Virtual Nursing : A Step Into The Future

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 Discuss vICU program and its implications for nursing in the critical care setting.

About Houston Methodist



More Than 100 Years...

2023 System Patient Safety Symposium



1919



2020



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



Opened in 2010

Houston Methodist Clear Lake Houston Methodist Continuing Care



Added in 2014



Added in 2014

Houston Methodist The Woodlands



Opened July 2017

Our Hospitals

2023 System Patient Safety Symposium



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

Houston Methodist Cypress will be the

Houston Methodist Cypress



"Hospital of the Future".



Physician's Organization Footprint



2023 System Patient Safety Symposium



- PRIMARY CARE GROUP
- SPECIALTY PHYSICIAN GROUP
- SAME DAY CLINIC
- ORTHOPEDIC INJURY CLINIC
- COMPREHENSIVE CARE CENTER

FACILITIES AND CAPACITY

Houston Methodist is a faith-based, academic medical center comprised of 8 hospitals,



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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...

E-Weeklies	Conferences	Webinars	Whitepapers	Print Issue	Multimedia	Lists	
Physicians	Leadership Strategy	/ Executive Mo	ves Transaction & \	Valuation Human F	Resources Patient	Flow <u>Faciliti</u>	e
Orthopedics F	Patient Engagement F	Pharmacy Popu	lation Health Legal	& Regulatory Corr	pensation Payer	Opioids Ra	in

Houston Methodist unveils \$700M patient tower this month

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

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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.



Financial Realities of Healthcare

2023 System Patient Safety Symposium

Hospitals continue to struggle

June 29, 2022 Todd Shryock

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Revenue and volumes rise, but hospitals still performing below pre-pandemic levels

The financial outlook for hospitals and health systems continues to be bleak as rising expenses and lower margins took their tool in May, even though revenue and patient volumes improved, according to National Hospital Flash Respit from Kaufman Hall.

The group's analysis say that the economic outlook for the year is murky because margins are not expected to improve to pre-pandemic levels this year.

"While we are seeing hospitals revenues inchup, it simply is not enough to mitigate the skytocketing costs of material and labor expenses, resulting in negative operating marging for the nation's <u>hospitals</u> and health systems," easil Erk Swanson, a serior vice president of Data and Analytics with Kuriman Nalli, in a cl i

retain and attract nor Here are some key fi Median Operating I The median Kaufma median change in op Increased Revenue

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.

Source: Getty Images

By Victoria Bailey

June 02, 2022 - After experiencing some early signs of relief in March, hospital finances regressed in April 2022, with facilities seeing significant decreases in revenue and patient volumes, Kaufman Hall's **National Hospital Flash Report** found. JUL 26 MORE ON ACCOUNTING & FINANCIAL MANAGEMENT

Universal Health Services sees profits plunge 50% in Q2

One of the main factors influencing revenue was admissions at its acute care facilities, which were not as high as anticipated.

Photo: Xavier Lorenzo/Getty Images

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Acute and behavioral hospital operator Universal Health Services saw higher revenue in the second quarter but a much lower profit, with profits dipping by half compared to its quarterly performance in Q2 2021, according to financial documents released by the company this week.

Nonprofit hospitals hit hard by cost inflation, need 'transformational change,' finds Fitch

Expenses are eroding margins, and it's happening quickly due to elevated labor, supply and capital costs.

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Photo: Sam Edwards/Getty Images

The COVID-19 pandemic has been hard on nonprofit hospitals, and without action to address upward pressure on their expenses, the hardships are likely to continue, according to a market update from Fitch Ratings.

Cost of a Quality Workforce

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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%

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

asers: The Nurses Fighting Coronavirus From Hot Spot to Hot Spot

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

Nurses' salaries, overtime and bonuses increased during the pandemic. PHOTO: CARLOS BARRIA/REUTERS

Struggles to Hire and Retain

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Retirements Cut Ranks of Scarce Frontline Workers

STATELINE ARTICLE | February 4, 2022 | By: Tim Henderson | Read time, 5 min

Healthcare may see a 'Great Retirement,' too Moliv Gamble (Twitter) - Updated Monday, October 18th, 2021

♥ f ♥ in ▶ rT i M Save Post Tweet Share Listen Text Size Print Email

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 or 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 CommonSpirit Health, will retire in summer 2022. Including his 19
 years at Dignity Health before it merged to form CommonSpirit, Mr. Dean has spent 22 years at the
 helm. Dignity merged with Catholic Health initiatives to form \$30 billion CommonSpirit in February
 2019.
- Marna Borgstrom, CEO of Yale New Haven (Conn.) Health, will retire in March 2022. She has been with the system 43 years, 17 of them as the system's first female CEO.
- Stephen Klasko, MD, will retire Dec. 31 after eight years as CEO of Jefferson Health. Since he
 joined the organization in 2013, the Philadelphia-based system has expanded from three hospitals
 to 18 and annual revenue has grown from \$1.5 billion to upward of \$6.7 billion.
- Jim Hinton, CEO of Baylor Scott & White, will also retire 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-defining year, according to ACHE.

Noneheass, these organizations and the industry will bid adieu to a generation of executives who led their health systems through numerous milestones and headwinds, including input and compliance with the Althorabid Cear Act, the move from paper to digital ecords and major mergers and labor strikes. Since 2020, they have been the top decision-matters as their organizations met the demands of the COVID-19 pandemic and its consequences. They set the tone and had final say in how forcefully their institutions condemned racism and what actions they took to fight health inequiles.

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 who, procisely, is at the to of their local hospital or health system. The past I constits chalanged that status quo, throwing hospital leaders and executives into the limelight as many Americans sought leadership, expertise, scientific evidence and local voices to make sense of what, in many cases, felt unsensible. The general public saw hospital CEOs' faces, heard their voices and read their words more within the past year-plus than ever.

Nursing Is in Crisis': Staff Shortages Put Patients at Risk "When hospitals are understaffed, people die," one expert warned as the U.S. health systems reach a breaking point in the face of the Delta variant.

Valerie Kiper, a registered nurse, treated Debra Collinsgru, a Covid patient, in the emergency room of Ocean Springs Hospital in Mississippi on Sunday. Rory Doyle for The New York Times

Texas Grapples With Medical Staffing Shortage

By <u>Sean Price</u>

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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Innovating to Sustainability

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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

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

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vICU Overview cont.

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

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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

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Outcomes

Virtual ICU Analytics Drives Outcomes

OPTIMIZATION: Top Performance Metrics

OPTIMIZATION: HMH All ICUs Nocturnal Code Blue Trends

Code blue events Code blue events / 1000 ICU patient daysLinear (Code blue events / 1000 ICU patient days) 50

Actual to Predicted ICU Mortality (%)

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

Jay Paul Bedruz, BSN, RN, CNML Melissa Quindoy, BSN, RN, CCRN Sarah Cammarata, MSN, RN- BC, CCRN

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 (ILTVV) 4-6 m//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.

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 ^w to obtain accurate data, PLV data is then generated by Sickbay ^w 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

Tools and Data

CRITICAL CARE MEDICAL TEAM

Protective Lung Ventilation Project

NIT:	DATE:				TIME:					
	Vent -	PIP .	PEEP .	PPlat	VT/kg -	DeltaP -	pH .	pa02 -	pCO2 -	PFR
	PCV+	34	2	33	4.7	31	7.32	100	54	285.71
	DuoPAP	34	16	33	5.9	17	7.34	104	63	91
	PCV+	37	5	36	4.4	31	7.26	124	92	137.78
	PCV+	26	10	25	5.7	15	7.37	59	58	65.56
	PCV+	25	12	24	4.3	12	7.33	96	50	105.67
	PCV+	33	11	31	5.3	20	7.3	89	68	111.25
	ASV	20	8	19	4.7	11	7.42	49	40	150
	SIMV+/	20	5	19	6.8	14	7.47	91	37	162.5
	PCV+	35	12	33	6.5	21	7.2	34	71	34
	PSIMIV+	20	10	19	6.8	9	7.46	112	32	248.89
	PCV+	29	10	27	6.4	17	7.37	77	45	154
	PCV+	37	12	31	6.1	19	7.42	86	51	156.36

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 LTVV compliance, documentation of ARDS diagnosis and associated ICD-10 coding as well as new metric modeling (delta P).

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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References

Low Tidal Volume Ventilation: Introduction, Evidence, and Implementation: Facilitator Guide, February 2017. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov//hai/tools/mvp/modules/technical/ Itv-intro-fac-guide.html

The ARDS Definition Task Force. Acute Respiratory Distress Syndrome: The Berlin Definition. JAMA. 2012; 307(23):2526-2533. doi:10.1001/jama.2012.5669

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