



INTERACTIVE AND SPECIALIST HEALTHCARE ACROSS THE MILES:

ECARE AND IT'S IMPACT ON TODAY'S HEALTH

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DISCLOSURES

- I Work for Avera eCare's eICU in Sioux Falls, SD
 - eIntensivist
 - Medical Director
- I Am a Bedside Intensivist for Henry Ford West Bloomfield Hospital in Detroit, MI
- I Actively Promote Adoption of eICU Services to Interested Health Systems Across the Country
- I Will Receive Waived Conference Fees in Exchange for Providing this Lecture



OBJECTIVES

- 1) Explain Broad Update and Opportunities in telemedicine and How it Can and May Effect The Practice of Internists.
- 2) Review Relevant Concerns When Working With and Using Telemedicine.
- 3) Actively Engage The Audience in Discussion Regarding Questions and Concerns with Telemedicine and e-Communication.

AVERA eCARE

How it All Started

- Established in 1993
- Challenge: Provide Services
 - Rural
 - Frontier
 - Critical Access Hospitals
- 24 Hour
- On-Demand
- Video/Audio Call
- Board Certified Providers

Helmsley Grant

- Awarded in 2009
- Expanded Service Lines
 - Pharmacy
 - ER
- Expanded Facilities
 - 200 More
 - Beyond Avera System
 - 8 States
- Built Virtual Hospital Hub

Where We Are Today

- Most Comprehensive Telehealth System
- Support Facilities in 11 States
- Expanding to a New Hub 2017
- Adding New Service Lines
- Working with
 - NATO
 - Dartmouth
 - Henry Ford
 - National Standards



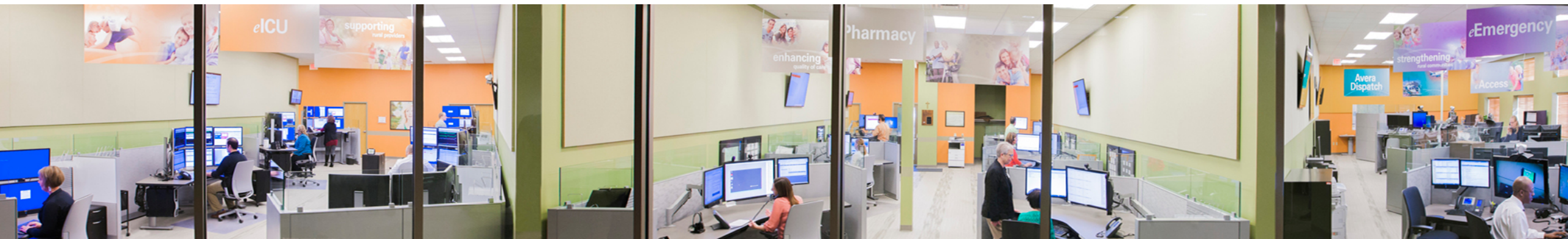
AVERA eCARE SERVICE LINES

- Present

- eConsult
- eEmergency
- eICU
- ePharmacy
- eLong Term Care
- eCorrectional Health
- eUrgent Care

- Future Opportunities

- eHospitalist
- eHospice
- eInternist
- eCare for the Workplace
- eSchool Nurse
- AveraNow
- *eEndless Opportunities*



WHY IS THIS IMPORTANT TO ME?

- Support their onsite staff members and services
- Deliver fast response to patients' health needs, including urgent and critical care
- Help avoid unnecessary transfers
- Reduce patient travel time and expense by improving care for residents where they live
- Coordinate referrals to additional medical specialists

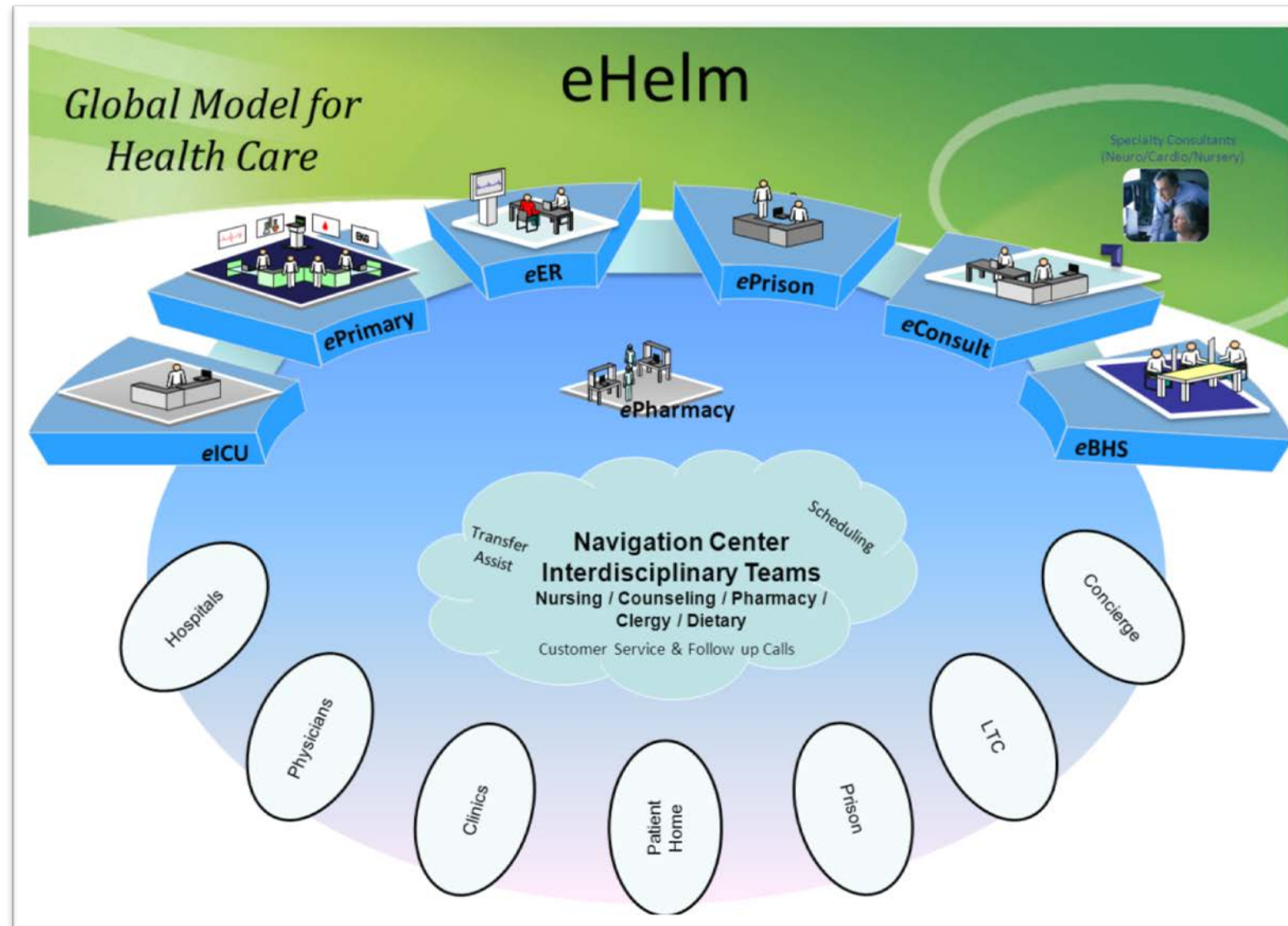


WHY IS THIS IMPORTANT TO ME?

- Part of Cost Reduction Strategies
- Reduced Mortality
 - LOS
 - Readmissions
 - Complications
- Support of House Staff
 - New Physicians, RNs, APPs
- Increased Collegiality
 - Other Regional Health Practices



WORLDWIDE ACCESS TO CARE



WHAT IS *e*CARE?

- Remote, Electronic Monitoring of Patients
 - Intensivist, Hospitalist, Internist, Geriatrician, Emergency Physician
 - APP
 - Nursing Staff
 - Pharmacist
 - Secretary
- Quite Variable Among the 22+ Companies in the US
- Do Most Anything You Can at the Beside
 - Stethoscope
 - Touch
 - Pronounce
- Collaboration with the Bedside or Facility Staff
 - NOT Big Brother



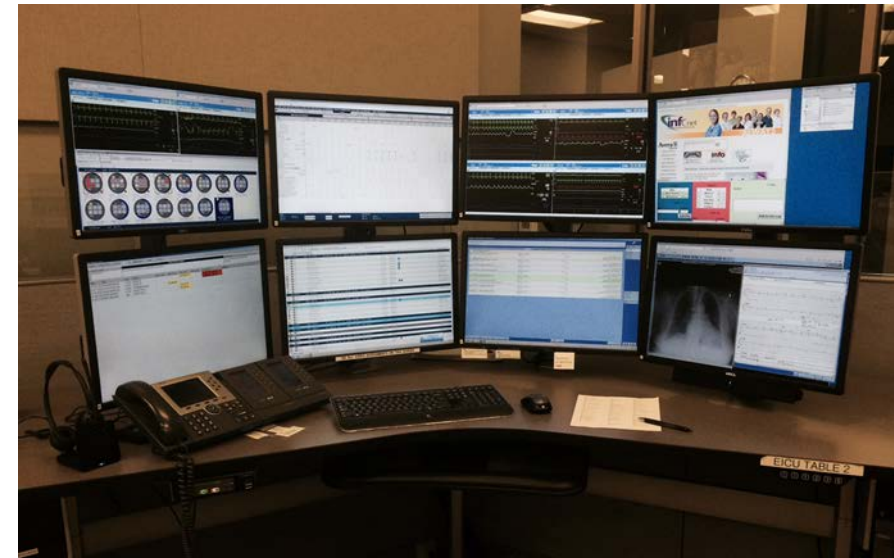
ICU APPLICATIONS

- Approximately 10 % of Inpatient Stays
 - 30 % of US Health Care Costs
 - Part of Cost Reduction Strategies
- Estimates That ATC Intensivist Managed ICU Approach
 - Could Save > 50,000 US Lives Each Year
- More Than 50% of Patients in an ICU Will Be Monitored Remotely
- Half of ALL ICU Patients Nationwide Are in Small Community or Critical Access Hospitals
- Your FUTURE!



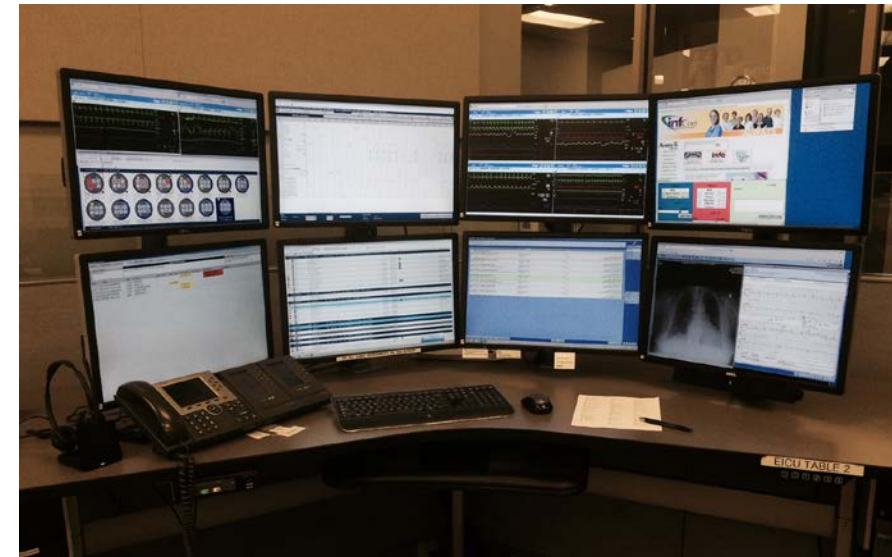
WHAT DO EICU PHYSICIANS DO?

- Review Admits
- Review and Respond to Every Patient Lab
- Round on Patients
 - Review/Write Notes
 - Interventions
 - Critical Access Hospitals
 - Read CXR, EKG's



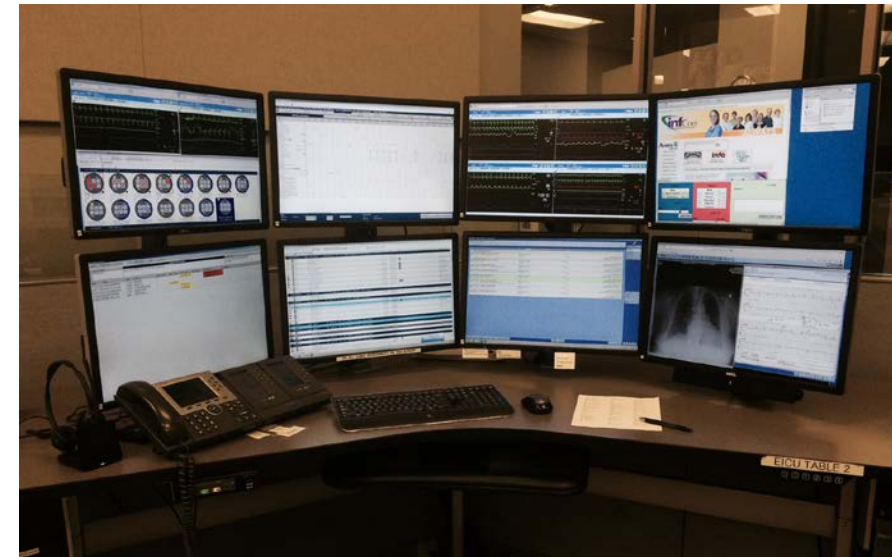
WHAT DO EICU PHYSICIANS DO?

- Respond to eAlerts
- Monitor Decompensating Patients
- Adjust Antibiotics to Cultures
- Discuss Problem Cases with Physicians, Staff
- Alert Bedside Staff of Problems Identified
- Hold Family Meetings
- Collaborate on Difficult/Complex Patients



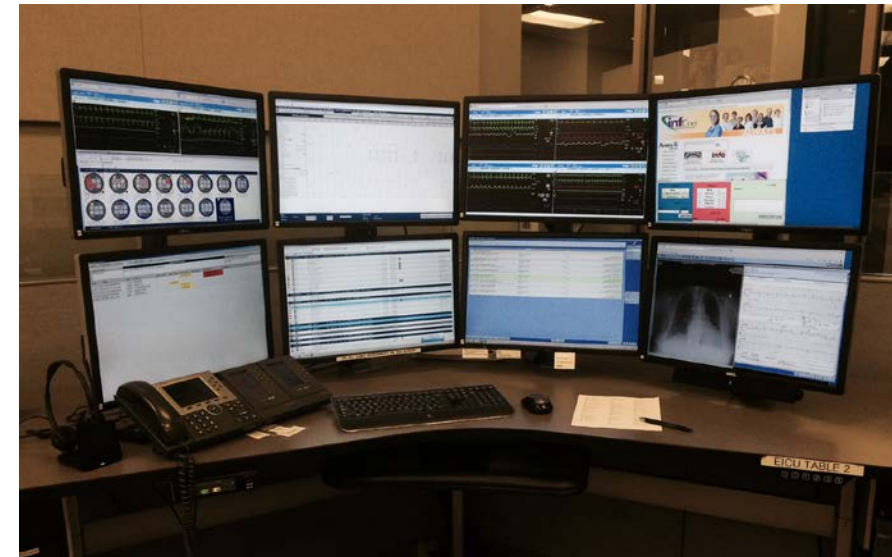
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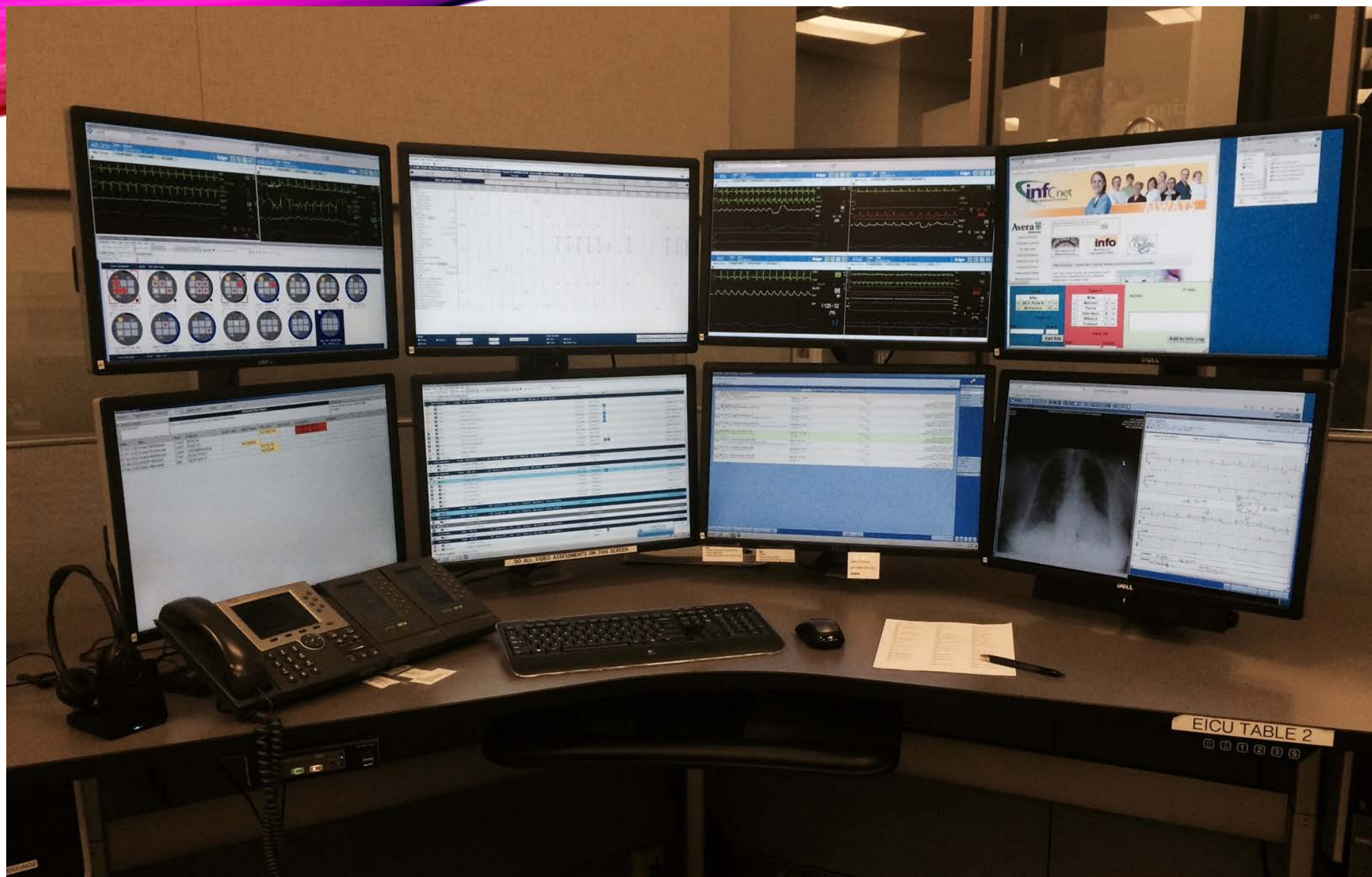
- Connect Staff to Consultants
- Facilitate Transfers
- Extubate
 - Medically Ready
 - Post-Op
- Adjust Vent Settings
- Provide End of Life Care



WHAT DO EICU PHYSICIANS DO?

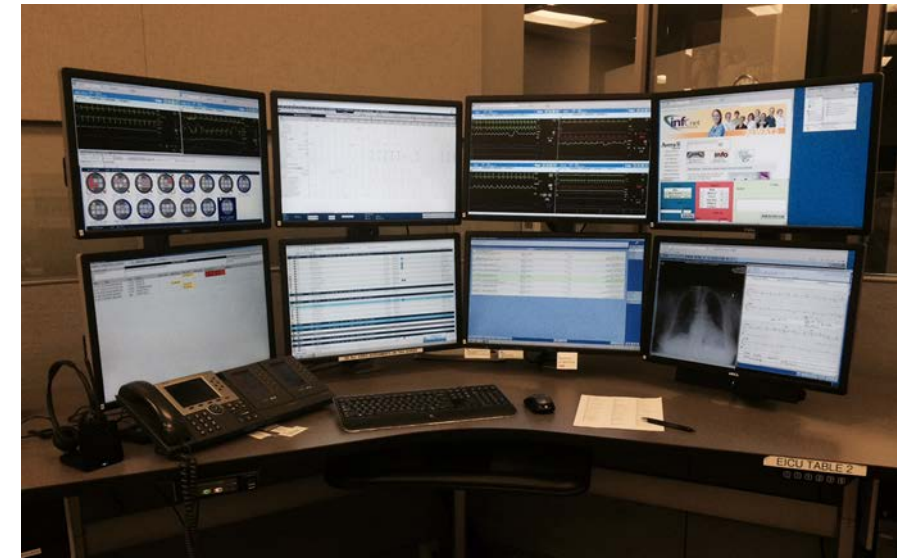
- Connect Staff to Consultants
- Rapid Bedside Assistance for Emergencies
 - 30 Seconds
- 24 Hour Intensivist Monitoring and Accessibility
- Provides an Extra Set of Eyes on Patients Even if Intensivist is Actively Rounding
- Run Codes
- Supervise Procedures



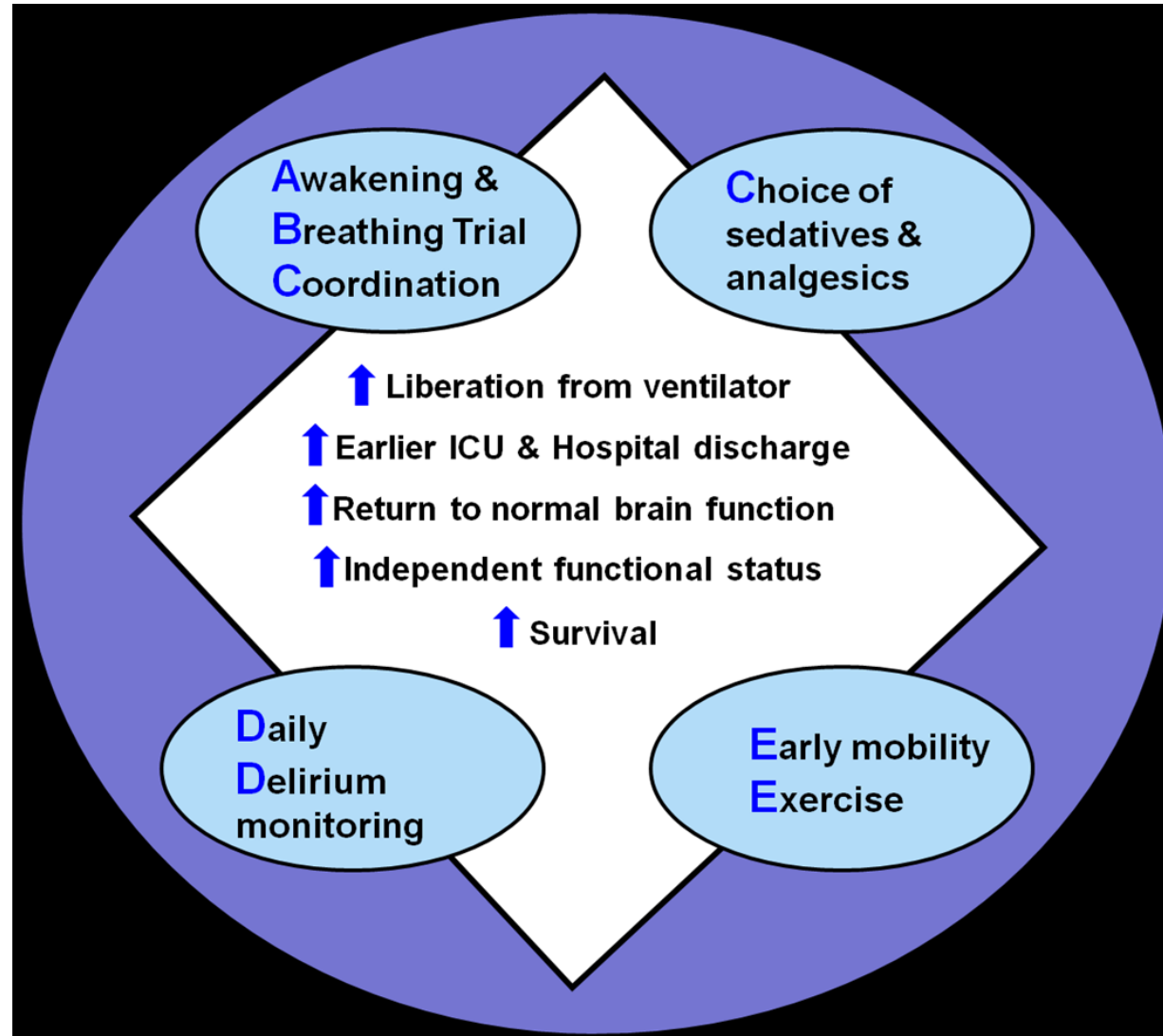


WHAT IS MONITORED?

- eAlerts
- Labs
- Two or more BG > 200
- GI/DVT Prophylaxis
- 6 Hour Sepsis F/U
- ABCDE Bundles
- Specific Site Requests



ABCDE BUNDLE



EICU/EER VIDEOS

<https://www.youtube.com/embed/ICK5yS5Czt8>

https://www.youtube.com/watch?v=NJkg3_VSXvw

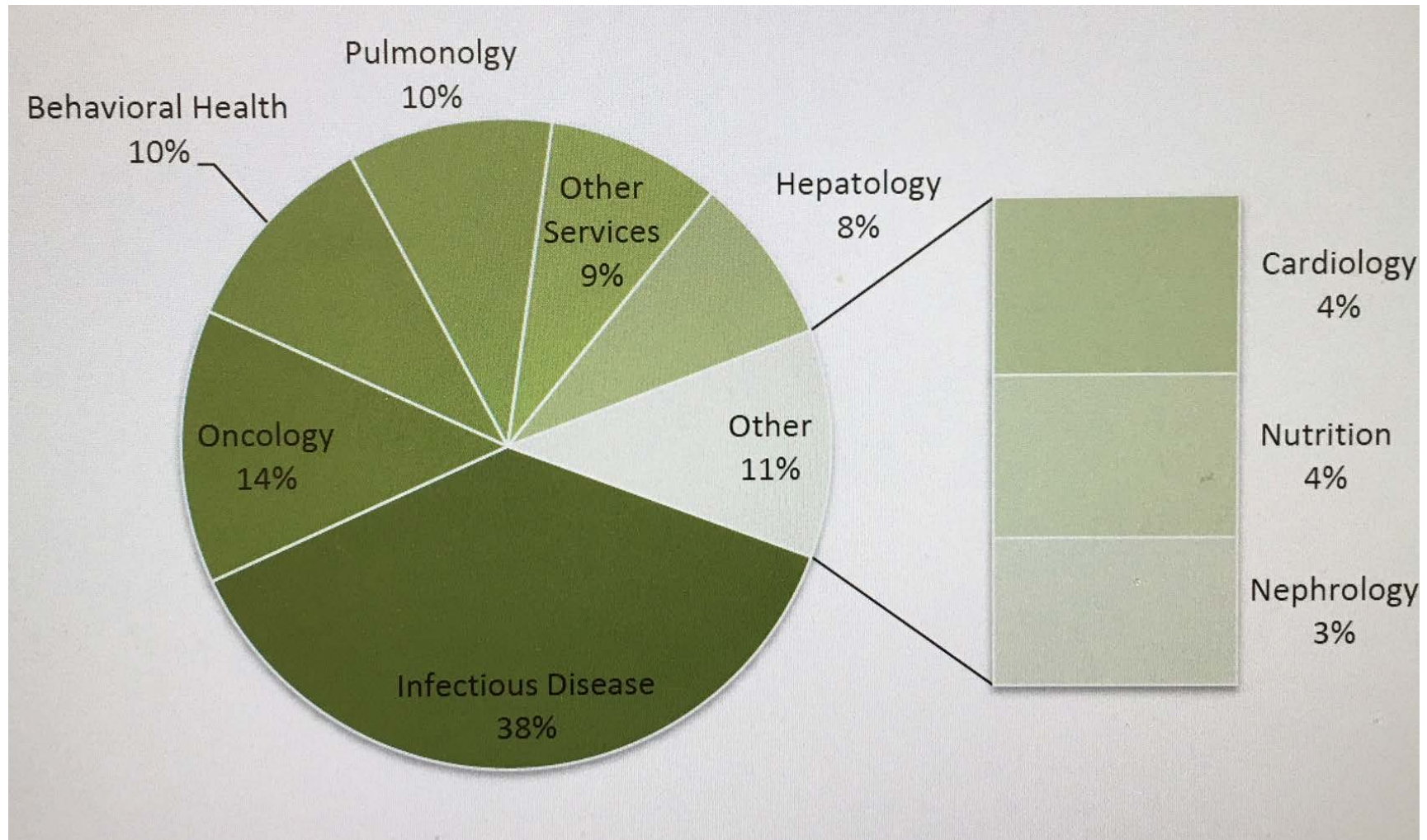


WHAT DO *E*CONSULT PHYSICIANS DO?

- Scheduled Specialty Consults
- Examination
 - Telephonic Stethoscopes
 - Otoscopes
 - Examination Cameras
- Access to Rare Subspecialties
- Decreased Time and Travel for Incapacitated Patients
- Follow-up Care

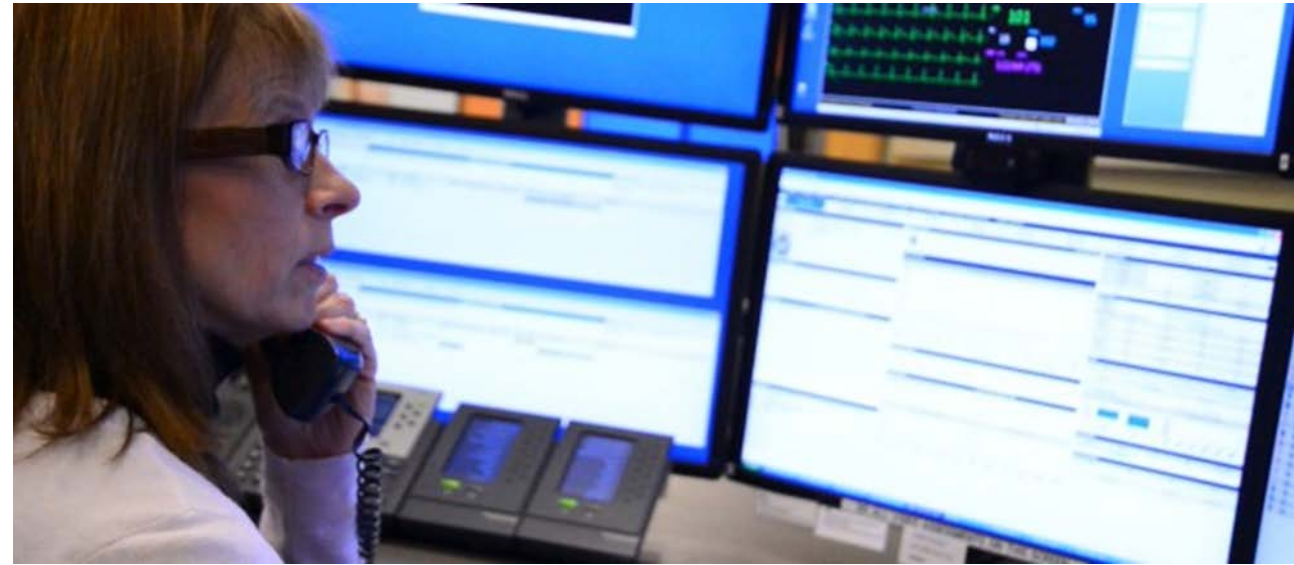


ECONSULT



WHAT *E*CONSULTS ARE AVAILABLE?

- Women's Health
- Dermatology
- Rehab
- Gastroenterology
- Otolaryngology
- Occupational Health
- Palliative Care
- Neuro Surgery
- Neonatology



CHALLENGES IN HEALTHCARE

- Staffing
 - Workforce Shortages
 - Geographic Isolation
 - Burdensome Workloads
- Patient Care
 - Limited Access
 - Poor Performance on Quality Measures
 - Aging Population
 - Health Plan Coverage



CHALLENGES IN HEALTHCARE

- Financial Sustainability
 - Diminished Community Resources
 - Capitated Reimbursements
- Expectations
 - Families, Patients, Staff
- Medical Modalities
 - More of Them
 - Accessibility



IMPACT ON CARE

- Tertiary Care Center
 - Large Academic Medical Centers
 - Trainee Support
 - Full Access to Sub-Specialists
- Community Care Centers
 - Hospital Specialists with Limited Availability
- Critical Access Hospitals
 - Limited or No Access to Specialists
 - 50% of US Hospitals



TERTIARY CARE CENTER

- 24 Hour Hospital Coverage
 - Increased Patient Safety
- Extended Guidance for Trainees
 - Students
 - Residents
 - Fellows
- Closer Monitoring and Evaluating of Critical Patient Changes



TERTIARY CARE CENTER

- Improved Patient Care
 - Early Identification of Subtle Negative Trends
 - Increased Focus on Quality Metrics
 - Works in Conjunction with Bedside Team
 - Mobile Support of Step-Down Beds
 - Physician Support in Rapid Responses



TERTIARY CARE CENTER

- Decreased Burnout with Reduced Staff Calls
- Gap Coverage
- Support Financial Stability
 - Increased Service Offerings
 - Maintain More Patients
 - Support Community Economy



COMMUNITY CARE/CRITICAL ACCESS CENTER

- Support Financial Stability
 - Increased Service Offerings
 - Access to Unavailable Specialists
 - Maintain More Patients
 - Support Community Economy
- Key Resource Center
 - Improving Care Throughout the State
 - Solidify Supervising Hospital's Reputation
 - Serves the Community



COMMUNITY CARE/CRITICAL ACCESS CENTER

- Rural Workforce Support
 - Access to Professional Colleagues
 - Extended Physician Practices
- Improved Patient Care
 - Enhanced Access to Specialists
 - Increased Focus on Quality Metrics
- Support Financial Stability
 - Increased Service Offerings
 - Maintain More Patients
 - Support Community Economy



ENDLESS EOPTIONS

eConsults
ePharmacy
eEmergency
eLong Term Care
eCardiology
eLearning
eLectures
eConferences



eICU
eIP
eTransplant
eNephrology
ePulmonology
ePalliative Care
eBehavioral Health
eSimulation Center

The list is only limited by our imaginations...

POTENTIAL RETURN

- More Efficient Use of Current Hospital/ICU Beds
- Standardized Care
 - QI Activities
 - APACHE Data Utilization
- Decreased LOS and Mortality
- Grow Referral Business
- Increase Surgical and Interventional Programs
- Performing Outreach



POTENTIAL RETURN

- Decreased Costs for Outcome Measures
- Cost-Efficiency with Bundled Payments
- Support Financial Stability
 - Increased Service Offerings
 - Maintain More Patients
- Key Resource Center
 - Improving Care Throughout the State (Keystone)
 - Solidify our Reputation
 - Serving the Community



CASE PRESENTATION # 1

- 54 yo F
 - Acute Respiratory Failure
 - Community Hospital
 - MO
 - Needed Transfer to Tertiary Care Center
 - 4 Hours Away
 - 2 Fixed Wing
 - New Hospitalist Unable to Intubate
 - pO₂ 34
- ***What Do You Do?***



CASE PRESENTATION # 1

- Initiated Transfer Process
- Called Local Paramedic
- Ramped Patient
- Intubated!



CASE PRESENTATION # 1

- Concerns
 - Can You Really Assist with a Procedure Via Camera?
 - What if She Wasn't Successfully Intubated?
 - Legal Ramifications
 - Who is Responsible?
 - Additional Options?



CASE PRESENTATION #2

- 38 yo M
 - Critical Access Hospital
 - Fulminant Septic Shock
 - Intubated with TLC
 - Winter Storm
 - Unable to Transfer
 - Unable to Get Pharmacist on Site to Prep Antibiotics
- ***What Do You Do?***



CASE PRESENTATION #2

- Bedside Practitioner Couldn't Get to Hospital Either
- D/W Nurses Available Antibiotics
- Monitored Patient Entire Night
- Transferred to Tertiary Care Hospital in the AM



CASE PRESENTATION #2

- Concerns
 - Lack of Antibiotic Selection
 - Resourceful Measures
 - Inability for Physician to Visualize Patient/Arrive at Bedside
 - How Did Inexperienced Nurses Manage Patient?



CASE PRESENTATION #3

- 46 yo F
 - Intentional OD of Klonopin
 - Bradycardic in the 50's
 - BP 74/37
 - Given
 - Boluses: Volume Depletion
 - Hydrocortisone: Adrenal Insufficiency
- ***What Do You Do?***



CASE PRESENTATION #3

- Requested Home Medications
- Picture Didn't Make Sense
- Consider Other Options
 - Glucagon
 - Patient Also Took Toprol XL
- Concerns
 - Additional Provider Input



CASE PRESENTATION #4

- 88 yo M
 - ESRD
 - MI with STEMI
 - Community Hospital
 - Could Not Have Procedures There
 - Never Left Borders of Town
 - Refused Transfer For Treatment
- *What Do You Do?*



CASE PRESENTATION #4

- Provided Supportive Care
- Bedside Practitioner Had Never Managed
 - *Always Transferred Out*
- Respected Patient Wishes
- Concerns
 - Truncated Scope of Practice
 - Patient Autonomy



CASE PRESENTATION #5

- 31 yo M
 - ETOH with MVA
 - SDH with Anoxic Brain Injury
 - Family Waited Days to Decide
 - Urgently Requested End of Life Discussion
 - Provider Occupied/Out of House
- *What Do You Do?*



CASE PRESENTATION #5

- Hold Discussion With Family
- Discussed With Primary Physician
- Initiated Comfort Measures
- Concerns
 - Family Video Discussion
 - Primary Physician Collaboration



SUPPORTIVE ARTICLES

- **Archives of Internal Medicine 2010** – *Association of Health Information Technology and Teleintensivist Coverage With Decreased Mortality and Ventilator Use in Critically Ill Patients*
- **Chest 2014** – *A Multicenter Study of ICU Telemedicine Reengineering of Adult Critical Care*
- *****Critical Care Medicine 2009** – *Clinical and economic outcomes of the electronic intensive care unit: Results from two community hospitals*
- **Critical Care Research and Practice 2013** – *Telemedicine Intervention Improves ICU Outcomes*
- **Health Economics 2009** – *Impact of an Intensive Care Telemedicine Program on a Rural Health System*

SUPPORTIVE ARTICLES

- *****JAMA 2010** – *Association of Telemedicine for Remote Monitoring of Intensive Care Patients With Mortality, Complications, and Length of Stay*
- **JAMA 2011** – *Hospital Mortality, Length of Stay, and Preventable Complications Among Critically Ill Patients Before and After Tele-ICU Reengineering of Critical Care Processes*
- *****JAMA Internal Medicine 2014** – *Impact of an Intensive Care Unit Telemedicine Program on Patient Outcomes in an Integrated Health Care System*
- **NEHI 2013** – *Emerging Best Practices for Tele-ICU Care Nationally*
- **SD Medicine Journal 2006** – *Prognostic Outcomes After the Initiation of an Electronic Telemedicine Intensive Care Unit (eICU) in a Rural Health System*
- **Telemedicine and eHealth 2014** – *Expanding Technology in the ICU: The Case for the Utilization of Telemedicine*

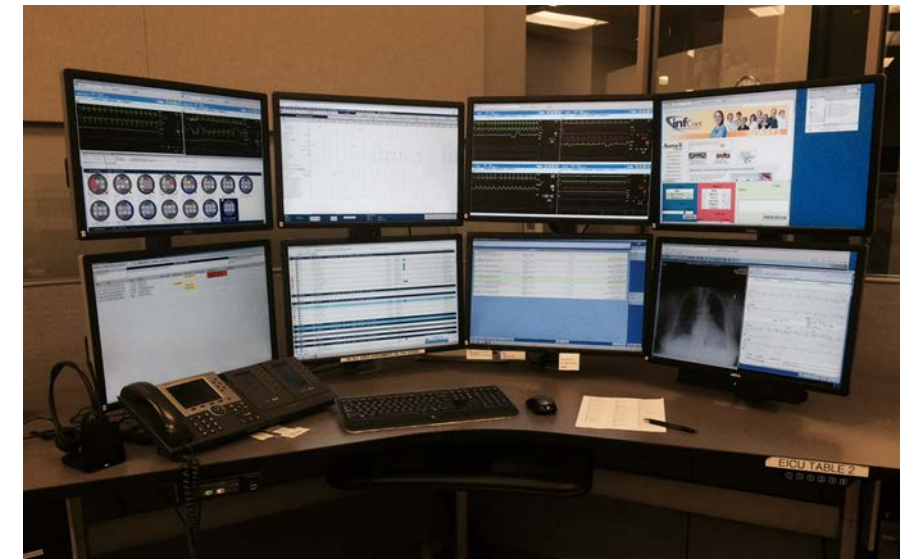
OUTCOMES

- Severity-Adjusted
 - 20% Reduction in Mortality
 - 30% Reduction in LOS
 - Associated Decreased Costs
- Greater Discharges Home vs. LTC
- Better Best Practice Compliance
- Improved Sepsis Care
- Decreased Ventilator Days

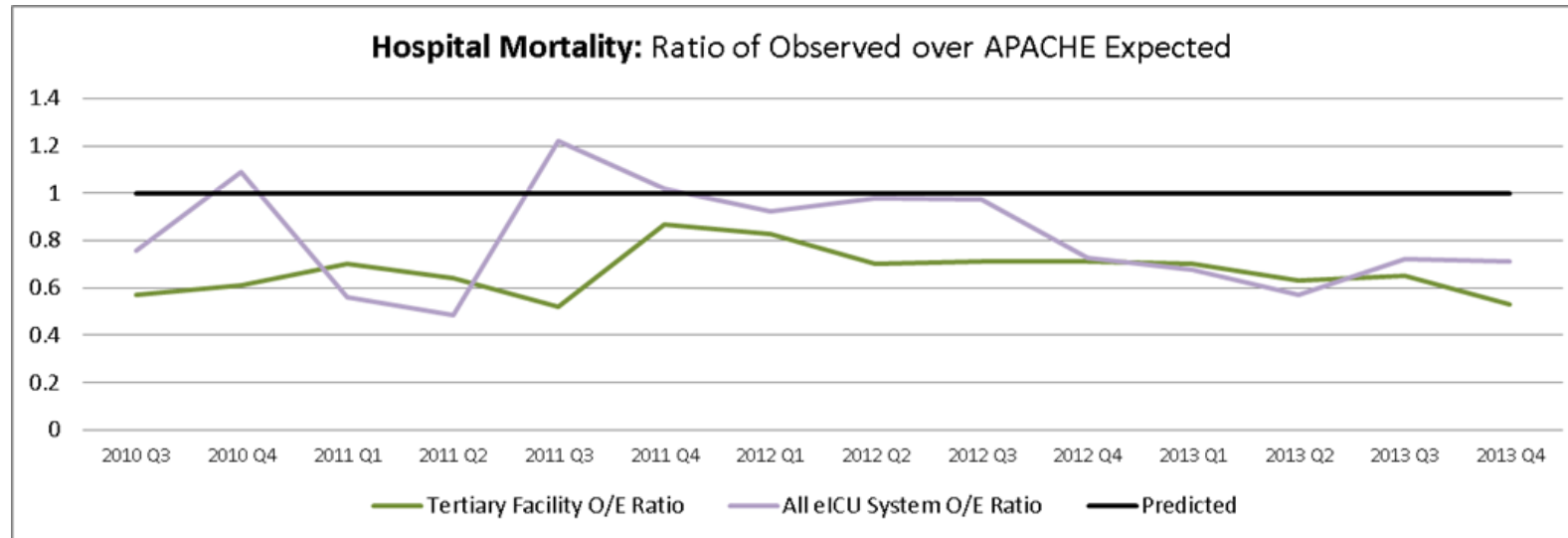


SUPPORTIVE EVIDENCE

- Top Clinical Impacts
 - Reduce Mortality
 - Reduce ICU & Hospital Length of Stay
 - Improve Use of Evidence Based Medicine
 - Reduce Complications



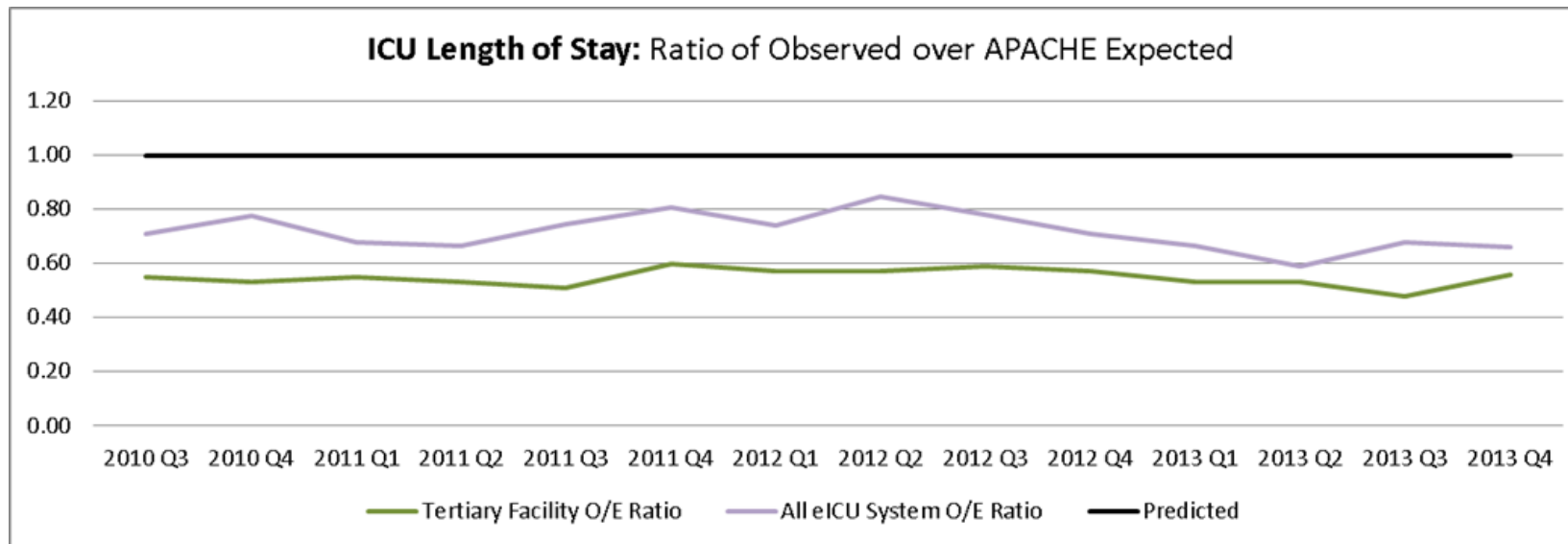
HOSPITAL MORTALITY



Nationally, other programs have achieved similar results:

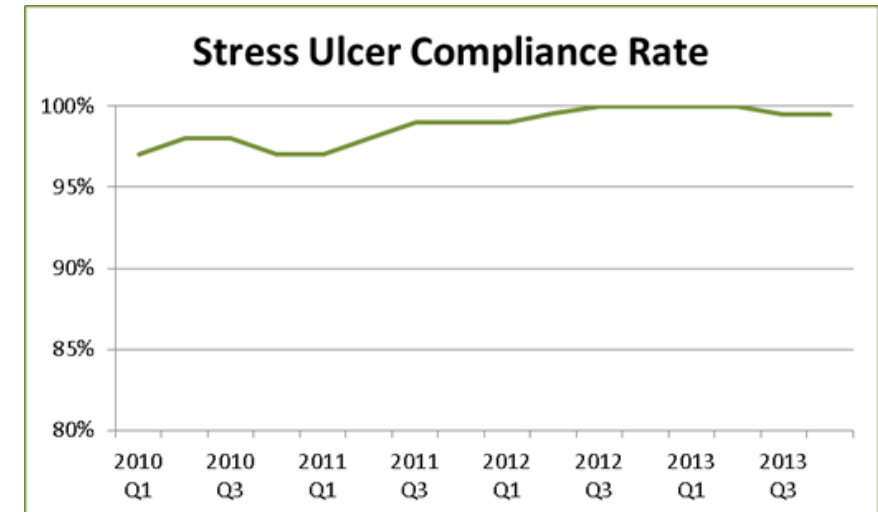
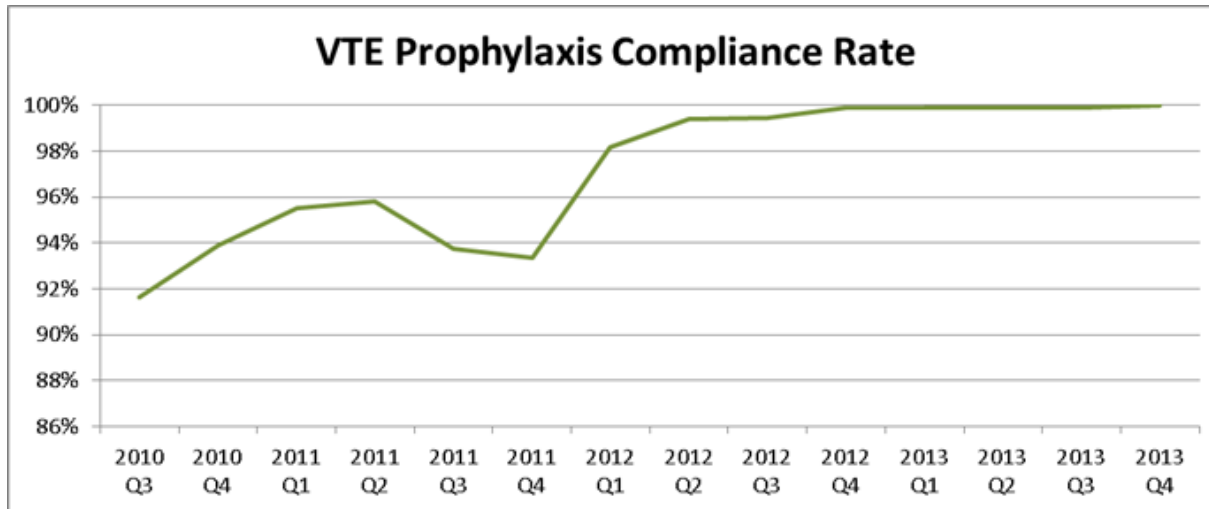
- 40% reduction in severity-adjusted mortality across seven academic intensive care units
- 58% reduction in severity-adjusted mortality over 2.5 years
- 63% reduction of ICU mortality, comparing pre- and post-data over a three-year period
- 38% reduction in codes per patient day

LENGTH OF STAY

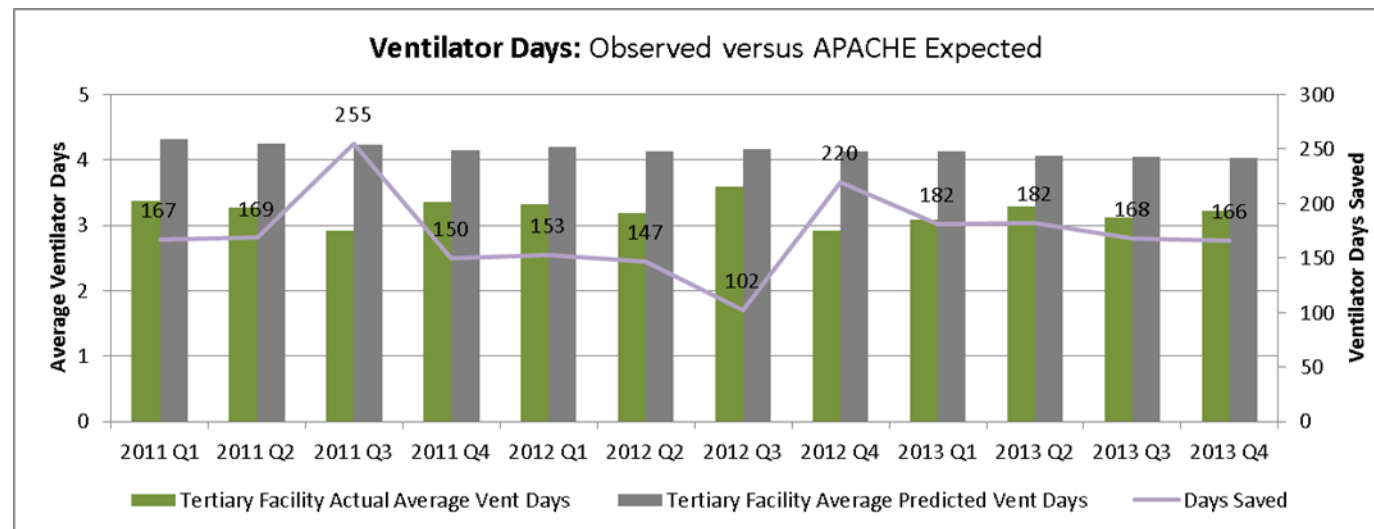
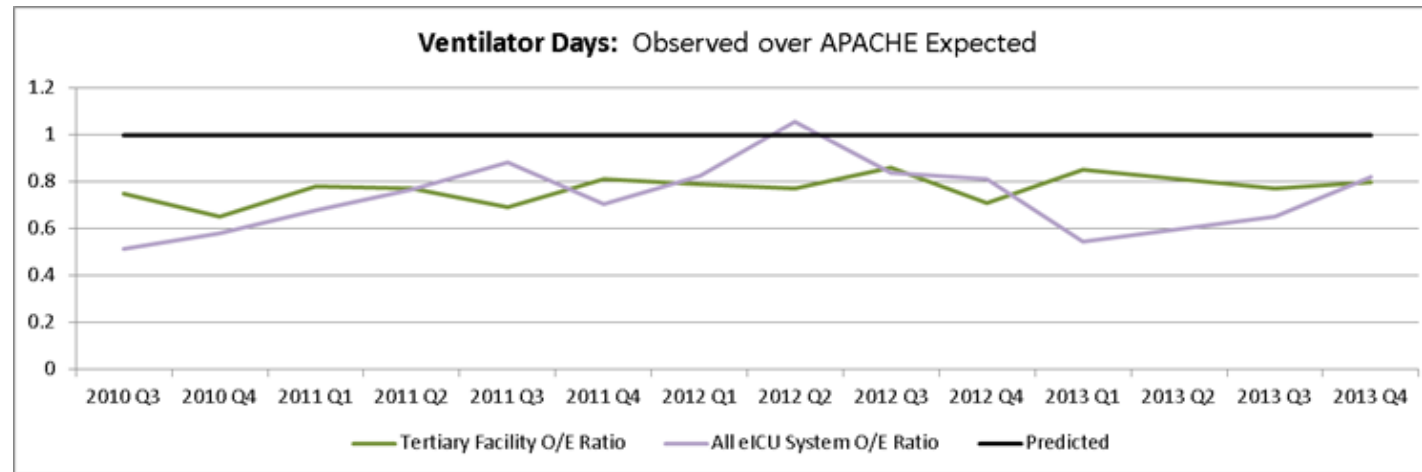


Additionally, overall hospital length of stay has been consistently 80 percent as long as predicted.

EVIDENCE BASED MEDICINE



COMPLICATION REDUCTION



RESEARCH

- More Data is Coming out Regularly About the Benefits of eICU Care
- Large, Multi-Center Papers Evaluating Cost Effectiveness are Lacking
- Significant Variability in Practice Habits
- eICU Expansion Leading to APACHE Data Reports
 - Used to Support Value
 - Data Rich for Studies



ASSISTANCE TO PROVIDERS

- Rapidly Changing VS
- Electrolyte Replacements
- On-Demand Partner
- Fluid Boluses
- Nursing Support
- Simultaneous Procedures/Codes
- Family Meetings



THINGS TO CONSIDER

- Make it an Adjunctive Part of Your Job
 - Do Not Do it Full Time
 - Ask What Expectations They Have in the Service
- Ask What Exercise Options/Breaks They Provide
- Increases Your Marketability
- May Effect Your Practice in the Near Future



QUESTION #1

How Can Telemedicine Be Effective When The Practitioner Cannot Touch The Patient?

- A) Telemedicine Is Equal to Bedside Management Because Physicians Rarely Utilize Physical Exam Skills to Evaluate Patients Anymore.
- B) Telemedicine Does Not Replace Bedside Management But Provides Many Adjunctive Ways to Evaluate and Support the Patient.
- C) Telemedicine is Not Effective Because The Practitioner Cannot Touch the Patient, It Just Acts As a Secondary Method of Patient Evaluation.
- D) Telemedicine Is Considered Equal to Bedside Management Because of the Additional Tools That Can Be Digitally Connected to The Camera for Patient Evaluation.

QUESTION #1 ANSWER...

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QUESTION #2

What is The Shared Liability of a Telemedicine Physician?

- A) The Telemedicine Physician Does Not Have Any Liability In Regards to Patient Management.
- B) The Liability of The Telemedicine Physician Is Equal to That of the Bedside Provider.
- C) The Telemedicine Physician Does Not Share In the Liability of Patient Management.
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QUESTION #3

How Likely Am I To Be Exposed To Telemedicine?

- A) Telemedicine is Already a Large Part of Healthcare, but Has Limited Capacity For Further Expansion.
- B) Telemedicine Will Not Likely Reach Tertiary Care Centers Where I Currently Work.
- C) Telemedicine is Already a Large Part of Healthcare and Is Only Projected Continued Growth.
- D) Telemedicine Is Not Likely To Out Last Other Rapidly Areas of Growth in Healthcare.

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THANK YOU!



ANY QUESTIONS??