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Minding Mentation: Improving Delirium Detection in Older ICU Patients

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Division of Geriatrics and Gerontology Grand Rounds
August 3, 2021

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My Delirium Journey

Stanford: 1997-2001

"First Ever" Sleep-Delirium Study

Arch Gen Psychiat Vol 15, July 1966
Psychiatric and EEG Observations on a Case of Prolonged (264 Hours) Wakefulness
GEORGE GULEVICH, MD; WILLIAM DEMENT, MD; AND LAVERNE JOHNSON, PhD, SAN DIEGO, CALIF

The New York Times
Dr. William Dement, Leader in Sleep Disorder Research, Dies at 91
At Stanford, he created the world's first successful sleep clinic and taught a popular class on sleep and dreams. (If he caught students dozing, he'd wake them with a water gun.)
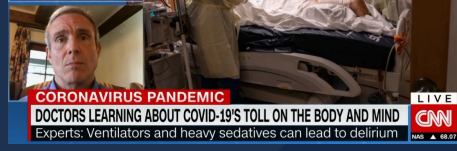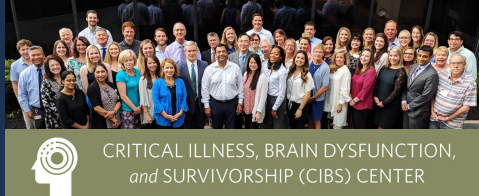*June 17, 2020*

OBITUARY
William Dement obituary
Scientist who set up the first sleep disorder research centre, came up with the term REM and once kept a student awake for 11 days
THE TIMES

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My Delirium Journey

Vanderbilt: 2001-2009

CRITICAL ILLNESS, BRAIN DYSFUNCTION, *and* SURVIVORSHIP (CIBS) CENTER

Getty Images

CORONAVIRUS PANDEMIC
DOCTORS LEARNING ABOUT COVID-19'S TOLL ON THE BODY AND MIND
Experts: Ventilators and heavy sedatives can lead to delirium

BREAKING NEWS
SOME SURVIVORS FACE LONG ROAD TO RECOVERY AFTER ICU STAYS
CBS EVENING NEWS WITH NORAH O'DONNELL

Ely. *Lancet Resp* Jan 2021

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My Delirium Journey

Johns Hopkins: 2009-2013

OACIS
Outcomes After Critical Illness and Surgery
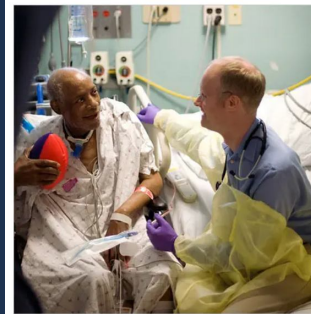
A Tactic to Cut I.C.U. Trauma: Get Patients Up

The New York Times
Jan. 11, 2009

Kenneth Ebron, 70, has been walking the halls of the intensive care unit at Johns Hopkins in Baltimore. Mr. Ebron, who has lung and heart disease, chatted with Dr. Dale Needham.
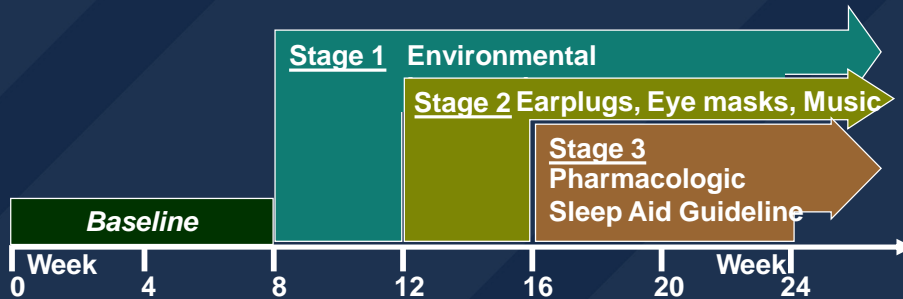Chris Hartlove for The New York Times

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ICU Sleep-Delirium Improvement Project

The Effect of A Quality Improvement Intervention on Perceived Sleep Quality and Cognition in A Medical ICU
*Critical Care Med* 2013;41:800-808

Biren B. Kamdar, MD, MBA, MHS[1,2]; Lauren M. King, RN, MSN[1,3]; Nancy A. Collop, MD[4];
Sruthi Sakamuri, BS[5]; Elizabeth Colantuoni, PhD[1,6]; Karin J. Neufeld, MD, MPH[1,7];
O. Joseph Bienvenu, MD, PhD[1,7]; Annette M. Rowden, PharmD[8]; Pegah Touradji, PhD[1,9,10];
Roy G. Brower, MD[2]; Dale M. Needham, MD, PhD[1,2,10]

Stage 1 Environmental

Stage 2 Earplugs, Eye masks, Music

Stage 3 Pharmacologic Sleep Aid Guideline

Baseline

Week 0   4   8   12   16   20   Week 24

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ICU Sleep-Delirium Improvement Project

The Effect of A Quality Improvement Intervention on Perceived Sleep Quality and Cognition in A Medical ICU
Critical Care Med 2013;41:800-808

Proportion of patients with delirium

Sleep Promoting Interventions

July A S O N D Jan F M A M J J
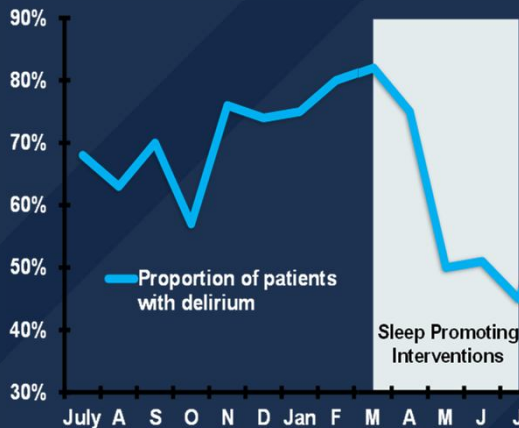
n=110 Baseline
n=175 Sleep QI

20% reduction in incidence of delirium/coma
(OR = 0.49, p=0.02)

5% improvement in daily delirium/coma-free status
(OR = 1.64, p=0.03)

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A Delirium Journey: UCSD 2018 to Now

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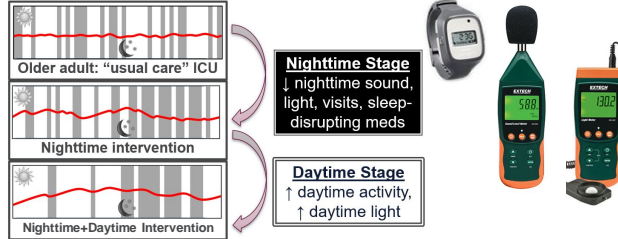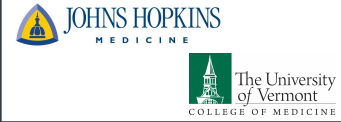
di-ˈlir-ē-əm

" a **disturbance in attention and awareness** that develops over a **short period of time** (hours to days), representing an **acute change** from baseline, that **tends to fluctuate** over the course of the day. " — *DSM 5*

A **brain disturbance** characterized by:
- **Acute/rapid onset** over hours/days
- **Fluctuating** course during the day
- **Inattention**
- **Disorganized thinking** or **clouded consciousness**

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Delirium is very common in the ICU
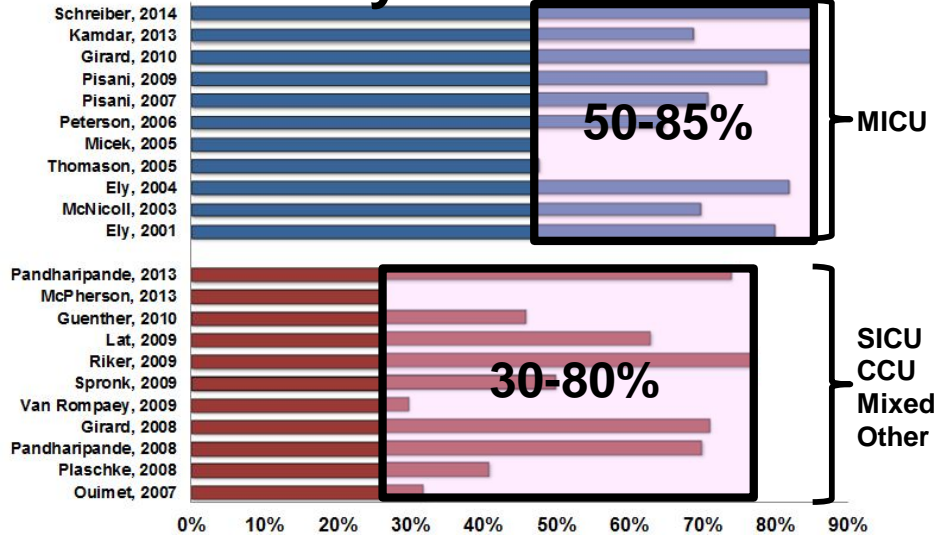
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VIDEO

'COVID-19 Is a Delirium Factory'

The Atlantic

In a new documentary from *The Atlantic*, coronavirus survivors describe frightening experiences in the intensive-care unit.

EMILY BUDER , ANNALISE PASZTOR , AND VISHAKHA DARBHA MAY 8, 2020

The 35-year-old COVID-19 survivor Leah Blomberg doesn't remember being rushed to the intensive-care unit, where she would spend 18 days fighting for her life on a ventilator.

What she does remember is far more traumatic.

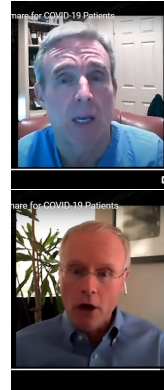"I woke up to something that I would never have imagined," Blomberg told me. A nurse was standing over her hospital bed with a saw, cutting off her arms and legs. Blomberg remembers yelling for help. At one point, she tried to touch her face—and realized, with horror, that only half of her skull was intact.

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Risk factors for ICU delirium

Patient-Centered

Not Modifiable
- Advanced Age
- Cognitive impairments
- Traumatic brain injury
- Comorbidities
- Severity of illness

Modifiable
- Prior alcohol/drug use
- Hypotension
- Hypoxia
- Sepsis
- Metabolic disturbances
- ?Cigarette smoking

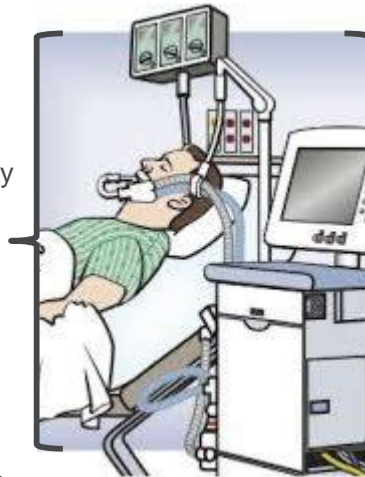Image: http://www.advances-in-medicine.net/
NEJM 2014;370(5):444-454.
Annals ATS 2013;10(6):648-56.

ICU-Acquired

Modifiable
- Benzodiazepines
- ?Other sedation
- Drug-induced coma
- Uncontrolled pain
- Immobility
- Poor sleep quality
- Physical restraints
- Isolation status
- Disorientation
- Unawareness of surroundings
- ?Mechanical ventilation

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Benzodiazepines and delirium

Lorazepam Is an Independent Risk Factor for Transitioning to Delirium in Intensive Care Unit Patients
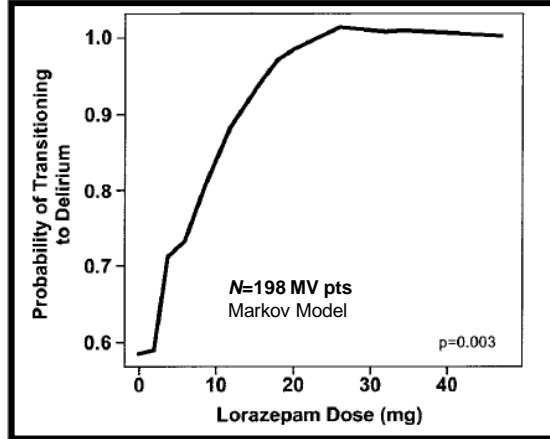
Anesthesia 2006; 104:21-26.

N=198 MV pts
Markov Model

p=0.003

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Outcomes associated with ICU delirium

Increased duration of MECHANICAL VENTILATION[1,2]	Increased ICU LENGTH OF STAY[1,2,3]	Increased HOSPITAL LENGTH OF STAY[2,3]
Increased HOSPITAL COSTS[4] USA Annual Costs $150B/Year	Increased risk of EARLY DEATH[2,6]	Long-term post-ICU COGNITIVE & PHYSICAL IMPAIRMENTS[7,8,9]

1) *CCM* 2009;37:1898-1905. 2) *JAMA*. 2004; 291(14):1753-1762. 3) *Critical Care* 2005;9(4):R375-R381.
4) *Crit Care Med* 2004;32(4):955-962. 5) *CCM* 2013;41(1):264-306. 6) *AJRCCM* 2009; 180:1092-1097.
7) *Crit Care Med* 2014; 42:369–377. 8) *NEJM* 2013; 369:1306–16. 9) *Crit Care Med* 2010; 38:1513–1520.

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Detecting ICU delirium:

Confusion Assessment Method for the ICU
(CAM-ICU)

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Detecting ICU delirium:

Confusion Assessment Method for the ICU (CAM-ICU)

Step 1: Level of consciousness assessment
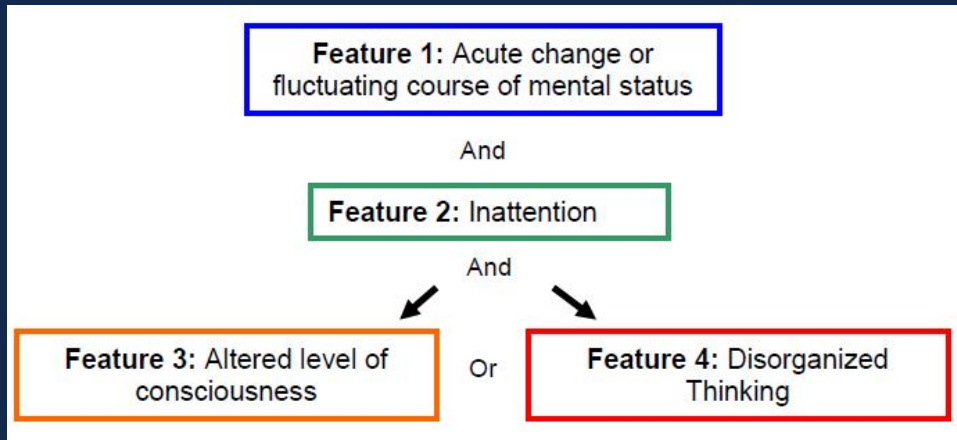
Richmond Agitation-Sedation Scale

Scale	Label	Description	
+4	COMBATIVE	Combative, violent, immediate danger to staff	
+3	VERY AGITATED	Pulls to remove tubes or catheters; aggressive	
+2	AGITATED	Frequent non-purposeful movement, fights ventilator	
+1	RESTLESS	Anxious, apprehensive, movements not aggressive	
0	ALERT & CALM	Spontaneously pays attention to caregiver	
-1	DROWSY	Not fully alert, but has sustained awakening to voice (eye opening & contact >10 sec)	V O I C E
-2	LIGHT SEDATION	Briefly awakens to voice (eyes open & contact <10 sec)	
-3	MODERATE SEDATION	Movement or eye opening to voice (no eye contact)	
If RASS is ≥ -3 proceed to CAM-ICU (Is patient CAM-ICU positive or negative?)			T O U C H
-4	DEEP SEDATION	No response to voice, but movement or eye opening to physical stimulation	
-5	UNAROUSABLE	No response to voice or physical stimulation	
If RASS is -4 or -5 → STOP (patient unconscious), RECHECK later			

Inouye *Ann Intern Med* 1990;113:941-948. Ely *CCM* 2001:29:1370-1379. Ely *JAMA* 2001;286:2703-2710.

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Detecting ICU delirium:
Confusion Assessment Method for the ICU (CAM-ICU)

Step 2: Acuity Assessment

Feature 1: Acute change or fluctuating course of mental status

And

Feature 2: Inattention

And

Feature 3: Altered level of consciousness

Or

Feature 4: Disorganized Thinking

Inouye *Ann Intern Med* 1990;113:941-948. Ely *CCM* 2001:29:1370-1379. Ely *JAMA* 2001;286:2703-2710.

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MEDICAL NEWS & PERSPECTIVES

JAMA®

Delirium Often Not Recognized or Treated Despite Serious Long-term Consequences

Bridget M. Kuehn

PREVALENCE STUDIES HAVE FOUND that between 10% and 85% of hospitalized patients develop delirium, which evidence suggests has 10 days longer, and are more likely to end up in a nursing home (16% vs 3%) (Maldonado JR. *Crit Care Clin.* 2008; 24[4]:657-722).

"They will never be the same," said Maldonado, assistant professor of psy- develop posttraumatic stress disorder, Maldonado noted.

Caring for patients with delirium costs at least twice as much as caring for similarly ill patients without delirium, according to Maldonado. These

"Clinicians view delirium as inevitable in very ill patients and believe that it will resolve after the patient improves…without cognitive testing to confirm this belief."

"We've been living with it so long we're numb to it"

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Delirium Assessment in Critically Ill Older Adults
Considerations During the COVID-19 Pandemic
Critical Care Clin 2021

Maria C. Duggan, MD, MPH[a,b,*], Julie Van[c,d], Eugene Wesley Ely, MD, MPH[b,c,d]

"The COVID-19 pandemic has raised many challenges in managing critically ill older adults with attention to delirium prevention and management. To spare this vulnerable population of older adults from poor outcomes associated with delirium, early recognition of delirium is critical. Despite the health care system limitations during this pandemic and the difficult clinical challenges, delirium screening and management remains an evidence-based cornerstone of critical care."

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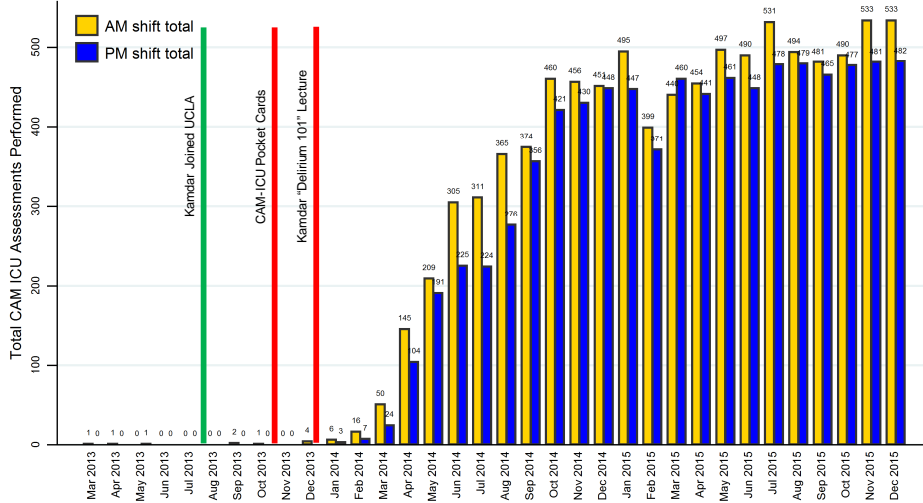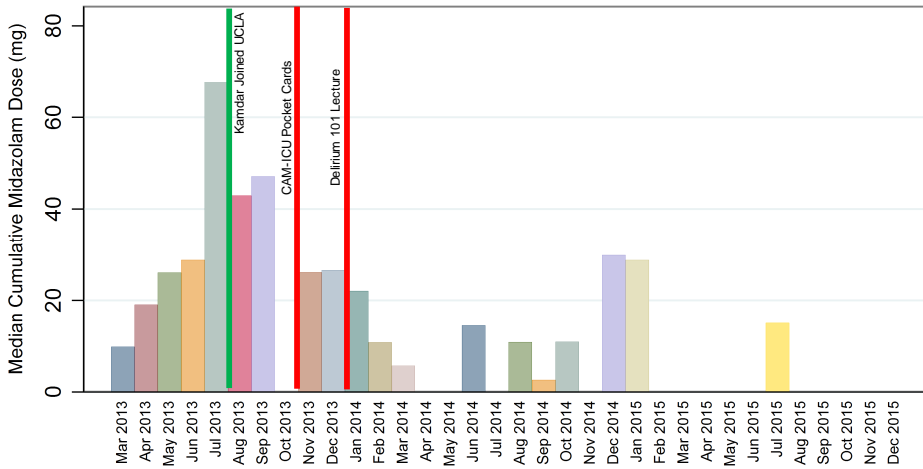
MICU Delirium QI Project (UCLA)(2013-2018)

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CAM-ICU Assessments: UCLA MICU

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Benzodiazepine Use

Cumulative Midazolam Dose: Mechanically Ventilated Patients

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Delirium Detection: UCSD 2018-2019

How were we doing in 3g/3h (MICU)?

- ✓ **CAM-ICU performed on every patient on every shift**
- ✓ **CAM-ICU status discussed on nurse-led rounds**

but…

- ❑ **Difficulty in sustaining prior delirium-prevention efforts**
- ❑ **Turnover in champions, leadership, and priorities**
- ❑ **~50% of non-comatose patients scored "unable-to-assess"**
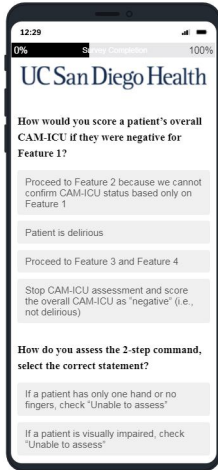- ❑ ***No formal established staff training methods***

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Improving CAM-ICU Performance

"Nurses Teaching Nurses" Video Shoot!
October 27, 2020

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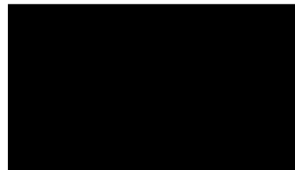
Improving CAM-ICU Performance

Focus Group: Cumulative CAM-ICU Quiz Performance, N = 20					
		Mean % Correct			
Question Topic	Number of Questions	Pre-Video	Post-Video	Pre-Post Difference	*P* Value
Feature 1: Acute Change in Mental Status	5	69%	88%	21%	0.0008
Feature 2: Inattention	10	69%	81%	21%	0.015
Feature 3: RASS	6	61%	60%	18%	0.9
Feature 4: Disorganized Thinking	6	60%	79%	21%	0.0002
CAM-ICU Scoring	1	60%	70%	40%	0.5
Entire Exam	**28**	**66%**	**79%**	**14%**	**<0.0001**

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Delirium Assessment Barrier: LA County

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Barrier Evaluation: Language
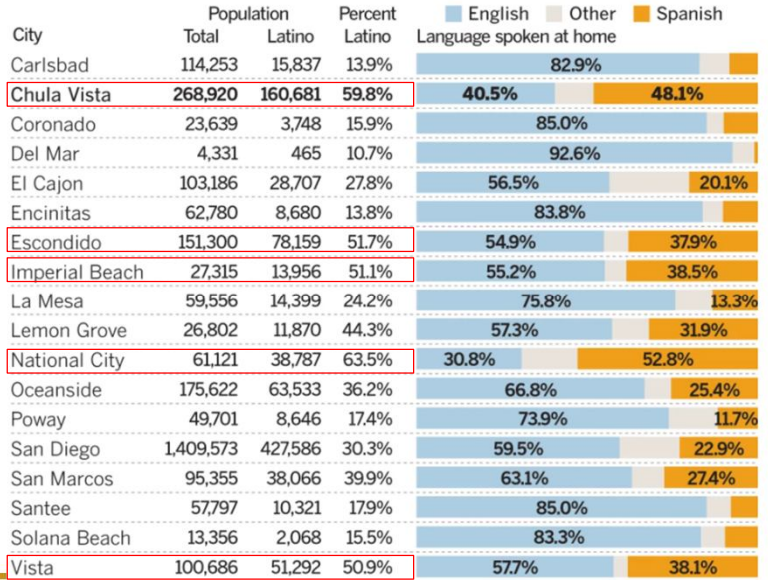

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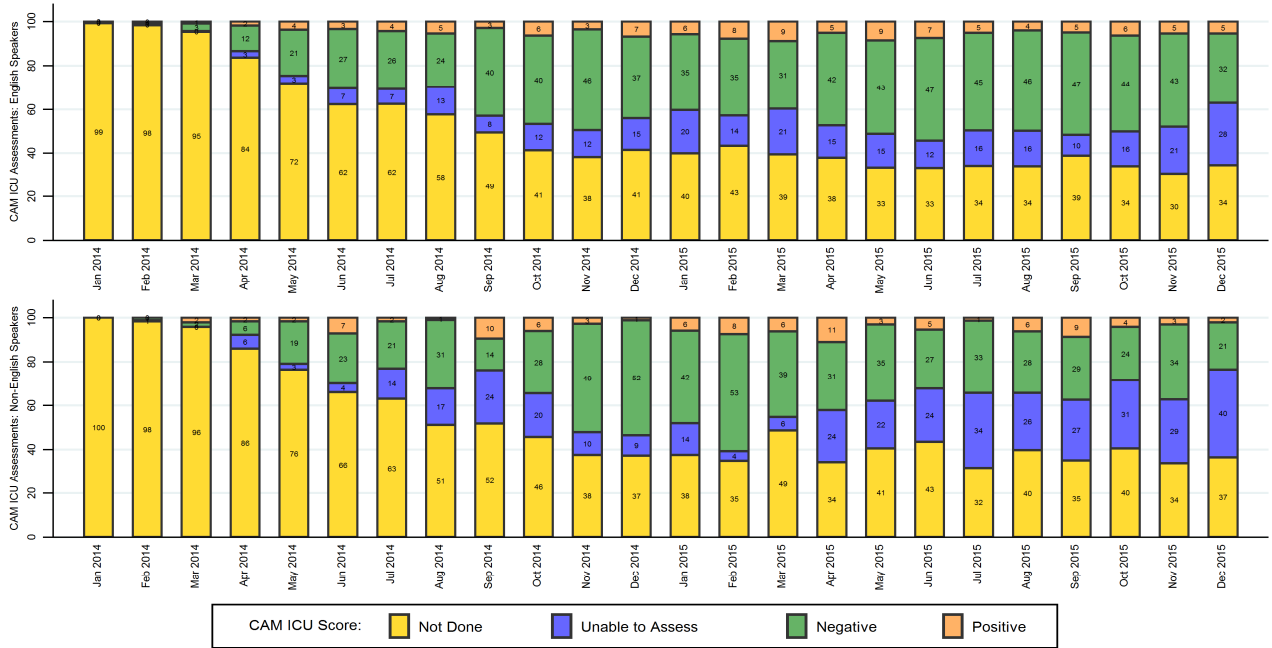
Demographics by city and language spoken at home
Chula Vista now offers Spanish interpretations at its City Council meetings.

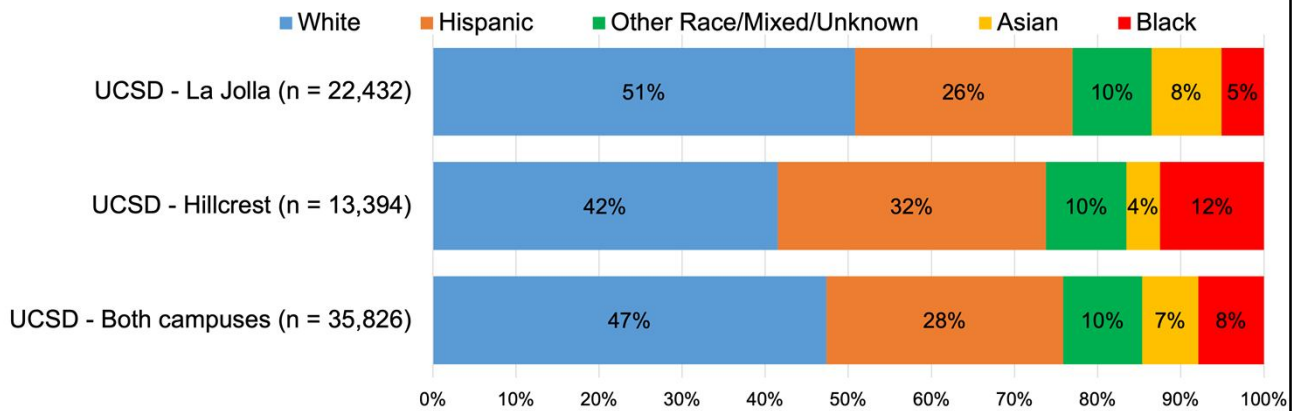| City	Population Total	Latino	Percent Latino	Language spoken at home (English / Other / Spanish)
Carlsbad	114,253	15,837	13.9%	82.9%
Chula Vista	268,920	160,681	59.8%	40.5% / 48.1%
Coronado	23,639	3,748	15.9%	85.0%
Del Mar	4,331	465	10.7%	92.6%
El Cajon	103,186	28,707	27.8%	56.5% / 20.1%
Encinitas	62,780	8,680	13.8%	83.8%
Escondido	151,300	78,159	51.7%	54.9% / 37.9%
Imperial Beach	27,315	13,956	51.1%	55.2% / 38.5%
La Mesa	59,556	14,399	24.2%	75.8% / 13.3%
Lemon Grove	26,802	11,870	44.3%	57.3% / 31.9%
National City	61,121	38,787	63.5%	30.8% / 52.8%
Oceanside	175,622	63,533	36.2%	66.8% / 25.4%
Poway	49,701	8,646	17.4%	73.9% / 11.7%
San Diego	1,409,573	427,586	30.3%	59.5% / 22.9%
San Marcos	95,355	38,066	39.9%	63.1% / 27.4%
Santee	57,797	10,321	17.9%	85.0%
Solana Beach	13,356	2,068	15.5%	83.3%
Vista	100,686	51,292	50.9%	57.7% / 38.1%

Language spoken at home for population five and older.
Source: San Diego County

MICHELLE GILCHRIST U-T

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Discharges by Race/Ethnicity in UCSD

Legend: ■ White ■ Hispanic ■ Other Race/Mixed/Unknown ■ Asian ■ Black

	White	Hispanic	Other Race/Mixed/Unknown	Asian	Black
UCSD - La Jolla (n = 22,432)	51%	26%	10%	8%	5%
UCSD - Hillcrest (n = 13,394)	42%	32%	10%	4%	12%
UCSD - Both campuses (n = 35,826)	47%	28%	10%	7%	8%

Data Source: OSHPD CY 2019

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SPANISH CAM-ICU

The New York Times

Puerto Rico Just Had Its 'Worst Moment' for Covid-19

The island saw explosive growth in coronavirus cases, fueled by business reopenings, Easter and tourists on spring break.

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THE LANCET
Psychiatry

Disparities in the recovery from critical illness due to COVID-19

Vol 7   August 2020

"…Black and Latino patients demonstrate worse quality-of-life measures, more neurobehavioural complications, impaired community integration, and are less likely to receive treatment or be employed compared with white patients."

Johnson et al., *The Lancet Psychiatry* 2020

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DELIRIUM DETECTION 2.0: SPANISH
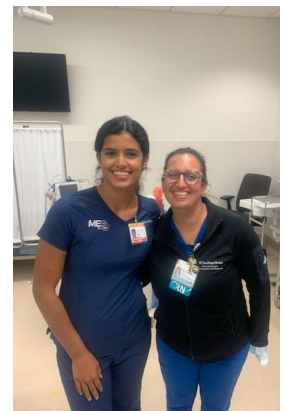
Filming: July 22, 2021

ENGLISH   SPANISH

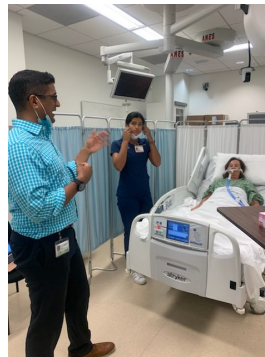*Dr. Maria Maquine*

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DELIRIUM DETECTION 2.0: SPANISH

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FUTURE DIRECTIONS

- Spanish CAM-ICU educational package
  - Video editing
  - Quiz development
  - Focus Group
- Develop and implement educational interventions at UPR.
  - Collaborate with Dr. Carmen Arroyo and Dr. Milagros Figueroa
- Develop infrastructure to associate delirium detection education with ICU outcomes.
- Large scale dissemination

PUERTO RICO

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ACKNOWLEDGEMENTS

- Francesca Novelli
- Hirsh Makhija
- Dr. Maria Marquine and lab members
- Silvia Marquine
- Dan Pollack
- MSTAR Program

Thank you!

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Delirium Detection & Prevention: Larger-Scale Future Directions

Finalize CAM-ICU Education
English: UCSD; Spanish: Univ. Puerto Rico/UCSD
Quiz validation and focus groups

Dissemination & Implementation
Teaming with UCSD DISC, nursing leadership
Audit and feedback, PDSA cycles
Performance measurement (ACTRI dashboard)

Intervention Evaluation (i.e., sedation, length of stay)
Outcomes measurement (ACTRI dashboard)

Multi-ICU Dissemination (Health/UC System, etc.)
Extramural funding (NIH, AHRQ, PCORI)

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Thank you!

@SleepICU @AmerDelirium
@ICURehab @ICURecovery @EurDelirium

ICUdelirium.org
ICUliberation.org

AMERICAN DELIRIUM SOCIETY
ADS

American Delirium Society
2022 Annual Conference
Indianapolis, June 12-14, 2022

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