen saturation (venous cath) or mixed venous oxygen saturation 70% or 65%, respectively (grade 1C)
2. In patients with elevated lactate levels targeting resuscitation to normalize lactate (grade 2C)

Elevation in serum lactate at the time of febrile neutropenia (FN) in hemodynamically-stable patients with hematologic malignancies (HM) is associated with the development of septic shock within 48 hours

Lactate as prognostic factor & marker for response to therapy

- ▶ The higher the lactate, the worse
- ▶ Sepsis without lactate has a better prognosis
- ▶ Generally, a drop in lactate levels correlates with better outcome
- ▶ Epinephrine can confound the picture

Lactate as marker of response to treatment

Early lactate clearance is associated with improved outcome in severe sepsis and septic shock*

Early Lactate-Guided Therapy in Intensive Care Unit Patients
A Multicenter, Open-Label, Randomized Controlled Trial

Serum lactate is associated with mortality in severe sepsis independent of organ failure and shock*

The relationship between blood lactate and survival following the use of adrenaline in the treatment of septic shock

The story on Lactate

- ▶ Increased Lactate in blood does not necessarily mean hypoxia
- ▶ Increased Lactate in blood does not necessarily mean acidosis
- ▶ Initial aggressive resuscitation aims to address tissue hypoxia as a source of lactic acidosis
- ▶ There is significant individual variation in the anaerobic threshold
- ▶ Lactic acidosis can develop without tissue hypoxia
- ▶ On the other hand, even when oxygen delivery is adequate, anaerobic metabolism can occur
- ▶ **Lactate is like smelling smoke: better be sure where is coming from before you dismiss it...**

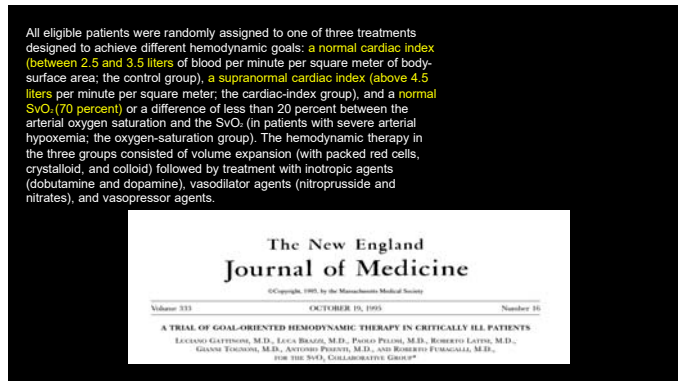
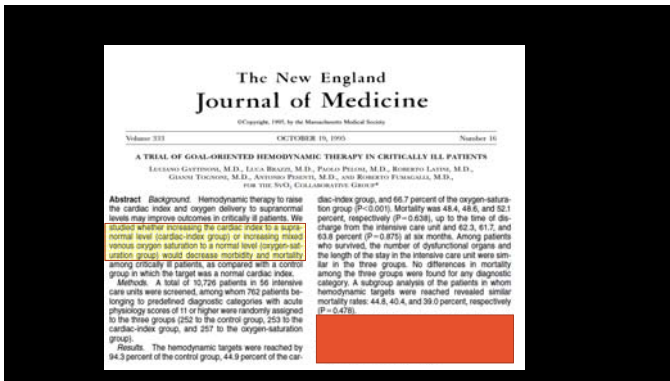


SV_O₂

$$DO_2 = SV \cdot HR \cdot (Hb \cdot 1.34 \cdot SaO_2 + 0.003 \cdot PaO_2) = CO \cdot (CaO_2)$$

$$VO_2 = CO \cdot (CaO_2 - (Hb \cdot 1.34 \cdot SvO_2 + 0.003 \cdot PvO_2)) = CO \cdot (CaO_2 - CvO_2)$$

oxygen supply		oxygen demand	
low SvO ₂ , SaO ₂		high SvO ₂ , SaO ₂	
low	high	low	high
anemia bleeding hypovolemia hypoxia heart failure	pain agitation shivering seizure fever	transfusion fluids oxygen isotropics	sedation analgesia hypothermia O ₂ extraction sepsis



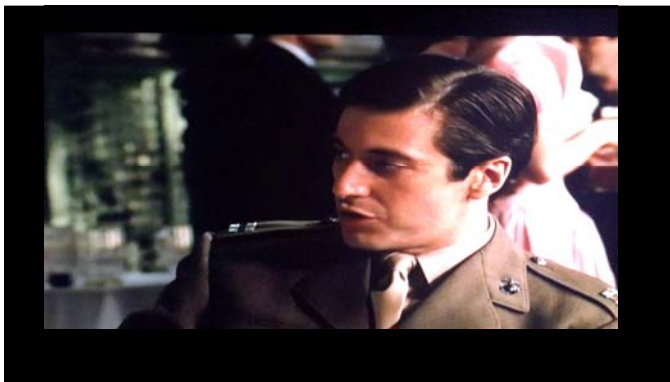
The New England Journal of Medicine
 ©Copyright, 1995, by the Massachusetts Medical Society
 Volume 333 OCTOBER 19, 1995 Number 16

A TRIAL OF GOAL-ORIENTED HEMODYNAMIC THERAPY IN CRITICALLY ILL PATIENTS
 LEONARD GATTIHOON, M.D., LUCIA BRAGIO, M.D., PAOLO PRIMO, M.D., ROBERTO LATINI, M.D.,
 GIANNI TONONDI, M.D., ANTONIO PIRELLI, M.D., AND ROBERTO FERRAGALLI, M.D.,
 FOR THE SOCI COLLABORATIVE GROUP*

Abstract Background: Hemodynamic therapy to raise the cardiac index and oxygen delivery to supranormal levels may improve outcomes in critically ill patients. We studied whether increasing the cardiac index to a supra-normal level (cardiac-index group) or increasing mixed venous oxygen saturation to a normal level (oxygen-saturation group) would decrease morbidity and mortality among critically ill patients, as compared with a control group in which the target was a normal cardiac index. Methods: A total of 10,726 patients in 56 intensive care units were screened, among whom 762 patients belonging to predefined diagnostic categories with acute physiology scores of 11 or higher were randomly assigned to the three groups (352 to the control group, 253 to the cardiac-index group, and 257 to the oxygen-saturation group). Results: The hemodynamic targets were reached by 94.3 percent of the control group, 44.9 percent of the cardiac-index group, and 66.7 percent of the oxygen-saturation group, respectively (P=0.001). Mortality was 48.4, 48.6, and 52.1 percent, respectively (P=0.638), up to the time of discharge from the intensive care unit and 62.3, 61.7, and 63.8 percent (P=0.875) at six months. Among patients who survived, the number of dysfunctional organs and the length of the stay in the intensive care unit were similar in the three groups. No differences in mortality among the three groups were found for any diagnostic category. A subgroup analysis of the patients in whom hemodynamic targets were reached revealed similar mortality rates: 44.8, 45.4, and 39.0 percent, respectively (P=0.476).

The New England Journal of Medicine
 ©Copyright, 1995, by the Massachusetts Medical Society
 Volume 333 OCTOBER 19, 1995 Number 16

A TRIAL OF GOAL-ORIENTED HEMODYNAMIC THERAPY IN CRITICALLY ILL PATIENTS
 LEONARD GATTIHOON, M.D., LUCIA BRAGIO, M.D., PAOLO PRIMO, M.D., ROBERTO LATINI, M.D.,
 GIANNI TONONDI, M.D., ANTONIO PIRELLI, M.D., AND ROBERTO FERRAGALLI, M.D.,
 FOR THE SOCI COLLABORATIVE GROUP*



The New England Journal of Medicine
 ©Copyright, 1995, by the Massachusetts Medical Society
 Volume 333 OCTOBER 19, 1995 Number 16

A TRIAL OF GOAL-ORIENTED HEMODYNAMIC THERAPY IN CRITICALLY ILL PATIENTS
 LEONARD GATTIHOON, M.D., LUCIA BRAGIO, M.D., PAOLO PRIMO, M.D., ROBERTO LATINI, M.D.,
 GIANNI TONONDI, M.D., ANTONIO PIRELLI, M.D., AND ROBERTO FERRAGALLI, M.D.,
 FOR THE SOCI COLLABORATIVE GROUP*

Abstract Background: Hemodynamic therapy to raise the cardiac index and oxygen delivery to supranormal levels may improve outcomes in critically ill patients. We studied whether increasing the cardiac index to a supra-normal level (cardiac-index group) or increasing mixed venous oxygen saturation to a normal level (oxygen-saturation group) would decrease morbidity and mortality among critically ill patients, as compared with a control group in which the target was a normal cardiac index. Methods: A total of 10,726 patients in 56 intensive care units were screened, among whom 762 patients belonging to predefined diagnostic categories with acute physiology scores of 11 or higher were randomly assigned to the three groups (352 to the control group, 253 to the cardiac-index group, and 257 to the oxygen-saturation group). Results: The hemodynamic targets were reached by 94.3 percent of the control group, 44.9 percent of the cardiac-index group, and 66.7 percent of the oxygen-saturation group, respectively (P=0.001). Mortality was 48.4, 48.6, and 52.1 percent, respectively (P=0.638), up to the time of discharge from the intensive care unit and 62.3, 61.7, and 63.8 percent (P=0.875) at six months. Among patients who survived, the number of dysfunctional organs and the length of the stay in the intensive care unit were similar in the three groups. No differences in mortality among the three groups were found for any diagnostic category. A subgroup analysis of the patients in whom hemodynamic targets were reached revealed similar mortality rates: 44.8, 45.4, and 39.0 percent, respectively (P=0.476).

Conclusions: Hemodynamic therapy aimed at achieving supranormal values for the cardiac index or normal values for mixed venous oxygen saturation does not reduce morbidity or mortality among critically ill patients. (N Engl J Med 1995;333:1065-72.)

SvO_2 $ScvO_2$

$$DO_2 = SV \cdot HR \cdot (Hb \cdot 1.34 \cdot SaO_2 + 0.003 \cdot PaO_2) = CO \cdot (CaO_2)$$

$$VO_2 = CO \cdot (CaO_2 - (Hb \cdot 1.34 \cdot SvO_2 + 0.003 \cdot PvO_2)) = CO \cdot (CaO_2 - CvO_2)$$

oxygen supply

low

- ↓CO
- ↓Hb
- anemia
- bleeding
- hypovolemia
- hypoxia
- heart failure

oxygen demand

high

- ↑Tb
- ↑Tm
- transfusion
- fluids
- oxygen
- hypothermia
- ↑VO₂
- sepsis
- acidemia
- hyperthermia
- O₂ extraction
- sepsis

Protocol for Early Goal-Directed Therapy.

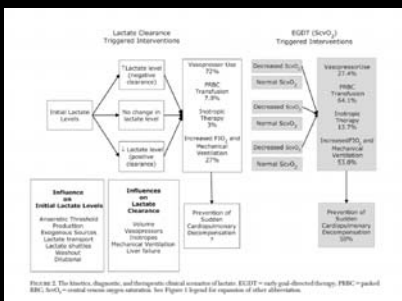
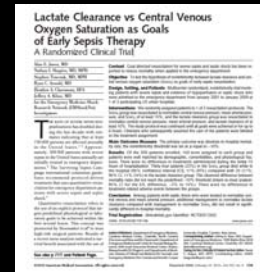
Rivers E et al. N Engl J Med 2001;345:1368-1377.

ScvO₂-based monitoring

- ▶ Rivers study has been the high point
- ▶ Has not been reproduced consistently
- ▶ It has been criticized harshly
- ▶ SCCM did adopt ScvO₂ as a marker/goal in SSC
- ▶ High ScvO₂ may actually portend bad outcomes
- ▶ It requires the placement of a CVC
 - ▶ This opens a whole new controversy about CVC in sepsis

Lactate vs. SvO₂

Among patients with septic shock who were treated to normalize central venous and mean arterial pressure, additional management to normalize lactate clearance compared with management to normalize ScvO₂ did not result in significantly different in-hospital mortality.



Lactate Clearance vs Central Venous Oxygen Saturation as Goals of Early Sepsis Therapy

Published in final edited form as:
Acad Emerg Med 2012 March; 19(3): 252-258. doi:10.1111/j.1553-2712.2012.01292.x.

Prognostic Value and Agreement of Achieving Lactate Clearance or Central Venous Oxygen Saturation Goals During Early Sepsis Resuscitation

Michael A. Puskarich, MD, Stephen Trzeciak, MD, MPH, Nathan I. Shapiro, MD, MPH, Ryan C. Arnold, MD, Alan C. Heffner, MD, Jeffrey A. Kline, MD, Alan E. Jones, MD, and Emergency Medicine Shock Research Network (EMSHOCKNET)

No agreement was found between LC and ScvO₂ goal achievement in early sepsis resuscitation. Achievement of a ScvO₂ ≥70% without LC ≥10% was more strongly associated with mortality than achievement of LC ≥10% with failure to achieve ScvO₂ ≥70%.
These data suggest that if only one goal is achieved, failure to achieve an LC of 10% has a worse prognosis than failure to achieve an ScvO₂ of 70% during early sepsis resuscitation.

- ▶ It is clear that lactate clearance and ScvO₂ are not equivalent.
- ▶ Both Lactate and ScvO₂ have significant problems to be trusted as sole parameters during sepsis resuscitation



The story is Far more complex

Microvascular Perfusion as a Target for Fluid Resuscitation in Experimental Circulatory Shock*

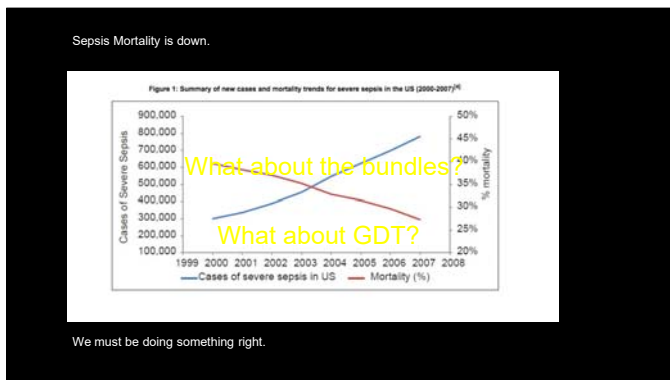
Michel Eglise van Genderen, MSc; Eva Klijn, MD; Alexandre Lima, MD, PhD; Jeroen de Jonge, MD, PhD; Steven Sleeswijk Visser, MD; Jacqueline Voorbeijtel, BSc; Jan Bakker, MD, PhD; Jasper van Bommel, MD, PhD

The Right Target at the Right Time: The Microcirculation in Circulatory Shock*



Is that the future of Monitoring?

- ▶ Likely the combination of many different techniques increase the yield of a positive result
- ▶ Measuring regional, rather than global oxygen delivery and extraction holds promise
- ▶ Monitoring micro, rather than macrocirculation may be even better
- ▶ We're not there just yet, but...



Consistency...

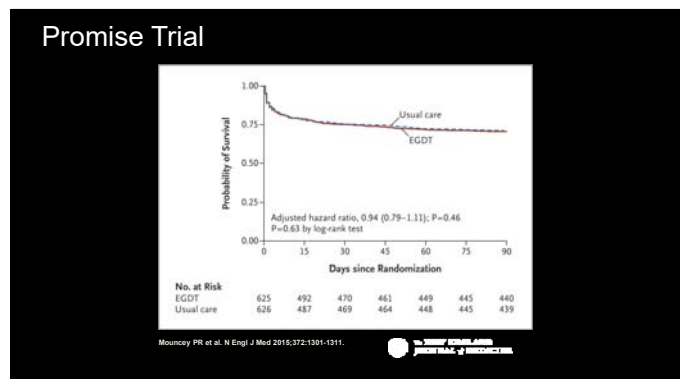
Is only good as long as you're not a screw up

- ▶ ProCESS

ARISE

Outcome	EGDT	Usual care	HR (95% CI)	P-value
90-day mortality	20.9%	23.3%	1.13 (0.96-1.33)	0.14
28-day mortality	14.6%	16.4%	1.12 (0.96-1.30)	0.14
30-day mortality	15.1%	17.1%	1.13 (0.96-1.33)	0.14
90-day mortality (adjusted)	19.9%	22.8%	1.14 (0.96-1.35)	0.13
28-day mortality (adjusted)	14.4%	16.2%	1.13 (0.96-1.32)	0.14
30-day mortality (adjusted)	14.9%	16.9%	1.14 (0.96-1.35)	0.13

Figure 1: Probability of survival and subgroup analysis of the risk of shock in all patients.



Some Final Thoughts

- ▶ We are doing things in a much better, organized and protocolized fashion even if we don't hang our hat in a single value
- ▶ Medicine is an art:
 - ▶ We measure CVP to help reduce mortality in Sepsis even though we discredit it as a measure of volume assessment
 - ▶ We don't believe in PAC yet is the gold standards from which we compare all the measurements of NICO monitors
 - ▶ We declare an epidural hematoma a bumping emergency yet if it is the best way to take care of some headaches...
- ▶ Just by putting everything together, is already a big difference compared to 20 years ago. Everything we do is a Goal Directed Therapy.

Some Final Thoughts

- ▶ We are doing things in a much better, organized and protocolized fashion even if we don't hang our hat in a single value
- ▶ Medicine is an art:
 - ▶ We measure CVP to help reduce mortality in Sepsis even though we discredit it as a measure of volume assessment
 - ▶ We don't believe in PAC yet is the gold standards from which we compare all the measurements of NICO monitors
 - ▶ We declare an epidural hematoma a bumping emergency yet if it is the best way to take care of some headaches...
- ▶ Just by putting everything together, is already a big difference compared to 20 years ago. Everything we do is a Goal Directed Therapy.



Thank you...

Waste, Lean and Opportunity in Healthcare

James Rawson, MD

Chairperson of Radiology

Augusta University

Augusta, GA

At the conclusion of the presentation, the learner should be able to:

1. Review waste and inefficiency in healthcare
2. Review Tools of Lean
3. Discuss opportunities for improvements

CURRICULUM VITAE

James Vincent Rawson, MD, FACR

jrawson@augusta.edu

[@Jim Rawson MD](#)

**P.L., J. Luther, Ada Warren Chair
Chair of Radiology and Imaging
Medical College of Georgia**

**Chief of Radiological Services
Georgia Regents Medical Center
Childrens Hospital of Georgia**

**Professor of Business Administration
Hull College of Business**

Augusta University (formerly Georgia Regents University)

RECENT ADMINISTRATIVE PROJECTS

- Inaugural Chair of American College of Radiology Commission on Patient and Family Centered Care: created commission of five committees with almost 100 radiologists, radiation oncologists, patients, technologists and other stakeholders to improve patient experience in Radiology
- Project Lead on Georgia Regents Medical Center-Philips Health Agreement: 15 year partnership (\$300 million) including equipment, maintenance, education and innovation for enterprise; Georgia BIO Deal of the Year 2014
- Implementation of Lean Process Improvement in Radiology resulting in combined increased revenue and decreased expenses of over \$10 million

EDUCATION

1975-79 Medford Public High School, Medford, Massachusetts
1979-83 Tufts University, Medford, Massachusetts; Bachelor of Science Cum Laude; Triple Major in Chemistry, Religion and Biology
1983-85 Tufts University Graduate School/Department of Chemistry, Medford, Massachusetts
1985-89 Tufts University School of Medicine, Boston, Massachusetts; Doctor of Medicine

POSTDOCTORAL TRAINING

1989-90 Transitional Medical Internship, Lemuel Shattuck Hospital/Department of Public Health, Jamaica Plain, Massachusetts
1990-94 Diagnostic Radiology Resident, New York Medical College, Valhalla, New York; (Senior Chief Resident, 1993 to 1994)

1994-95	Fellow/Instructor, Body Magnetic Resonance Imaging, Mallinckrodt Institute of Radiology, Washington University, St. Louis, Missouri
1998	Certificate in Healthcare Evaluation, Medical College of Georgia
1999-2000	American College of Physician Executives (Courses: Health Law, Informatics A & B, Physicians in Management Seminar)
2013	Certificate of Achievement, Academy of Radiology Leadership and Management
2014	Certified Change Agent, National Health Services, School for Health Care Radicals
2015	I-CAN Scholar, Institute of Healthcare Improvement

CERTIFICATION AND LICENSURE

1996	Certified Diplomat, American Board of Radiology (Diagnostic Radiology)
1995	Georgia Medical License
1994	Missouri Medical License

ACADEMIC/ADMINISTRATIVE APPOINTMENTS

Medical College of Georgia, Augusta, Georgia

7/1/1995-3/1/2000	Assistant Professor of Radiology
1/1996-6/96	Assistant Chief of Abdominal Imaging, Department of Radiology,
7/1996-7/97	Chief of Abdominal Imaging Department of Radiology
7/1997-99	Chief of Body Imaging, Department of Radiology
1999-3/00	Chief Adult Imaging Section, Department of Radiology
2000-03	Interim Chair and Associate Professor, Department of Radiology
7/1/2000	Medical Director and Chief of Service, Radiology Services, Medical College of Georgia Health, Incorporated, <ul style="list-style-type: none"> • Medical College of Georgia Health, named best performer by University HealthSystem Consortium, 2001 • Patient Centric Imaging Award 2013 • Patient Centric Imaging Award 2015
2002-03	Medical Director, Vascular Ultrasound, Medical College of Georgia
2003-14	Warren Professor and Chair, Department of Diagnostic, Therapeutic, and Interventional Radiology
2010-13	President of Medical Staff, Medical College of Georgia Health Inc
2014	P.L., J. Luther, Ada Warren Endowed Chair and Chair of Radiology and Imaging, Medical College of Georgia
2016	Interim Chair/Chief of Service Radiation Oncology

GRANT/RESEARCH SUPPORT

Project title : Discovering the Value of Imaging: A Collaborative Training Program in Biomedical Big Data and Comparative Effectiveness Research for the Field of Radiology,

Waste, Lean and Opportunity in Healthcare Georgia Society of Anesthesiologists 2016 Summer Meeting

Jim Rawson, MD, FACR
P.L. J. Luther and Ada Warren Professor
Chair, Radiology and Imaging
Medical College of Georgia
Augusta University

 AUGUSTA UNIVERSITY

- Nothing to disclose

 AUGUSTA UNIVERSITY

Learning Objectives

- Review waste and inefficiency in healthcare
- Review Tools of Lean
- Discuss opportunities for improvements

 AUGUSTA UNIVERSITY

Perspective: Glass of Wine

- Half Full-optimist
- Half Empty-pessimist
- Always full-half wine, half air
- Poorly designed-engineer
- Twice as large as it needs to be-Lean thinker



 AUGUSTA UNIVERSITY

MORE

 AUGUSTA UNIVERSITY

LESS

 AUGUSTA UNIVERSITY

Eliminating Waste in HealthCare

1. Failures of Care Delivery
2. Failures of Care Coordination
3. Overtreatment
4. Administrative Complexity
5. Pricing Failures
6. Fraud and Abuse

Total 21-34% National Health Expenditures

Total \$558 Billion-\$910 Billion

Berwick, Hackbarth JAMA. 2012;307(14):1513-1516

Wastes

Transportation
Inventory
Motion
Waiting
Overproduction
Over-processing
Defects

TIM WOOD

Transportation

- Patient not transported on time

Inventory

- How many different knee prosthesis do you have on the shelf?
- If you use 10 of an item everyday, why do you have 250 on the shelf?

Motion

- Is everything you need within your reach?
- Do you have to go to another part of the room or another room to get commonly used items?

Waiting

- Waiting for patient
- Patient waiting for you

Waiting

"Waiting is not a healthcare function."

Pat Sodomka



 AUGUSTA UNIVERSITY

Overproduction

- Unnecessary imaging
- Procedures, treatments without evidence
- Procedures, treatments that the patient doesn't want

 AUGUSTA UNIVERSITY

Over-processing

- How many people document the same event?
- How many people analyze the same patient data?
- How consults do we get to manage the same problem?

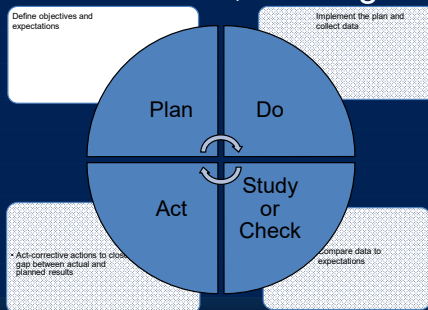
 AUGUSTA UNIVERSITY

Defects

- Medical errors
- Wrong sided surgery
- Right procedure, wrong patient

 AUGUSTA UNIVERSITY

PDCA-Shewart, Deming



 AUGUSTA UNIVERSITY

Lean

- Based on Toyota Production System (TPS)
- Introduced into US manufacturing and management consulting
- Lean and US Healthcare

 AUGUSTA UNIVERSITY



PROBLEM

AUGUSTA UNIVERSITY

Lean

- Tools and culture
- Value
- **Respect for people**
- Elimination of waste
- Long term journey
- NOT cost cutting, reduced staffing

AUGUSTA UNIVERSITY

Lean



AUGUSTA UNIVERSITY

Pre-work

- AKA Staging or set up
- Is there preparation that can be done before the primary task?
- Is there equipment that could be turned on, warmed up, organized, located?

AUGUSTA UNIVERSITY

5S

- Sort
- Straighten
- Shine
- Standardize
- Sustain
- Other
- Safety
- Security
- Forerunner of the Just In Time inventory system

AUGUSTA UNIVERSITY

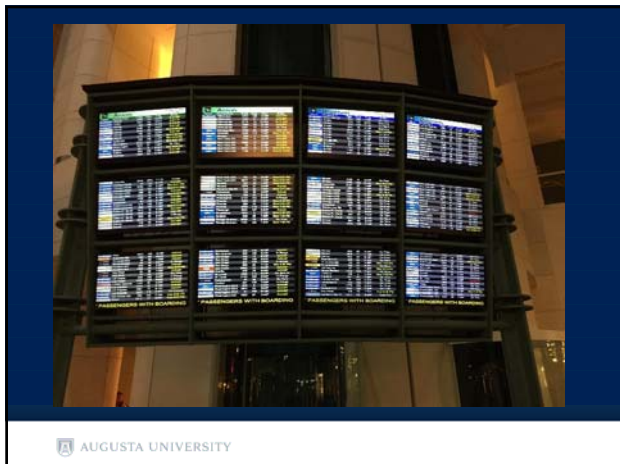


AUGUSTA UNIVERSITY



Andon (Visual Feedback) Paper lantern

- Traffic light
- Airplane monitors
- Check engine light



Spaghetti Diagrams (Layout)

80% reduction in travel distance

<http://www.leadingedgegroup.com/consulting/lean-healthcare/laboratories/>

Distant Rooms:

- CT control: lidocaine from pixsys
- 'Water': gowns, linen, specimen cups
- Supplies: biopsy trays, hats, masks if out
- Desk: Phone, computer

“Every system is perfectly designed to achieve the results it achieves”

Paul Batalden

Poka-Yoke (Error Proofing)

- Eliminate waste by preventing, correcting or calling attention to human errors as they occur
- 1960s Shigeo Shingo Toyota
- Cannot plug an ethernet cable in upside down
- Cannot start your car in reverse
- Computer cables
- Gasoline vs Diesel



AUGUSTA UNIVERSITY

People vs Systems

- Can you set someone up to fail?
- Can you set someone up for success?

AUGUSTA UNIVERSITY



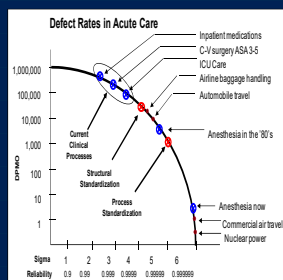
AUGUSTA UNIVERSITY

Pull System (Kanban)

- Product is not made or moved until it is ready to be used
- Minimize inventory
- What if the rate limiting step "pulled" when it was ready instead of the prior steps "pushing" and causing queuing/backlog/waiting

AUGUSTA UNIVERSITY

Healthcare and Six Sigma



Courtesy of Doug Welch CEO Doctors Hospital of Augusta 2012

AUGUSTA UNIVERSITY

Opportunity

- How much waste is in a process?

AUGUSTA UNIVERSITY

Thank you

jrawson@augusta.edu
[@Jim_Rawson_MD](https://twitter.com/Jim_Rawson_MD)

Opportunity for Improvement

Nitin Anand, BA, MD

Assistant Professor of Anesthesia

Augusta, GA

At the conclusion of the presentation, the learner should be able to:

1. Outline several Lean based quality improvement projects.
2. Discuss the process of developing and designing a Lean based improvement project.
3. Discuss the Lean tools best suited to different projects.
4. Outline the difficulties and common errors made during the process.

NITIN ANAND MD

1318 Hickman Rd, Augusta, GA 30904 • 706-386-2967 • nitin23@gmail.com

SUMMARY

- Highly qualified and efficient physician. Board Certified Cardiac Anesthesiologist with TEE Certification. Experienced in diverse anesthetic case load including Cardiac, Thoracic, Vascular, Neuro, Ortho, Urology, OB, Acute Pain and Healthy Peds. Skilled in neuraxial anesthesia and basic regional blocks. Comfortable with critically ill complex patient populations and building rapport with patients and family. Provide leadership and supervision to Medical Students, Interns & Residents. Professional and team-oriented.

PROFESSIONAL EXPERIENCE

Assistant Professor of Anesthesiology
Augusta University

Augusta, GA USA
09/2015 - Present

EDUCATION

Medical Degree
Saint Louis University School of Medicine

St. Louis, MO USA
2010

Bachelor of Health Studies Honours
McMaster University

Hamilton, ON CAN
2006

POST GRADUATE TRAINING

Fellowship
Western University | *Cardiac Anesthesia Fellow*

London, ON CAN
08/2014 - 06/2015

Internship & Residency
RUSH University Medical Centre | *Resident Anesthesiologist*

Chicago, IL USA
06/2010 - 06/2014

CERTIFICATION

American Board of Anesthesiology's (ABA) Part 1 Examination Written
American Board of Anesthesiology's (ABA) Part 2 Examination Oral
Advanced Preoperative Transesophageal Echocardiography

Certified 07/2014
Taken
Passed 09/2015

RESEARCH & PUBLICATION

Midwest Anesthesiology Residents Conference (MARC)
Presenter

- Presented, "A Rat Model of Lumbar Facet Joint Osteoarthritis"
- Received FAER Award

Chicago, IL USA
03/2011

University of Toronto - Department of Laboratory Medicine & Pathobiology
Clinical Researcher

Toronto, ON CAN
05/2007- 08-2007

PROFESSIONAL MEMBERSHIPS

Society of Cardiovascular Anesthesiologists
Canadian Anesthesiologist Society
American Society of Anesthesiologists
American Medical Association

2012-Present
2009-Present
2008-Present
2006-2010

MEDICAL VOLUNTEER EXPERIENCE

Rush University Medical Centre House Staff Association | *Vice President*
St.Louis University School of Medicine Health Resource Centre | *Lead Coordinator*

Chicago, IL USA
06/2012 - 06/2013

St. Louis, MO USA
08/2007- 04/2010

REFERENCES AVAILABLE UPON REQUEST


1

Opportunities For Improvement

Nitin Anand, MD
Assistant Professor
Anesthesiology and Perioperative Medicine
Medical College of Georgia
Augusta University

7/13/2016

2



No
Financial
Disclosures

7/13/2016

3

Learning Objectives

- To outline several Lean based quality improvement projects
- To discuss the process of developing and designing a Lean based improvement project
- To discuss the lean tools best suited to different projects
- To outline the difficulties and common errors made during the process

7/13/2016

PROJECTS

7/13/2016

5

Examples

- **Incomplete airway management documentation and lack of a difficult airway alert in the patient's eMR.**
- **Patient hand-offs are performed inconsistently with variable patient information in the OR, PACU and ICU.**

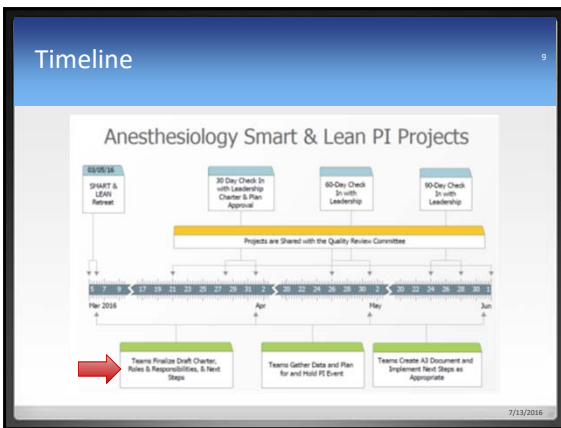
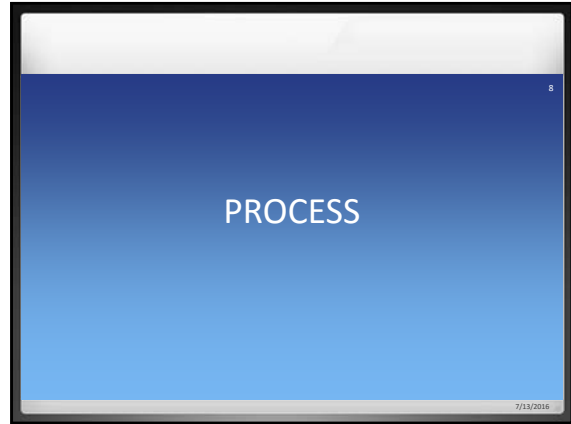
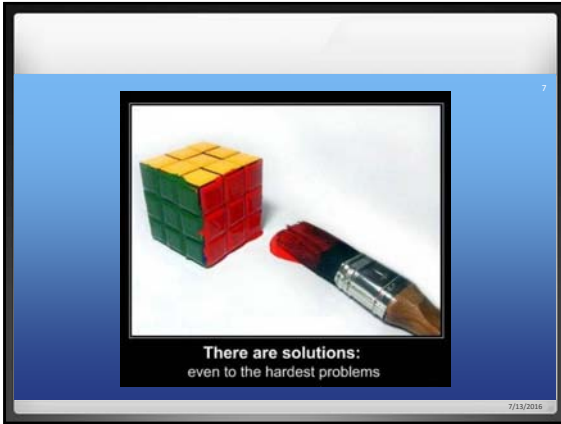
7/13/2016

6

Cont...

- **Anesthesia OR Joint Commission requirements are met inconsistently; e.g. syringe labeling, locking up of drugs.**
- **Preoperative patient evaluation guidelines are not uniformly practiced leading in some cases to day-of-surgery delays or cancellations.**

7/13/2016



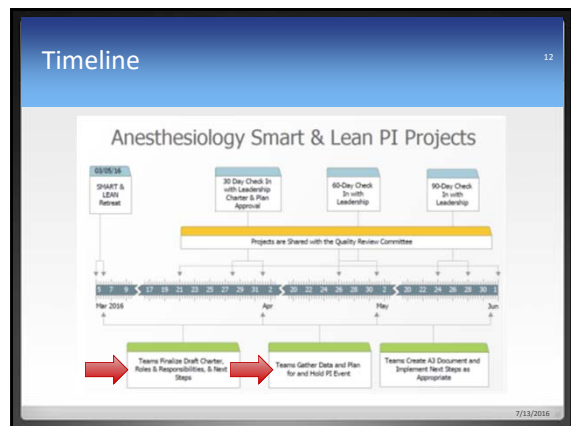
- ### Charter
- Background & Business Need
 - Project Scope Statement
 - Project Objectives/Deliverables
 - Boundaries
 - Assumptions
 - External Dependencies
 - Project Risks
 - Key Stakeholders
 - Required Resources
 - Requested Timeline/Milestones
- ## WHY???

 - 1) Communication
 - 2) Planning
 - 3) Analysis
 - 4) Authorization
 - 5) Documentation
- 7/13/2016

Project Charter

Project Leader: Betsy Avera		Team Members	
Business Case		Chairman	Business Leader
Claim: Reducing the time to process claims		Champion	Vice President
Problem Statement		Sponsor	Assistant Vice President
Project & Milestones		Team Member	Jill Kappert
Project Start Date	01/01/2016	Team Member	MARK DICK, 4 Associates, MI team, AM, PE & AM Operations
Project End Date	01/01/2017	Goal Statement	To increase process productivity from 48.56 documents per hour to 58 documents per hour by 23rd November 2016
Project Milestones		Timeline	
Project Start	01/01/2016	START	01/01/2016
Project End	01/01/2017	END	01/01/2017
Project Milestones		START	01/01/2016
Project Start	01/01/2016	START	01/01/2016
Project End	01/01/2017	END	01/01/2017
Project Milestones		START	01/01/2016
Project Start	01/01/2016	START	01/01/2016
Project End	01/01/2017	END	01/01/2017

7/13/2016



PI Event

- Getting to work
- Structured
- Goal Oriented
- Focused
- Accountability

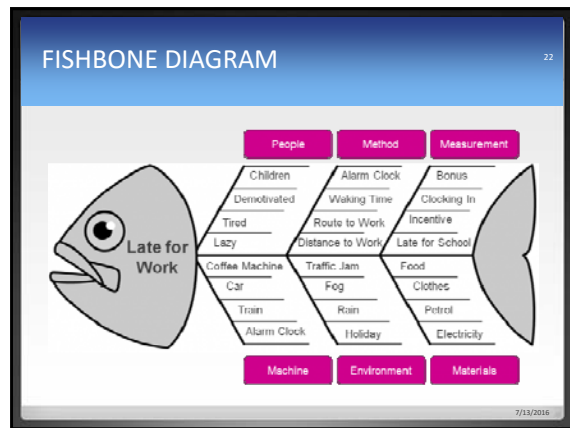
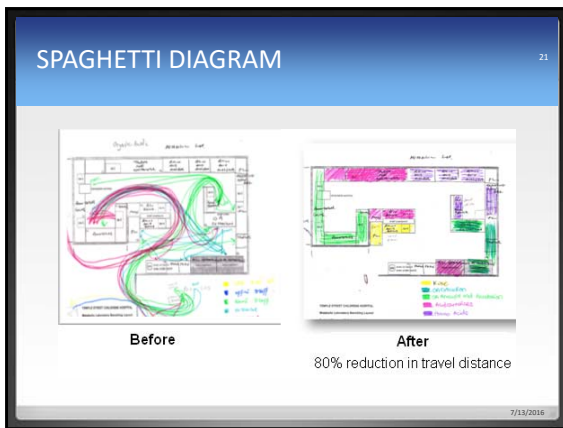
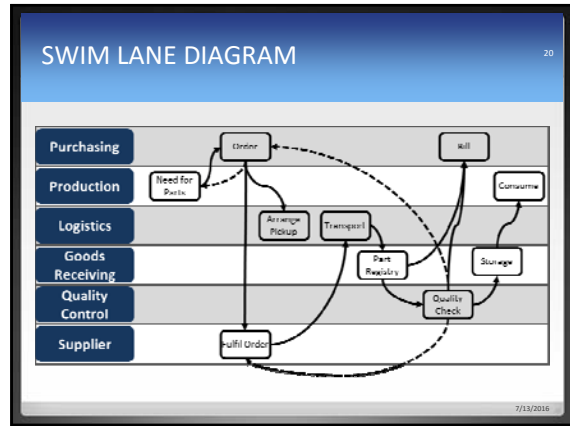
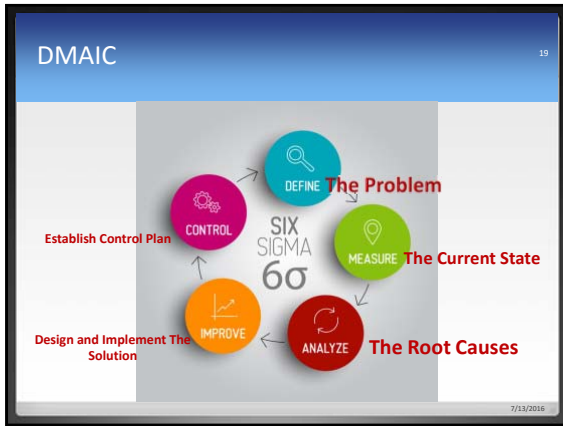
Timeline

Anesthesiology Smart & Lean PI Projects

A3 Template

PDCA Cycle

TOOLS



DIFFICULTIES

23

7/13/2016



NO TIME/LACK OF EFFORT 25

Are you too busy to improve?

No thanks! We are too busy

7/13/2016

50 Reasons Not To Change

Image copyright: <http://13c4.wordpress.com/2007/02/24/50-reasons-not-to-change/>

7/13/2016

Questions? 27

• nanand@augusta.edu

7/13/2016

Thanks! 28

I'm half Full I'm half Empty I think this is Pee!

OPTIMIST PESSIMIST REALIST

7/13/2016

Pediatric OSA- Anesthetic Perspectives

Heather Byrd, MD

Augusta University

Augusta, GA

J. Drew Prosser, MD

Augusta University

Augusta, GA

At the conclusion of the presentation, the learner should be able to:

1. Define pediatric OSA and discuss associated comorbidities.
2. Differentiate between adult and pediatric OSA.
3. Discuss pathophysiology related to pediatric OSA.
4. Discuss anesthetic implications of pediatric OSA and tonsillectomy.

CURRICULUM VITAE

Heather Scott Byrd, MD
 Assistant Professor
 Department of Anesthesiology and Perioperative Medicine

Children's Hospital of Georgia
 Augusta University
Office: 1446 Harper St. BT-2651, Augusta, GA 30912
Office: 707-721-5271

Home: 3585 Granite Way, Augusta, GA 30907
Cell: 256-431-0587

EDUCATION**HIGH SCHOOL**

1996-2000 Athens High School
 Athens, AL
 Salutatorian

UNDERGRADUATE

Dates Attended	Name and Location Of Institution	Degree Subject	Major
2000-2004	University of Alabama <i>summa cum laude</i> Tuscaloosa, AL	B.S.	Chemistry
2004-2008	University of Alabama School Of Medicine Birmingham, AL	M.D.	

POSTGRADUATE

Dates Attended	Name and Location Of Institution and Discipline	Name of Program Director
7/2008-6/2012	Department of Anesthesia and Perioperative Medicine Medical University of South Carolina Charleston, SC	Matt McEvoy, MD

7/2013-6/2014 Fellowship Franklyn Cladis, MD
Pediatric Anesthesia
Children's Hospital of Pittsburgh
Pittsburgh, PA

SPECIALTY CERTIFICATION

American Board of Anesthesiology (certificate #49973 – expires 12/2023)
American Board of Pediatric Anesthesiology (9/13/2014 – 12/31/2024)

PROFESSIONAL

Years Inclusive	Name and Location of Institution	Rank/Title
2012 - 2013	Department of Anesthesia University of Pittsburgh Medical Center Pittsburgh, Pennsylvania	Clinical Instructor
2014 – present	Department of Anesthesia – Division of Pediatric Anesthesiology Augusta University Augusta, GA	Assistant Professor

HONORS/AWARDS

2003 Phi Beta Kappa
2005 Summer Neurology Student Research Scholarship, University of Alabama
School of Medicine
2006 Fearn Fellow, University of Alabama School of Medicine

SCIENTIFIC AND PROFESSIONAL SOCIETIES

2008 – Present American Society of Anesthesiology
2008 – 2012 ASA Political Action Committee
2008 – 2012 South Carolina Society of Anesthesiologists
2011 – Present Society for Pediatric Anesthesia
2014 – Present Georgia Society of Anesthesiologists

COMMUNITY ACTIVITIES

2006-08 Integrated Medical Sciences Subcommittee, Committee Member, UASOM
2010-12 Pediatrics Working Specialty Group, MUSC
2011-12 Anesthesia Education Committee, MUSC
2011-12 Residency Interview Committee, MUSC
2013-14 Fellowship Interview Committee, Children's Hospital of Pittsburgh

CURRICULUM VITAE

JOHN DREW PROSSER

918 Heard Ave
Augusta, Georgia
TEL: 706-338-7858
Email: jprosser@augusta.edu

EDUCATION/TRAINING:

Statesboro High School, Statesboro, GA	2000 (National Honor Society)
University of Georgia, Athens, GA B.S. Genetics	2004 (Honors, Cum Laude)
Medical College of Georgia, Augusta, GA Program: Medicine (M.D.)	2008 (AOA Honors)
Georgia Regents University, Residency Department of Otolaryngology	2013 (Chief Resident, Finalist Resident of the Year)
Cincinnati Children's Hospital Pediatric Otolaryngology Fellow	2013-2015

MEDICAL LICENCES

Georgia Number: 73632	Active: 2015-present Exp: 11/2016
Ohio Number: 57. 022822	Inactive 9/9/2013-6/30/2015
South Carolina Number: LL 33077	Inactive 8/4/2010-6/30/2012
Georgia Number: RTL 003094	Inactive 7/1/2008-6/30/2013

BOARD CERTIFICATIONS

American Board of Otolaryngology Head and Neck Surgery 2015

OTHER LICENCES AND CERTIFICATIONS

National Provider Identifier: Number: 1942462627	2008-present
---	--------------

DEA Provider Number 2015-present
Number: FP 5161384 Exp: 3/31/2018

EMPLOYMENT

Assistant Professor 2015-present
Department of Otolaryngology- Head and Neck Surgery
Division of Pediatric Otolaryngology
Augusta University
Augusta, Georgia 30912

CURRENT HOSPITAL LEADERSHIP POSITIONS

Associate Residency Program Director 2015-present
Otolaryngology Head and Neck Surgery Residency

Surgical Director/ Co-founder 2015-present
Multidisciplinary Pediatric Sleep Disorders Center

Member of the Craniofacial Team 2015-present

Surgical Director/ Co-founder 2016-present
Multidisciplinary Pediatric Trach/Vent Center

Co-Director of Otolaryngology Medical Student Rotation 2016-present

Medical Informatics Director, Dept of Oto-HNS 2016-present

CURRENT COMMUNITY LEADERSHIP POSITIONS

Family Promise of Augusta 2016-present
Board of Directors

The Church of the Good Shephard 2016-present
Confirmation leader

MEDICAL SOCIETIES

American Medical Association (2004-2008)
American Medical Student Association (2004-2008)
American College of Physicians (2006-2008)
American Academy of Otolaryngic Allergy (2009-2013)
The Triological Society (2010-2013)
American Broncho-Esophagological Association (2011-2013)
American Academy of Otolaryngology (2009-present)
American Society of Pediatric Otolaryngology (2013-present)

Pediatric Sleep Apnea – Anesthetic Perspectives and Who needs a sleep study before T&A and what do we do with that information?

J. Drew Prosser, MD
Assistant Professor
Pediatric Otolaryngology
Children's Hospital of Georgia

Heather S. Byrd, MD
Assistant Professor
Pediatric Anesthesia
Children's Hospital of Georgia

Children's Hospital
of Georgia

Disclosures

- None

Children's Hospital
of Georgia

Pediatric Sleep Apnea

- Sleep Disordered Breathing
- Obstructive Sleep Apnea – Pediatrics vs Adults
- Causes
- Pathophysiology
- Sequelae
- Diagnosis
- Complications
- Anesthetic Considerations

Children's Hospital
of Georgia

Sleep-Disordered Breathing

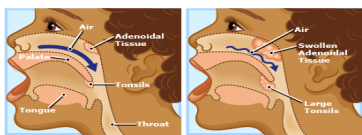
- SDB – spectrum of sleep-related breathing abnormalities
 - Primary snoring – 20%
 - Upper airway resistance syndrome
 - Obstructive hypopnea syndrome
 - Obstructive sleep apnea



DURING SNORING AIRFLOW PARTIALLY BLOCKED
DURING SLEEP APNEA AIRFLOW COMPLETELY BLOCKED

Children's Hospital
of Georgia

Obstructive Sleep Apnea



Normal Anatomy Open airways allow air to flow easily.
Common Causes of Sleep Apnea Large tonsils and adenoids make airflow more difficult.

- What is OSA?
 - Episodic upper airway obstruction that occurs during sleep
 - Episodic hypoxia
 - Intermittent hypercapnia
 - Sleep fragmentation

Children's Hospital
of Georgia

OSA Manifestations in Children

Nocturnal

- Snoring
- Increased respiratory effort
- Apnea
- Oxygen desaturation
- Hypercapnia
- Enuresis
- Disturbance in sleep patterns

Daytime

- FTT
- Obesity
- Poor school performance
- Inattentiveness
- Hyperactivity
- Somnolence
- Behavior disturbance

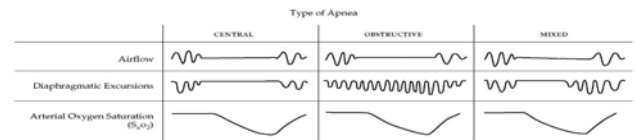
Children's Hospital
of Georgia

Pediatric OSA

- Apneas and hypopneas
 - Obstructive apnea – respiratory effort but no airflow (85%)
 - Central apnea – interruption in airflow and effort (10%)
 - Mixed apneas (5%)
 - Hypopnea – shallow breathing, decreased airflow by at least 50%
 - Adult vs pediatric criteria

Children's Hospital
of Georgia

Pediatric OSA



Central vs. Obstructive vs. Mixed Apneas

Children's Hospital
of Georgia

Pediatric OSA

- Predisposing factors for upper airway obstruction
 1. Airway narrowing: obesity, enlarged tonsils/adenoids
 2. Discoordination between airway walls and muscles
 3. Abnormal neural control
 4. Muscle weakness: neuromuscular disorders

Children's Hospital
of Georgia

Pediatric OSA

Table 1 – Factors that can contribute to obstructive sleep apnea in children

<p>Anatomical factors</p> <ul style="list-style-type: none"> • Craniofacial or mandibular abnormalities^{43,44} • Enlargement of the tongue,⁴⁵ tonsils, or adenoids⁴⁶ • Laryngomalacia⁴⁷ • Fat deposition in the neck, such as occurs in obesity⁴⁸
<p>Conditions that produce inflammation of the soft tissues of the upper airway</p> <ul style="list-style-type: none"> • Gastroesophageal reflux disease⁴⁹ • Allergic rhinitis and viral upper respiratory tract infections⁵⁰ • Exposure to environmental tobacco smoke⁵¹
<p>Conditions that result in reduced baseline central muscle tone</p> <ul style="list-style-type: none"> • Neuromuscular disorders • Some chromosomal variations, such as Down syndrome⁵² and Prader-Willi syndrome⁵³ • Cerebral palsy • Use of certain medications⁵⁴

Children's Hospital
of Georgia

Pediatric OSA

- OSA defined
 - Mild OSA: AHI 1-5
 - Moderate OSA: AHI 6-10
 - Severe OSA: AHI >10
 - REM Sleep
 - Prevalence: 1-3%
 - Peak 3-6 years



<http://www.kidshospital.org/newsroom>

Children's Hospital
of Georgia

OSA Pathophysiology

- Deep sleep → decreased pharyngeal muscle tone → reduced airway dimensions → discoordinated pharyngeal muscle tone
- Progressive airway collapse → intermittent obstruction → increased respiratory effort → no airflow
- Prolonged airway obstruction → Hg desaturation, increased CO₂

Children's Hospital
of Georgia

OSA Pathophysiology

```

graph TD
    A[Sleep Onset] --> B[Apnea/Hypopnea]
    B --> C["↓O2, ↑CO2, ↓pH"]
    C --> D[Sleep Arousal]
    D --> E[Resumption of Airflow]
    E --> F[Return to Sleep]
            
```

Exhausting!!

Children's Hospital of Georgia

OSA Sequelae

- FTT
- CV: pulmonary HTN, RVH, cor pulmonale
- CNS: neurocognitive dysfunction, attention deficits, learning disabilities, behavioral problems

Children's Hospital of Georgia

OSA Diagnosis

- PSG – EEG, EMG, EKG, pulse oximetry, airflow, and thoracic and abdominal movement
- Obstruction = more than two obstructive breaths
- Nocturnal oximetry
- Daytime sleep patterns and questionnaires

Children's Hospital of Georgia

PSG in Adults vs Children

<p>Adults</p> <ul style="list-style-type: none"> • Apnea duration 10 sec • Hypopnea desat >=4% • Hypopnea duration 10 sec • Cortical arousals common • Normal AHI <5 	<p>Children</p> <ul style="list-style-type: none"> • Apnea duration 2 breaths • Hypopnea desat >=3% • Hypopnea duration 2 breaths • Cortical arousals uncommon • Normal AHI <1
--	--

From Karlson KM Jr: What's new in pediatric obstructive sleep apnea? Clin Pulm Med 15:226, 2008.

Children's Hospital of Georgia

Why doesn't everyone have a PSG?

- Lack of laboratories
- Expensive
- Requires overnight stay

Children's Hospital of Georgia

Nocturnal Oximetry

- McGill Oximetry Scores
- MOS 1 = inconclusive
- MOS2 = oxygen nadir <90
- MOS3 = oxygen nadir <85
- MOS4 = oxygen nadir <80 (24%)

Children's Hospital of Georgia

OSA and Postop Respiratory Complications

- Severity of OSA predicts the nature of perioperative respiratory complications
- RDI > 20 = breathing holding with induction
- RDI > 30 = laryngospasm and desaturation with emergence
- AHI > 10 and SaO₂ < 80%

Children's Hospital
of Georgia

Risk Factors for Postop Respiratory Complications

- Age < 3 years
- Severe OSA on PSG
- Cardiac complications from OSA
- Marked obstruction on induction
- FTT
- Obesity
- Hx of Prematurity
- Recent URI
- Neuromuscular disorder
- Craniofacial abnormalities
- Genetic/chromosomal disorders



Children's Hospital
of Georgia

Conditions Associated with OSA

- | | |
|-----------------------------|-------------------------|
| • Achondroplasia | • Mucopolysaccharidosis |
| • Apert syndrome | • Obesity |
| • Beckwith-Wiedemann | • Pierre Robin |
| • CP | • Pfeiffer syndrome |
| • Cleft palate after repair | • Prader-Willi |
| • Crouzon syndrome | • Sickle cell disease |
| • Cystic hygroma | • Treacher Collins |
| • Down syndrome | |
| • Hypothyroidism | |
| • Klippel-Feil syndrome | |

From Sterni LM, Tunkel DE: Obstructive Sleep Apnea in Children: an update. Pediatr Clin North Am 50:427, 2003.

Children's Hospital
of Georgia

Facial features associated with OSA

- Small triangular chins
- Retro-position of the mandible
- Steep mandibular plane
- High palate
- Long, oval shaped face
- Long soft palate
- Large tonsils with the above features



Goossens et al., Pediatrics 2006;118:871-82

Anesthetic Considerations



Anesthetic Considerations T and A

- Midazolam premed
- Inhalational induction
- Upper airway obstruction
- PEEP, 100% oxygen, and manipulation of TMJ
- Morphine 10-20 mcg/kg or fentanyl 0.2-0.5 mcg/kg
- Suction for blood and secretions
- Extubated awake
- Lateral recovery position
- Nasal airway

Children's Hospital
of Georgia

Analgesics



Children's Hospital
of Georgia

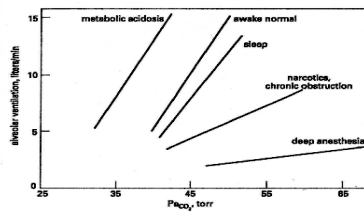
Analgesics for T and A

- Dexamethasone – reduces pain, edema, and vomiting
- NSAIDS – controversial
- Acetaminophen
- Dexmedetomidine
- Local anesthetics – intracranial hemorrhage, bulbar paralysis, deep cervical abscess, cervical osteomyelitis, medullopontine infarct, cardiac arrest

Children's Hospital
of Georgia

Opioid Sensitivity

- CO₂ response curve
- Oxygen nadir < 85%
- Mu receptors
- Morphine requirement is halved



Children's Hospital
of Georgia

PONV

- Opioids
- Propofol
- Ondansetron
- Dexamethasone – up to 24 hours
- Fluids (10-20ml/kg)



Children's Hospital
of Georgia

Outcomes

- >75% with improvement after adenotonsillectomy
- Obesity, severe OSA, RDI >19 may be associated with persistent OSA
- Craniofacial anatomy (Trisomy 21) and decreased neuromotor tone (CP) are risk factors
- CPAP
- Orthodontic maxillary expansion
- Mandibular distraction/advancement, midface advancement

Children's Hospital
of Georgia

Discharge

- AHI <10, no comorbidities, age > 3 years
- Mild OSA → decreased apnea events, improved oxygen saturation
- 2 hour minimum pacu stay
- More research is needed

Children's Hospital
of Georgia

Protocol?

- Mild OSA
 - Premed: midazolam 0.7mg/kg po
 - Hydromorphone: 10mcg/kg
- Moderate OSA
 - Premed: midazolam 0.5mg/kg
 - Hydromorphone: 7 mcg/kg
- Severe OSA
 - Premed: midazolam 0.5mg/kg
 - Hydromorphone: 5 mcg/kg
- All received tylenol, dexamethasone, and ondansetron

Children's Hospital of Georgia

References

Baugh RF, Archer SM, Mitchell RB, et al. Clinical practice guideline: tonsillectomy in children. *Otolaryngology–head and neck surgery: official journal of American Academy of Otolaryngology–Head and Neck Surgery*. 2011;143(1 Suppl):S1–S6.

Brown KA. Outcome, risk, and error in the child with obstructive sleep apnea. *Pediatric anesthesia*. 2011;21(7):771–780.

Brown KA, Laffonts A, Lakhouram L, Moss JB. Recurrent hypoxemia in children is associated with increased analgesic sensitivity to opioids. *Anesthesiology*. 2006;105(4):655–669.

Cole CJ, Lemmon L, Anderson RL, eds. *A Practice of Anesthesia for Infants and Children*. 5th ed. Elsevier; 2013.

Gross JB, Bachenberg RL, Benumof JL, et al. Practice guidelines for the perioperative management of patients with obstructive sleep apnea: a report by the American Society of Anesthesiologists Task Force on Perioperative Management of patients with obstructive sleep apnea. *Anesthesiology*. 2006;104(5):1081–1093. quiz 1117–1088.

Ishiah A, Pereira KD. Outcomes after adenotonsillectomy using a fixed anesthesia protocol in children with obstructive sleep apnea. *International journal of pediatric otorhinolaryngology*. 2015;79(5):638–644.

Lerman J. A. Disposition on sleep-disordered breathing in children. *Pediatric anesthesia*. 2009;19 Suppl 1:100–108.


Meyer KC, Raghu G, Baughman RP, et al. An official American Thoracic Society clinical practice guideline: the clinical utility of bronchoalveolar lavage cellular analysis in interstitial lung disease. *American journal of respiratory and critical care medicine*. 2012;185(3):304–314.

Motomura EK, Davis P. *Smith's anesthesia for infants and children*. 7th ed. Philadelphia, Pa.: Mosby; 2006.

Roland PS, Rosenfeld RM, Brooks LL, et al. Clinical practice guideline: Polysomnography for sleep-disordered breathing prior to tonsillectomy in children. *Otolaryngology–head and neck surgery: official journal of American Academy of Otolaryngology–Head and Neck Surgery*. 2011;143(1 Suppl):S1–S5.


Schwengel DA, Stern LM, Tunkel DE, Heilmiller ES. Perioperative management of children with obstructive sleep apnea. *Anesthesia and analgesia*. 2009;109(1):60–75.

Who needs a sleep study?



Children's Hospital of Georgia


How about this kid? (my 5 year old!)



Children's Hospital of Georgia

Answer

- Maybe both or
- Maybe neither
- Depending on who you ask!



Children's Hospital of Georgia

AMERICAN ACADEMY OF
OTOLARYNGOLOGY
HEAD AND NECK SURGERY
FOUNDATION

Clinical Practice Guideline: Polysomnography for Sleep-Disordered Breathing Prior to Tonsillectomy in Children

© American Academy of Otolaryngology–Head and Neck Surgery Foundation 2011
Reprints and permission:
otajournals.com/journalPermissions.aspx
DOI: 10.1177/0149981114096127
http://otajournals.org

SAGE

Peter S. Roland, MD¹, Richard M. Rosenfeld, MD, MPH²,

- Obesity, Down syndrome, craniofacial abnormalities, neuromuscular disorders, sickle cell disease, or mucopolysaccharidoses.
- Cited “benefit [to] clinicians and patients by improving diagnostic accuracy in high-risk populations and defining the severity of OSA to optimize perioperative planning. History and physical exam alone are poor predictors of OSA severity or risk of postoperative complication.”

Children's Hospital of Georgia

AAO recommendations continued

- Surgeon “should advocate for PSG prior to tonsillectomy for SDB in children without any of the comorbidities ... for whom the need for surgery is uncertain or when there is discordance between tonsillar size on physical examination and the reported severity of SDB.”
- **Summary: Sleep study as the tie breaker.**
 - Big tonsils but no snoring with concerned parent/clinician
 - Small tonsils but loud snoring/ questionable apneas

Children's Hospital
of Georgia

RESPIRATORY INDICATIONS FOR POLYSOMNOGRAPHY IN CHILDREN

Practice Parameters for the Respiratory Indications for Polysomnography in Children

R. Nisha Aurora, MD¹, Rochelle S. Zak, MD², Anoop Karippot, MD³, Cami I. Lamm, MD⁴, Timothy I. Morgenthaler, MD⁵, Sanford H. Auerbach, MD⁶, Sabin R. Bista, MD⁷, Kenneth R. Casey, MD⁸, Susmita Chowdhuri, MD⁹, David A. Kristo, MD¹⁰, Kannan Ramani, MD¹¹

- American Academy of Sleep Medicine (2011)
- **Summary:** Everyone who is considered for T&A for obstructive symptoms should have PSG prior.

Children's Hospital
of Georgia

Where do they agree?

- “Nap studies” are bad and should not be used in children
- Home sleep studies are bad and should not be used in children
- Definitions of severity
 - Mild 1-5
 - Mod 5-10
 - Severe >10
- And since the AASM wants everyone to get a sleep study prior, they also agree with the AAO recommendation for those with comorbidities or discrepant H&P.

Children's Hospital
of Georgia

What are the problems with getting a PSG for everyone?

- Expense
- Delay in treatment
- No apnea, no need to treat.... right?

Published in final edited form as:
Pediatrics. 2006; April; 117(4): e769-e778.

SLEEP-DISORDERED BREATHING, BEHAVIOR, AND COGNITION IN CHILDREN BEFORE AND AFTER ADENOTONSILLECTOMY

Ronald D. Chervin, M.D., M.S.¹, Deborah L. Ruzicka, R.N., Ph.D.¹, Bruno J. Giordani, Ph.D.², Robert A. Weatherly, M.D.³, James E. Dillon, M.D.⁴, Elise K. Hodges, Ph.D.², Carole L. Marcus, M.B.B.Ch.⁵, and Kenneth E. Guire, M.S.⁶

Children's Hospital
of Georgia

What do we do here?

- For the most part we follow the AAO guidelines unless we have already decided on the higher level of post-operative care (PICU anyway regardless of what the sleep study says)
- I generally **avoid** sleep studies in the loud snorer with big tonsils and associated neurocognitive/behavioral problems
 - Negative PSG does mean will not benefit from T&A (Chervin, 2006)

Children's Hospital
of Georgia

What do we do with the information?



Children's Hospital
of Georgia

Guideline

Clinical Practice Guideline: Polysomnography for Sleep-Disordered Breathing Prior to Tonsillectomy in Children

Peter S. Roland, MD¹, Richard M. Rosenfeld, MD, MPH²

- Communicate results to the anesthesiologist.
- “Overnight monitoring after tonsillectomy, if they are under age 3 years or have severe OSA (apnea-hypopnea index of 10 or more obstructive events/hour, oxygen saturation nadir less than 80%, or both).”
- “monitoring” defined as continuous pulse ox with the ability to provide O₂, CPAP, and intubation if required (not specifically PICU)

Children's Hospital of Georgia

AMERICAN ACADEMY OF
Otolaryngology—
Head and Neck Surgery
14915 51-515
© American Academy of
Otolaryngology—Head and Neck
Surgery Foundation 2011
Reprints and permission:
aapublications.com/journalsPermissions.cfm
DOI: 10.1177/1493988114269837
http://jnh.sagepub.com

Children's Hospital of Georgia

Tonsillectomy Care for the Pediatrician
Glenn Isaacson
Pediatrics 2012;130:324; originally published online July 2, 2012;
DOI: 10.1542/peds.2011-3857

- “Children younger than 3 years and those with severe obstructive sleep apnea, coagulopathy, or certain comorbid conditions (eg, neuromuscular disorders, prematurity, obesity, failure to thrive, craniofacial anomalies) benefit from in-hospital observation”

Children's Hospital of Georgia

Predictors of Perioperative Complications in Higher Risk Children after Adenotonsillectomy for Obstructive Sleep Apnea: A Prospective Study

Anchana Thongyam, MD^{1,2,3}, Carole L. Marcus, MBBCh¹, Justin L. Lockman, MD⁴, Mary Anne Cornaglia¹, Aviva Caroff⁵, Paul R. Gallagher, MA⁶, Justine Shults, PhD⁵, Joel T. Traylor, RPSGT¹, Mark D. Rizzi, MD⁵, and Lisa Elden, MD⁵

¹Sleep Center, The Children's Hospital of Philadelphia and the University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania, USA ²Bangkok Pattaya Hospital,

- Anyone with PSG defined OSA should be admitted after T&A (cited up to 25% respiratory complications post-op)
- AHI not the only predictor
 - O₂ nadir
 - Elevated peak CO₂


Children's Hospital of Georgia

AASM Summary

“... values should not be considered absolute cutoffs, especially as ROC models failed to precisely define populations at risk, and thus, **clinical judgment is still needed** to determine which children with OSAS should have surgery at an ambulatory or pediatric hospital site and which should be admitted after adenotonsillectomy.”

Children's Hospital of Georgia

Thank you



Children's Hospital of Georgia

Head and Neck Surgery: The Difficult Airway

J. Kenneth Byrd, MD

Augusta University

Augusta, GA

J. Drew Prosser, MD

Augusta University

Augusta, GA

At the conclusion of the presentation, the learner should be able to:

1. Recognize challenging airway scenarios in patients with head and neck disorders.
2. Formulate an airway plan based on anatomical factors in head and neck surgery.
3. Recognize understand the surgeon's perspective in head and neck disorders

5/13/15

CURRICULUM VITAE

NAME:	James Kenneth Byrd, MD	BIRTHPLACE:	Lexington, SC
HOME ADDRESS:	3585 Granite Way Martinez, GA 30907	CELL PHONE:	(843) 819-6392
OFFICE:	1120 15 th Street BP4109 Augusta, GA 30912	CITIZENSHIP:	United States
		E-MAIL:	ken.byrd@gru.edu
OFFICE PHONE:	(706) 721-6100	OFFICE FAX:	(706) 721-0112

EDUCATION AND TRAINING

UNDERGRADUATE

Dates Attended	Name and Location Of Institution	Degree Subject	Major
1999-2003	University of South Carolina <i>magna cum laude</i> With Honors, USC Honors College Columbia, SC	B.S.	Chemistry
2003-2007	Medical University of South Carolina Valedictorian Charleston, SC	M.D.	

POSTGRADUATE

Dates Attended	Name and Location Of Institution and Discipline	Name of Program Director
7/07-6/08	Internship Department of Otolaryngology Department of General Surgery Medical University of South Carolina Charleston, SC	Ted Meyer, MD, PhD Otolaryngology
7/08-6/12	Residency in Otolaryngology- Head and Neck Surgery, Medical University of South Carolina Charleston, SC	Ted Meyer, MD, PhD

5/13/15

7/12-6/14	Clinical Fellowship Advanced Training in Oncologic Head and Neck Surgery, Skull Base Surgery University of Pittsburgh Medical Center Pittsburgh, PA	Robert L. Ferris, MD, PhD Carl H. Snyderman, MD, MBA
-----------	--	---

APPOINTMENTS AND POSITIONS

ACADEMIC

Years Inclusive	Name and Location of Institution	Rank/Title
2012 - 2014	Department of Otolaryngology University of Pittsburgh Medical Center Pittsburgh, Pennsylvania	Clinical Instructor
2014-Current	Department of Otolaryngology Georgia Regents University Augusta, Georgia	Assistant Professor

CERTIFICATION AND LICENSURE

SPECIALTY CERTIFICATION

American Board of Otolaryngology (certificate # 21296), 6/1/13 - 6/30/23

MEDICAL OR OTHER PROFESSIONAL LICENSURE

Pennsylvania State License - #MD445072

Georgia State License - #72220

DEA License - #FB3127330

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

2007 - Present	American Academy of Otolaryngology/Head and Neck Surgery (AAOHNS)
2010 - Present	American Head and Neck Society, Candidate Member

HONORS/AWARDS

2003	Phi Beta Kappa
2003	Alpha Omega Alpha Pitts-Aiken Scholarship
2005	Thomas Holbrook Award, Outstanding Second Year Achievement
2005	Provost's Scholarship, Medical University of South Carolina
2005	Alpha Omega Alpha

The Difficult Airway in Head and Neck Surgery

J. Kenneth Byrd, MD
Assistant Professor
Medical College of Georgia at Augusta University

J. Drew Prosser, MD
Assistant Professor
Medical College of Georgia at Augusta University

Disclosures

- None

Objectives

- For Adult and Pediatric patients with disorders of the head and neck:
 - Recognize challenging airway scenarios
 - Formulate an airway plan based on anatomical factors
 - Recognize and understand the surgeon's perspective

Adult HN Patients

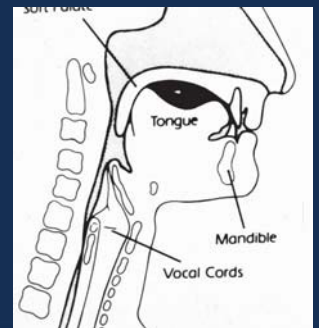
Head and Neck Squamous Cell Carcinoma

- >50,000 New Cases Annually
- ~50% survival for all patients
- Affects appearance, communication, breathing, and swallowing
- Paucity of literature discussing general anesthesia for these patients



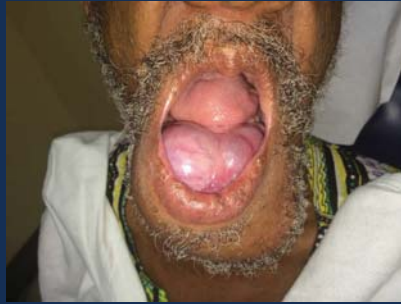
Head and Neck Cancer Common Sites

- Oral cavity
- Oropharynx
- Larynx
- Hypopharynx
- Nasopharynx
- Paranasal Sinuses/Skull base
- Skin
- Thyroid
- Salivary



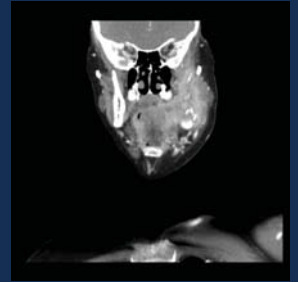
Challenges for Anesthesia Team

- Tumor
 - Bleeding
 - Airway impingement
 - Trismus
- Treatment
 - Prior surgery
 - Reconstruction
 - Prior tracheotomy
 - Radiation
- Tolerance
 - Substance dependence



Workup

- Assess for symptoms of occult airway compromise
 - Stridor/retractions
 - Hoarseness
 - Muffled voice
 - Inability to swallow saliva
- Preoperative imaging
 - CT neck with contrast
- Preoperative fiberoptic laryngoscopy
 - Hypopharyngeal/laryngeal pathology
 - Superior to indirect laryngoscopy



HNSCC: Subsite-specific Information

Oral Cavity

- Most common site in HN... maybe
- Common subsites
 - Tongue
 - Floor of Mouth
- Primary Treatment
 - **Surgery**
 - Resection, reconstruction, neck dissection
 - Adjuvant radiation +/- chemotherapy for Stage III/IV



Oral Cavity Staging

Table	41-6	Oral Cavity (AJCC Staging, 7th ed., 2010)
T1a	<2 cm	
T2	2-4 cm	
T3	>4 cm	
T4a	Invades bone, floor of mouth, inferior alveolar nerve, extrinsic tongue musculature, skin of face, or maxillary sinus	
T4b	Involves masticator space, pterygoid plate, skull base, or surrounds internal carotid artery	

Greenfield's Surgery, 6th Ed: Head and Neck. Byrd JK, Ferris RL. In Press

Oral Cavity: Anesthesia Concerns

- Trismus due to pterygoid muscle involvement will not resolve with paralytics
- T3/T4 oral tongue tumors have impaired mobility, making intubation difficult
- >T2 tongue will often require reconstruction
 - Tracheotomy indicated based on size and location of defect
 - Nasotracheal intubation is an alternative to tracheotomy*



USE OF NASOTRACHEAL INTUBATION IN PATIENTS RECEIVING ORAL CAVITY FREE FLAP RECONSTRUCTION

Michael G. Moore, MD,¹ Amit D. Bhargy, MD,² David G. Francis, MD,³ Bevan Yueh, MD,² Neil G. Futran, MD, PhD²

Oropharynx

- Increasing incidence
- Subsites
 - Tonsils
 - Tongue base
 - Soft Palate
- Treatment
 - Surgery or Radiation
 - Transoral Robotic Surgery*



Oropharynx: Anesthesia Concerns

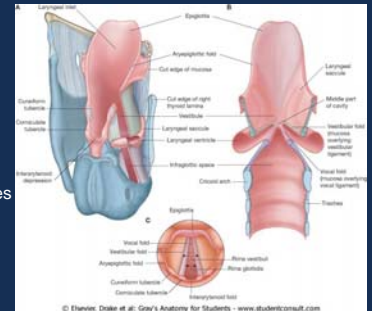
- Friable
- Trismus
- Tongue base tumor
 - May displace epiglottis
 - Midline laryngoscopy may not be possible
- Tonsil tumors
 - Careful with Glidescope!

Table	41-7	Oropharynx (AJCC Staging, 7th ed., 2010)
T1	<2 cm	
T2	2-4 cm	
T3	>4 cm	
T4a		Invades larynx, extrinsic tongue musculature, medial pterygoid muscle, mandible, or hard palate
T4b		Invades lateral pterygoid muscle, pterygoid plates, lateral nasopharynx, skull base, or surrounds internal carotid artery

TORS

Larynx

- 2nd most common subsite
- Glottic > Supraglottic >> Subglottic
- Glottic tends to grow slowly due to fibrous ligaments
- Invasion of pre-epiglottic and paraglottic spaces allows more rapid spread
- Vocal fixation signifies cricoarytenoid joint involvement, mechanical obstruction in paraglottic space, or RLN infiltration



Laryngeal Cancer: AJCC Staging

Laryngeal Cancer: Anesthesia Concerns

Supraglottis	
T1	Limited to one supraglottic subsite, with normal vocal cord mobility
T2	Tumor involves >1 subsite of epiglottis, or involves one adjacent mucosal subsite outside of epiglottis
T3	Vocal cord fixation, pre-epiglottic or paraglottic space involvement, or invasion of inner cortex of thyroid cartilage
T4a	Tumor invades outer cortex of thyroid cartilage, or invades tissues beyond larynx
T4b	Invasion of prevertebral fascia, mediastinal structure, or encasement of carotid artery

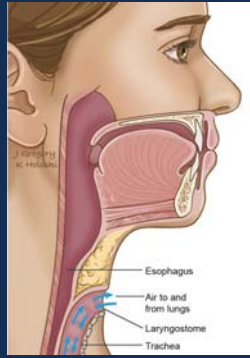
Glottis	
T1a	Tumor limited to one vocal cord, with normal mobility
T1b	Tumor involves both vocal cords, with normal mobility
T2	Extension into supraglottis or subglottis, or with impaired cord mobility
T3	Vocal cord fixation, paraglottic space involvement, or invasion of inner cortex of thyroid cartilage
T4a	Tumor invades outer cortex of thyroid cartilage, or invades tissues beyond larynx
T4b	Invasion of prevertebral fascia, mediastinal structure, or encasement of carotid artery

- T3 cancers will narrow glottic aperture but do not always preclude orotracheal intubation
- Bulky supraglottic tumors necessitate awake fiberoptic intubation versus awake tracheotomy



Laryngectomy

- Functional separation of trachea from upper airway
- Permanent stoma that does not require tracheostomy tube
- “Safest airway in the world...”
- **Not intubatable transorally**
 - Important to differentiate from tracheostomy



www.headandneckcancerguide.org

The Irradiated Patient

- Late effects of radiation may increase difficulty of endotracheal intubation
- Changes continue to progress years after treatment
- Anatomical and functional changes may not be easily recognized with standard evaluation

Long-term Changes Induced by High-Dose Irradiation of the Head and Neck Region: Imaging Findings¹

Minerva Becker, MD • Gerhard Schroth, MD • Peter Zbaren, MD
 Jacqueline Delavelle, MD • Richard Greiner, MD • Peter Vock, MD
 Abdelkarim Allal, MD • Daniel A. Rifjenacht, MD • François Terrier, MD

Post-Radiation Airway Changes

- | Finding | Consequence |
|---|-------------------------------------|
| • Osteoradionecrosis | • Potential mandible fracture |
| • Chondronecrosis of larynx | • Difficulty mask-ventilating |
| • Fibrosis <ul style="list-style-type: none"> – Trismus – Tongue/floor of mouth – Suprahyoid musculature – Neck/spine musculature | • Smaller pharyngeal aperture |
| • Supraglottic/glottic edema and friability | • Anterior laryngeal displacement |
| | • Poor neck extension |
| | • Difficult laryngeal visualization |
| | • Coexistent sleep apnea |

Mallika Balakrishnan MD, Renju Kuriakose MD & Rachel Cherian Koshy MD
 (2004) Radiation induced changes in the airway—anaesthetic implications, Southern African Journal of Anaesthesia and Analgesia, 10:2, 19-21.

Obstructive Sleep Apnea in Survivors

- Mounting evidence for increased prevalence of OSA in patients who have undergone surgery or nonsurgical treatment of HN Cancer
 - Payne RJ, et al. High prevalence of obstructive sleep apnea among patients with head and neck cancer. J Otolaryngol. 2005 Oct;34(5):304-11
 - Stern TP, Auckley D. Obstructive sleep apnea following treatment of head and neck cancer. Ear Nose Throat J. 2007 Feb;86(2):101-3.
 - Faiz SA, Balachandran D, Hessel AC, Lei X, Beadle BM, William WN Jr, Bashoura L. Sleep-related breathing disorders in patients with tumors in the head and neck region. Oncologist. 2014 Nov;19(11):1200-6
 - Zhou J, Jolly S. Obstructive sleep apnea and fatigue in head and neck cancer patients. Am J Clin Oncol. 2015 Aug;38(4):411-4
- Given the rising incidence of HPV+ OPSCC and its favorable outcome, we can expect to encounter this more often

Techniques

Direct Laryngoscopy

- Standard intubation indicated for early-stage cancers
- Operative laryngoscopes may be useful in difficult airways
 - Dedo
 - Anterior commissure
- Videolaryngoscopy
 - Allows simultaneous visualization by anesthesia and surgical teams
 - Angle of blade advantageous after radiation therapy*



*Presenter's experience

Videolaryngoscopy

Can J Anaesth/Can Anesth (2012) 59:41-52
DOI 10.1007/s12330-011-9620-5



REPORTS OF ORIGINAL INVESTIGATIONS

Glidescope® video-laryngoscopy versus direct laryngoscopy for endotracheal intubation: a systematic review and meta-analysis

Donald E. G. Griesdale, MD · David Liu, MD ·
James McKinney, MD · Peter T. Choi, MD

- 17 trials, 1998 patients
- Relative risk 3.5 for difficult intubation
- Less benefit in "experts"
- "Compared to direct laryngoscopy, Glidescope video-laryngoscopy is associated with improved glottic visualization, particularly in patients with potential or simulated difficult airways."

Awake Fiberoptic Laryngoscopy

- Several published techniques
 - Topical anesthetic alone versus sedative administration
 - Glossopharyngeal/superior nerve blocks
- Transnasal versus Transoral
 - Transnasal may provide more advantageous angle but requires nasal preparation
- Adequate topicalization is paramount to prevent gag and laryngospasm
- **Sedation is contraindicated in the emergent setting due to potential for decompensation**
 - True for noncancerous emergencies, as well
 - Angioedema, anaphylaxis, epiglottitis, etc.

Awake Tracheotomy

- Fang et al. Emergent Awake Tracheostomy. *The Laryngoscope*, Nov 2015
 - 84 patients 2009-2014
 - Malignancy most common indication
 - Supraglottic subsite m/c (48%)
 - 35% local anesthesia alone, 65% local + sedation
 - 32% long-term complications
 - 22% decannulated at a mean 11.8 months

Collaborative Care

Outcomes of intubation in difficult airways due to head and neck pathology

Tim A. Iseli, MBBS, FRACS; Claire E. Iseli, MBBS, MS; J. Blake Golden, MD; Virginia L. Jones, MD; Arthur M. Boudreaux, MD; James R. Boyce, MD; David M. Weeks, MD; William R. Carroll, MD, FACS

- Iseli et al. *ENT Journal* 2012
- University of Alabama at Birmingham
- 152 sequential difficult airways in ENT patients
 - 2 Head/Neck anesthesiologists, 19 general anesthesiologists
 - 44% awake fiberoptic
 - 1.3% awake tracheotomy
 - Fewer changes in plan, perceived difficulty under HN anesthesia care

Head and Neck Cancer: Summary

- Increasing airway difficulty with higher T-stage
- Trismus due to tumor infiltration of masticatory muscles will not improve dramatically with paralytics
- Bulky supraglottic or tongue base tumors may preclude direct laryngoscopy
- Glidescope may facilitate orotracheal intubation after radiation
- Awake fiberoptic intubation is rarely wrong
- Communication between anesthesia and surgical teams is paramount

Thank you

Sunday, July 24

General Session

Payment System Reform

James Rawson, MD

Chairperson of Radiology

Augusta University

Augusta, GA

At the conclusion of the presentation, the learner should be able to:

1. Review current models of reimbursement.
2. Review proposed models of reimbursement.

Payment system reform Georgia Society of Anesthesiologists 2016 Summer Meeting

Jim Rawson, MD, FACR
P.L. J. Luther and Ada Warren Professor
Chair, Radiology and Imaging
Medical College of Georgia
Augusta University

AUGUSTA UNIVERSITY



- Nothing to disclose

AUGUSTA UNIVERSITY

Learning objectives

- Review current models of reimbursement
- Review proposed models of reimbursement

AUGUSTA UNIVERSITY

Current models of Reimbursement

- Hospital
- Ambulatory Surgery Center
- Physician

AUGUSTA UNIVERSITY

Physician Reimbursement: Volume

- Fee for Service
- Contract
- Employed

AUGUSTA UNIVERSITY

Physician Incentives

- Meaningful Use
- PQRS

AUGUSTA UNIVERSITY

Transition from Volume to Value

- What is value?
- Value to who?
- How much does value pay?

Payments linked to Quality

Basing Medicare Payments on Value

- January 26, 2015 Announcement
- Half of all Medicare payments to physicians and hospitals in 2018: alternative payment models e.g. medical homes and accountable care organizations (ACOs)
- Department of Health and Human Services (HHS) has set a goal of tying 85% of all fee-for-service payments to quality and cost measures by 2016, and 90% by 2018.

MACRA

- Medicare Access and CHIP Reauthorization Act of 2015
- Passed House 3/26/2015
- Passed Senate 4/14/2015
- Signed into Law 4/16/2015
- Repeals 1997 Sustainable Growth Rate Physician Fee Schedule Update
- Changes Medicare PFS Payment

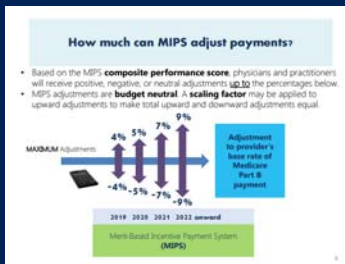
Future Physician Fee Schedule

- Merit-Based Incentive Payment System (MIPS)
- Incentives for participation in Alternate Payment Model (APM)
- January 1, 2019 – MIPS and APM incentive payments begin
- EPs can participate in MIPS or meet requirements to be qualifying APM participant
- Replacing Physician Quality Reporting Program (PQRS), Value-Based Payment Modifier, Medicare EHR Incentive Program

Domains of MIPS

- Quality measures (30% of Score)
- Resource Use measures (30% of Score)
 - Counts for not more than 10% in 2019 and 15% in 2020; additional weight of at least 20% and 15%, respectively, are added to the Quality score in those years
- Clinical Improvement Activities (15% of Score)
 - Sub-Categories- Includes Better Off-Hours Access, Care Coordination
 - Patient Safety, Beneficiary Engagement
 - Others as Determined by Secretary
- Meaningful Use of EHRs (25% of Score)

MIPS



<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-LAN-PPT.pdf>

Exceptions to MIPS adjustment

- First year of Medicare participation
- Participants in eligible APM who qualify for the bonus payment
- Below low Threshold

APM-incentive quality and value

- ✓ **CMS Innovation Center model** (under section 1115A, other than a Health Care Innovation Award)
- ✓ **MSSP** (Medicare Shared Savings Program)
- ✓ **Demonstration** under the Health Care Quality Demonstration Program
- ✓ **Demonstration** required by Federal Law

<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-LAN-PPT.pdf>

APM reimbursement

Those who participate in **the most advanced** APMs may be determined to be **qualifying APM participants ("QPs")**. As a result, QPs:

1. Are **not subject** to MIPS
2. Receive 5% lump sum **bonus payments** for years 2019-2024
3. Receive a **higher fee schedule update** for 2026 and onward

<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-LAN-PPT.pdf>

ACO

- Accountable Care Organizations



<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-LAN-PPT.pdf>

Medicare Process

- Listening Sessions
- Proposed Rule
- Comment Period
- Final Rule

- Proposed Rule and Final Rule Published in Federal Registry

Themes

- Population health
- Value
- Patient engagement
- Information technology
- Appropriate utilization
- Prevention/Public Health

Medicare vs Non-Medicare

Thank you

jrawson@augusta.edu
[@Jim_Rawson_MD](#)

Error, Competencies and Standards in Critical Care

Timothy G. Buchman, PhD, MD

Emory University

Atlanta, GA

At the conclusion of the presentation, the learner should be able to:

1. Describe a taxonomy of error in conception and delivery of critical care.
2. Discuss the evolution of competency-based training in critical care.
3. Compare the training strategies of aviation and critical care.
4. Contrast the use of competencies and standards in evaluation of aviation and of critical care professionals.

Dr. Timothy Buchman, Ph.D., M.D.

Dr. Buchman is the founding director of the Emory's Critical Care Center (ECCC), which is integrating ICUs throughout the Emory Healthcare system. The Center has assembled clinicians, teachers and investigators from diverse disciplines to deliver the Right Care, Right Now, Every Time. Dr. Buchman is past president of the Shock Society, the Society for Complex Acute Illness and the Society of Critical Care Medicine, the latter being the largest organization of critical care professionals worldwide. His research has spanned the bench-to-bedside continuum, including NIH-funded studies of physiological dynamics; of patient monitoring; of the genetics of sepsis and of ICU end-of-life care.


Before joining Emory, he served as the Edison Professor of Surgery and Director of Acute and Critical Care Surgery at Washington University in St. Louis. Prior to his 15 years on the faculty at Washington University, Dr. Buchman directed the surgical intensive care unit and founded the trauma service at Johns Hopkins Hospital in Baltimore, where he completed his surgical training.

Dr. Buchman's current activity focuses on promoting situation awareness in critical care to achieve better health, better care and lower costs. He is the principal investigator on a Round 1 CMMI Healthcare Innovation Award entitled "Rapid Training and Deployment of Non-Physician Providers in Critical Care". The award includes two innovations—telemedicine and the use of advanced practice providers—to efficiently deliver high-reliability care to locations where critical care physicians are in short supply. Now in its fourth year, the award has achieved its objectives of delivering better, smarter care to the federal beneficiaries it serves. Scaling and dissemination have started, with three Non-Physician Provider Program graduates recruited to healthcare systems in Michigan, Texas and Washington (state) to establish their own training programs.

Error, Competencies, and Standards in Critical Care


Emory Critical Care Center

Tim Buchman
2016 GSA Summer Meeting
July 22-24, 2016




Disclosures Relevant To This Presentation

- I am the Editor-In-Chief of Critical Care Medicine
- This is a part-time position.
 - Stipend paid for by the Society of Critical Care Medicine to Emory University
- I am an advisor to a not-for-profit philanthropy, the James S. McDonnell Foundation.
 - Honorarium transferred to Emory.

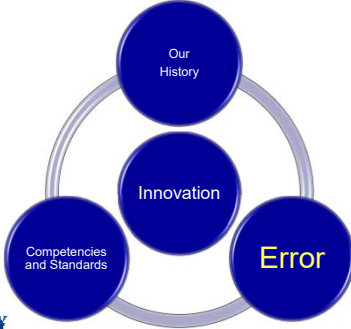


Disclaimers

- The **opinions expressed are strictly personal**. They may or may not represent the opinions and views of any organization or publication with which I am affiliated.
- The contents of this presentation are solely the **responsibility of the presenter**.




An excerpt from a three-lecture arc on Innovation in Critical Care




Objectives and how I propose to Achieve Them


1. Describe a taxonomy of error in conception and delivery of critical care.
LECTURE
2. Discuss the evolution of competency-based training in critical care.
DISCUSSION of our APP Training Program
3. Compare the training strategies of aviation and critical care.
DISCUSSION of Personal Experience
4. Contrast the use of standards versus competencies in evaluation of aviation and of critical care professionals.
DISCUSSION of a transition: "Practical Test Standards" to "Airman Certification Standards"



How should we discuss innovation and errors?





Cognitive Error – Patient Level



Small-scale (patient-level) cognitive errors include:


- Anchoring—getting stuck in a belief because of specific finding
- Availability—remembering recent cases
- Attribution—thinking that a patient has a particular problem because of labeling (old age, alcohol use etc)




Cognitive Error: Situational Level

Situational cognitive errors are data based and come in three general types:


- failure to receive/perceive data;
- failure to comprehend data;
- failure to accurately project the consequences of decisions based on the data.



Air Traffic Control



eICU (telehealth)






Cognitive Error – Large Scale

Common in critical care



Arises from need to believe in innovation that can produce extraordinary outcomes

Often “demonstrated” in “pivotal trial” implying a new “best practice”

Rapid and wide adoption, slow realization of problems

Neurological System

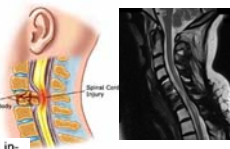
Neurological System

The New England Journal of Medicine

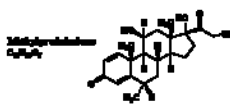

Volume 377 MAY 11, 1988 Number 20

A RANDOMIZED, CONTROLLED TRIAL OF METHYLPREDNISOLONE OR HALOGENE D₂ FRACTURED VERTEBRAL BODY

Results of the Second National Acute Spinal Cord Injury Study



We conclude that in patients with acute spinal-cord injury, treatment with methylprednisolone in the dose used in this study improves neurologic recovery when the medication is given in the first eight hours.

Neurological System

The New England Journal of Medicine

Volume 377 MAY 11, 1988 Number 20


A RANDOMIZED, CONTROLLED TRIAL OF METHYLPREDNISOLONE OR HALOGENE D₂ FRACTURED VERTEBRAL BODY

Results of the Second National Acute Spinal Cord Injury Study

Statement of efficacy based on post-hoc subgroup analysis of 45 vs. 44 patients (!)

Table 5. Change in Neurologic Measures Six Weeks and Six Months after Injury in Patients Who Received the Study Drug within Eight Hours of Injury.*

CATEGORY OF INJURY AND MEASURE†	SIX WEEKS			SIX MONTHS		
	METHYLPREDNISOLONE	HALOGENE D ₂	PLACEBO	METHYLPREDNISOLONE	HALOGENE D ₂	PLACEBO
change in score (P value)						
Flgic with total sensory loss						
No. of patients	47	37	46	45	34	44
Motor	6.2 (0.021)	3.2 (0.394)	1.3 (8)	10.5 (0.019)	7.5 (0.254)	4.2 (8)
Proprietary	5.9 (0.062)	3.0 (0.690)	2.2 (8)	9.4 (0.038)	4.2 (0.947)	4.0 (8)
Touch	6.8 (0.051)	3.7 (0.622)	2.6 (8)	9.7 (0.050)	7.1 (0.374)	4.7 (8)



Neurologic system—what happened

EMORY
MEDICAL CENTER

12

Neurologic system—what happened

EMORY
MEDICAL CENTER

13

Neurologic System

- Many additional trials performed.
- No clear evidence of benefit
- Clear evidence of harm
- 23 years after prior study, recommendations finally changed.

Pharmacological Therapy for Acute Spinal Cord Injury

KEY WORDS: Class I, Longitudinal, Methylprednisolone, NIOSCI Study, Pharmacologic Therapy, Spinal Cord Injury
Anesthesiology 2009; 111: 2012 DOI: 10.1097/ALN.0b013e318191701a www.anesthesiology.com

RECOMMENDATIONS

Level I

- Administration of methylprednisolone (MP) for the treatment of acute spinal cord injury (SCI) is not recommended. Clinicians considering MP therapy should bear in mind that the drug is not Food and Drug Administration (FDA) approved for this application. There is no Class I or Class II medical evidence supporting the clinical benefit of MP in the treatment of acute SCI. Scattered reports of Class III evidence claim inconsistent effects likely related to random chance or selection bias. However, Class I, II, and III evidence exists that high-dose steroids are associated with harmful side effects including death.

EMORY
MEDICAL CENTER

14

Heart and Vascular System

EMORY
MEDICAL CENTER

15

Heart and Vascular System: Supernormal Oxygen Delivery

EMORY
MEDICAL CENTER

20

Heart and Vascular System: Supernormal Oxygen Delivery

Physiologic Patterns in Surviving and Nonsurviving Shock Patients

Use of Sequential Cardiopulmonary Variables in Defining Criteria for Therapeutic Goals and Early Warning of Death
Arch Surg/Vol 106, May 1973 William C. Shoemaker, MD, Elton S. Mangano, Elton Kaplan, BS, David H. Reynolds, PhD, New York

Therefore, the data from surviving patients of this series were used to frame retrospectively a set of provisional physiologic goals for therapy in the severely ill, postoperative patient. These therapeutic goals are as follows: (a) cardiac index about 4 to 5.5 liters/min/sq m; ie, an increase of 30% to 80% above normal; (b)

EMORY
MEDICAL CENTER

21

Heart and Vascular System: Suprnorm Oxygen Delivery

Critical Care Medicine
Copyright © 1993 by Williams & Wilkins

Vol. 21, No. 4
Printed in U.S.A.


— Clinical Investigations —

Effect of maximizing oxygen delivery on morbidity and mortality rates in critically ill patients: A prospective, randomized, controlled study

MIHAE YU, MD, MITCHELL M. LEVY, MD, PHILIP SMITH, MD, SHARON A. TAKIGUCHI, RN, MS, ALISON MIYASAKI, RN, MS, SALLY A. MYERS, RN, MS

Interventions: Patients were randomized into treatment and control groups. The treatment group was assigned a therapeutic \dot{D}_oI indexed (\dot{D}_oI) goal of >600 mL/min/m². Interventions to attain this goal included fluid boluses, administration of blood products, and the use of inotropes.

Patients who reached suprnorm values ($\dot{D}_oI >600$ min/m²), regardless of the treatment received to reach that goal, had a lower mortality rate than patients who did not.



Heart and Vascular System: Suprnorm Oxygen Delivery

Critical Care Medicine
Copyright © 1993 by Williams & Wilkins

Vol. 21, No. 4
Printed in U.S.A.

— Clinical Investigations —

Effect of maximizing oxygen delivery on morbidity and mortality rates in critically ill patients: A prospective, randomized, controlled study


MIHAE YU, MD, MITCHELL M. LEVY, MD, PHILIP SMITH, MD, SHARON A. TAKIGUCHI, RN, MS, ALISON MIYASAKI, RN, MS, SALLY A. MYERS, RN, MS

Subgroup Name	Characteristic
T ≥ 600	Treatment group (n = 21) which achieved \dot{D}_oI of >600 mL/min/m ²
C 450-550	Control group (n = 15) treated to normal \dot{D}_oI of 450-550 mL/min/m ²
T <600	Treatment group (n = 12) which failed to reach \dot{D}_oI of 600 mL/min/m ²
C ≥ 600	Control group (n = 14) which self-generated to \dot{D}_oI of ≥ 600 mL/min/m ²
T & C <450	Patients (n = 5) from both groups who failed to reach even normal \dot{D}_oI of 450 mL/min/m ²

Table 7. \dot{D}_oI , \dot{V}_oI , mortality and length of stay of the subgroup



	T ≥ 600 (n = 21)	C 450-550 (n = 15)	T <600 (n = 12)	C ≥ 600 (n = 14)	T & C <450 (n = 5)	p Value
\dot{D}_oI	714 ± 189*	513 ± 80	466 ± 81	742 ± 129	359 ± 64	.001
\dot{V}_oI	137 ± 42	113 ± 29	109 ± 30	139 ± 27	99 ± 22	.008
Mortality	14% (3)	53% (8)	58% (7)	14% (2)	60% (3)	.01

Patients who reached suprnorm values ($\dot{D}_oI >600$ min/m²), regardless of the treatment received to reach that goal, had a lower mortality rate than patients who did not.





Suprnorm Oxygen Delivery: What Happened

Critical Care Medicine


+



24

Suprnorm Oxygen Delivery: What Happened

Critical Care Medicine




+


25

...and finally

The Journal of TRAUMA® Injury, Infection, and Critical Care

J Trauma. 2002;53:825-832.

Normal versus Suprnorm Oxygen Delivery Goals in Shock Resuscitation: The Response Is the Same


Bruce A. McKinley, PhD, Rosemary A. Kozar, MD, PhD, Christine S. Coccomor, MD, Rosemary A. Kozar, MD, PhD, R. Matthew Sailors, PhD, Drua N. Ware, MD, and Frederick A. Moore, MD

Suprnorm Trauma Resuscitation Causes More Cases of Abdominal Compartment Syndrome

Zaoh Balogh, MD; Bruce A. McKinley, PhD; Christine S. Coccomor, MD; Rosemary A. Kozar, MD, PhD; Alicia Valdivia, RN; R. Matthew Sailors, PhD; Frederick A. Moore, MD



Conclusion: Suprnorm resuscitation, compared with normal resuscitation, was associated with more lactated Ringer infusion, decreased intestinal perfusion (higher GAP_{CO2}), and an increased incidence of IAH, ACS, multiple organ failure, and death.

Arch Surg. 2003;138:637-643

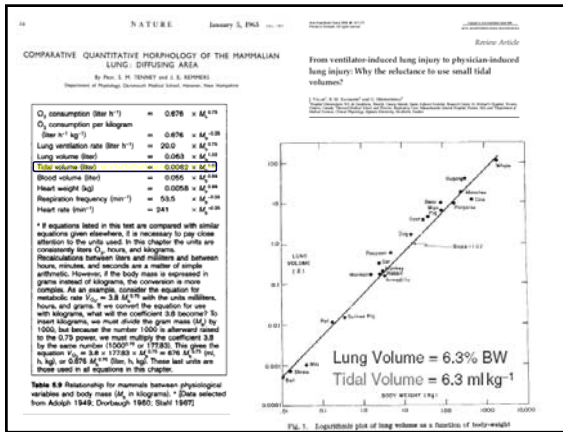


26

Respiratory System

27



The ARDSNet Trial

The New England Journal of Medicine

VENTILATION WITH LOWER TIDAL VOLUMES AS COMPARED WITH TRADITIONAL TIDAL VOLUMES FOR ACUTE LUNG INJURY AND THE ACUTE RESPIRATORY DISTRESS SYNDROME

The Acute Respiratory Distress Syndrome Network*

Variable	Group Receiving Lower Tidal Volumes	Group Receiving Traditional Tidal Volumes	P Value†
Death before discharge home and breathing without assistance (%)	31.0	39.8	0.007
	6.8 ml/kg	> 8 ml/kg	

Statistically significant and clinically important reduction in death using low tidal volume strategy.

22 percent reduction in death

EMORY CRITICAL CARE CENTER

Neurologic system—what happened

THE NEW ENGLAND JOURNAL OF MEDICINE

6 ml/kg

RAISED FROM THE DEAD

EMORY CRITICAL CARE CENTER

Yes, but off-trial mortality looks at least as good as the strategy proposed in the trial

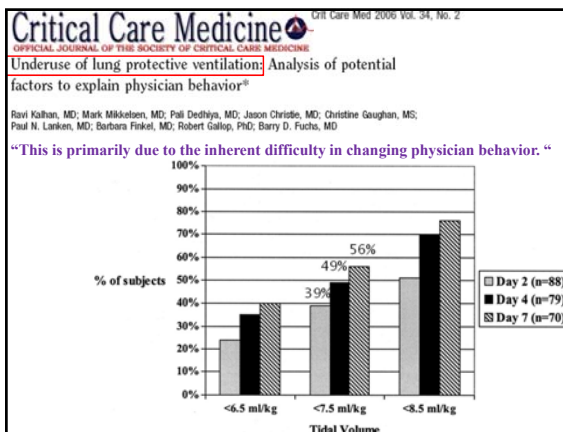
Editorials

Mechanical ventilation in ARDS: One size does not fit all[®]

In light of the unexplained high control mortality rate reported in the trial by Kallet et al. and the marked relationship between compliance and mortality in the low tidal volume arm of the ARDS trial, a single ventilatory strategy such as 6 ml/kg tidal volume ventilation may not be ideal for all patients with ARDS and ALI.

Katherine J. Deans, MD
 Peter C. Minnick, MD
 Critical Care Medicine
 Department
 Clinical Center
 National Institutes of Health
 Bethesda, MD
 Department of Surgery
 Massachusetts General Hospital
 Boston, MA

EMORY CRITICAL CARE CENTER



Oh well, what about...

Methylprednisolone

$C_{22}H_{35}O_6$

EMORY CRITICAL CARE CENTER

Well, perhaps corticosteroids are better

Caring for the Critically Ill Patient

Effect of Prolonged Methylprednisolone Therapy in Unresolving Acute Respiratory Distress Syndrome

A Randomized Controlled Trial

G. Umberto Mehta, MD, A. Stacy Headley, MD, Ernest Gordon, MD, Stephanie J. Canon, PhD, Nisha A. Srinivasan, PhD, Shrey Kishor Phansalkar, Elizabeth A. Tobey, PhD

JAMA. 1998 Jul 8;280(2):159-65

Table 3.—Outcome Measures*

Outcome Measures	Methylprednisolone	Placebo	P Value
Survivors of ICU admission, No. (%)	16 (100)	3 (37)	.002
Survivors of hospital admission, No. (%)	14 (87)	3 (37)	.03
Death associated with unresolved ARDS, No.†	0 of 2	5 of 5	NA
MOOS-free days by study day 28, mean (SEM)‡	16 (2)	6 (2)	.005
Duration of mechanical ventilation, median, d	11.5	23	.001

EMORY CRITICAL CARE CENTER 34

Tight Control of Glucose: What Happened

JAMA The Journal of the American Medical Association

EMORY CRITICAL CARE CENTER 35

Respiratory System: ARDS

The NEW ENGLAND JOURNAL of MEDICINE

Efficacy and Safety of Corticosteroids for Persistent Acute Respiratory Distress Syndrome

CONCLUSIONS: These results do not support the routine use of methylprednisolone for persistent ARDS despite the improvement in cardiopulmonary physiology. In addition, starting methylprednisolone therapy more than two weeks after the onset of ARDS may increase the risk of death. (ClinicalTrials.gov number, NCT00295263)

Table 2. Primary and Secondary Outcomes and Adverse Events Defined A Priori According to the Protocol.*

Variable	Placebo (N=91)	Methylprednisolone (N=89)	P Value
60-Day mortality according to time from ARDS onset			
7-13 Days (%)	36	27	0.26
No. of patients	66	66	
>14 Days (%)†	8	35	0.02
No. of patients	23	23	

EMORY CRITICAL CARE CENTER 36

Renal System

EMORY CRITICAL CARE CENTER 37

Renal System

The NEW ENGLAND JOURNAL of MEDICINE

Effects of Dopamine in Man: Augmentation of Sodium Excretion, Glomerular Filtration Rate, and Renal Plasma Flow*

ROBERT H. MCDONALD, JR., D. LEON I. GOLDBERG, J. DREW L. McSAY, and JAMES P. TAYLOR, JR.

DRUG THERAPY
Dopamine—Clinical Uses of an Endogenous Catecholamine
LEON I. GOLDBERG, Ph.D., M.D.

Preliminary studies have demonstrated the efficacy of dopamine as part of the regimen for treatment of acute renal failure^{1,2}

EMORY CRITICAL CARE CENTER 38

Renal System

THE LANCET Critical Care Medicine

DOPIAMINE HYDROCHLORIDE IN OLIGURIC STATES

I. S. HENDERSON, T. J. BEATTIE, A. C. KENNEDY
University Department of Medicine, Royal Infirmary, Glasgow G4 0GF

Summary Low-dose dopamine infusion (1 µg/kg/min) produced a diuresis in early oliguric acute tubular necrosis. No complications were encountered during or after the infusion.

THE LANCET, OCTOBER 18, 1980

TABLE II.—RESPONSE TO DOPAMINE INFUSION

Variable	Mean hourly values for the 4-h period before dopamine and the first 7-h periods during dopamine infusion				Significance ^a
	Before dopamine	Period 1	Period 2	Period 3	
Urine volume (ml/h)	15.6	186.5	118.7	87.1	<0.001
Serum blood urea nitrogen (mg/dl)	11.8	11.4	11.1	10.1	NS
Arterial pulse rate (beats/min)	86.1	86.2	86.3	86.2	NS
Central venous pressure (cm water)	86.1	86.2	86.3	86.2	NS
Central venous pressure (mmHg)	64.2	64.1	64.2	64.2	<0.001

EMORY CRITICAL CARE CENTER 39

Renal System : What Happened

Critical Care Medicine

THE LANCET
The NEW ENGLAND JOURNAL OF MEDICINE

Nc1ccc(O)c(O)c1
Dopamine

EMORY
CRITICAL CARE CENTER

40

Renal System: 20 years later

Critical Care Medicine

Use of dopamine in acute renal failure: A meta-analysis

John A. Kellum, MD; Janine M. Decker, RN

17 of these were randomized clinical trials (n = 854). Dopamine did not prevent mortality, (relative risk, 0.90 [0.44–1.83]; $p = .92$), onset of acute renal failure (relative risk, 0.81 [0.55–1.19]; $p = .34$), or need for dialysis, (relative risk, 0.83 [0.55–1.24]; $p = .34$).

Conclusions: The use of low-dose dopamine for the treatment or prevention of acute renal failure cannot be justified on the basis of available evidence and should be eliminated from routine clinical use. (Crit Care Med 2001; 29:1526–1531)

EMORY
CRITICAL CARE CENTER

41

GI System

EMORY
CRITICAL CARE CENTER

42

GI System: total parenteral nutrition

1972

ANNALS OF SURGERY
A Monthly Review of Surgical Science Since 1885

Parenteral Hyperalimentation and Its Practical Applications

J. M. OWEN, M.D., W. E. BOHAK, JR., M.D., RAYMOND C. BASAGK, M.D.
From the Department of Surgery, General General Hospital, Greenville, South Carolina 29601

By use of this method up to 5,000 calories and 20 grams of nitrogen can be given daily,² with positive nitrogen balance and weight gain attainable even in the immediate postoperative period.¹¹

It is our hope that by reviewing our experience we can persuade others in similar institution to embark on analogous programs.

- 1968: Dr. Stanley Dudrick reports use of total parenteral nutrition to support children with short gut syndromes

EMORY
CRITICAL CARE CENTER

43

GI System: What Happened

ANNALS OF SURGERY
A Monthly Review of Surgical Science Since 1885

EMORY
CRITICAL CARE CENTER

44

GI System: total parenteral alimentation

JAMA The Journal of the American Medical Association

Caring for the Critically Ill Patient
December 15, 1996, Vol 276, No. 23

Total Parenteral Nutrition in the Critically Ill Patient
A Meta-analysis

David R. Feingersh, MD, FRCP(C), MSc; Brian MacDonnell, MD, FRCP(C); Leslie Roberts, MD; John W. Wilson, MD, FRCP(C)

Abel et al.¹ 1976
Huber and Fischer² 1977
Fleuret et al.³ 1979
Thompson et al.⁴ 1981
Muller et al.⁵ 1982
Wernick et al.⁶ 1983
Brennan et al.⁷ 1984
Aikawa et al.⁸ 1986
Muller et al.⁹ 1986
Sole et al.¹⁰ 1987
Sallatone et al.¹¹ 1988
Maguid et al.¹² 1989
Smith and Harsanyi¹³ 1988
Fan et al.¹⁴ 1989
Figueras et al.¹⁵ 1988
Harrison et al.¹⁶ 1989
Woochton and Smith,¹⁷ 1989
Oys et al.¹⁸ 1990
Ridley et al.¹⁹ 1990
Veterans Affairs,²⁰ 1991
Von Meyenfeldt et al.²¹ 1992
Huang et al.²² 1992a
Huang et al.²³ 1992b
Sandstrom et al.²⁴ 1993
Fan et al.²⁵ 1994
Jirassakuldech et al.²⁶ 1995
Charrat et al.²⁷ 1996

Overall Risk Ratio

EMORY
CRITICAL CARE CENTER

45

GI System: hyperalimentation

J Am Diet Assoc. 1998 Jul;98(7):795-806.

Overfeeding macronutrients to critically ill adults: Metabolic complications

CATHERINE J. ALZINI, MS, RD; GENA S. STANER, MS, RN, COHN; CHARLES E. WILES III, MD

Complication
Azotemia
Fat overload syndrome
Hepatic Steatosis
Hypercapnia
Hyperglycemia
Hyperglycemia hyperosmolar nonketotic syndrome

46

GI System: hyperalimentation

THE LANCET 2006

Parenteral nutrition in adult inpatients with functioning gastrointestinal tracts: assessment of outcomes

Seyi Ogunje

Outcome in human beings

Parenteral nutrition was developed to support patients who did not have functioning gastrointestinal tracts, since without nutritional support many of them would die. However, as a result of the ease of administration, a failure to properly understand gut function and enteral feeding techniques, and an absence of simple enteral feeding devices, parenteral nutrition developed as a major technique for feeding patients with functioning gastrointestinal tracts.

Previously well-nourished patients rarely benefit from the acute administration of parenteral nutrition.

47

Endocrine System

48

Endocrine System: Glucose

- Maintaining blood glucose between 80-110 mg/dl cut ICU mortality in half!

In conclusion, the use of exogenous insulin to maintain blood glucose at a level no higher than 110 mg per deciliter reduced morbidity and mortality among critically ill patients in the surgical intensive care unit, regardless of whether they had a history of diabetes.

49

Tight Control of Glucose: What Happened

50

Tight Control of Glucose: Ambulatory Patients

- In ambulatory patients, tight control of glucose causes an INCREASE in mortality.

51

Tight Control of Glucose: ICU Patients

The NEW ENGLAND JOURNAL of MEDICINE
MARCH 26, 2009

Intensive versus Conventional Glucose Control in Critically Ill Patients
The NICE-SUGAR Study Investigators*

- In general critically ill patients (NOT CT surgical patients on TPN), tight control of glucose causes an INCREASE in mortality.

EMORY
CRITICAL CARE CENTER

Hematologic System

EMORY
CRITICAL CARE CENTER

Hematologic System: Correction of Anemia

JAMA The Journal of the American Medical Association

Efficacy of Recombinant Human Erythropoietin in Critically Ill Patients
A Randomized Controlled Trial

JAMA. 2002;288:2827-2835

Erythropoietin reduces requirement for transfusion in critically ill patients

	Placebo (n=450)	rhEPO (n=450)	P Value†
Units transfused per patient, No.	3,035 (40)	2,248 (76)	
Mean (SD)	2 (1.4)	1 (0.3)	<.001
Median (IQR)	0 (0-2)	0 (0-1)	
95% CI of upper limit	16 (2.0)	10 (2.7)	
95% CI of lower limit	-16 (2.0)	-10 (2.7)	

EMORY
CRITICAL CARE CENTER

Hematologic System: Correction of Anemia

+

PROCRIT[®] 10
Darbepoetin Alfa — No Phosphate
10,000 U/mL/10mL

EMORY
CRITICAL CARE CENTER

Correction of Anemia: What Happened

The NEW ENGLAND JOURNAL of MEDICINE
SEPTEMBER 8, 2007

Efficacy and Safety of Epoetin Alfa in Critically Ill Patients

Table 4. Serious Adverse Events*

Event	Epoetin alfa (n=1128)	Placebo (n=1128)	P Value
Clinically relevant thrombotic vascular event	120 (10.7)	83 (7.4)	0.008
Pulmonary embolism	16 (1.4)	12 (1.1)	0.17
Deep venous thromboses	43 (3.8)	42 (3.7)	0.90
Cardiovascular event	14 (1.2)	16 (1.4)	0.52
Myocardial infarction	13 (1.2)	4 (0.4)	0.08
Cardiac arrest or ventricular fibrillation	13 (1.2)	12 (1.1)	0.69

CONCLUSIONS

The use of epoetin alfa does not reduce the incidence of red-cell transfusion among critically ill patients, but it may reduce mortality in patients with trauma. Treatment with epoetin alfa is associated with an increase in the incidence of thrombotic events. (ClinicalTrials.gov number, NCT00091910.)

Variable	Epoetin Alfa (N=733)	Placebo (N=727)	Relative Risk [95% CI]	P Value
Patients receiving a transfusion — no. (%)	337 (46.0)	351 (48.3)	0.95 (0.85-1.06)	0.34

EMORY
CRITICAL CARE CENTER

Infection/Immune System

EMORY
CRITICAL CARE CENTER

Sepsis Rates Rising

ORIGINAL ARTICLE

The Epidemiology of Sepsis in the United States from 1979 through 2000

Greg S. Martin, M.D., David M. Mannino, M.D., Stephanie Eaton, M.D., and Marc Moss, M.D.

Figure 1. Population-Adjusted Incidence of Sepsis, According to Sex, 1979-2000. Points represent the annual incidence rate, and 1 bars the standard error.

Figure 2. Case-Fatality Mortality Rate among Patients Hospitalized for Sepsis, 1979-2000. Mortality averaged 27.8 percent during the first six years of the study and 17.9 percent during the last six years. The 1 bars represent the standard error.

EMORY
CRITICAL CARE CENTER

Drotrecogin alfa (Xigris)

The New England Journal of Medicine

Copyright © 2001 by the Massachusetts Medical Society

VOLUME 344 NUMBER 18 MAY 18, 2001

EFFICACY AND SAFETY OF RECOMBINANT HUMAN ACTIVATED PROTEIN C FOR SEVERE SEPSIS

Gregory R. Bernard, M.D., Jean-Louis Vincent, M.D., Ph.D., Peter Francisco-Leyro, M.D., Silvio F. Lobo, M.D., Alex Frenkel, D.D., M.D., Ph.D., Alan Levy, M.D., Ph.D., Jan T. Schwab, M.D., Gert S. Gommert, M.D., Bruce D. Gelman, Ph.D., E. Walter Smith, M.D., M.P.H., and Gregory J. Fisher, M.D., for the PROWESS Sepsis Group*

EMORY
CRITICAL CARE CENTER

Infection/Immune system—what happened

The NEW ENGLAND JOURNAL of MEDICINE

RAISED FROM THE DEAD

EMORY
CRITICAL CARE CENTER

Concerns about safety and efficacy

clinical investigations in critical care

Extended Evaluation of Recombinant Human Activated Protein C United States Trial (ENHANCE US)¹

A Single-Arm, Phase 3B, Multicenter Study of Drotrecogin Alfa (Activated) in Severe Sepsis

Gordon B. Bernard, MD, FCCP, Benjamin D. Maples, MD, FCCP, Harvey M. Shanson, MD, FCCP, E. Wesley Ho, MD, MPH, FCCP, Arthur P. Wheeler, MD, FCCP, Howard Levy, MD, FCCP, JMD, FCCP, Ken Wang, MD, and Thomas J. Wright, MD, for the Extended Evaluation of Recombinant Human Activated Protein C United States Investigators¹

- Worse survival than original study.
- More serious bleeding than original study

EMORY
CRITICAL CARE CENTER

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MAY 31, 2002 VOL. 346, NO. 22

Drotrecogin Alfa (Activated) in Adults with Septic Shock

Y. Hsiao-Ryan, M.D., S. Taylor-Thompson, M.D., Philip S. Barie, M.D., M.B.A., Jean-François Dintaman, M.D., Jean S. Douglas, M.D., Simon Fink, F.R.C.P., Bruce Gelman, M.D., John C. Marshall, M.D., Andrew Wheeler, M.D., Anthony Perrino, M.D., Ph.D., Didier Payen, M.D., Ph.D., John Tenkum, M.D., Ph.D., Hanso K. Al Khalaf, Ph.D., Victor Thompson, M.D., Ph.D., Jonathan Jones, M.B., B.S., William L. Meade, M.D., Ph.D., Richard Vignone, M.D., and Mark D. Williams, M.D., for the PROWESS-SHOCK Study Group¹

Our study showed that DrotAA was not beneficial when administered to a population of patients for which it was an approved treatment. The fact that we found no benefit in any of the prespecified subgroups should reassure clinicians who no longer have DrotAA available to treat patients with septic shock.³⁷

EMORY
CRITICAL CARE CENTER

Synthesis

- A common problem was reported to yield to a simple solution that could be rapidly (albeit in the case of drugs expensively) implemented.
- Change was implemented on a huge scale, much larger than could possibly be justified by the study.
- Patients were likely harmed. The new standard was either discarded or extensively modified.
- In each case, the new standard involved a seemingly simple change in practice

EMORY
CRITICAL CARE CENTER

Synthesis - 2

- Humans are not only complicated (meaning that they have multiple interacting parts) but also complex (meaning that the physiology of the whole cannot be predicted by summing the physiology of the component parts).
- Critical care “works” because critical care physicians, nurses and allied health personnel create a safe context in which the patient can heal.
- Well-intended interventions might or not have the desired effect.
- However with very high frequency, these newer interventions have unintended adverse effects.

Synthesis - 3

- There are few “miracle treatments” in critical care
- Apparent success of an innovation should trigger caution. Who actually benefitted? Where is the opportunity for improvement and are we focusing there?

A Tale of Two Studies

EMORY UNIVERSITY
Early Goal-Directed Therapy in the Treatment of Severe Sepsis and Septic Shock

Wernli, D. J., et al. *Crit Care Med* 2010; 38(10):e1001-10. doi:10.1097/CCM.0b013e3181d11111

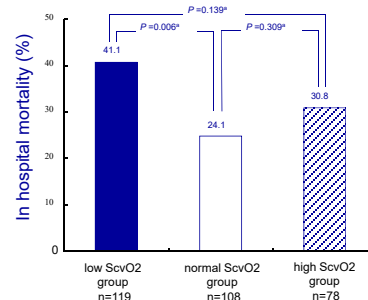
EMORY UNIVERSITY
A Randomized Trial of Protocol-Based Care for Early Septic Shock

Chelimo, C. M., et al. *Crit Care Med* 2010; 38(10):e1001-10. doi:10.1097/CCM.0b013e3181d11111

Table 3. Kaplan-Meier Estimates of Mortality and Causes of Death in Death

Variable	Randomized Therapy (n=102)	Early Goal-Directed Therapy (n=102)	Relative Risk (95% CI)	P Value
In-hospital mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16
30-day mortality	48 (47%)	38 (37%)	0.80 (0.58-1.11)	0.16

Our severe sepsis patients after initial resuscitation: where to focus?



Synthesis - 4

- There are few “miracle treatments” in critical care
- Apparent success of an innovation should trigger caution. Who actually benefitted? Where is the opportunity for improvement and are we focussing there?
- Follow-up evaluation of the innovation “in the wild” on the appropriate patient population is essential.
- If we should be cautious about new treatments in critical care, what should we strongly and immediately embrace?

Objectives and how I propose to Achieve Them

1. Describe a taxonomy of error in conception and delivery of critical care.
LECTURE—DONE

WHICH OF THE FOLLOWING WOULD YOU LIKE TO CHAT ABOUT?

2. Discuss the evolution of competency-based training in critical care.
DISCUSSION of our APP Training Program

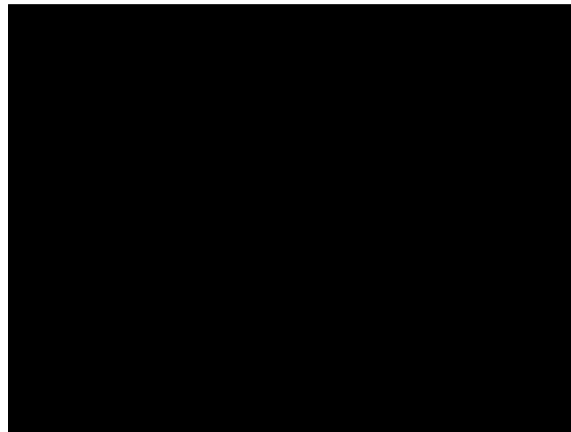
3. Compare the training strategies of aviation and critical care.
DISCUSSION of Personal Experience

4. Contrast the use of standards versus competencies in evaluation of aviation and of critical care professionals.
DISCUSSION of a transition: “Practical Test Standards” to “Airman Certification Standards”

Thank you



EMORY
MEDICAL CENTER



The ICU: Past, Present and Future for Georgia and the Nation

Timothy G. Buchman, PhD, MD

Emory University

Atlanta, GA

Cheryl Hiddleston, MSN

Emory Healthcare Inc.

Atlanta, GA

At the conclusion of the presentation, the learner should be able to:

1. Review the history of ICU telehealth.
2. Discuss the evolution of for-profit and not-for-profit ICU telehealth delivery system.
3. Critically evaluate prior reports of tele-ICU clinical and financial performance.
4. Analyze the tele-ICU component of the Emory CMS Healthcare Innovation Award with respect to clinical and financial performance.

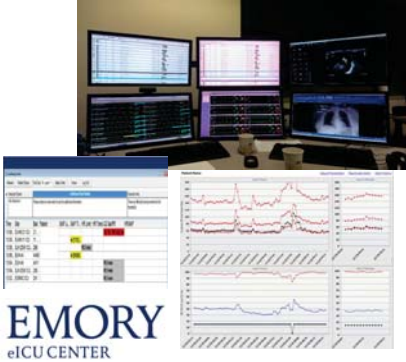
Cheryl Hiddleston MSN, RN, CCRN-E

Cheryl is the Director of the Emory eICU Center. Cheryl completed her Masters degree in Clinical Nurse Leadership from The University of Alabama in 2013. She is a member of The Society of Critical Care Medicine, The American Association of Critical Care Nurses, Georgia Nurses Association, American Telemedicine Association, Society of Critical Care Medicine, and the Georgia Association of Nurse Leaders.

Cheryl joined Saint Joseph's Hospital in 1991 and has held various positions including 15 years in the Medical Surgical ICU as the daily charge nurse, critical care resource nurse, and most recently Administrative Supervisor/Flow Coordinator. She has extensive experience related to critical care, patient logistics, and patient flow/throughput. Cheryl is committed to advancing innovative care delivery methods such as tele-ICU and telehealth, to promote quality care for all patients regardless of location.

Participating in Yoga and road cycling are two of the activities she enjoys most when not working.

Tele ICU: Past, present and future for Georgia



Cheryl Hiddleston
MSN, RN, CCRN-E
Director, Emory eICU Center

Timothy G. Buchman
PhD, MD, FACS, FCCP, MCCM
Founding Director,
Emory Critical Care Center
Emory eICU Center

Disclosures: None



emoryhealthcare.org



Disclosure/Disclaimer

- Neither speaker has financial interests or other conflicts relevant to this talk
 - Dr. Buchman is Editor-in-Chief of *Critical Care Medicine* and also serves as an advisor to the not-for-profit James S. McDonnell Foundation, a grantmaking philanthropy, www.jsmf.org
 - Neither Emory nor the speakers receive ANY financial consideration from Philips Corporation
- All opinions are personal and do not represent those of Emory, SCCM, CMS, or *Critical Care Medicine*

emoryhealthcare.org



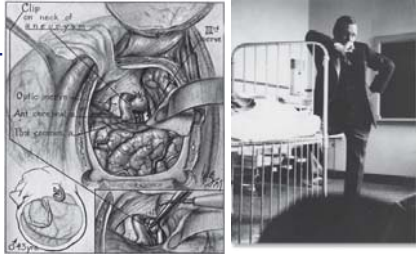
A Short History of Critical Care Medicine

1923:

Walter Dandy, MD. Neurosurgeon at Johns Hopkins

Invented many neurosurgical procedures, such as the clipping of aneurysms.

Also invented the post-operative recovery unit—the first ICU



3

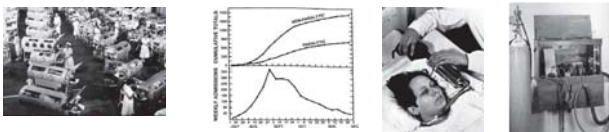


4

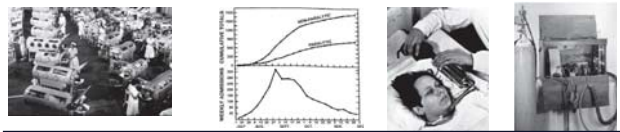
A few historical innovations: from problem to solution



A few historical innovations: from problem to solution



A few historical innovations: from problem to solution



5



6

ICUs evolved as a location to consolidate equipment



1958 Blodgett Memorial Hospital, USA
around-the-clock care for critically ill patients

Led to creation of Coronary Care Units, 1963

First three coronary care units were established in 1963 in Toronto (Toronto General Hospital); Kansas City (Bethany Hospital) and Philadelphia (Presbyterian Hospital).



Results varied widely. The Kansas City group reported that mortality was cut in half—from 39% to 19%—following acute myocardial infarction.



Led to creation of Coronary Care Units, 1963

The Toronto group reported dismal results—no improvement.

Although the equipment was the same, the application was different. **The Toronto group required that a patient with a life-threatening arrhythmia be treated by 8 steps!**

1. Summoning a physician,
2. Wheeling the patient in bed to the nurses station,
3. Placing a board under the chest,
4. Inserting an airway,
5. Beginning chest compressions,
6. Endotracheal intubation,
7. Obtain an ECG and
8. **Finally defibrillate the patient if the defibrillator was available**



*Not just technology.
How technology is applied.*

Data trying to make inroads: Computers and Bedside Monitors (1966)

Efficient Monitoring with a Digital Computer of Cardiovascular Function in Seriously Ill Patients
Herbert Shubin, M.D., F.A.C.P., and Max Harry Weil, M.D., F.A.C.P.
Los Angeles, California

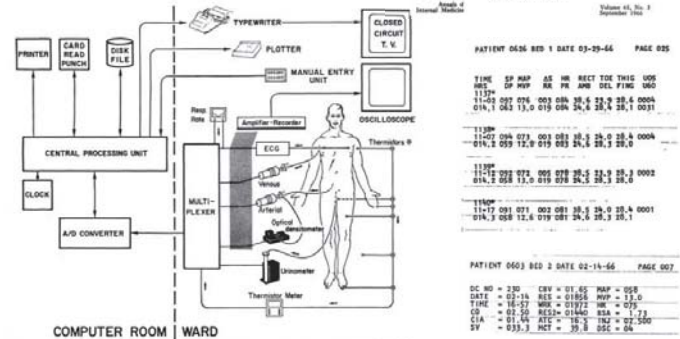
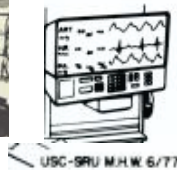
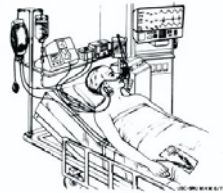


FIGURE 1. Relationship of sensing and display devices to the computer. A detailed description of the flow of information is provided in the text.

The modern Bedside Monitor

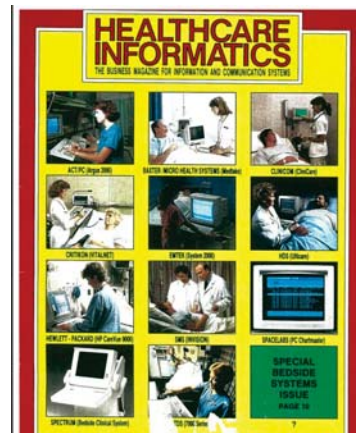


Max Harry ('Hal') Weil, MD Herbert S. Shubin, MD



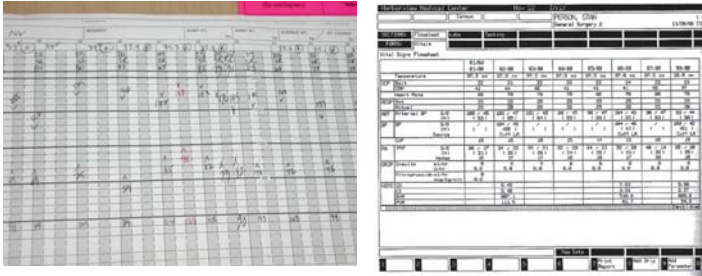
The birth of current generation monitoring

Rise of Informatics – EMR (1)



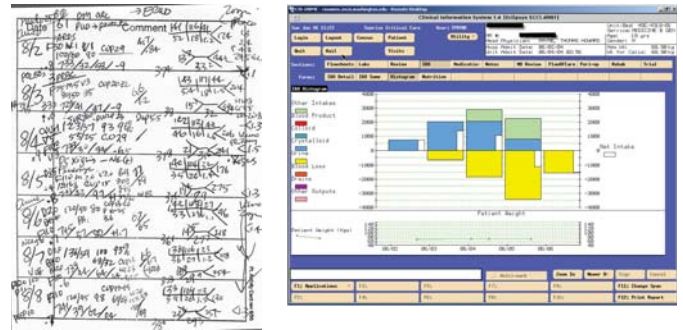
Rise of Informatics– EMR (2)

Circa 1988



Rise of Informatics- EMR (3)

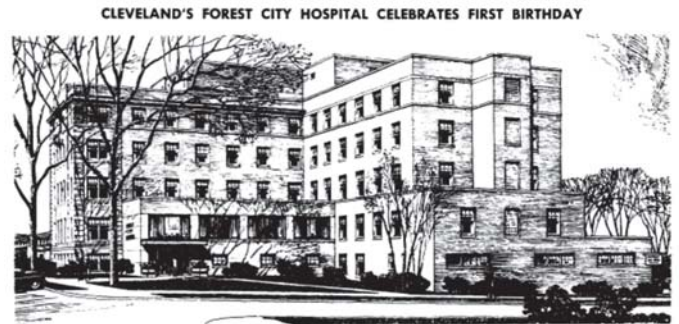
Circa 2009



New York World's Fair, 1964 Bell "Picture Phone"



Forest City Hospital, Cleveland, Ohio



Forest City Hospital, Cleveland, Ohio

Cleveland, Ohio– Mid 1970's

Telemedicine in Critical Care: An Experiment in Health Care Delivery

Betty L. Grundy, MD*
Pauline Crawford, RN†
Paul K. Jones, PhD‡
May Lou Kiley, PhD§
Arnold Reisman, PhD¶
Yoh-Han Pao, PhD†
Edward L. Wilkerson, MD*
J. S. Gravenstein, MD*
Cleveland, Ohio

INTRODUCTION

Because of a scarcity and maldistribution of intensivists — physicians who specialize in critical care medicine — in the United States, there are significant problems with optimal delivery of critical care services.¹ We are investigating telemedicine — medicine practiced from a distance using telecommunications — to assess whether it can solve these problems.² Specifically, we hypothesized that

1) Telemedicine can enable an intensivist to consult with patients in the intensive care unit (ICU) of a small hospital with no critical care physician of its own.

Grundy BL, Crawford P, Jones PK, Kiley ML, Reisman A, Pao YH, Wilkerson EL, Gravenstein JS: Telemedicine in critical care: An experiment in health care delivery. *JACEP* 6:439-444, October, 1977. telemedicine, hospital cooperation.

Cleveland, Ohio- Mid 1970's



Fig. 1. Mobile Camera Unit. FCH users — nurses, physicians, and patients — see themselves and the UI consultant on 5-inch monochrome screens.



Fig. 2. Monitoring Station. The UI consultant, controlling the mobile camera at FCH remotely, views medical personnel and patients on a 19-inch color screen.

Grundy BL, Crawford P, Jones PK, Kiley ML, Reisman A, Pao YH, Wilkerson EL, Gravenstein JS: Telemedicine in critical care: An experiment in health care delivery. *JACEP* 6:439-444, October, 1977. telemedicine, hospital cooperation.

Present problems of telemedicine in critical care stem less from inadequate technology than from inadequate ways of using available systems. Technical innovations can free us from limitations of time and space only when we develop innovative professional and administrative patterns of use.

Grundt BL, Crawford P, Jones PK, Kiley ML, Reisman A, Pao YH, Wilkerson EL, Gravenstein JS: Telemedicine in critical care: An experiment in health care delivery. *JACEP* 6:439-444, October, 1977. *telemedicine, hospital cooperation.*

0000-3493/82/0007-0471\$02.00/0
Copyright © 1982 by The Williams & Wilkins Co.

Telemedicine in critical care: Problems in design, implementation, and assessment

BETTY LOU GRUNDY, MD; PAUL K. JONES, PhD; ANN LOVITT, MD

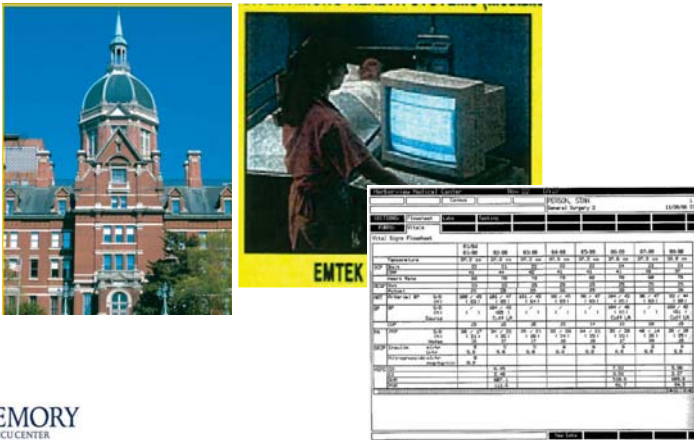
We introduced telemedicine, i.e., telecommunications for delivery of health services, to alleviate scarcity and maldistribution of critical care services. For 18 months, we used interactive television to provide consultation with university-based critical care physicians for patients in the ICU of a 100-bed hospital. Telemedicine "visits" (1548) were made to 395 patients. Television consultation had greater clinical and educational impact than consultation using the telephone. Equipment was expensive but proved to be reliable and easy to use. Interactive television extended the availability of specialist expertise, but full exploitation of this technology for delivery of critical care services was not achieved. Extensive background research, currently underway at the University of Pittsburgh, is necessary before the next telemedicine demonstration.

CONCLUSION

Since the closure of Forest City Hospital, many patients who would have been treated in its ICU are undoubtedly being admitted to larger institutions with relatively complete acute care facilities. Thus, closing small hospitals may represent one solution for problems stemming from scarcity and maldistribution of critical care services. By using telemedicine for consultation and triage, however, and transporting those patients who require the services of a large institution, the small hospital might serve community needs in a cost-effective way as part of a regionalized health care system.

Road to convergence of video and EMR - 1

1991– EMTEK installed in Hopkins SICU



Road to convergence of video and EMR - 2

"eICU" term invented and trademarked



IC-USA: E-Solutions for Critical Care

IC-USA brings technology and expertise together to dramatically improve critical care outcomes. Our e-solutions for critical care, the Continuous Expert Care Network (CXCN) and the Intensivist Decision Support System (IDSS) are built upon an Intensivist's understanding of what creates value in the critical care delivery process. To this understanding we bring the power of today's connectivity and information technologies, such as private networks, the Internet, relational databases, decision analysis, and telemedicine. Together these building blocks are defining a new standard for critical care.

Road to convergence of video and EMR - 3

Intensive care unit telemedicine: Alternate paradigm for providing continuous intensivist care

Brian A. Rosenfeld, MD, FCCM, FCCP; Todd Dorman, MD, FCCM; Michael J. Breslow, MD, FCCM; Peter Pronovost, MD, PhD; Mollie Jenckes, MSc; Nancy Zhang, PhD; Gerard Anderson, PhD; Haya Rubin, MD, PhD

Objective: Intensive care units (ICUs) account for an increasing percentage of hospital admissions and resource consumption. Adverse events are common in ICU patients and contribute to high mortality rates and costs. Although evidence demonstrates reduced complications and mortality when intensivists manage ICU patients, a dramatic national shortage of these specialists precludes most hospitals from implementing an around-the-clock, on-site intensivist care model. Alternate strategies are needed to bring expertise and proactive, continuous care to the critically ill. We evaluated the feasibility of using telemedicine as a means of achieving 24-hr intensivist oversight and improved clinical outcomes.

Design: Observational time series triple cohort study.

Setting: A ten-bed surgical ICU in an academic-affiliated community hospital.

Patients: All patients whose entire ICU stay occurred within the study periods.

Interventions: A 16-wk program of continuous intensivist oversight was instituted in a surgical ICU, where before the intervention, intensivist consultation was available but there were no on-site intensivists. Intensivists provided management during the intervention using remote monitoring methodologies (video conferencing and computer-based data transmission) to obtain clinical information and to communicate with on-site personnel. To assess the benefit of the remote management program, clinical and economic performance during the intervention were compared with two 16-wk periods within the year before the intervention.

Measurements and Main Results: ICU and hospital mortality (observed and Acute Physiology and Chronic Health Evaluation II, severity-adjusted), ICU complications, ICU and hospital length-of-stay, and ICU and hospital costs were measured during the 3 study periods. Severity-adjusted ICU mortality decreased during the intervention period by 60% and 40%, compared with baseline periods one and two, respectively. Severity-adjusted hospital mortality decreased by 33% and 30%, and the incidence of ICU complications was decreased by 44% and 50%. ICU length of stay decreased by 34% and 30%, and ICU costs decreased by 33% and 36%, respectively. The cost savings were associated with a lower incidence of complications.

Conclusions: Technology-enabled remote care can be used to provide continuous ICU patient management and to achieve improved clinical and economic outcomes. This intervention's success suggests that remote care programs may provide a means of improving quality of care and reducing costs when on-site intensivist coverage is not available. (*Crit Care Med* 2000; 28: 3925-3931)

Key Words: telemedicine; critical care; complications; medical errors; intensivists; monitoring; medical conditions; e-health care; remote care; remote monitoring

manance during the intervention were compared with two 16-wk periods within the year before the intervention.

Measurements and Main Results: ICU and hospital mortality (observed and Acute Physiology and Chronic Health Evaluation II, severity-adjusted), ICU complications, ICU and hospital length-of-stay, and ICU and hospital costs were measured during the 3 study periods. Severity-adjusted ICU mortality decreased during the intervention period by 60% and 40%, compared with baseline periods one and two, respectively. Severity-adjusted hospital mortality decreased by 33% and 30%, and the incidence of ICU complications was decreased by 44% and 50%. ICU length of stay decreased by 34% and 30%, and ICU costs decreased by 33% and 36%, respectively. The cost savings were associated with a lower incidence of complications.

Conclusions: Technology-enabled remote care can be used to provide continuous ICU patient management and to achieve improved clinical and economic outcomes. This intervention's success suggests that remote care programs may provide a means of improving quality of care and reducing costs when on-site intensivist coverage is not available. (*Crit Care Med* 2000; 28: 3925-3931)

Key Words: telemedicine; critical care; complications; medical errors; intensivists; monitoring; medical conditions; e-health care; remote care; remote monitoring

Road to convergence of video and EMR - 4

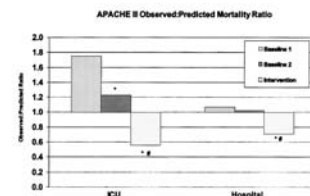


Figure 1. Acute Physiology and Chronic Health Evaluation II observed/predicted mortality ratio. ICU, intensive care unit. *p < .05 vs. baseline 1; #p < .05 vs. baseline 2.

Table 3. Complications

Complication	Baseline 1 No. (%)	Baseline 2 No. (%)	Intervention No. (%)
Sepsis	14	17	10
Reintubation	8	9	6
Myocardial infarction	3	4	1
Acute renal failure	4	4	4
Respiratory failure	1	3	2
GI bleed	4	10	2
Cardiac arrest	8	6	3
Readmission to ICU (within 48 hrs)	8	10	6
Total complications	50	65	34*
Total no. of patients with complications (%)	34 (15.1)	38 (18.8)	19 (9.5)*

GI, gastrointestinal; ICU, intensive care unit.

*p < .05 compared with baseline period 2. Incidence of ICU complications during the three study periods.

Pacific Venture Group is Lead Investor in Financing IC-USA, Inc.

- IC-USA Aims to Improve Clinical Outcomes in Intensive Care Units -
 - PVG Gains Seat on Board of Directors -

IRVINE, Calif., June 12 /PRNewswire/ -- Pacific Venture Group (PVG), a leading healthcare focused venture capital firm, today announced a \$3 million lead investment, part of a \$9 million first close Series B Preferred round in IC-USA, Inc., provider of a unique telemedicine application that enables hospital Cardinal Health Ventures and Abell Foundation, also participated in the financing.



9/02/2002 @ 12:00AM

The E-Gang: Medical Marvels



Inspired, the doctors quit their hospital jobs in 1998 to found closely held Visicu in Baltimore to commercialize the concept. Visicu designed an "eICU" that, rather than replace on-site staff, provides another set of expert eyes to watch over patients 24 hours a day. An eICU manned by one doctor and a couple of nurses costs \$2 million to \$3 million to set up, about \$2 million a year to run, and can monitor 50 to 100 beds in multiple ICUs. One monitor in the eICU functions like a Bloomberg terminal for patient data, displaying readings on blood-oxygen levels and other data; a click of the mouse switches from one patient to another. Proprietary software continuously monitors vital signs and pops up "smart alerts" when patients start to deviate beyond their established stable ranges. High-resolution cameras at bedside let the remote team visually examine patients.

Patent Granted 2004



(12) **United States Patent** (10) Patent No.: **US 6,804,656 B1**
 Rosenfeld et al. (45) Date of Patent: **Oct. 12, 2004**

(54) **SYSTEM AND METHOD FOR PROVIDING CONTINUOUS, EXPERT NETWORK CRITICAL CARE SERVICES FROM A REMOTE LOCATION(S)**

(75) Inventors: **Brian A. Rosenfeld**, Baltimore, MD (US); **Michael Breslow**, Lutherville, MD (US)

(73) Assignee: **VISICU, Inc.**, Baltimore, MD (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/443,072**

(22) Filed: **Nov. 18, 1999**

Related U.S. Application Data

OTHER PUBLICATIONS

Terry Ann Capuano, et al., Remote Telemetry, Nursing Management, Vol. 26, No. 7, Jul. 1995, p. 26.*
 Valeriy Nenov and John Klopp, Remote Access to Neuro-surgical ICU Physiological Data using the World Wide web, health Care in the Information Age, 1996, pp. 242-249.*
 Betty L. Grundy, et al., Telemedicine in Critical Care: An Experiment in Health Care Delivery, JACEP, vol. 6, Oct. 1977, pp. 439-444.*
 Susan L. Mabrey, et al., Integrated Medical Analysis System, Proceedings of the 1997 Winter Simulation Conference., 1997, pp. 1167-1168.*
 Simon M. Kaplan and Geraldine Fitzpatrick, Designing Support for Remote Intensive-Care Telehealth Using the Locales Framework, ACM, 1997, pp. 173-184.*
 Douglas A. Perednia, Telemedicine Technology and Clinical Applications, JAMA, vol. 6, Feb. 8, 1995, p. 483.*
 Microsoft Press Computer Dictionary, Third Edition, 1997, p. 430.*

(List continued on next page.)

IPO: Going Public

It was the era of the tech bubble

3/31/2006 @ 6:00AM



Visicu: Great Promise, But Beware

Visicu offers investors great promise: The founders, intensive care unit doctors, saw a way to improve care in their field and developed it. The company has growing revenue and recent profits, but warns that it expects losses in the future as it expands and tries to grab market share.

The company's promise comes wrapped in uncertainty and risk. Visicu holds one patent and has applied for ten others, but is likely to square off against a competitor in a nasty, expensive patent dispute in the future.

Do individual investors want to bet on a new company in a highly competitive and regulated sector and feed the lawyers, too? Probably not. Despite the company's solid technology and strong customer list, the IPO won't show much of a heartbeat in early trading.

The prognosis for Visicu Inc.'s future on the stock market looked good Wednesday, as the Baltimore health care technology company's stock rose 55 percent in its first day of trading.

Visicu (NASDAQ: EICU) had already raised the share price twice in the 24 hours before it began trading. The company ultimately priced the 6 million shares it is offering the public at \$16. Trading opened Wednesday at \$18.08 and ended at \$24.78. Shares had spiked as high as \$25.92 over the course of trading.

January, 2008 (Just before the global financial collapse)

VISICU, Inc. Acquired by Philips

February 20, 2008 09:25 AM Eastern Standard Time

BALTIMORE--(BUSINESS WIRE)--VISICU, Inc. ("Visicu" or the "Company") (NASDAQ: EICU), a healthcare information technology and clinical solutions company focused on critical care, today announced the successful completion of the acquisition of the Company by Philips Holding USA Inc. ("PHUSA"), a subsidiary of Koninklijke Philips Electronics, N.V. (NYSE: PHG, AEX: PHI) ("Royal Philips") for approximately \$427 million, including payment to option holders, pursuant to the previously announced Agreement and Plan of Merger, dated as of December 18, 2007, by and among Visicu, PHUSA and Ice Merger Sub, Inc. As of February 20, 2008, shares of Visicu common stock will no longer be listed on the NASDAQ.

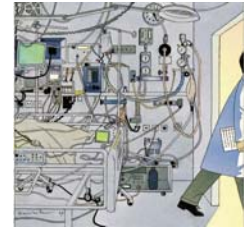
Visicu stockholders will receive shortly a mailing from the Company's transfer agent describing the procedure for returning stock certificates and receiving payment of the merger consideration.

"We should spend more time learning how to achieve an accurate diagnosis and less time searching for a magic bullet"

Roger Bone, "Sir Issac Newton, sepsis, SIRS, and CARS." Crit Care Med 1996. 24:1125-1128.



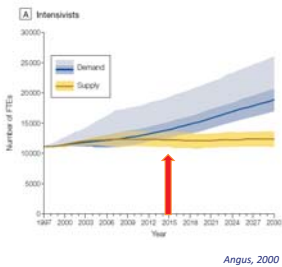
Why, What and How eICU works



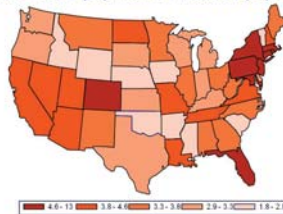
Early years:
Many clinicians, little technology,
no data

Present day:
Fewer clinicians, disconnected technology
massive data

Origin of the value proposition: Too few ICU MDs and maldistribution

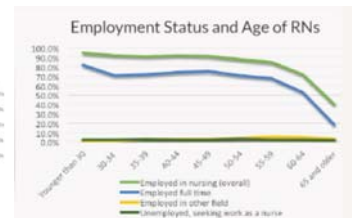
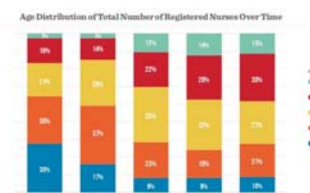


Number of CCM physicians / 100,000 population



Origin of the value proposition: Aging of the US Nursing workforce

In 2008, RNs over the age of 50 made up 43% of the overall registered nursing population. As these nurses reach retirement age, the nursing workforce will lose a large portion of their most experienced healthcare professionals.



Need for a new strategy (2004)

Feature Articles

Effect of a multiple-site intensive care unit telemedicine program on clinical and economic outcomes: An alternative paradigm for intensivist staffing[®]

Michael J. Breslow, MD; Brian A. Rosenfeld, MD; Martin Doerfler, MD; Gene Burke, MD; Gary Yates, MD; David J. Stone, MD; Paige Tomaszewicz, MSN, BSN; Rod Hochman, MD; David W. Plocher, MD

Objective: To examine whether a supplemental remote intensive care unit (ICU) care program, implemented by an integrated delivery network using a commercial telemedicine and information technology system, can improve clinical and economic performance across multiple ICUs.

Design: Before-and-after trial to assess the effect of adding the supplemental remote ICU telemedicine program.

Setting: Two adult ICUs of a large tertiary care hospital. Patients & total of 2,140 patients receiving ICU care between 1999 and 2001.

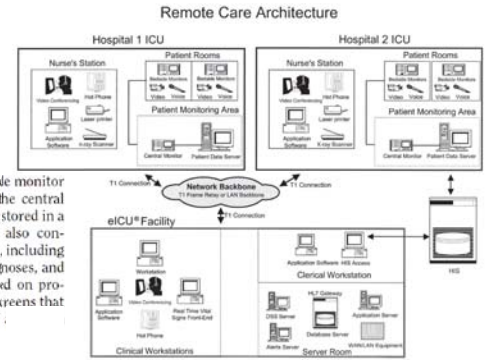
Interventions: The remote care program used intensivists and physician extenders to provide supplemental monitoring and management of ICU patients for 19 hrs/day (noon to 7 am) from a centralized, off-site facility (eICU). Supporting software, including electronic data display, physician notes, and order-writing applications, and a computer-based decision-support tool, were available both in the ICU and at the remote site. Clinical and economic performance during 6 months of the remote intensivist program was compared with performance before the intervention.

Measurements and Main Results: Hospital mortality for ICU patients was lower during the period of remote ICU care (9.4% vs. 12.9%; relative risk, 0.73; 95% confidence interval [CI], 0.55–0.95), and ICU length of stay was shorter (5.63 days [95% CI, 5.21–6.04] vs. 6.25 days [95% CI, 5.93–6.70]). Lower variable costs per case and higher hospital revenues (from increased case volumes) generated financial benefits in excess of program costs.

Conclusions: The addition of a supplemental, telemedicine-based, remote intensivist program was associated with improved clinical outcomes and hospital financial performance. The magnitude of the improvements was similar to those reported in studies examining the impact of implementing on-site dedicated intensivist staffing models; however, factors other than the introduction of off-site intensivist staffing may have contributed to the observed results, including the introduction of computer-based tools and the increased focus on ICU performance. Although further studies are needed, the apparent success of this on-going multiple-site program, implemented with commercially available equipment, suggests that telemedicine may provide a means for hospitals to achieve quality improvements associated with intensivist care using fewer intensivists. (JGIM Care Med 2004; 22:31–38)

Key Words: telemedicine; remote consultation; critical care; intensivists; medical economics; e-health care

Need for a new strategy (2004)



Bedside monitor data were captured directly from the central monitoring station in real time and stored in a relational database. This database also contained detailed patient information, including medications, lab results, active diagnoses, and therapies. These data were displayed on proprietary, ICU-specific information screens that could be accessed from the eICU.

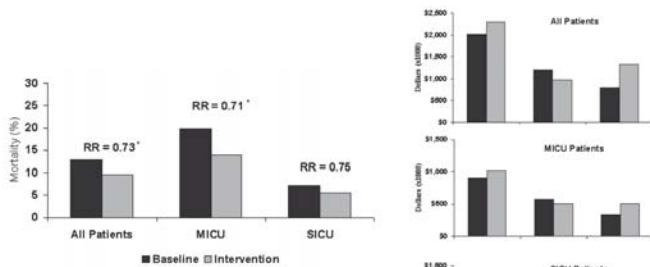
emoryhealthcare.org

EMORY HEALTHCARE

emoryhealthcare.org

EMORY HEALTHCARE

Need for a new strategy (2004)



emoryhealthcare.org

EMORY HEALTHCARE

JAMA The Journal of the American Medical Association

Home Current Issues All Issues Online First Collections CME Multimedia Quizzes For Authors Subscribe

June 1, 2011, Vol 305, No. 21

» Previous Article Next Article »

Going for the Critically Ill Patient | June 1, 2011

Hospital Mortality, Length of Stay, and Preventable Complications Among Critically Ill Patients Before and After Tele-ICU Reengineering of Critical Care Processes

Craig M. Linn, MD; Shyam Chiv, MD/MSA; Rihy Hwang, PhD; Karen L. Lacey; Stephen P. Baker, MD/PhD; John M. Roberts, DO; M. Willsa Chandler, MBA; Richard S. Innes, MD; for the University of Massachusetts Memorial Critical Care Operations Group

JAMA. 2011;305(21):2175-2183. doi:10.1001/jama.2011.697

Test Size: A A A

Abstract

ABSTRACT METHODS | RESULTS | COMMENT | CONCLUSIONS | ARTICLE INFORMATION | REFERENCES

Context The association of an adult tele-intensive care unit (tICU) intervention with hospital mortality, length of stay, best practice adherence, and preventable complications for an academic medical center has not been reported.

Objective To quantify the association of a tele-ICU intervention with hospital mortality, length of stay, and complications that are preventable by adherence to best practices.

Design, Setting, and Patients Prospective stepped-wedge clinical practice study of 6030 adults admitted to any of 7 ICUs (2 medical, 3 surgical, and 2 mixed cardiovascular) on a campus of an 836-bed academic medical center that was performed from April 06, 2006, through September 30, 2007. Electronically supported and monitored processes for best practice adherence, care plan creation, and clinician response times to alerts were evaluated.

Main Outcome Measures Care-risk and severity-adjusted hospital mortality. Other outcomes included hospital and ICU length of stay, best practice adherence, and complication rates.

The JAMA Network

From: Hospital Mortality, Length of Stay, and Preventable Complications Among Critically Ill Patients Before and After Tele-ICU Reengineering of Critical Care Processes
JAMA. 2011;305(21):2175-2183. doi:10.1001/jama.2011.697

The JAMA Network

From: Hospital Mortality, Length of Stay, and Preventable Complications Among Critically Ill Patients Before and After Tele-ICU Reengineering of Critical Care Processes
JAMA. 2011;305(21):2175-2183. doi:10.1001/jama.2011.697

Table 1. Comparison of Intensive Care Unit (ICU) Processes Before and After Tele-ICU Intervention

Preintervention	Tele-ICU Intervention
Bedside monitor alarms	Physiological trend alerts Abnormal laboratory value alerts Review of response to alerts Off-site team rounds
Daily goal sheet	Electronic detection of nonadherence Real-time auditing Nurse manager audits Team audits
Telephone case review initiated by house staff or affiliate practitioner	Workstation review initiated by intensivist includes electronic medical record, imaging studies, interactive audio and video of patient, interaction with nurse and respiratory therapist, and assessment of response to therapy

Table 3. Mortality and Length-of-Stay Outcomes

Outcome	Preintervention Group (n = 1529)	Tele-ICU Group (n = 4761)	Unadjusted P Value	Tele-ICU Effect Estimates ^a	P Value	
No. (%) of Patients						
Mortality rate	Hospital	562 (11.8)	.07	0.40 (0.31-0.52) ^b	.005	
	ICU	164 (10.7)	410 (8.6)	.01	0.37 (0.28-0.49) ^b	.003
Mean (SD) and Median [IQR], d						
Length of stay	Hospital	13.3 (17.1) 7.9 [0.2-15.0]	9.8 (10) 6.8 [0.2-12.0]	<.001	1.44 (1.33-1.56) ^c	<.001
	ICU	6.4 (11) 2.5 [0.2-6.5]	4.5 (6.7) 2.4 [0.1-4.6]	<.001	1.26 (1.17-1.36) ^c	<.001

^aAbbreviations: ICU, intensive care unit; IQR, interquartile range.
^bEstimate of effect size after adjustment for differences in acuity score, admission source, admission ICU, time after enrollment of first case in group, and other predictive factors including laboratory values and physiological measurements as detailed in the eSupplement at <http://www.jama.com>.
^cIndicates odds ratio (95% confidence interval).
^dIndicates hazard ratio (95% confidence interval).

Table 4. Association of Tele-ICU Intervention Group With Best Practice and Complication Measures

Clinical Practice Guideline Adherence	No./Total (%) of Patients Eligible*		OR (95% CI)	P Value
	Preintervention Group	Tele-ICU Group		
Prophylaxis				
Stress ulcer	1253/1505 (83)	4550/4760 (96)	4.57 (3.91-5.77)	<.001
Deep venous thrombosis	1299/1527 (85)	4707/4733 (99.5)	15.4 (11.3-21.1)	<.001
Best practice				
Cardiovascular protection	311/391 (80)	2866/2894 (99)	30.7 (19.3-49.2)	<.001
Prevention of ventilator-associated pneumonia	190/582 (33)	770/1492 (52)	2.20 (1.79-2.70)	<.001
Ventilator-associated pneumonia	76/584 (13)	32/1949 (1.6)	0.15 (0.09-0.23)	<.001
Catheter-related bloodstream infection	19/1529 (1)	29/4761 (0.6)	0.50 (0.27-0.93)	.005
Acute kidney injury	174/1452 (12)	540/4565 (12)	1.00 (0.71-1.69)	.98
After hours care plan review for ICU admissions, No. (%)	705/1529 (46) [†]	2267/4761 (48) [‡]		
Interventions for physiological instability	All bedside clinician initiated	483 [§] 37.57 [§]		

Abbreviations: CI, confidence interval; ICU, intensive care unit; OR, odds ratio.
 *Unless otherwise indicated.
 †Off hours admission review not using a verbalization.
 ‡Off hours admission review using a verbalization.
 §Initiated by bedside clinician.
 ¶Initiated prior to action by bedside clinicians.

Outcomes reports (2012)

Clinical outcomes after telemedicine intensive care unit implementation⁶

Beth Willmitch, RN, BSN; Susan Golembeski, PhD, RN, CHRC; Sandy S. Kim, MA, MEd; Loren D. Nelson, MD, FACS, FCCM; Louis Gidel, MD, PhD, FCCP

Objective: To examine clinical outcomes before and after implementation of a telemedicine program in the intensive care units of a five-hospital healthcare system.
Design: Observational study with the baseline period of 1 yr before the start of a telemedicine intensive care unit program implementation at each of 5 hospitals. The post periods are 1, 2, and 3 yrs after telemedicine intensive care unit program implementation at each hospital.

Setting: Ten adult intensive care units (114 beds) in five community hospitals in south Florida. A telemedicine intensive care unit program with remote 24/7 intensivist and critical care nurse electronic monitoring was implemented by a phased approach between December 2005 and July 2007.

Measurements and Main Results: Records from 34,656 adult intensive care unit patients were analyzed. Hospital length of stay, intensive care unit length of stay, hospital mortality, and Case Mix Index were measured. Severity of illness using All Patient Refined-

Diagnosis Related Groups scores was used as a covariate. From the baseline year to year 3 postimplementation, the severity-adjusted hospital length of stay was lowered from 11.86 days (95% confidence interval [CI] 11.55-12.21) to 10.16 days (95% CI 9.88-10.52; $p < .001$), severity-adjusted intensive care unit length of stay was lowered from 4.35 days (95% CI 4.22-4.48) to 3.80 days (95% CI 3.65-3.94; $p < .001$), and the relative risk of hospital mortality decreased to 0.77 (95% CI 0.69-0.87; $p < .001$).

Conclusions: After 3 yrs of deployment of a telemedicine intensive care unit program, this retrospective observational study of mortality and length of stay outcomes included all cases admitted to an adult intensive care unit and found statistically significant decreases in severity-adjusted hospital length of stay of 14.2%, intensive care unit length of stay of 12.5%, and relative risk of hospital mortality of 23%, respectively, in a multihospital healthcare system. (Crit Care Med 2012; 40:450-454)

Key Words: ICU outcomes; tele-ICU; telemedicine

Outcomes reports (2012): shorter stays—less RN demand

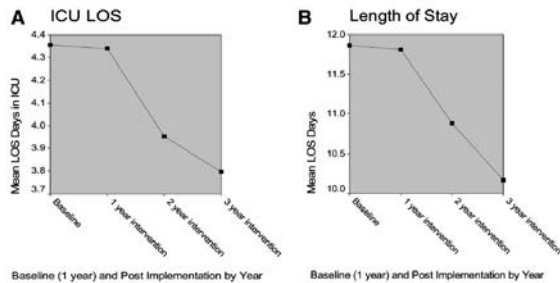


Figure 1. A, Severity of illness-adjusted intensive care unit (ICU) length of stay (LOS). B, Severity of illness-adjusted hospital LOS.

Outcomes reports (2012)

Table 4. Logistic regression model for hospital mortality

Variable	Relative Risk	95% Confidence Interval		p
Hospital mortality				
Intervention period				
Baseline	Reference			
1 yr post	0.92	0.82	1.03	.142
2 yr post	0.88	0.78	0.98	.025
3 yr post	0.77	0.69	0.87	<.001

Hosmer-Lemeshow statistics for goodness of fit for model $p < .001$.

A look back(2014)

Adoption of ICU Telemedicine in the United States

Jeremy M. Kahn, MD, MS^{1,2}; Brandon D. Cicero, MPH¹; David J. Wallace, MD, MPH^{1,2}; Theodore J. Iwashyna, MD, PhD^{1,3}

Objective: ICU telemedicine is a novel approach for providing critical care services from a distance. We sought to study the extent of use and patterns of adoption of this technology in U.S. ICUs.
Design: Retrospective study combining a systematic listing of ICU telemedicine installations with hospital characteristic data from the Centers for Medicare and Medicaid Services. We examined adoption over time and compared hospital characteristics between facilities that have adopted ICU telemedicine and those that have not.
Setting: U.S. ICUs.
Setting: U.S. hospitals from 2002 to 2010.
Interventions: None.
Measurements and Main Results: The number of hospitals using ICU telemedicine increased from 16 (0.4% of total) to 213 (4.6% of total) between 2003 and 2010. The number of ICU beds covered by telemedicine increased from 598 (0.9% of total) to 5,799 (7.9% of total). The average annual rate of ICU bed coverage growth was 101% per year in the first four study years but slowed to 8.1% per year over the last four study years ($p < 0.001$ for difference in linear trend). Compared with non-adopting hospitals, hospitals adopting

ICU telemedicine were more likely to be large (percentage with > 400 beds: 11.1% vs 3.7%, $p < 0.001$), teaching (percentage with resident coverage: 31.4% vs 21.9%, $p = 0.003$), and urban (percentage located in metropolitan statistical areas with more than 1 million residents: 45.3% vs 30.1%, $p < 0.001$).

Conclusions: ICU telemedicine adoption was initially rapid but recently slowed. Efforts are needed to uncover the barriers to future growth, particularly regarding the optimal strategy for using this technology most effectively and efficiently. (Crit Care Med 2014; 42:362-368)

Key Words: critical care; intensive care units; rural hospitals; telemedicine

Conclusions: ICU telemedicine adoption was initially rapid but recently slowed. Efforts are needed to uncover the barriers to future growth, particularly regarding the optimal strategy for using this technology most effectively and efficiently. (Crit Care Med 2014; 42:362-368)

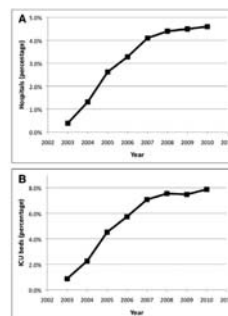
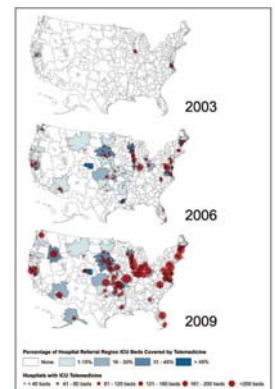


Figure 4. Utilization of ICU telemedicine by year expressed as percentage of all US hospitals (A) and percentages of US ICU beds (B).



Benefits are debated-- 1

Wilcox and Adhikari *Critical Care* 2012, **16**:R127
http://ccforum.com/content/16/4/R127



RESEARCH

Open Access

The effect of telemedicine in critically ill patients: systematic review and meta-analysis

M Elizabeth Wilcox^{1*} and Neill KJ Adhikari²

Conclusions: Telemedicine was associated with lower ICU and hospital mortality among critically ill patients, although effects varied among studies and may be overestimated in nonrandomized designs. The optimal telemedicine technology configuration and dose tailored to ICU organization and case mix remain unclear.



49

Benefits are debated-- 2

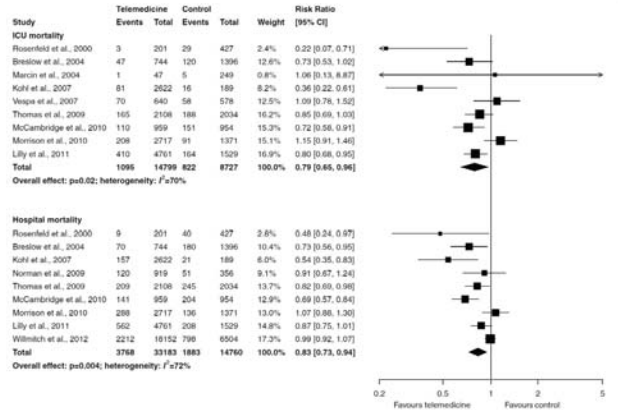


Figure 2 Effect of telemedicine on ICU mortality (upper panel) and hospital mortality (lower panel). The pooled risk ratio with 95% confidence interval (CI) was calculated by using a random-effects model. Weight refers to the contribution of each study to the overall estimate of treatment effect.



50

Benefits debated-- 3

High intensity

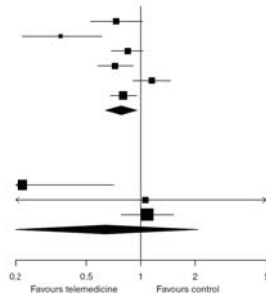
Study	Telemedicine Events	Telemedicine Total	Control Events	Control Total	Weight	Risk Ratio [95% CI]
High intensity passive or active systems						
Breslow et al., 2004	47	744	120	1396	14.7%	0.73 [0.53, 1.02]
Kohl et al., 2007	81	2622	16	189	9.2%	0.36 [0.22, 0.61]
Thomas et al., 2009	165	2108	188	2034	19.4%	0.85 [0.69, 1.03]
McCambridge et al., 2010	110	959	151	954	18.3%	0.72 [0.58, 0.91]
Morrison et al., 2010	208	2717	91	1371	18.0%	1.15 [0.91, 1.46]
Lilly et al., 2011	410	4761	164	1529	20.4%	0.80 [0.68, 0.95]
Total	1021	13911	730	7473	100.0%	0.78 [0.64, 0.95]

Overall effect: $p=0.01$; heterogeneity: $I^2=74\%$

Low intensity

Study	Telemedicine Events	Telemedicine Total	Control Events	Control Total	Weight	Risk Ratio [95% CI]
Low intensity passive systems						
Rosenfeld et al., 2000	3	201	29	427	33.2%	0.22 [0.07, 0.71]
Marcin et al., 2004	1	47	5	249	19.0%	1.06 [0.13, 8.87]
Vespa et al., 2007	70	640	58	578	47.7%	1.09 [0.78, 1.52]
Total	74	888	92	1254	100.0%	0.64 [0.20, 2.07]

Overall effect: $p=0.45$; heterogeneity: $I^2=71\%$



51

Costs hotly debated -- 1



CHEST

Original Research

CRITICAL CARE

The Costs of Critical Care Telemedicine Programs

A Systematic Review and Analysis

Gaurav Kumar, MD; Derik M. Falk, MD; Robert S. Bonello, MD; Jeremy M. Kohn, MD; Eli Perencevich, MD; and Peter Cram, MD, MBA



52

Costs hotly debated -- 2

Results: Our systematic review identified eight studies reporting tele-ICU costs. These studies suggested combined implementation and first year of operation costs for a tele-ICU of \$50,000 to \$100,000 per monitored ICU-bed. Changes in patient care costs after tele-ICU implementation ranged from a \$3,000 reduction to a \$5,600 increase in hospital cost per patient. VHA data suggested a cost for implementation and first year of operation of \$70,000 to \$87,000 per ICU-bed, depending on the depreciation methods applied.

Conclusions: The cost of tele-ICU implementation is substantial, and the impact of these programs on hospital costs or profits is unclear. Until additional data become available, clinicians and administrators should carefully weigh the clinical and economic aspects of tele-ICUs when considering investing in this technology.

CHEST 2013; 143(1):19-29



53

Contemporary (2016) economic modeling

Economic Evaluation of Telemedicine for Patients in ICUs*

Byung-Kwang Yoo, MD, PhD¹; Minchul Kim, PhD²; Tomoko Sasaki, PhD³; Joy Melnikow, MD, MPH⁴; James P. Marcin, MD, MPH⁴

Objective: Despite telemedicine's potential to improve patients' health outcomes and reduce costs in the ICU, hospitals have been slow to introduce telemedicine in the ICU due to high upfront costs and mixed evidence on effectiveness. This study's first aim was to conduct a cost-effectiveness analysis to estimate the incremental cost-effectiveness ratio of telemedicine in the ICU, compared with ICU without telemedicine, from the healthcare systems perspective. The second aim was to examine potential cost saving of telemedicine in the ICU through probabilistic analyses and break-even analyses.

Design: Simulation analyses performed by standard decision models.

Setting: Hypothetical ICU defined by the U.S. literature.

Patients: Hypothetical adult patients in ICU defined by the U.S. literature.

Interventions: The intervention was the introduction of telemedicine in the ICU, which was assumed to affect per-patient per-hospital-stay ICU cost and hospital mortality. Telemedicine in the ICU operation costs included the telemedicine equipment-installation (start-up) costs with 5-year depreciation, maintenance costs, and clinician staffing costs. Telemedicine in the ICU effectiveness was measured by cumulative quality-adjusted life years for 5 years after ICU discharge.

Measurements and Main Results: The base case cost-effectiveness analysis estimated telemedicine in the ICU to extend 0.011 quality-adjusted life years with an incremental cost of \$516 per patient compared with ICU without telemedicine, resulting in an incremental cost-effectiveness ratio of \$45,320 per additional quality-adjusted life year (= \$516/0.011). The probabilistic cost-effectiveness analysis estimated an incremental cost-effectiveness ratio of \$50,265 with a wide 95% CI from a negative value (suggesting cost savings) to \$375,870. These probabilistic analyses projected that cost saving is achieved 37% of 1,000 iterations. Cost saving is also feasible if the per-patient per-hospital-stay operational cost and physician cost were less than \$422 and less than \$155, respectively, based on break-even analyses. **Conclusions:** Our analyses suggest that telemedicine in the ICU is cost-effective in most cases and cost saving in some cases. The thresholds of cost and effectiveness, estimated by break-even analyses, help hospitals determine the impact of telemedicine in the ICU and potential cost saving. (Crit Care Med 2016; 44:265-274)

Key Words: cost-effectiveness; cost saving; economic evaluation; intensive care units; telehealth; telemedicine



54

Economic Evaluation of Telemedicine for Patients in ICUs*

Yoo, Byung-Kwang MD, PhD¹; Kim, Minchul PhD²; Sasaki, Tomoko PhD²; Melnikow, Joy MD, MPH²; Marcin, James P. MD, MPH³

Measurements and Main Results: The base case cost-effectiveness analysis estimated telemedicine in the ICU to extend 0.011 quality-adjusted life years with an incremental cost of \$516 per patient compared with ICU without telemedicine, resulting in an incremental cost-effectiveness ratio of \$45,320 per additional quality-adjusted life year (= \$516/0.011). The probabilistic cost-effectiveness analysis estimated an incremental cost-effectiveness ratio of \$50,265 with a wide 95% CI from a negative value (suggesting cost savings) to \$375,870. These probabilistic analyses projected that cost saving is achieved 37% of 1,000 iterations. Cost saving is also feasible if the per-patient per-hospital-stay operational cost and physician cost were less than \$422 and less than \$155, respectively, based on break-even analyses.

Emory total eICU operational costs are currently \$643 per patient.

\$422+\$155=\$577 is break-even even if no 'downstream' cost savings

eICU staffing is based on patient ratios. This creates step fixed costs: if we monitored just 12 additional beds, our eICU costs per patient would drop to approximately \$500 (varies depending on occupancy rates).

Economic Evaluation of Telemedicine for Patients in ICUs*

Yoo, Byung-Kwang MD, PhD¹; Kim, Minchul PhD²; Sasaki, Tomoko PhD²; Melnikow, Joy MD, MPH²; Marcin, James P. MD, MPH³

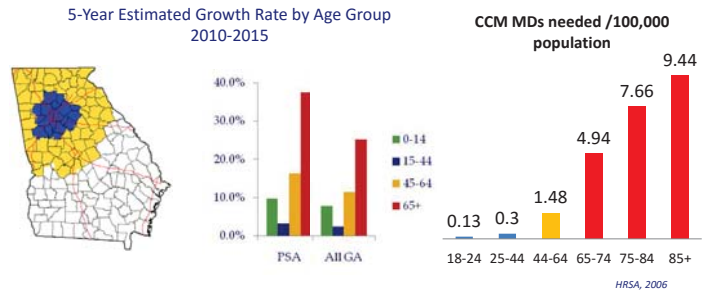
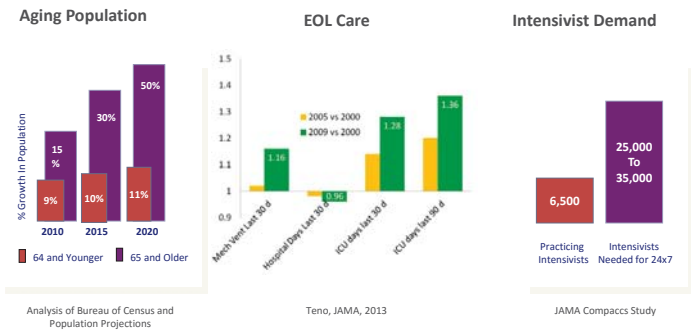
Parameter	Incremental Cost-Effectiveness Ratio < \$100,000 (Per Quality-Adjusted Life Year)	Cost Saving*
ICU-mortality reduction by tele-ICU (18.5-28.9%)	15.8%	Not feasible even when 100%
Impact of tele-ICU on per-patient per-hospital-stay ICU cost (ratio to pre-tele-ICU cost, excluding tele-ICU operation cost) (0.71-1.14)	98.4% (1.6% reduction)	90.3% (9.7% reduction)
Floor-mortality increase by tele-ICU (12.3-51.8%)	53.4% (increase)	Not feasible even when (-) 100% (i.e., 100% "reduction")
Impact of tele-ICU on per-patient per-hospital-stay floor cost (ratio to conventional floor cost, excluding tele-ICU operation cost) (0.89-1.30)	108.4%	96.7%
Per-patient per-hospital-stay tele-ICU operation cost (\$909-\$1,057)	\$1,560	\$422
(1) Per-patient per-hospital-stay tele-ICU equipment-installation (start-up) cost (\$200-\$348) [†]	\$851	Not feasible even when \$0
(2) Per-patient per-hospital-stay tele-ICU maintenance and clinical staffing cost (\$680-\$828) [†]	\$1,331	\$193
(3) Per-patient per-hospital-stay tele-ICU physician staffing cost (\$642-\$790) [†]	\$1,293	\$155
Baseline-mortality in pre-tele-ICU (8.91-9.38%)	6.3%	Not feasible even when 100%
Baseline mortality in conventional floor (2.8-3.57%)	5.1%	Not feasible even when 100%

Tele-ICU = telemedicine in the ICU. Pre-tele-ICU = ICU without a telemedicine team.
*Cost saving of tele-ICU compared with pre-tele-ICU without a telemedicine team; that is, tele-ICU dominates pre-tele-ICU without a telemedicine team.
†Assuming 5-year depreciation (12, 14).
*Calculated as per-patient per-hospital-stay tele-ICU operation cost minus (i) per-patient per-hospital-stay tele-ICU equipment-installation (start-up) cost (12, 14) or (ii) part of (ii) per-patient per-hospital-stay tele-ICU maintenance and clinical staffing cost (12, 14).
The lower incremental cost-effectiveness ratio values indicate that tele-ICU is more efficient in an economic sense. All costs in U.S. 2014 dollars.

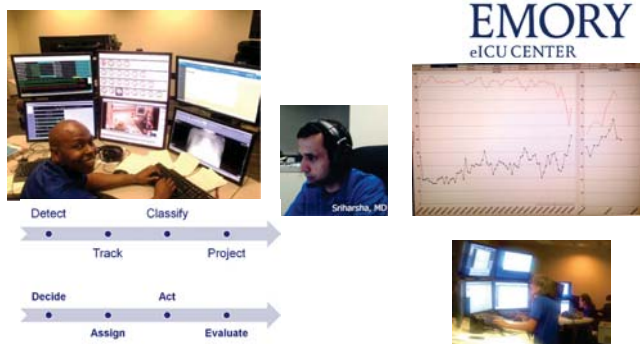
Georgia and Nationally:

↑ Demand for Care, ↓ Provider Resource

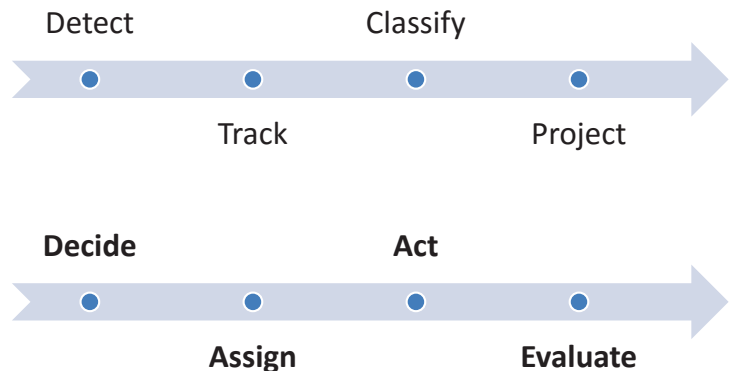
What we were facing

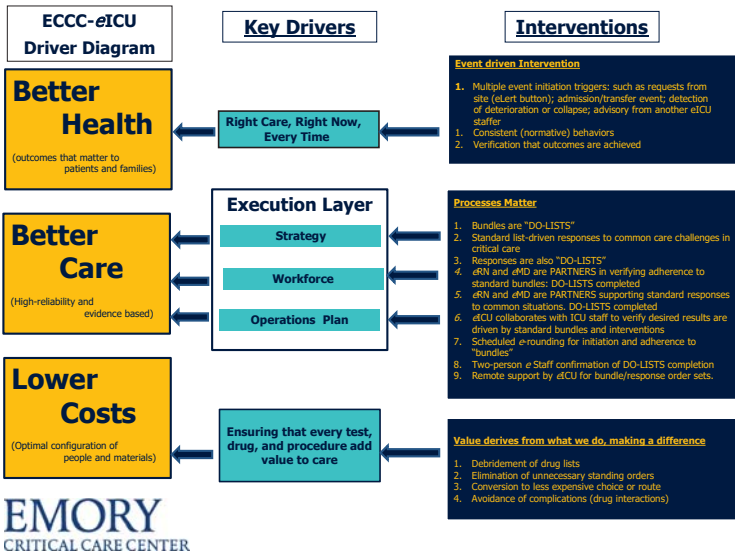


The Emory eICU COR



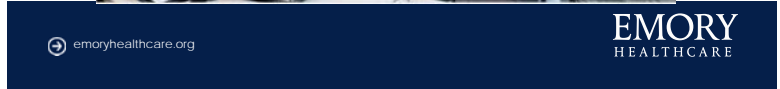
What we are (really) doing: detection/correction of anomalies



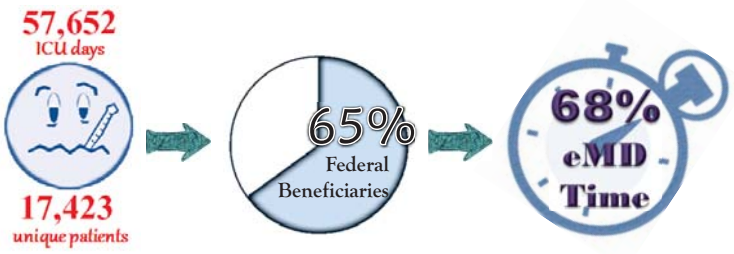


The Emory Program:
 eRN: 24 x 7 x 365
 eMDs: nights weekends and holidays

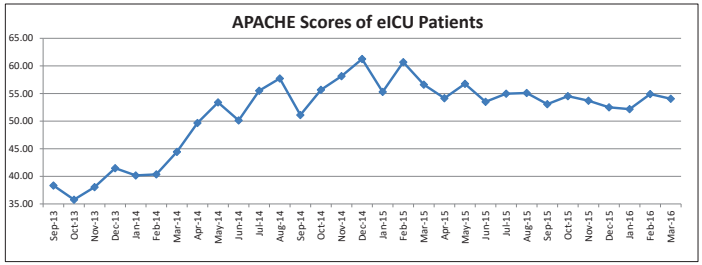
Industry standard convergent eICU platform
 Multiple EMR, physiologic monitors
 16 locations, 136 beds in 5 hospitals
 (2 university, 1 hybrid, 2 community)



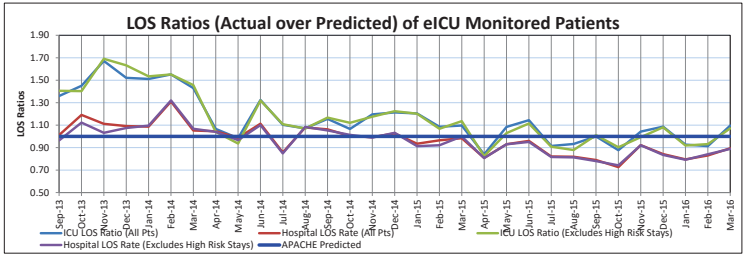
Since we began monitoring patients in March 2013



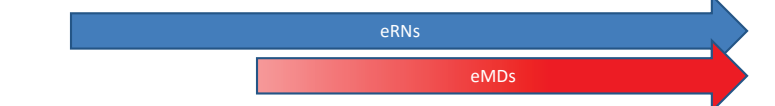
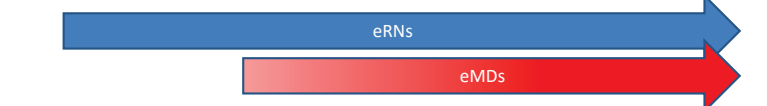
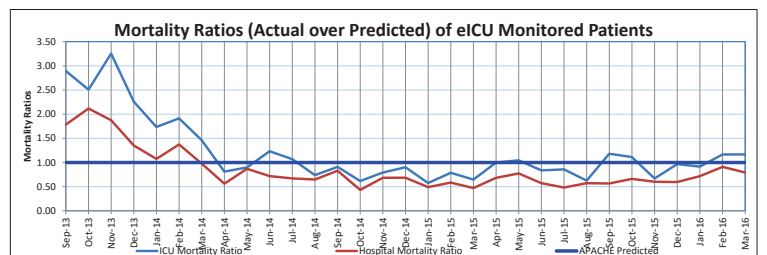
APACHE Scores of Emory eICU: Community-Centered Hospital



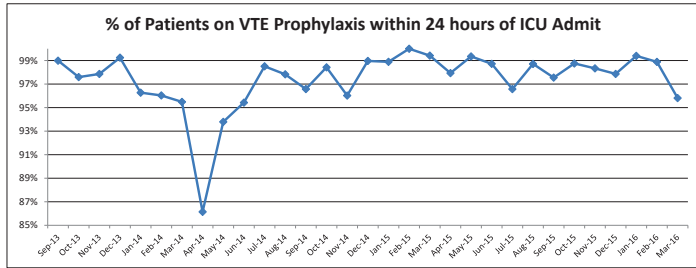
Emory eICU Results: Community-Centered Hospital



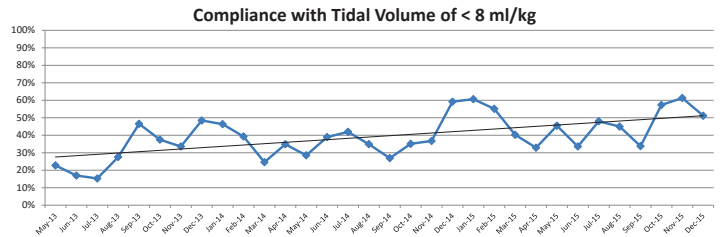
Emory eICU Results: Community-Centered Hospital



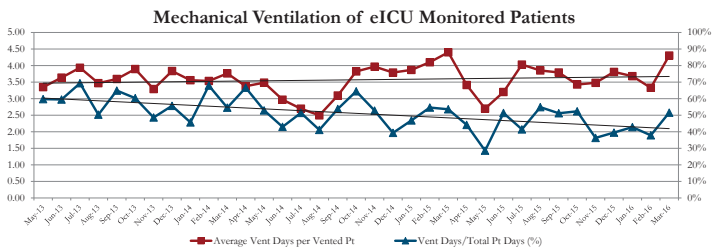
VTE Best Practice Compliance



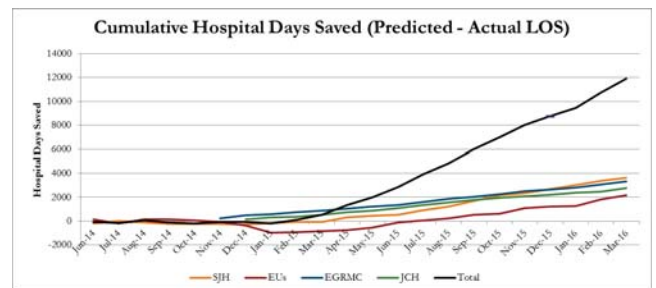
Lung Protection Compliance



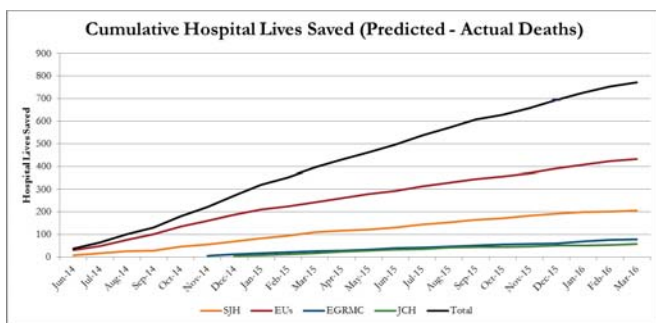
Reducing the ventilation burden



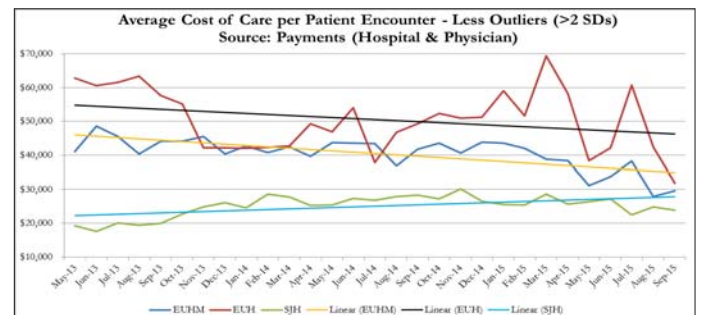
Resources Conserved



Lives Saved



Lower Costs – Internal Analysis



Lower Costs – External Analysis

3rd Party Commissioned by CMS, completely out of our control

The following information constitutes what has thus far been publicly released by CMS.

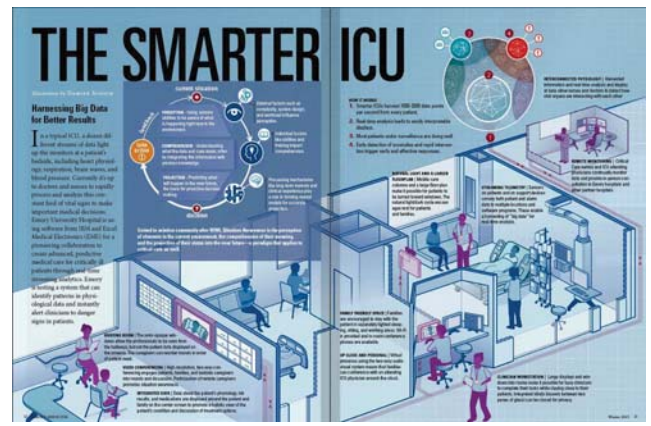
- Analysis of two consecutive quarters of operation beginning July 2014
- Metric: Total cost to federal beneficiaries for the hospitalization and extending 60 days post-discharge (their metric, not ours)
- Comparators: Propensity matching based on the evaluator’s criteria (not ours)
- Savings estimated at \$1200-\$2200 per federal beneficiary served, primarily through discharge in better health, lower need for long-term rehab/care
- At the end of the second quarter, p=0.1

Analysis is ongoing.

Additional quarters have been completed and reported to CMS.

Data are embargoed as of this date.

Where Emory is headed



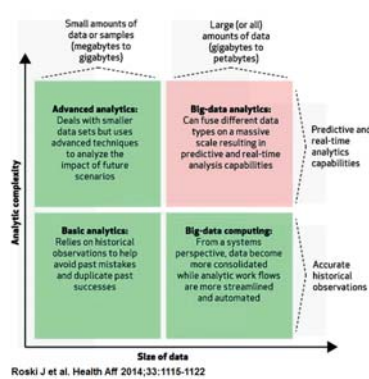
emoryhealthcare.org

emoryhealthcare.org

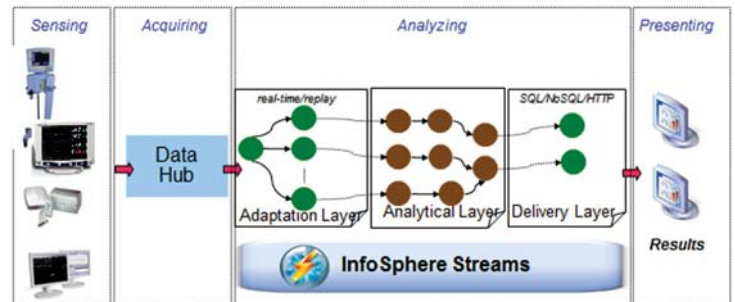
“Big” Data and Real-Time Analytics



Data Analytic Approaches, By Size Of Data And Analytic Complexity.

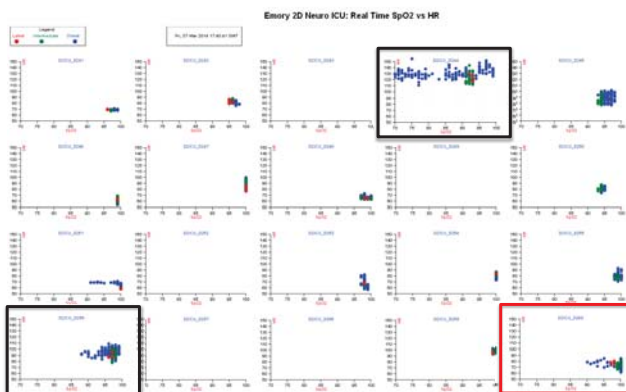


Stream Computing in Intensive Care

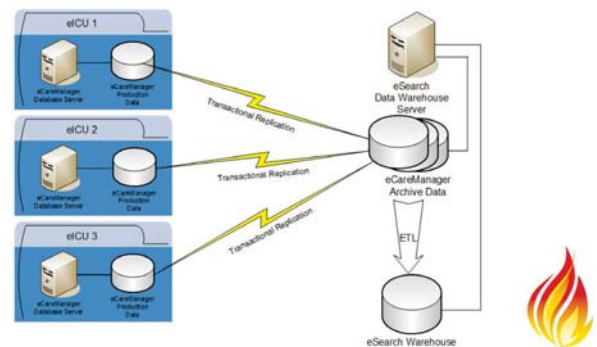


Computing across dozens of streams per patient, dozens of patients per ICU, multiple ICUs within a single hospital, multiple hospitals within a healthcare system, and referencing archived (reference) data.

Real-time population presentations



Leveraging the Philips DB



emoryhealthcare.org

GaTech FHIR project - 1

Data



```
GET /patient/
{
  resourceType: "Patient",
  total: 100,
  entry: [
    {
      resourceType: "Patient",
      id: "00000000-0000-0000-0000-000000000000",
      identifier: [
        {
          system: "FHIR",
          value: "123-45-6789"
        }
      ],
      name: [
        {
          family: "Damon"
        }
      ],
      given: [
        "John"
      ],
      gender: "male",
      birthDate: "1980-01-01T00:00:00-05:00",
      telecom: [
        {
          resourceType: "Patient",
          id: "00000000-0000-0000-0000-000000000000",
          identifier: [

```



GaTech FHIR project - 2

Data



```
GET /observation/
{
  resourceType: "Observation",
  total: 1000,
  entry: [
    {
      resourceType: "Observation",
      id: "00000000-0000-0000-0000-000000000000",
      code: [
        {
          system: "http://snomed.info/snomed",
          code: "38688001",
          display: "Pneumonia (Infectious) in torso or Pleura"
        }
      ],
      subject: [
        {
          resourceType: "Patient",
          id: "00000000-0000-0000-0000-000000000000",
          identifier: [
            {
              system: "FHIR",
              value: "123-45-6789"
            }
          ],
          birthDate: "1980-01-01T00:00:00-05:00",
          telecom: [
            {
              system: "http://snomed.info/snomed",
              value: "38688001"
            }
          ],
          resourceType: "Observation",
          id: "00000000-0000-0000-0000-000000000000",
          code: [

```



GaTech FHIR project - 3

Data

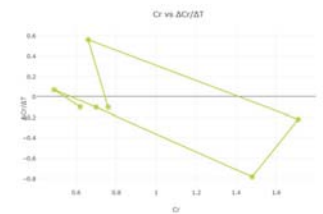
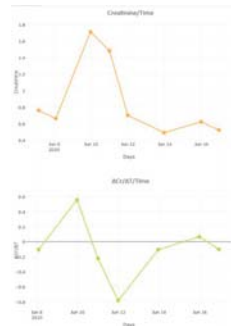


```
GET /observation?debt=true&subject=81D408B-CF95
{
  resourceType: "Observation",
  total: 100,
  entry: [
    {
      resourceType: "Observation",
      id: "00000000-0000-0000-0000-000000000000",
      code: [
        {
          system: "http://snomed.info/snomed",
          code: "38688001",
          display: "Pneumonia (Infectious) in torso or Pleura"
        }
      ],
      subject: [
        {
          resourceType: "Patient",
          id: "00000000-0000-0000-0000-000000000000",
          identifier: [
            {
              system: "FHIR",
              value: "123-45-6789"
            }
          ],
          birthDate: "1980-01-01T00:00:00-05:00",
          telecom: [
            {
              system: "http://snomed.info/snomed",
              value: "38688001"
            }
          ],
          resourceType: "Observation",
          id: "00000000-0000-0000-0000-000000000000",
          code: [

```



GaTech FHIR project - 4



What has been learned

- In some circumstances, eICU consistently saves lives
- In some circumstances, eICU consistently saves costs
- In some circumstances, eICU enhances consistent practice
- eICU can support local teams when numbers and experience of bedside personnel are overwhelmed by complexity, acuity or volume

What is not known

- Where impact of eICU is least/greatest
 - Bedside coverage (physician, APP, nursing, AHP)
 - Patient complexity (low, medium, high risk)
- Influence of local culture on eICU effectiveness
- Influence of eICU on local culture
- Influence of eICU on aggregate quality, safety, access, financial performance

What we are trying to do

Primitive



Standalones



Integrated



Sense-----Present-----Compute/Display

Next steps?



The Perioperative Surgical Home (PSH) & Us

Miguel Cobas, MD

University of Miami Miller School of Medicine

Department of Anesthesiology

Miami, FL

At the conclusion of the presentation, the learner should be able to:

1. Identify the characteristics that make anesthesiologists good candidates for perioperative physicians.
2. Discuss some of the challenges that make it difficult for an anesthesiologist to fully participate in PSH.
3. Discuss current trends in pediatric orthopedic surgery

THE PERIOPERATIVIST: WHO'S BETTER THAN US?

Miguel Cobas, MD
Associate Professor of Anesthesiology and Surgery
University of Miami/Jackson Memorial Hospital

University of Miami

NOTHING TO DISCLOSE

- ▶ Except that I don't run a PSH in my hospital

University of Miami

“The perioperative surgical home model would pioneer the role of anesthesiologists acting to coordinate the services provided by other health care professionals during the perioperative period. Such a model may, if executed correctly, help to manage the full spectrum of surgical episodes, reduce costly complications and improve the efficiency of care”

ASA COMMITTEE ON FUTURE HEALTH CARE MODELS

University of Miami

Why the Anesthesiologist?

Any physician can be the center of the PSH model, overseeing the patient care plan and ensuring the team meets the pre-defined goals. The anesthesiologist, however, is the optimal choice. Why? Anesthesiologists are uniquely positioned to fulfill this role because of their ability to assess, evaluate, and prepare patients with an array of complex comorbidities, and then manage these comorbidities intra-operatively and post-operatively. This in-depth understanding enables anesthesiologists to drive the standardization of care—one of the most critical components of PSH—thus reducing risk and optimizing outcomes.

Patient Safety and Quality Healthcare, March/April 2015

University of Miami

The US delivers inadequate value for its cost

Source: OECD Health Statistics 2013, <http://dx.doi.org/10.1787/health-data-en>, World Bank for non-OECD countries. StatLink <http://dx.doi.org/10.1787/888932916040>

HIGHER SPENDING, BETTER HEALTH?

University of Miami

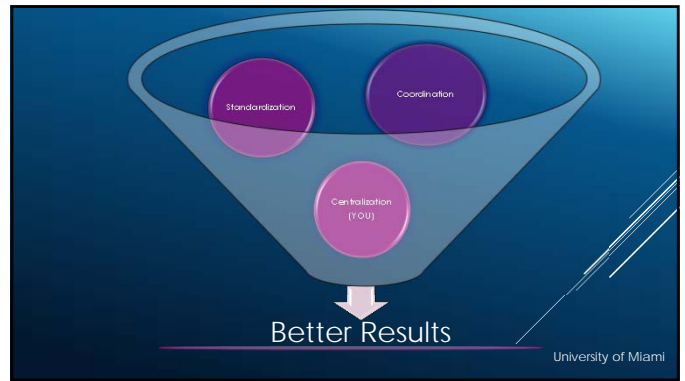
Berwick DM, Hackbarth AD. JAMA 2012; 307 (14)

University of Miami

Today	Future
Fragmented Care	Collaborative Care
Discounted Fee for Service	Shared Risk/Reward
Payment for Volume	Payment for Value
Isolated Patient Files	Integrated Electronic Record
Adversarial Payer-Provider Relations	Cooperative Payer-Provider Relations
Focus on procedure	Focus on triple aim
"Everyone For Themselves"	Joint Contracting

A CHANGE IN PARADIGM

University of Miami



- ▶ Ambitious and Measurable
 - ▶ Improving the patient experience of care (including quality and satisfaction)
 - ▶ Improving the health of populations
 - ▶ Reducing the per capita cost of health care.
- BETTER RESULTS**
- University of Miami



- ▶ 1967 Pediatric PCMH, revised in 2004 (so-so results)
 - ▶ New momentum for adult PCMH in 2008
 - ▶ EMR and IT infrastructure
 - ▶ Transformative and Redefining
- A LITTLE HISTORY**
- University of Miami

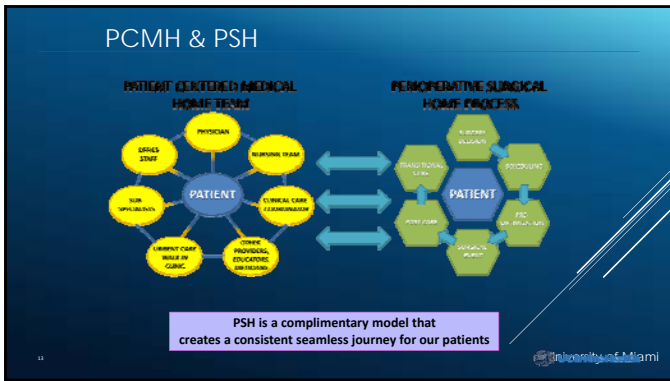
PRACTICE REDESIGN

A House Is Not A Home: Keeping Patients At The Center Of Practice Redesign

The patient-centered medical home could well be a transformative innovation—for some practices now, but for many others only in the long run.

by Robert A. Berenson, Terry Hammoms, David N. Gans, Stephen Zuckerman, Katie Merrill, William S. Underwood, and Aimee F. Williams

University of Miami



Why the Anesthesiologist?

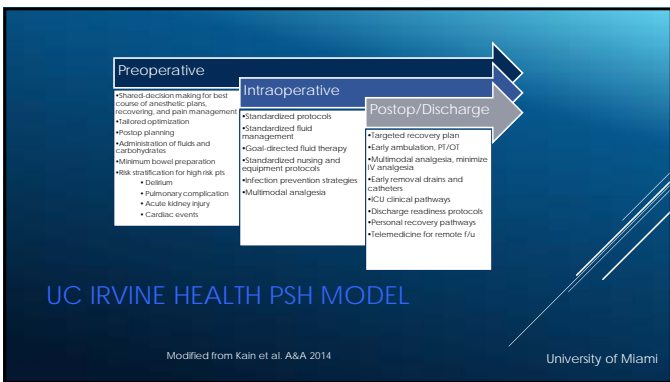
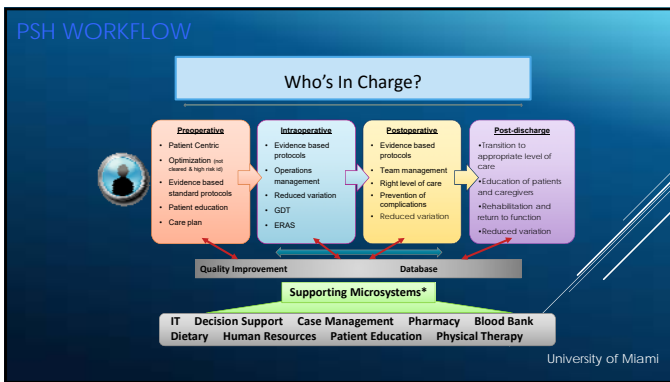
Strong Tradition in Patient Safety

Systems Management

Nobody knows the OR like we do.

But, do we want to do it?

Patient Safety and Quality Healthcare, March/April 2015



Health Care Costs and the Perioperative Surgical Home: A Survey Study

Darren R. Raphael, MD, MBA, Maxime Connesson, MD, PhD, Joseph Rinehart, MD, and Zeev N. Kain, MD, MBA

Anesthesia and Analgesia, May 2014

- ▶ Survey looking at attitudes towards **reducing cost** of healthcare and perioperative care delivery
- ▶ Enthusiasm in being part of cost reduction strategies
- ▶ In other words: how important do we see ourselves in the process?

THE CHOSEN ONES?

Health Care Costs and the Perioperative Surgical Home: A Survey Study

Darren R. Raphael, MD, MBA, Maxime Connesson, MD, PhD, Joseph Rinehart, MD, and Zeev N. Kain, MD, MBA

Anesthesia and Analgesia, May 2014

Entities with potential responsibility to reduce cost of health care	Responsibility, n (%)		
	Very responsible, n (%)	Some responsibility, n (%)	No responsibility, n (%)
Entities with potential responsibility to reduce cost of health care			
Employers	179 (20)	548 (62)	193 (17)
Government	323 (37)	452 (52)	506 (11)
Hospitals	499 (57)	362 (41)	14 (2)
Insurance companies	472 (54)	364 (42)	29 (4)
Physicians	332 (38)	526 (60)	37 (4)
Patients	399 (46)	426 (49)	50 (6)
Pharmaceutical companies	417 (48)	405 (46)	53 (6)
Professional societies	122 (14)	546 (63)	187 (21)
Technology companies	229 (26)	526 (60)	125 (14)
Total answers	419 (48)	295 (34)	163 (18)
Strategies to reduce cost of health care			
Standard payment model	43 (5)	272 (31)	518 (64)
Eliminate fee-for-service model	67 (8)	211 (24)	595 (68)
Pay for performance	124 (14)	401 (46)	348 (40)
Medicare payment cuts	6 (1)	85 (10)	812 (95)
Compensation reform	167 (19)	387 (44)	319 (37)

Table 5. Degree of Agreement/Disagreement Among US Anesthesiologists Survey Respondents Regarding Future Practice Roles

	Strongly agree, n (%)	Moderately agree, n (%)	Moderately disagree, n (%)	Strongly disagree, n (%)
Anesthesiologists should coordinate care from scheduling until hospital discharge	204 (23)	326 (37)	209 (24)	134 (15)
Anesthesiologists should coordinate care on the day of surgery only	208 (24)	262 (30)	225 (26)	178 (20)
Anesthesiologist coordination of all preoperative care should become standard of care	339 (39)	362 (42)	114 (13)	57 (7)
Consider cost of tests/studies	499 (57)	331 (38)	32 (4)	10 (1)
Employ evidence-based protocols	595 (68)	241 (28)	32 (4)	4 (<1)
Reduce cancellation rates	578 (66)	240 (28)	51 (6)	3 (<1)
Improve patient outcomes	566 (65)	255 (29)	46 (5)	5 (1)
Reduce overall cost of care	442 (51)	329 (38)	87 (10)	14 (2)
Reduce overall length of stay	364 (42)	339 (39)	142 (16)	27 (3)
Anesthesiologist intraoperative management should				
Become standard of care	450 (52)	352 (40)	52 (6)	18 (2)
Employ evidence-based protocols	389 (45)	400 (46)	67 (8)	16 (2)
Employ decision support technologies	555 (64)	269 (31)	41 (5)	7 (1)
Employ fluid management strategies	526 (60)	305 (35)	38 (4)	3 (<1)
Optimize postoperative management	619 (71)	236 (27)	15 (2)	2 (<1)
Reduce overall cost of care	433 (50)	300 (34)	66 (8)	13 (1)
Reduce overall length of stay	410 (47)	379 (43)	71 (8)	12 (1)
Anesthesiologist coordination of all postoperative care should				
Become standard of care	232 (27)	325 (37)	203 (23)	112 (13)
Employ evidence-based protocols	501 (57)	307 (35)	48 (6)	16 (2)
Improve patient outcomes	452 (52)	319 (37)	81 (9)	20 (2)
Reduce overall cost of care	365 (42)	352 (40)	128 (15)	27 (3)
Reduce overall length of stay	355 (41)	352 (40)	129 (15)	36 (4)
Reduce readmission rate	325 (37)	311 (36)	184 (21)	52 (6)

Health Care Costs and the Perioperative Surgical Home: A Survey Study
 Darren R. Raphael, MD, MBA, Maxime Carresse, MD, PhD, Joseph Rinehart, MD, and Zeev N. Kain, MD, MBA
 Anesthesia and Analgesia, May 2014

Table 6. Respondents' Opinions Regarding Comfort with Future Practice Roles and Exposure to Litigation (n = 873)

	Strongly agree, n (%)	Moderately agree, n (%)	Moderately disagree, n (%)	Strongly disagree, n (%)
Comfort with aspects of patient care management	572 (66)	290 (33)	43 (5)	6 (1)
Preoperative	572 (66)	290 (33)	43 (5)	6 (1)
Intraoperative	525 (60)	46 (5)	189 (22)	35 (4)
Postoperative	348 (40)	338 (39)	189 (22)	35 (4)
Personal exposure to litigation				
Adoption of the perioperative surgical home	161 (18)	344 (39)	279 (32)	87 (10)
Coordination of all preoperative care	187 (21)	330 (38)	255 (29)	99 (11)
Coordination of all postoperative care	247 (28)	368 (42)	187 (21)	72 (8)
Use of evidence-based protocols	56 (7)	329 (38)	305 (35)	33 (4)
Use of decision support technologies	58 (7)	312 (36)	425 (49)	218 (25)

Table 4. Understanding of the Perioperative Surgical Home Model

	Respondents (n = 873), n (%)
Reported understanding of the Perioperative Surgical Home	
Good understanding	239 (27)
Fair understanding	347 (40)
Poor understanding	287 (33)

The Anesthesiologist-Directed Perioperative Surgical Home: A Great Idea That Will Succeed Only if It is Embraced by Hospital Administrators and Surgeons
 John F. Butterworth, IV, MD, and Jeffrey A. Green, MD
 Anesthesia and Analgesia, May 2014

- Is everyone up/willing to the task?
- Compensation: now is \$0!, but we tend to be expensive
- Why would the executive choose an anesthesiologist rather than a lower paid medical specialist who is available, competent and willing?
- It will be up to anesthesiologists to provide the evidence that it will make sense for a health system to have anesthesiologists administer and provide care in its PSH rather than another specialist who is equally bright, equally information-technology-savvy, but potentially less expensive

Residency Board Certification Requirements and Preoperative Surgical Home Activities in the United States: Comparing Anesthesiology, Family Medicine, Internal Medicine, and Surgery
 Kayla M. Cline, MS, Rahul Roopani, BA, Bita A. Kash, PhD, MBA, and Thomas R. Wittler, MD, MPH
 Anesthesia and Analgesia, Issue: Volume 120(6), June 2015, p 1420-1425

Residency board certification requirements	Anesthesiology	Family Medicine	Internal Medicine	Surgery
Preoperative surgical home activities				
Early patient engagement	100%	0%	0%	0%
Coordinated preoperative testing	100%	0%	0%	0%
Ultrasound-guided intubation	75%	0%	0%	0%
Rapid response	100%	0%	0%	0%
Rapid to identify highest risk patients	100%	0%	0%	0%
Targeted protocols (e.g., ERAS)				
DR scheduling initiatives	100%	0%	0%	0%
Reduced oral intubation	100%	0%	0%	0%
Quality improvement initiatives	100%	0%	0%	0%
Rapid extubation	100%	0%	0%	0%
Patient throughput initiatives	100%	0%	0%	0%
Regional anesthesia	87%	0%	0%	0%
Blood utilization	87%	0%	0%	0%
Optimized pain management				
Nonopioid protocols (e.g., ERAS)	100%	0%	0%	0%
Painful fluid management	100%	0%	0%	0%
Use of oral or IV opioid infusions	100%	0%	0%	0%
Standardized care management	100%	0%	0%	0%
Reducing length of stay	87%	0%	0%	0%
Reduced oral intubation	87%	0%	0%	0%
Coordinated discharge planning	87%	0%	0%	0%
Discharge phone calls	87%	0%	0%	0%
Early mobility/transfer	87%	0%	0%	0%
Readmission protocols (e.g., ERAS)				
Readmission prevention	87%	0%	0%	0%

Effects of a hospitalist care model on mortality of elderly patients with hip fractures.
 Basile JA, Pina MP, Melton LJ 3rd, Schneek CD, Larson DR, Hudsonson PM, Hudsonson JM
 The improved efficiency in reducing length of stay and time to surgery in the hospitalist group did not adversely affect long-term mortality of this patient population.

Medicine versus orthopaedic service for hospital management of hip fractures.
 Chausse C, Rikowsky GJ, Hollenbeck CS, Armstrong AD
 Patients with medicine or orthopaedic services did not differ in the rate of severe or intermediate complications or length of stay in adjusted analysis. However, time to surgery was longer in patients managed by the medical service in adjusted analysis.


Does a multidisciplinary team decrease complications in male patients with hip fractures?
 Dy CJ, Dossou PM, Ton GV, Hollenbeck JF, Lorch DG, Lane JM
 Multidisciplinary collaboration for patients with hip fractures can decrease the likelihood of experiencing inpatient complications in male patients.

Associations between the hospitalist model of care and quality-of-care-related outcomes in patients undergoing hip fracture surgery.
 Roy A, Haskman MG, Roy V
 Hospitalist involvement in the medical management of patients undergoing hip fracture surgery may be associated with decreases in TIC, TIS, LOS, and total hospital cost.

The impact of hospitalists on length of stay and costs: systematic review and meta-analysis.
 Raehou JS, Skaf J, Camao E, Fitzpatrick E, Milcarek B, Kuper-Smith E, Schauer DB
 Our analysis supports the conclusion that hospitalists significantly reduce LOS without increasing costs. These findings can be used to define and measure expectations of performance for hospital medicine groups.

Associations between use of the hospitalist model and quality of care and outcomes of older patients hospitalized for heart failure.
 Hood HD, Himmil BG, Fomanow GG, Heidemreich PA, Go AS, Peterson ED, Curtis LR, Hernandez AJ
 Hospitalist care varied significantly across hospitals for heart failure admissions and was not associated with improved 30-day outcomes.

- ▶ Changing is hard
- ▶ Making others change is even harder
- ▶ The choice is no longer ours
- ▶ Adaptability and Variability are key



TREMENDOUS CHALLENGES AHEAD

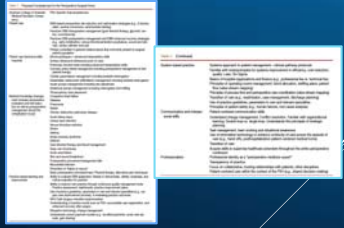
University of Miami

Future of Anesthesiology Is Perioperative Medicine

A Call for Action

Zsiv N. Kain, M.D., M.B.A., Jane C. K. Fitch, M.D., Jeffrey R. Kirsch, M.D., Bernd Mets, M.B., Ph.D., F.R.C.A., Ronald G. Pearl, M.D., Ph.D.

"[Our] chief aim [is] to present a proposal and rationale for changing the name of our specialty from 'Anesthesiology' to 'Anesthesiology and Perioperative Medicine' ..."



University of Miami

- ▶ engage (how do I make the world a better place?)
- ▶ educate (what do I need to do?)
- ▶ execute (how do we ensure we do it?)
- ▶ evaluate (how will I know I made a difference?)

CULTURE CHANGE IN THE HOSPITAL

Pronovost P, Berenholtz SM, Goschel CA, et al. Creating high reliability in health care organizations. *Health Serv Res.* 2006;41(4 Pt 2):1599-1617.

University of Miami

Managing Complex Change

Vision	+	Skills	+	Incentives	+	Resources	+	Action Plan	=	Change
		Skills		Incentives		Resources		Action Plan		= Confusion
Vision				Incentives		Resources		Action Plan		= Anxiety
Vision		Skills				Resources		Action Plan		= Resistance
Vision		Skills		Incentives				Action Plan		= Frustration
Vision		Skills		Incentives		Resources				= Treadmill

University of Miami

▶ Questions?

THANKS FOR YOUR ATTENTION

University of Miami

Directions for Claiming CME Credit

Please follow these directions to access the course, claim your CME credits, complete the program evaluation(s) and print your CME certificate(s):

1. Log in to the ASA Education Center at: <http://education.asahq.org/>

If you have accessed the ASA Education Center for a previous meeting, please use your existing ASA username and password.

If you have not previously accessed the ASA Education Center, you will soon receive an e-mail from the ASA Education Center with log-in instructions.

2. Once you have logged on to the ASA Education Center homepage, click the tab that says “MY CURRENT COURSES” for the link to the {course}.

“MY CURRENT COURSES” can be found at: <http://education.asahq.org/my-activities>

3. Select the link to access the course evaluation and claim credit.

4. To retrieve a username or password, enter your email address at: <http://education.asahq.org/user/password>

Note: Physicians should claim only credit commensurate with the extent of their participation.

If you have any questions, please contact the ASA Education Center at educationcenter@asahq.org.