

The Future of Critical Care Healthcare

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- ▶ Rush University Medical Center
- ▶ Chicago Illinois USA



Objectives

- ▶ Discuss future trends for critical care practice
- ▶ Identify strategies for meeting future healthcare needs in critical care



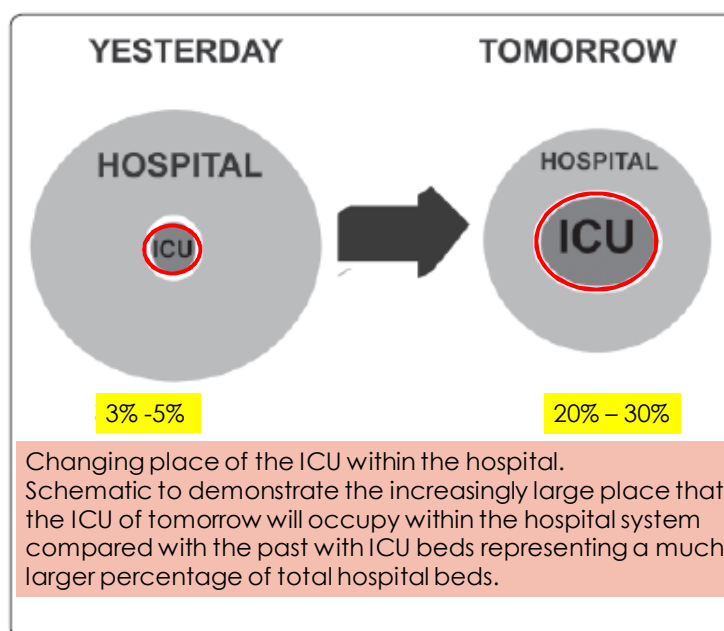
REVIEW

Critical care – where have we been and where are we going?

Jean-Louis Vincent*

The first ICUs were established in the late 1950s and the specialty of critical care medicine began to develop. Since those early days, huge improvements have been made in terms of technological advances.

Critical Care Medicine in one of the fastest-growing hospital specialties.





Worldwide variability in ICU bed capacity:
In the U.S., up to 20% of hospital beds can be labeled as ICU beds; in comparison, in the United Kingdom, ICU usually will comprise only up to 2% of total beds.



ICU Landscape

Facts:

- ▶ At present, the U.S. Population uses 23.2 million ICU days at an estimated cost of \$81.7 billion annually.
- ▶ This equates with 13.4% of hospital costs & 4.1% of the national health expenditure.



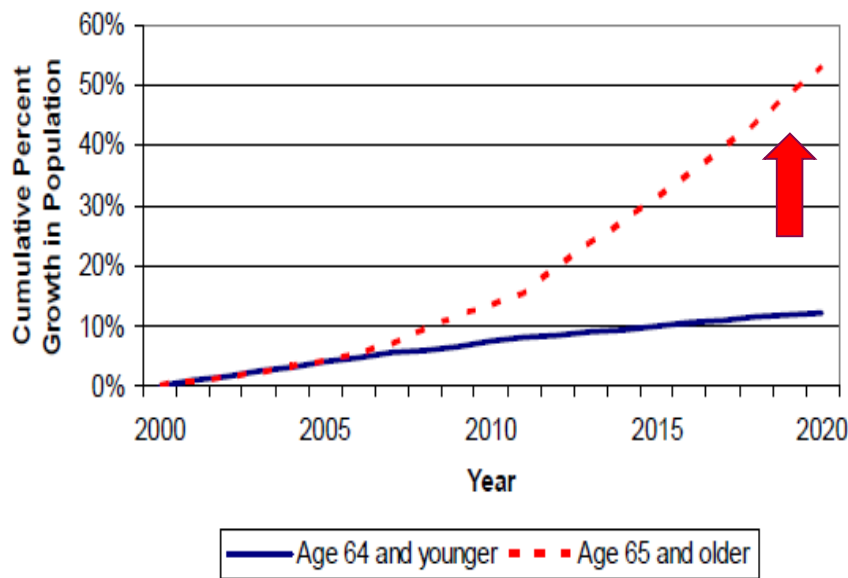
Gupta R. et al Journal of Critical Care 2013; doi.10.1016.h.hcrc.2013.06.010

Critical Care in the U.S.

- ▶ More than 5 million patients are admitted annually to ICUs in the United States.
- ▶ The five primary ICU admission diagnoses are:
 - Respiratory insufficiency/failure
 - Postoperative management
 - Ischemic heart disorder
 - Sepsis
 - Heart failure



<http://www.sccm.org/Communications/Pages/CriticalCareStats.aspx>



Source: Analysis of Bureau of Census population projections

HRSA Critical Care Workforce <http://bhpr.hrsa.gov/healthworkforce/reports/studycriticalcarephys.pdf>

Critical Care in the U.S.

- ▶ With a greater reliance on technology to keep critically ill patients alive (i.e., mechanical ventilation, hemodialysis, plasmapheresis, extracorporeal membrane oxygenation), the number of ICU beds has grown dramatically in the U.S., with the current estimate being >6,000
 - ▶ > 950,000 staffed beds



<http://www.sccm.org/Communications/Pages/CriticalCareStats.aspx>

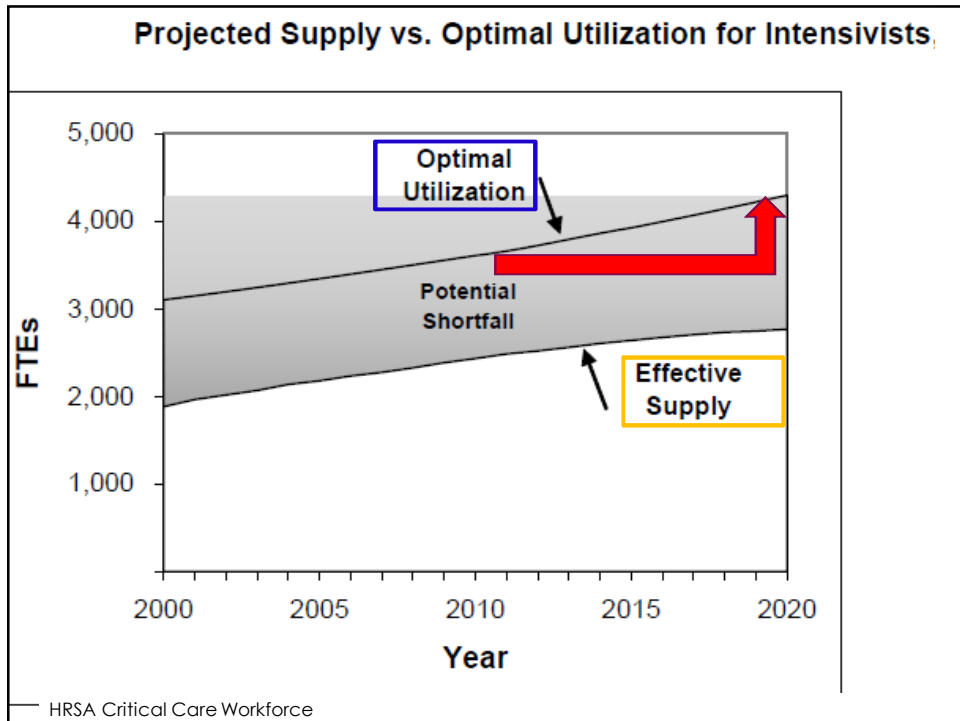
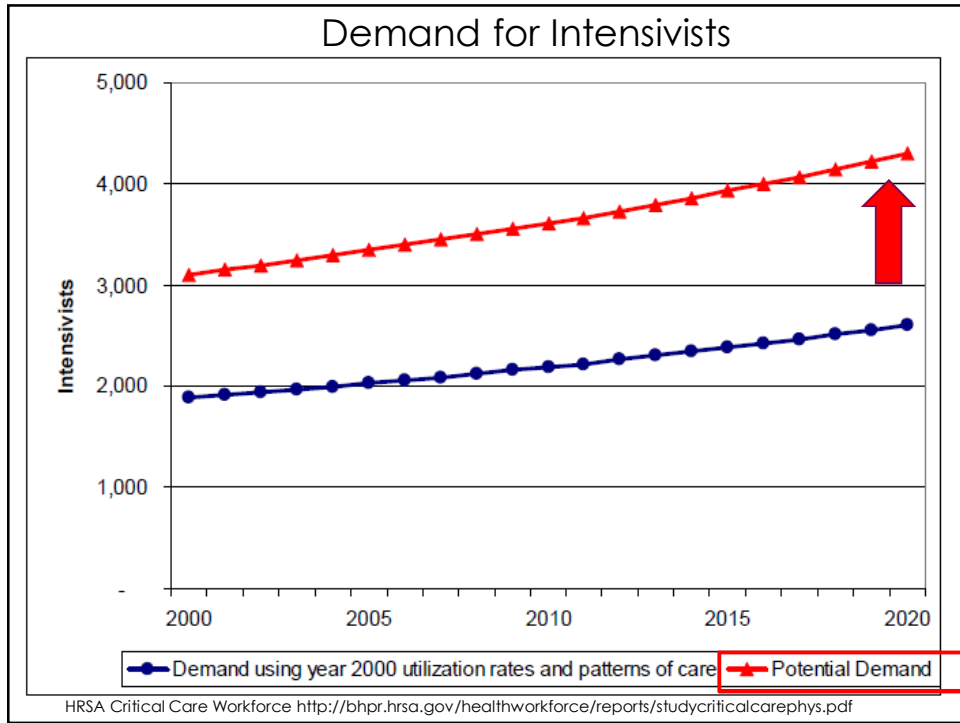
The Critical Care Workforce



Report to Congress

The Critical Care Workforce: A Study of the Supply and Demand for Critical Care Physicians

REQUESTED BY: SENATE REPORT 108-81, SENATE REPORT 109-103
AND HOUSE REPORT 109-143



Who will work in the ICU of the Future?

- ▶ The changing demographic of the "ICU Team"
- ▶ The role of technology
- ▶ Expansion of scope of practice of team members
- ▶ Development of new roles



ICU Volume 14 - Issue 1 - Spring 2014 - Cover Story:
ICU Organisation & Design



Creating the ICU of the Future: A Day of Innovation

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Main Concepts of an ideal ICU

- ▶ Create intelligent clinical systems
- ▶ Use computer-based technology to automate tasks (e.g., voice dictation), improve access to all data from any device (e.g., smartphone, tablet), and establish safeguards and reminders to assist clinicians in medical care and decisions.
- ▶ Such a system would eliminate duplicate documentation and data input, improve clinical diagnostics, decrease clinician's reliance on memory, and reduce the potential for medical error.



Pronovost P. et al 2014; Creating the ICU of the Future

Main Concepts of an ideal ICU

- ▶ Create an integrated information ecosystem
- ▶ Build an electronic platform to connect devices (e.g., ventilators, medication pumps), monitors, intelligent clinical systems (described in point 1), and the patient's EMR.
- ▶ The ecosystem would use wireless technology, have accurate sensors, and communicate information in real time to clinicians and patients. For example, the ecosystem would couple smart alarms to the patient's room equipment and EMR and communicate.



Pronovost P. et al 2014; Creating the ICU of the Future

Main Concepts of an ideal ICU

- ▶ Engage the patient and family in the medical care experience
- ▶ Design a patient room with smart screens that display patient information in a timely and understandable manner, offer multilingual translations, and play instructional videos tailored to the patient's medical situation.
- ▶ Reduce clutter (e.g., wireless connection of equipment, described in point 2) and provide an area of comfort for family members. Involve the family in the patient's care (e.g., provide oral care, help with mobility). This last point will increase engagement and reduce the sense of hopelessness felt when a loved one is critically ill (Hibbard and Greene 2013). Such involvement will also reduce the burden on caregiver.



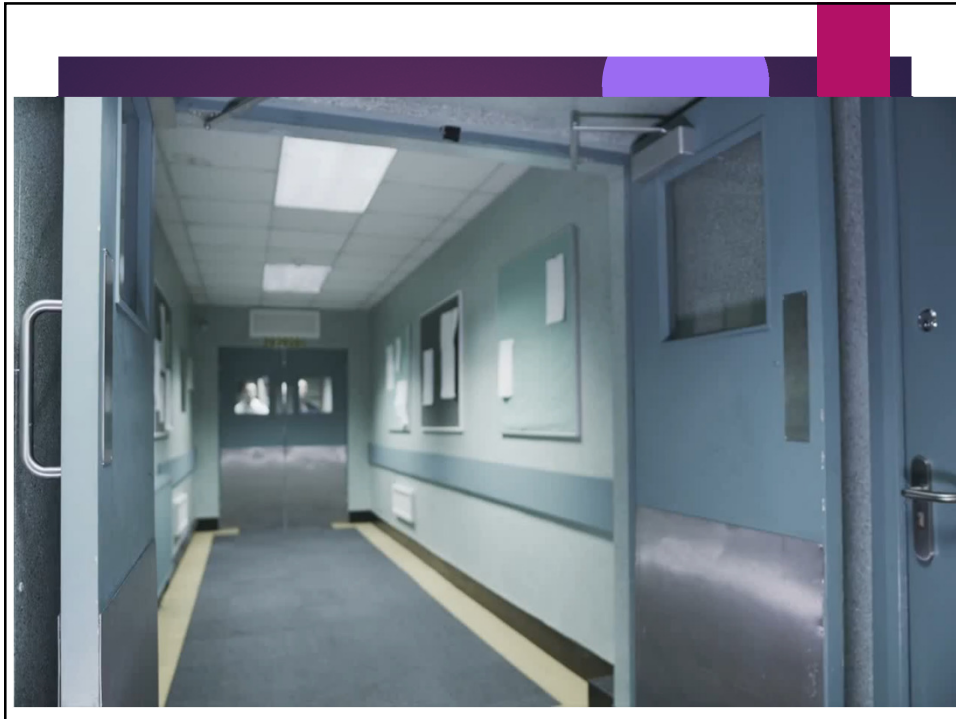
Pronovost P. et al 2014; Creating the ICU of the Future

Main Concepts of an ideal ICU

- ▶ Use technology to improve communications
- ▶ One key recommendation was the use of technology to allow everyone involved in care – patient, family, and care team – to communicate with each other as easily and often as possible.

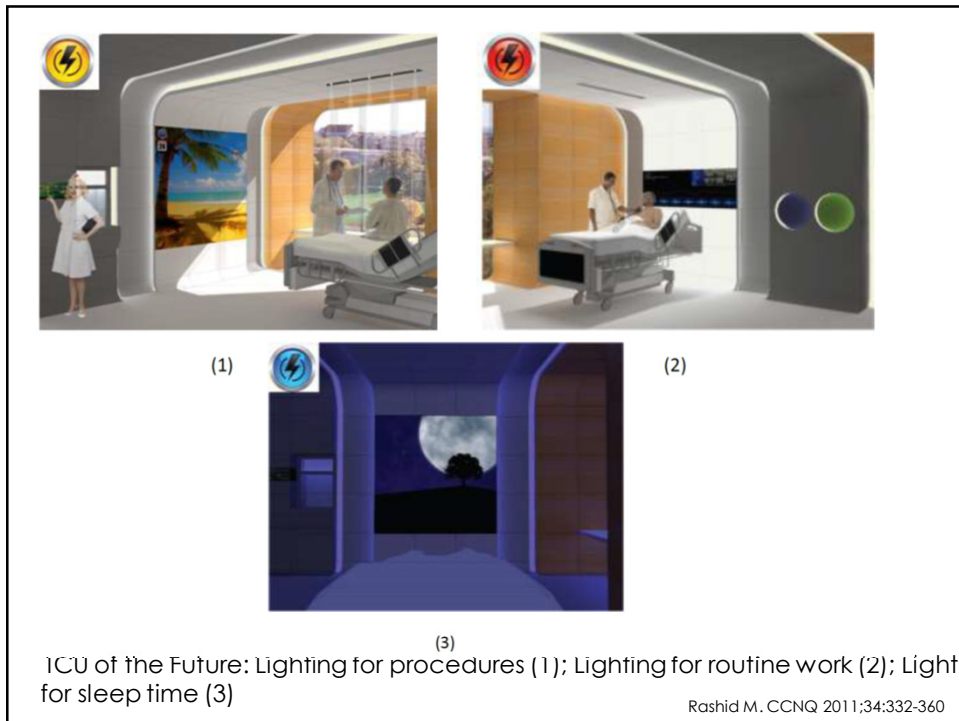
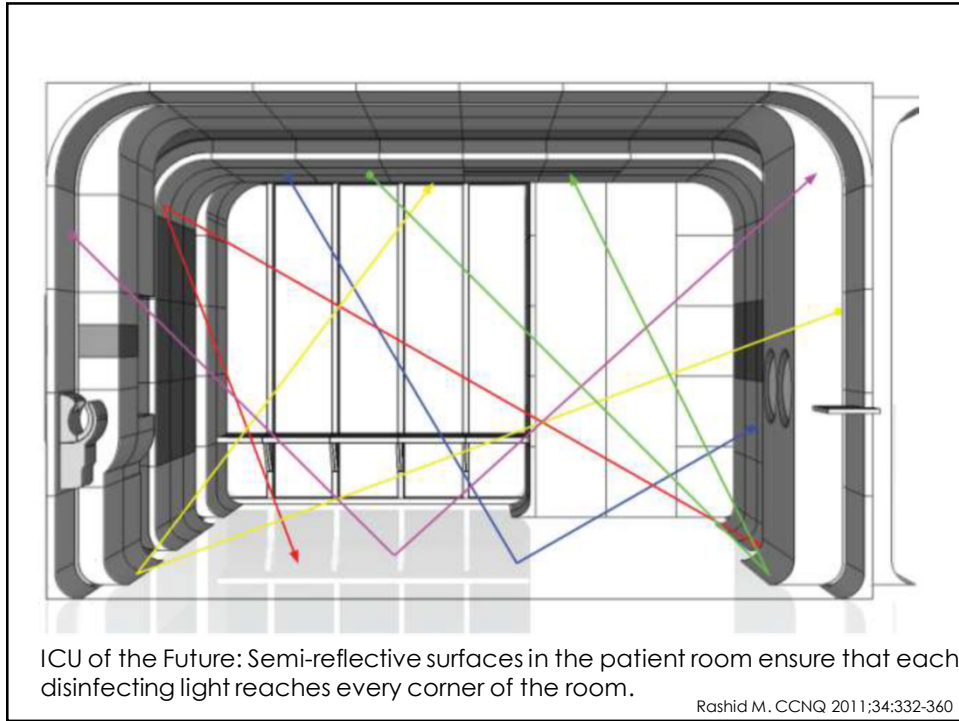


Pronovost P. et al 2014; Creating the ICU of the Future



The green screening does not only contribute to the well-being of the patient. It also regulates the circadian rhythm. The supervision room is located outside in the background; ©Tobias Hain/ graftlab

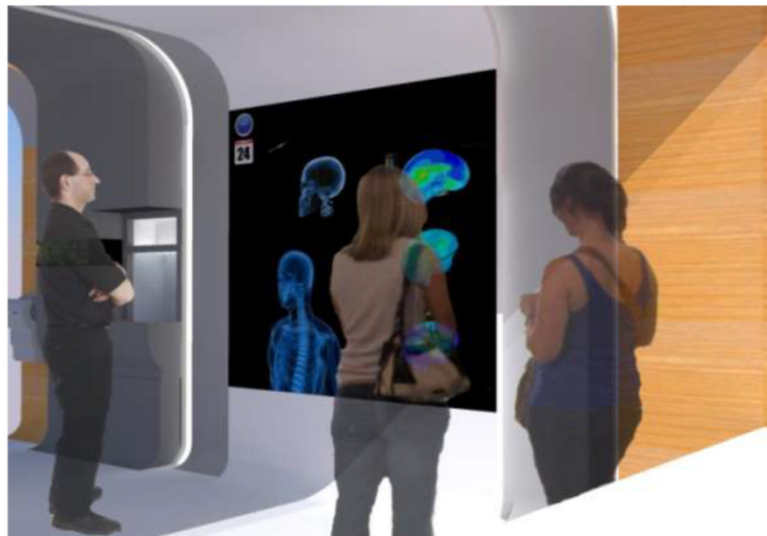






The smart surface at the integrated headwall system in its idle state, and the waste collection inlets in the patient room.

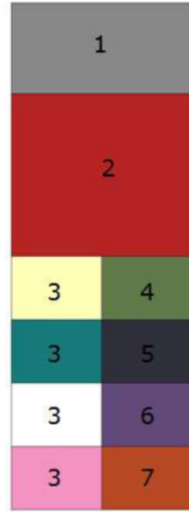
Rashid M. CCNQ 2011;34:332-360



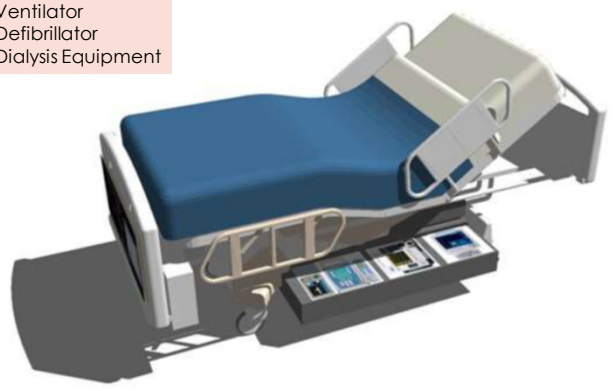
The multi-touch surface on the foot wall of the patient room can be used as a communication and collaboration tool for the patient, family, and staff. It can also be used as a form of entertainment for the patient and family.

Rashid M. CCNQ 2011;34:332-360

The smart patient bed. (1) The patient information interface in its regular position. (2) The patient information interface is pulled out.



- 1. Systems Computer
- 2. Battery Storage
- 3. Med-Gas Storage
- 4. External Pacemaker
- 5. Mechanical Ventilator
- 6. Defibrillator
- 7. Dialysis Equipment

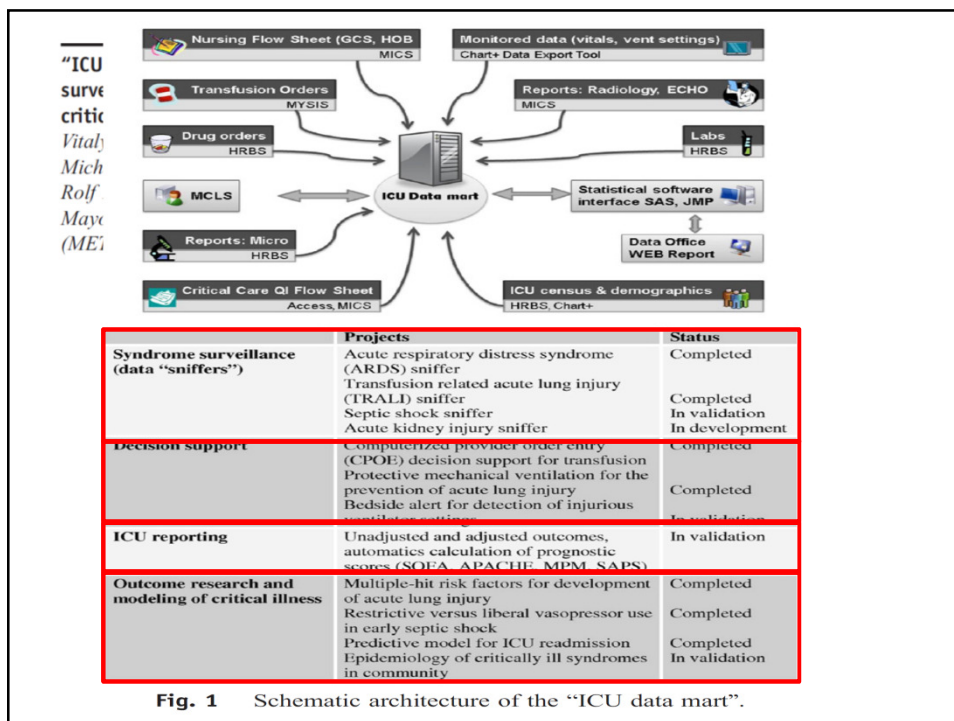


Rashid M. CCNQ 2011;34:332-360



A view of a private patient room.

Rashid M. CCNQ 2011;34:332-360



Royal College of Art

Future Critical Care

How can design improve the patient experience in the intensive care unit?

<http://www.rca.ac.uk/research-innovation/helen-hamlyn-centre/research-projects/2015-projects/future-critical->



joms Journal of Pioneering Medical Sciences *Blogs*

(formerly called Journal of Pakistan Medical Students)

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A Glimpse into the Future ICU: The Closed Loop System

Submitted by **Haris Riaz** on April 24, 2013 – 9:52 PM [1 Comment](#)



The modern health care system owes heavily to the technological developments which are occurring at a logarithmic pace. These advancements are necessary to overcome the burden of limited skilled manpower which healthcare has traditionally witnessed and this burden is likely to increase in the future.

Medical Education »

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By the end of this year, tens of thousands of students will enter a race towards acquiring the best medical scores. For many, this undertaking is viewed as a terrifying phase that is out to ...

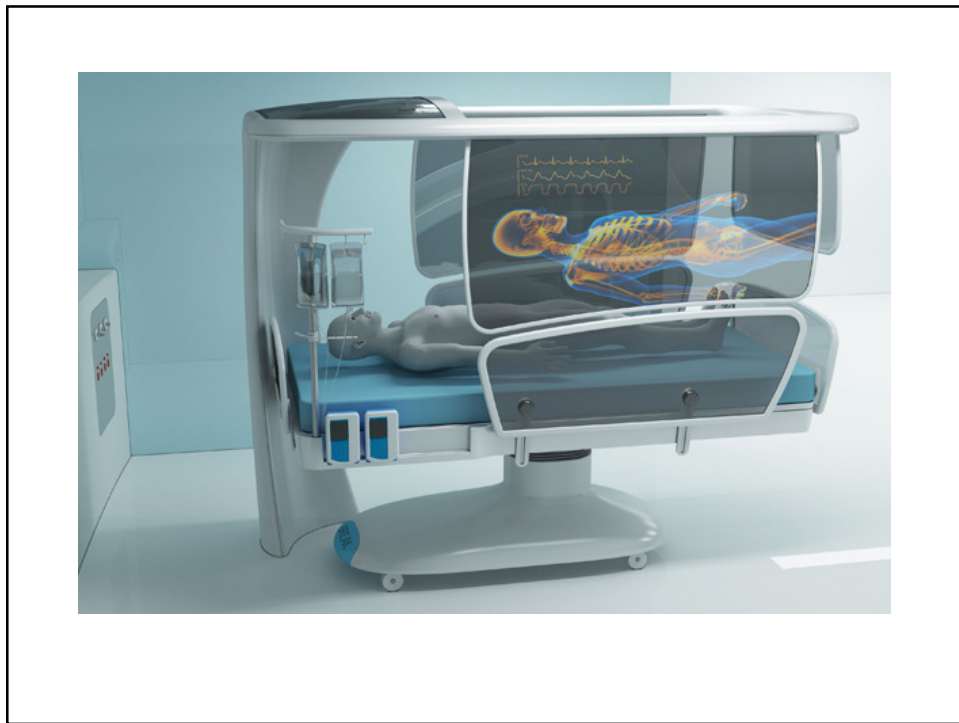
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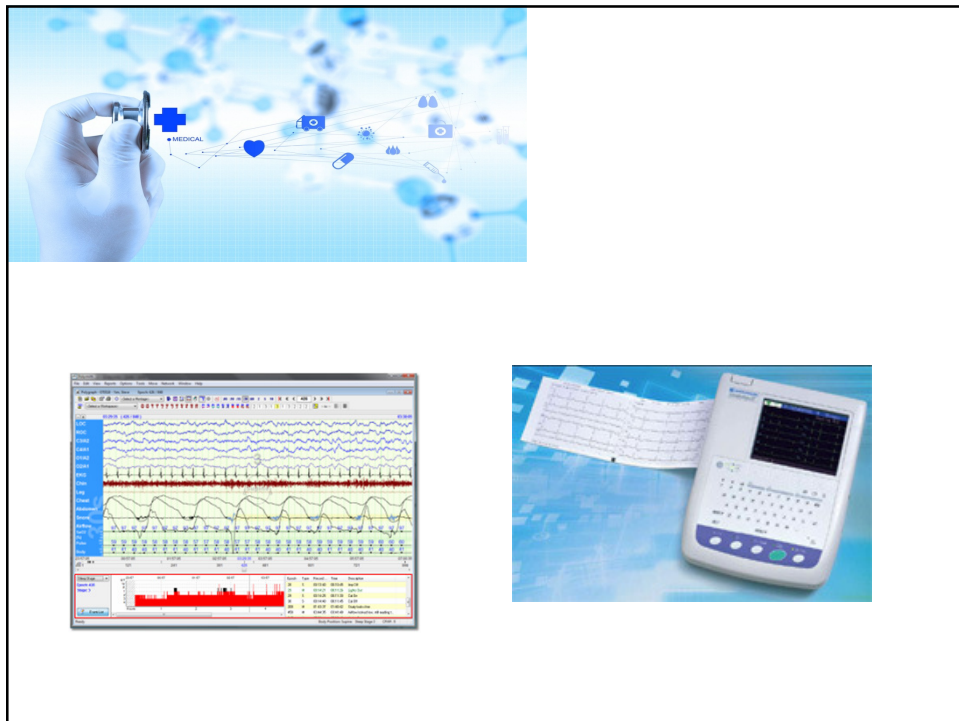
Social Issues »

A Rampant Crime of the Intimate: Domestic Violence against Women in Pakistan



It is well known that women are helpless







THE ICU OF THE FUTURE

4 elements: lighting, privacy, maintain normalcy, silence

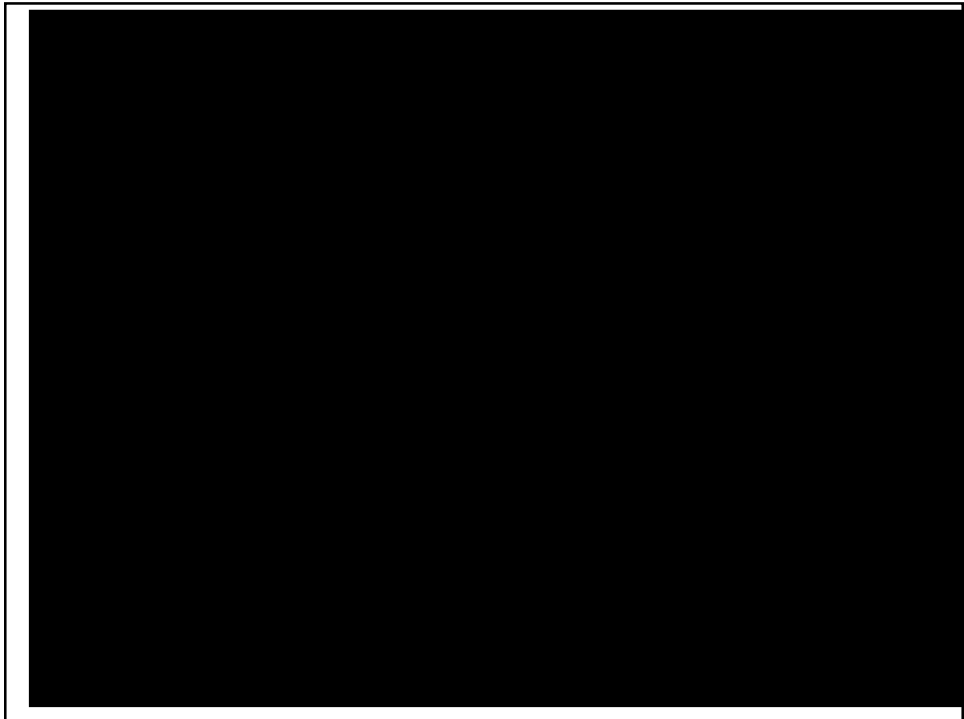


ICU of the Future: Expanded Use of Simulation



***EVERY intensive care nurse and
doctor needs to see this film***





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New eICU® Links FHN Intensive Care Unit with Team of UW Health Intensivists

FHN Memorial Hospital has debuted its eICU program, a collaboration between the Intensive Care Unit at FHN Memorial Hospital and UW Health e-Care of Wisconsin's team of intensivist physicians and critical care nurses.


FHN is among just 10 percent of rural hospitals across the country and the only rural hospital in northern Illinois and southern Wisconsin with a program like eICU, which provides a unique additional level of care to ICU patients.



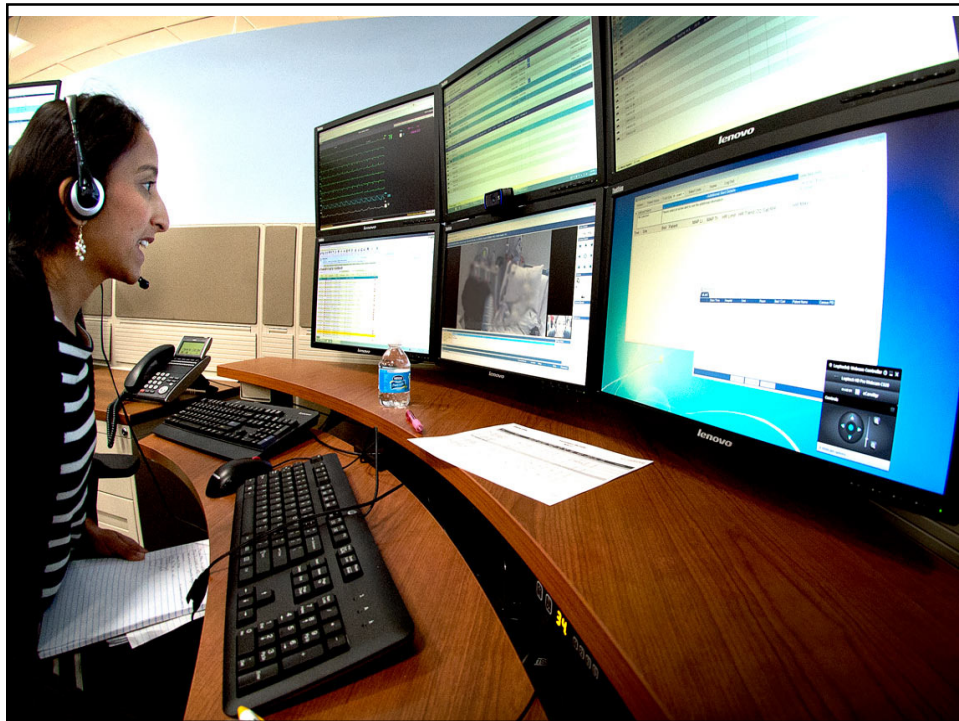
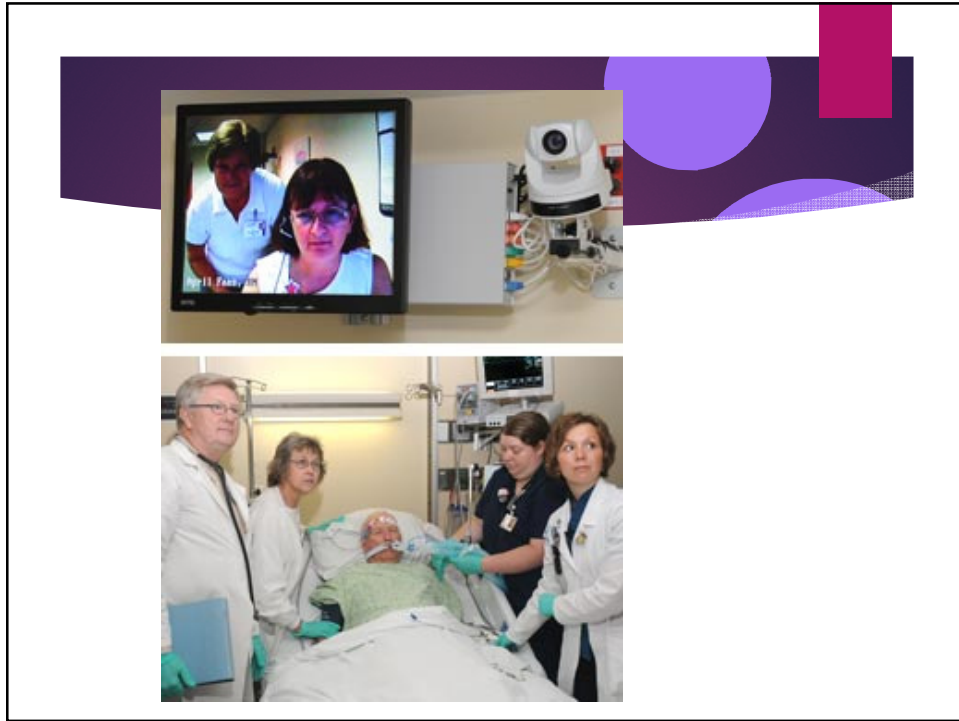
Small microphones and cameras in each ICU patient room provide a constant link to the e-Care team in Madison, which includes some of the nation's most respected intensivists (physician specialists in critical care medicine). Each ICU patient's vital information, such as heart rate, blood pressure, medications and test results are monitored in the FHN ICU and shared in real time with the e-Care team.



If a patient's condition changes rapidly or unexpectedly and requires a medical response, the FHN physicians and nurses at the patient's bedside can touch a button and activate a two-way visual and audio link for consultation with e-Care specialists.



The cameras and microphones can capture the smallest details for the e-Care specialists, from slight changes in the patient's skin color to monitor readings across the room. The patient and his or her caregivers can also see and hear the critical care nurse or physician on the other end of the link, which adds value in that the caregiver is consulting with a person who is visible on screen. The e-Care team members also are identified by name and credential on-screen. FHN is the only hospital to offer two-way visual





ICU of the Future

Partnering with Patients & Families







Society of Critical Care Medicine
The Intensive Care Professionals

email ID # Password Log In
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ABOUT SCCM • COMMUNICATIONS • EDUCATION CENTER • FUNDAMENTALS • MEMBER CENTER • PROFESSIONAL DEVELOPMENT • RESEARCH/QUALITY

SCCM > ResearchQuality > Quality > PCOR-ICU Collaborative

Surviving Sepsis Campaign
ICU Liberation
Patient-Centered Outcomes
Project Dispatch
PCOR-ICU Collaborative
Sepsis Definitions
Thrive
Quality Collaborations

PCOR-ICU Collaborative

The Society of Critical Care Medicine is launching a new collaborative aimed at helping hospitals implement patient and family engagement programs.

The Society is seeking intensive care unit (ICU) teams interested in participating in the PCOR-ICU Collaborative: Improving Care for Critically Ill Patients and Families Through Research Dissemination and Implementation. This program is funded through a Patient-Centered Outcomes Research Institute (PCORI) Eugene Washington PCORI Engagement Award (2626-SCCM).

The Society is seeking 50 ICU teams based in the United States to participate. Adult and pediatric ICUs will be considered.

There is no charge to participate in this collaborative. Participants will take part in monthly conference calls during the 10-month collaborative. The submission of a limited data set will be required that will include surveys of family and clinician experience. Participating organizations will also be responsible for the expenses of sending two project leaders to a one-day meeting in Chicago on September 8, 2016.

[Application](#)
[Application Preview](#)
[Fact Sheet](#)
[Letter of Commitment](#)

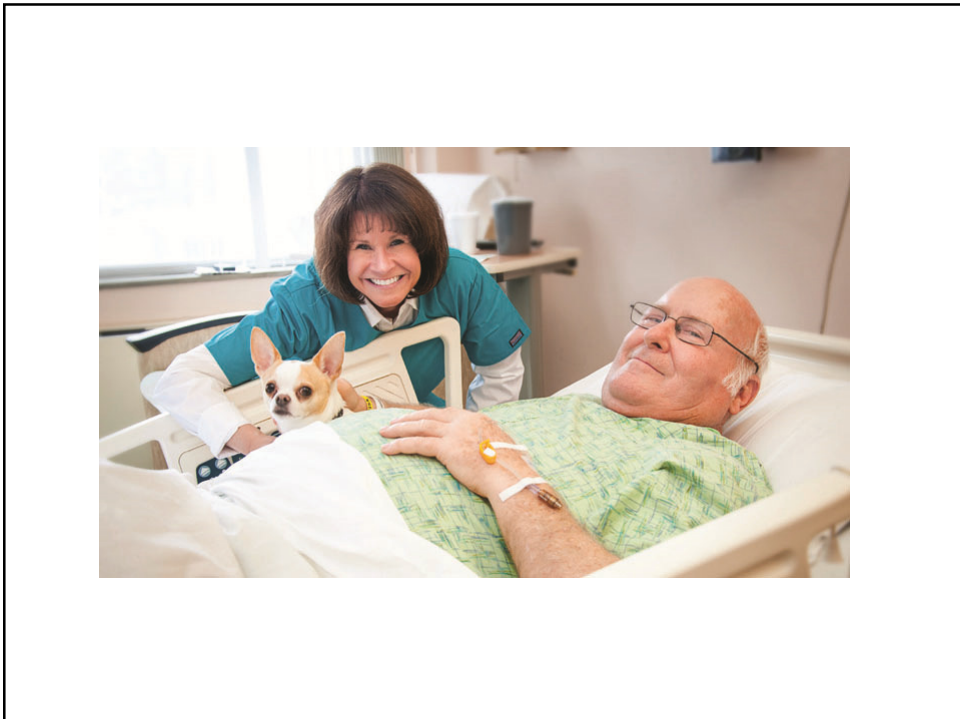
For additional information contact SCCM staff partner, [Kathy Vermoch](#).

[About PCOR-ICU Collaborative](#) [Collaborative Members Only](#) [About PCORI](#) [Leadership](#)

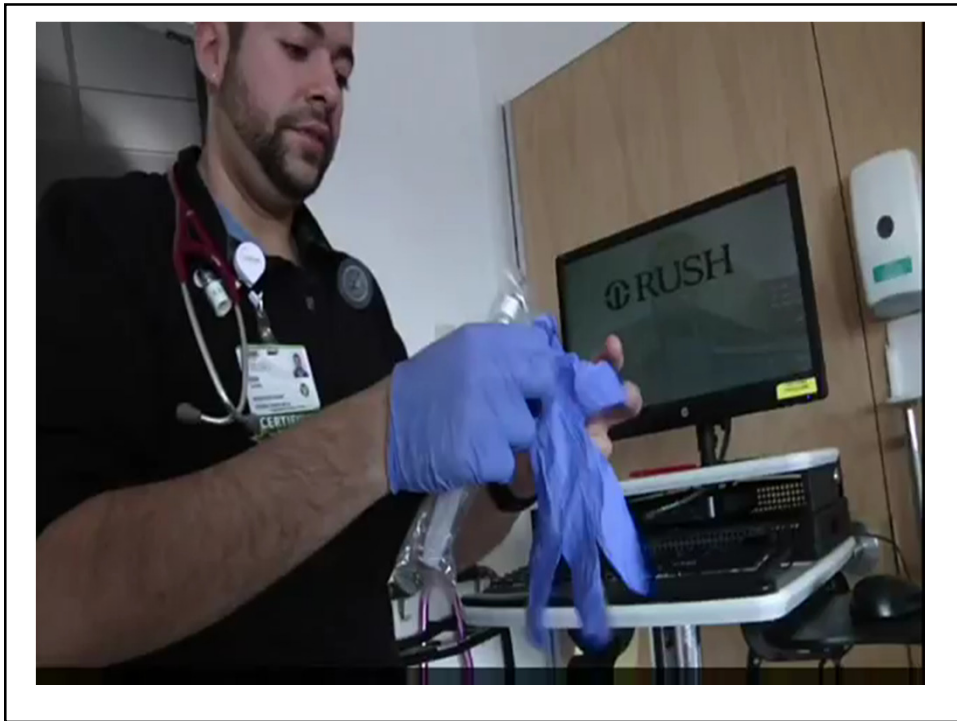
Led by SCCM Executive Committee members Ruth M. Knaipell, PhD, RN-CS, FAAN, FCCM, and Jerry J. Zimmerman, MD, PhD, FCCM, the PCOR-ICU Collaborative will bring together ICU teams to implement patient- and family-centered care initiatives.

Each team will select a project based on various factors, including the culture of the institution to innovate and progress, the community served, hospital policies and processes required to approve new interventions, sustainability commitments and interests of the ICU staff to integrate changes into their work flow.

Photo credit: iStockphoto.com/Scott G. Smith









ICU of the Future

Promoting Healthy Work Environment



CRITICAL CARE SOCIETIES COLLABORATIVE (CCSC)



Burnout Syndrome in Critical Care
Healthcare
Professionals: A Call for Action

THE LANCET

How do you deal with burnout in the clinical workplace?

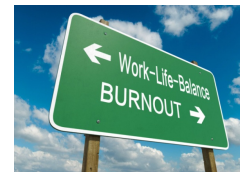


Talha Khan Burki


www.thelancet.com/respiratory Vol 3 August 2015

Provider Focused Interventions

- Stress reduction training
- Relaxation techniques
- Time management
- Assertiveness training
- Meditation
- Work-life balance measures: hobbies, family and social activities
- Self-care measures: ensuring adequate rest, exercise, healthy eating habits



Reader TW et al. *Intensive Care Medicine* 2008;34:4-6.

 RUSH UNIVERSITY
MEDICAL CENTER

STAFFING BY ACUITY COMMITTEE

PROFESSIONAL NURSING STAFF GUIDELINES FOR BREAKS

Take breaks with a minimum of one meal break to be refreshed and reengaged for the dynamic environment that is our workload.

In the past, we have received valuable feedback from the staff that they are refreshed and reengaged for the dynamic environment that is our workload.

Refreshed and Engaged caregivers will provide higher quality care, keeping themselves and patients safer.

Each professional nurse remains autonomous in his or her time management; and breaks should be considered in a healthy culture to be necessary.

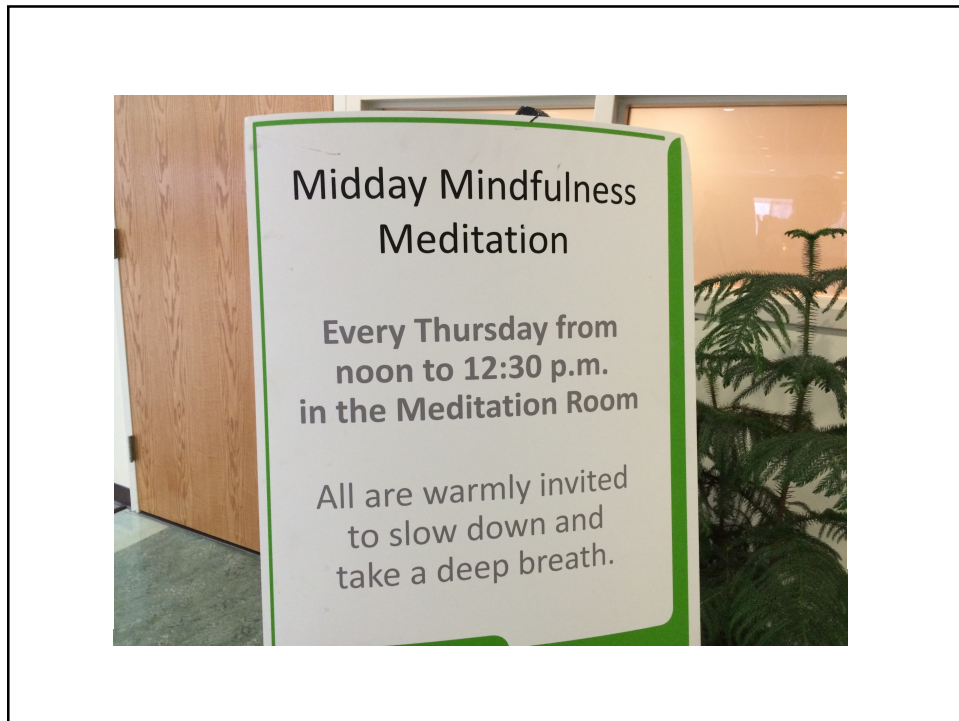
All staff, both direct care and leadership need to own the creation of cultures and environments that encourage breaks.

Where possible, breaks should be free of patients and in an environment that is set apart from the patient care area.

Professional Nursing Staff Breaks

the PINO Staffing by Acuity Committee have formulated these guiding principles as recommendations to all nurses.





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PROMOTING WELLNESS AT WORK

Rush invests \$6 million in new fitness center for employees

Jennifer Lewis wants to look her best when she gets married in April. She also wants to be in good health.

So five days a week, the Rush nurse works out on elliptical machines and treadmills at the hospital's recently opened fitness center.

"With work and family it's hard to find time to exercise," says Lewis, who has two teenage daughters from her first marriage and wants to keep her evenings free for her family. "Now that it's open, I go every day during lunch. I do 45 minutes of cardio, shower and come right back to work. It's wonderful."

Lewis, the infection control coordinator for Rush's Employee and Corporate Health Services, is among the more than 1,000 employees, faculty members and students who have joined the center since it opened on July 21.

The ICU of the Future has only been envisioned

ICU clinicians have the opportunity to influence the future of the ICU

THE FUTURE IS OURS TO CREATE.



1) Which of the following trends is most likely to impact critical care?

- A. Advanced informatics and technology
- B. Changes in disease presentation
- C. Aging population
- D. Costs of healthcare

Answer A is the correct answer because while all of the trends will influence healthcare in the future, advances in clinical information systems, and communication technology will significantly impact the clinicians ability to manage patient data and coordinate care.



2) New models of care for the ICU for the future may include changes in the traditional roles of healthcare providers

- A. True
- B. False

Answer A is the correct answer because future models of care for the ICU will involve the use of smart technology, new ways of integrating care for critically ill patients, and new opportunities for healthcare providers including increased interprofessional education, training and roles.