Virtual Nursing: A Step Into The Future

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Objective

• Discuss vICU program and its implications for nursing in the critical care setting.
About Houston Methodist
Our Hospitals

2023 System Patient Safety Symposium

Houston Methodist Hospital

Houston Methodist Baytown

Added in 1983

Houston Methodist Sugar Land

Opened in 1998

Houston Methodist Willowbrook

Opened in 2000

Houston Methodist West Houston

Houston Methodist Clear Lake

Added in 2014

Houston Methodist Continuing Care

Added in 2014

Houston Methodist The Woodlands

Opened July 2017

Houston Methodist Baytown

Opened in 2010
Houston Methodist Cypress Hospital will be the testament to our dedication to unparalleled safety, quality service and innovation.

Houston Methodist Cypress will be the "Hospital of the Future". 
FACILITIES AND CAPACITY
Houston Methodist is a faith-based, academic medical center comprised of 8 hospitals,

1 academic medical center
6 community hospitals
1 long-term acute care hospital
2,646 operating beds

PHYSICIANS AND STAFF

29,700+
Employees
1,100+
Employed Physicians
+ 4,900 Affiliated Physicians

PATIENT ENCOUNTERS
In 2022, Houston Methodist had
138,000+ HOSPITAL ADMISSIONS
1,929,000+ OUTPATIENT VISITS
1,800,000+ CLINIC VISITS

RECOGNITION AND ACCOLADES

RESEARCH, EDUCATION AND GIVING

$180 MILLION Research Institute funding
68 ACGME Residency Training Programs
WEILL CORNELL Medical School affiliation
ENMED PROGRAM Partnership with Texas A&M

More than $1 BILLION in charity care and community benefits
Why Virtual Medicine?
Demands of Physical Spaces
2023 System Patient Safety Symposium

How many more $700M patient towers we can build?

How quick can we build those?

Should we build more buildings...

Houston Methodist unveils $700M patient tower this month

Alia Paavola - Wednesday, August 8th, 2018 Print | Email

Houston Methodist will open its 22-story, $700 million patient tower Aug. 27.

The 954,705 square-foot, 366-bed facility will have three intensive care floors with private rooms, six acute care floors, 18 operating rooms and 14 heart catheterization labs.
Low Revenue, Patient Volumes Led Hospital Finances to Regress

Hospital finances are hurting once again as health systems saw negative operating margins, low revenues, and declining patient volumes in April.

The financial outlook for hospitals and health systems continues to be bleak as existing expenses and lower margins took their toll in May, even though revenue and patient volumes improved, according to the "National Hospital Flash Report" from KaufmanHall.

"While we are seeing hospitals continue to improve, it simply is not enough to mitigate the skyrocketing costs of materials and labor expenses, resulting in negative operating margins for the second quarter," said Eric Swanson, a senior vice president of data and analytics with KaufmanHall. "As a result, we are seeing the negative revenue trend continue."
Hospitals Look to Raise Treatment Costs as Nurses’ Salaries Increase

Health insurers and employers are pushing back against requests to increase hospital prices by as much as 15%

Nationwide nursing shortage is leading to big salary boosts

Nurses’ salaries, overtime and bonuses increased during the pandemic.

Nurse Salaries Rise as Demand for Their Services Soars During Covid-19 Pandemic

Average annual salary for registered nurses, not including bonus pay such as overtime, increased about 4% this year to $81,376

Traveling nurses are offsetting staffing shortages in hospitals around the U.S. where Covid-19 is surging. In this video from 2020, four nurses give viewers an intimate look into the mental and physical toll the work is having on them five months into the pandemic. Photo: Chelsea Walsh
Struggles to Hire and Retain
2023 System Patient Safety Symposium

Healthcare may see a ‘Great Retirement,’ too

Nolly Gambia (Twitter) - Updated Monday, October 11th, 2021

Numerous health systems are down to their final months with the same CEO who led the organization through a tumultuous decade for the industry.

CEOs of several of the largest and most prominent health systems in the country announced plans to retire within the next year. Some of their tenures span well beyond the average, which is about five years for a hospital CEO, according to the American College of Healthcare Executives.

- Lloyd Dean, CEO of 140-hospital CommunityHealth, will retire in late summer 2022. Including his 19 years at Baptist Health, Dean has spent 32 years at the helm. Dually merged with Catholic Health Initiatives to form YMCA CommunityHealth in February 2016.
- Mario Borgstrom, CEO of Yale New Haven (Conn.) Health, will retire in March 2022. He has been with the system 45 years, 11 of them as the system’s first female CEO.
- Stephen Klasko, MD, will retire Dec. 31 after eight years as CEO of Jefferson Health. Klasko joined the organization in 2013, the Philadelphia-based system has expanded from three hospitals to 10 and annual revenue has grown from $15 billion to upward of $30 billion.
- John Stossel, CEO of Baylor Scott & White, will also exit by year’s end. He has led the largest nonprofit health system in Texas since 2017.
- Penny Wheeler, MD, the first physician and woman to lead Minneapolis-based Allina Health as CEO, will retire at the end of the year after seven years in the role.

A bump in executive turnover is to be expected as the pandemic settles down. More executives stayed with their organizations throughout 2020, a career-redefining year, according to ASHE.

Nonetheless, these organizations and the industry will face all the generational challenges that led their health systems through numerous innovations and headwinds, including talent and compliance with the Affordable Care Act, the move from paper to digital records and major mergers and labor strikes. But the trend remains: As their organizations meet the demands of the COVID-19 pandemic and its consequences, they will see the tone and feel shift as these leaderships are transformed.

As the above institutions, and others still, prepare for a new CEO, it’s worth reflecting on what the role means in the grand scheme of things. Many Americans may carry on daily life with little awareness as to who, precisely, is at the top of their local hospital or health system. The past 10 months challenged that status quo, throwing hospital leaders and executives into the spotlight for many Americans caught off-guard, with little scientific evidence and few voices to make sense of it all. But even more important, the general public saw hospital CEOs in action, heard their voices, and read their words more within the past year-plus than ever.

Yolette Kiper, a registered nurse, treated Ibolya Collignon, a Covid patient, in the emergency room of Ochsner Hospital in Mississippi on Sunday. Rona Heiter for The New York Times

The most recent surge in the delta variant of COVID-19 has left San Antonio with almost no open beds in its intensive care units (ICUs), says pediatrician Woodson “Scott” Jones, MD. The obvious solution is to expand the number of ICU beds. But there’s one big problem — San Antonio hospitals can’t staff the medical teams needed to oversee those beds.
Traditional Methods Aren’t Working

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Reduce Clinical Costs
- Decrease Drug Costs
- Standardize Clinical Care Costs
- Cut LOS

Reduce Staff Costs
- Decrease Management Layers
- Consolidate Infrastructure
- Cut Number of Staff

Retention Bonuses
Salary Increases
Travel Nurses
SUSTAINABILITY IS THE SOLUTION

but we must find new ways to achieve this

**HARD SAVINGS**
Actual costs we can avoid, saving direct dollars, without compromising any functionality of the organization.

**EXAMPLES:**
- Changes in staffing ratios
- LOS reductions

**SOFT SAVINGS**
Quality and efficiency improvements that have downstream or indirect cost savings for the organization.

**EXAMPLES:**
- Improved patient outcomes
- Decreases in adverse events
Technology as a Sustainer

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What is Virtual ICU?
What is Virtual ICU (vICU)?

https://www.youtube.com/watch?v=LeozgZwDRp0
Overview - vICU

2019

7 MDs

9 Covered ICUs

6 Uncovered ICUs

2022

5 MDs + 3 vMDs

15 Covered ICUs

Emergency Departments
vICU Overview

PHYSICIAN SUPPORT (vMD)

- Experienced intensivist physician team available for immediate consultation
- Can assist with management of codes, admits, calls
- Works collaboratively with bedside team
- Plan of care support
NURSING SUPPORT (vRN)

- Experienced critical care nurses
- Facilitate video connections and conversations
- Support shift transitions & staff interaction and communication
- Consult resource to bedside nursing staff
vICU Overview cont.

MONITORING

- Software: consolidate data from bedside and EMR
- Extra set of eyes – vRN review monitoring info and communicate alerts/trends to bedside team/vMDs
- Algorithms and predictive analytics
- Data collection tool
Outcomes
Virtual ICU Analytics Drives Outcomes

**OPTIMIZATION: Top Performance Metrics**

- **Hospice Conversations**
- **ICU Code Blues**
- **Length of Stay**
- **Cardiac Surgery**
- **Unplanned Extubations**

**OPTIMIZATION: HMH All ICUs Nocturnal Code Blue Trends**

- **↓ 20% in code blue**

Graph showing trends in code blue events from Q1 2020 to Q2 2022, with a decrease of 20% indicated.

Legend:
- **Code blue events**
- **Code blue events / 1000 ICU patient days**
- **Linear (Code blue events / 1000 ICU patient days)**
Why vICU?

- Intensivist Shortage
- Specialized critical care delivery beyond traditional walls of ICU
- Improved ICU throughput
- Reduction in MD & ICU teams’ burnout
- Severity adjusted outcomes
- Sustainment of low mortality rates
- Decrease length of stay
- Decrease in hospital acquired conditions
- Remote patient monitoring and support with experienced nursing
Informatics Tool for Protective Lung Ventilation in ARDS Patients

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Houston Methodist Hospital - Texas Medical Center

Background
- Protective Lung Ventilation (PLV) strategy has become the standard of care for patients with ARDS. Studies have shown the benefits of low tidal volume ventilation (LTVV) 4-6 ml/kg of IBW and compliance with plateau pressures ≤30 protect the lungs from insults and injuries.
- HMH had no uniform tool in the ICU on early identification of ARDS severity by Berlin criteria. To generate PLV parameters, the data must be obtained from patient’s electronic health records and mechanical ventilator.
- vICU Sickbay ™ software monitoring and massive computing and data collection capability enabled a group of vICU nurses, critical care physicians, respiratory therapists and computer engineers to develop a tool for use in Protective Lung Ventilation strategy.

Tools and Data

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Future Actions
- If successful and adopted, a proven tested PLV tool to aid physicians and clinicians in early detection of ARDS severity will provide uniformity and consistency of care in the ICUs for HM system. The vICU computing and data analytics capability in generating this tool may help decrease ventilator days by preventing ventilator-associated events thereby decreasing resource utilization and hospitalization cost.

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MICU team
vICU team
Medical Informatics Corporation

References

Purpose/Objectives/Hypothesis
- To create an informatics tool using virtual ICU’s computing and data analytics capability to assist providers and clinicians in the early detection of ARDS, identify its severity, and to provide PLV parameters data for optimal mechanical ventilation management.

Methods
- Statistical analysis is automated in Sickbay ™ to obtain accurate data. PLV data is then generated by Sickbay ™ and a rapid report is made available to vRNs in a simplified tabular format that can be easily accessed from HMH’s work email account.

Process Map
- vICU Sickbay ™ software monitoring and massive computing and data collection capability enabled a group of vICU nurses, critical care physicians, respiratory therapists and computer engineers to develop a tool for use in Protective Lung Ventilation strategy.

Results
- Progression of PLV Tool
  - Manual data input & faxing
  - Automatic data input & local unit printing
  - Digital Learning Board integration
  - Adoption in multiple units across the system and requests from several others.

Integration/Acceptance
- Utilization of ICU big data to process very frequent observational data (i.e. every single mechanical ventilator cycle) to visualize compliance with best practice metrics for utilization at the bedside in ICUs.
- Early identification of ARDS via objective measures, improvements in plateau pressure and LTV compliance, documentation of ARDS diagnosis and associated ICD-10 coding as well as new metric modeling (delta P).