Abstract Presentations

1. Development and Evaluation of a Novel e-Health Resource to Support Patients and their Families in and after Intensive Care: ***Pam Ramsay, PhD****; Tim Walsh, MD; Eddie Donaghy, PhD; David Hope, BSc*
   Affiliation: Edinburgh Napier University

2. Emotional and Cognitive Sequelae of Medical-Surgical ICU Care: ***Jason Schultz, MS, EdS;*** *Kemuel Philbrick, MD; Matt Clark, PhD; Ognjen Gajic, MD; Lioudmila Karnatovskaia, MD*
   Affiliation: Mayo Clinic

3. A Financial Model of Cumulative Savings through Combining Quality Initiatives: ***Margaret Arnold, PT, CEES/CSPHP***
   Affiliation: Inspire Outcomes LLC.

4. Implementing an ICU Diary throughout all ICU's**:** ***Cynthia K Fine, MSN, CRRN***
   Affiliation: New York Presbyterian Hospital / Columbia University Medical Center

5. Patient Outcomes after Acute Respiratory Failure: A Qualitative Study of Survivors' Experience using the PROMIS Framework: ***Michelle N. Eakin, Ph.D;*** Yashika Patel, Pedro Mendez-Tellez, MD; Victor Dinglas, MPH; Dale Needham MD, PhD; Alison Turnbull, DVM, PhD.
   Affiliation: Johns Hopkins University Division of Pulmonary and Critical Care Medicine

6. Early Rehabilitation in the Pediatric Intensive Care Unit: A Quality Improvement Project: ***Jodi Herbsman, PT, DPT*****;** *Yasir Al-Qaqaa, MD; John Corcoran PT, DPT, MS, Cert.MDT; Jennifer Daly, Tiffany Folks, RN, BSN; Kelly Griffing, MS, OTR/L; Daniella Klein, PT, DPT, NCS; Siobhan O'Donnell, PT, DPT, PCS; Lucy Pereira-Argenziano, MD; Naomi Linder-Perlman, JD; Stacey Schneider, MA, ATR, CCLS, LCAT; Mary Ellen Sheldon, MA, RN-BC; Tina Tan, MS, CCC-SLP, BCS-S;David Wain, RT*
   Affiliation: NYULMC / Rusk Rehabilitation

7. PIM III does not Predict Rehabilitation Outcome at Discharge in Neurologically Injured Children. Simon Gates, PT; ***Susan Bagnall, PT***; Laura Kelly, OT; Rachel Keetley, PT
   Affiliation: Children's Therapy Department, Nottingham University Hospitals NHS Trust

Poster Presentations

1. "Steps to Restoring Independence and Dignity Early", a Multidisciplinary Approach to Reducing Harm in the ICU
   Heather Thornton, BSN, RN
   Affiliation: Johns Hopkins Bayview Medical Center

2. Sensory Intervention Model for Acute Delirium
   Katie Walker, OTR/L
   Affiliation: Baylor Institute for Rehabilitation

3. The "ECMO Snorkel". ECMO Mobilization Made Safe and Easy
   David M. Zemmel, PT, MS, CCS
   Affiliation: New York Presbyterian Hospital / Columbia University Medical Center

4. Establishing a Patient-Provider Communication Program in the Pediatric Intensive Care Unit (PICU)
   Tami Altschuler, MA, CCC-SLP
   Affiliation: Rusk Rehabilitation / NYU Langone Medical Center

5. Mobilization of a Patient on Veno-arterial Extracorporeal Membrane Oxygenation as a Bridge to Lung Transplant: A Case Report
   Thomas M. Benson PT, MS, CCS
   Affiliation: New York Presbyterian Hospital/Columbia University Irving Medical Center

6. Shifting Drivers: Positive Outcomes Of Converting From System-Driven To Value-Drive Practice In an ICU
   Doug Benson, DPT
   Affiliation: University of Utah Hospital

7. *Physical Therapy Management of a Critically Ill Infant After Cardiac Surgery: A Case Report and Literature Review*
   Ana M. Jara, PT
   Affiliation: Johns Hopkins All Children's Hospital

8. Combining Quality Initiatives: Opportunities for Improved Efficiency and Performance
   Margaret Arnold, PT, CEES
   Affiliation: Inspire Outcomes LLC.

Poster Presentations

9. “Running a Marathon without Training” …Hospital Course and Outcomes of 5 Patients Admitted with ARDS Requiring ECMO
   Michael Pechulis, PT
   Affiliation: Lehigh Valley Health Network

10. "A Multi-Professional Approach to Optimize Outcomes in Patients Weaning from Mechanically Ventilation, a Quality Improvement Project"
    Michael L. Davis, B.Sc
    Affiliation: Carolinas Healthcare System

11. Rehabilitation in the Intensive Care Units at the Mount Sinai Hospital: A Quality Improvement
    Ann H. Lichtenstein, DO
    Affiliation: Icahn School of Medicine at Mount Sinai

12. Occupational Therapy in the Neurocritical Care: Use of Cycle Ergometry for Early Upper Extremity Rehabilitation in a Critically Ill Stroke Patient
    Sandra Deluzio, MS, OTR/L
    Affiliation: The Johns Hopkins Hospital

13. VITALS: A Toolkit for Developing an Occupational Therapy Program in the ICU
    Alyssa Gartenberg, MS, OTR/L
    Affiliation: New York University Langone Medical Center

Abstract Presentations

5th Annual Johns Hopkins Critical Care Rehabilitation Conference

Baltimore, MD

A novel e-health resource to support patients and families after ICU

Dr Pam Ramsay, PhD

Edinburgh Napier University

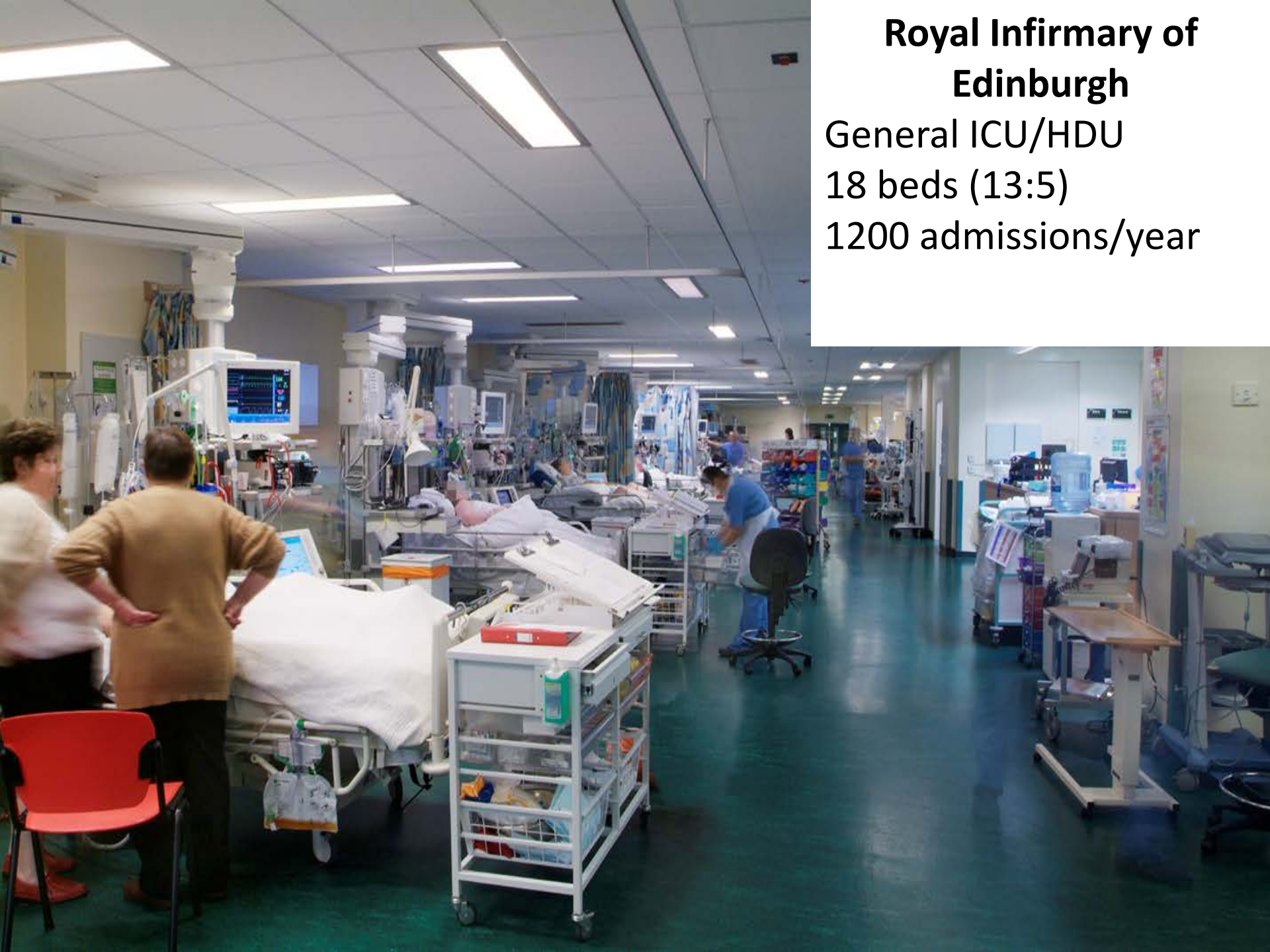
Edinburgh Critical Care Research Group

NHS Lothian

Edinburgh Critical Care Research Group

The University of Edinburgh

The Health Foundation Inspiring Improvement



Royal Infirmary of Edinburgh

General ICU/HDU

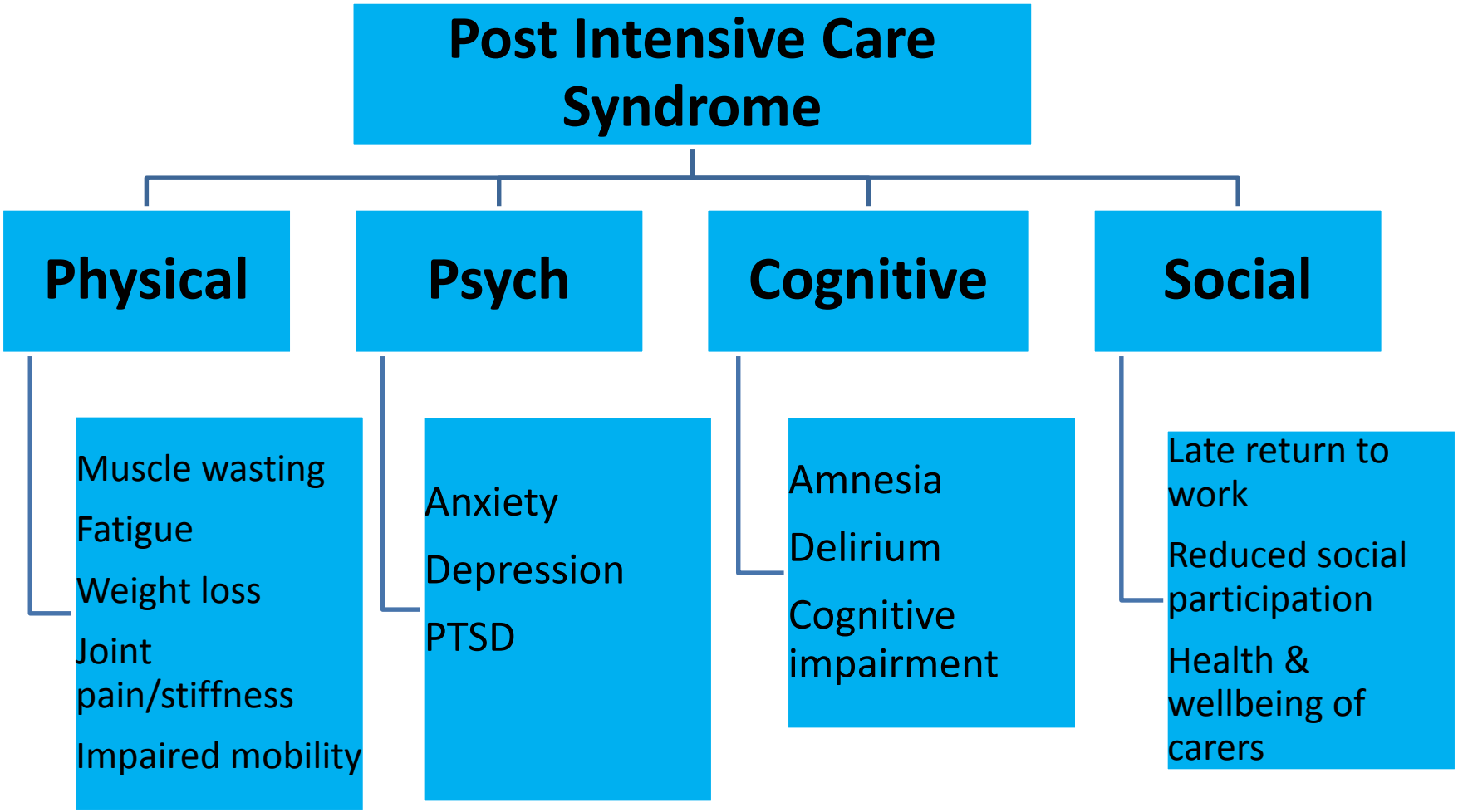
18 beds (13:5)

1200 admissions/year

Why is this needed?

- 140,000 patients admitted to UK ICUs each year
- >70% of patients survive
- Short hospital stays (median 10 days at RIE)*
- >70% of patients go directly home
- High unplanned hospital readmission rates*
- Healthcare costs per patient/year ~£49,000*

(*Lone et al, 2013)


Post Intensive Care Syndrome
Physical
Muscle wasting
Fatigue
Weight loss
Joint pain/stiffness
Impaired mobility
Psych
Anxiety
Depression
PTSD
Cognitive
Amnesia
Delirium
Cognitive impairment
Social
Late return to work
Reduced social participation
Health & wellbeing of carers

Qualitative evidence synthesis

- **PhD** "QoL following prolonged critical illness: a mixed methods study" (20 interviews)
- **RECOVER** trial: RCT of enhanced post-ICU acute hospital rehab. (4 focus groups)
- **RELINQUISH**: Longitudinal, qualitative study of healthcare and support needs (up to 1 year post-d/c) (78 interviews)
- **PROFILE:** Mixed methods study of drivers for early unplanned hospital readmission (56 interviews)

Innovation: development

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amnesia. anxiety. benefits. bereavement. breathless. carer. carers assessment. community care. death. depression. diaries. dreams. driving. drugs. employment. exercise. family. family & friends. fatigue. flashbacks. health. housing. information. joint. legal. legal rights. mobility. money. muscle wasting. nightmares. Occupational Therapist. Pacing. pain. pharmacist. physiotherapist. Physiotherapy. Post traumatic stress. power of attorney. psychological. social work. spiritual. strange memories. support. support groups. tiredness. visiting. ward. weakness. wheelchair. work

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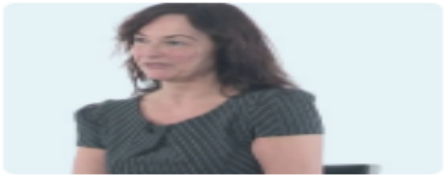
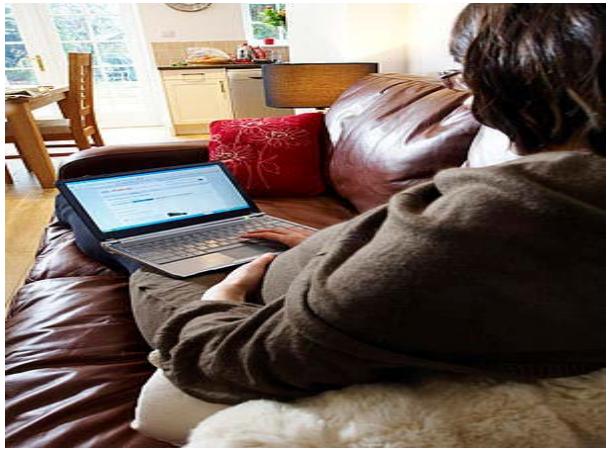


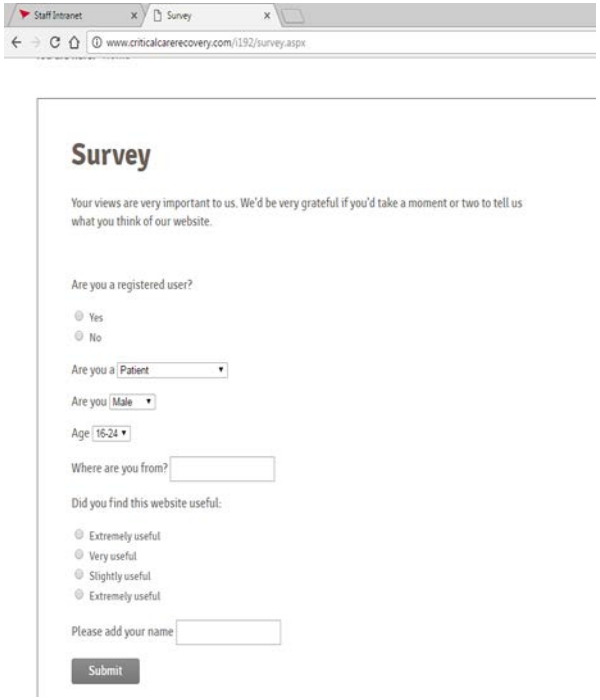
Implementation 1

ICU Follow Up Team



Implementation 2

Evaluation


Staff Intranet
Survey
www.criticalcarerecovery.com/i192/survey.aspx
Survey
Your views are very important to us. We'd be very grateful if you'd take a moment or two to tell us what you think of our website.
Are you a registered user?
Yes
No
Are you a Patient
Are you Male
Age 16-24
Where are you from?
Did you find this website useful:
Extremely useful
Very useful
Slightly useful
Extremely useful
Please add your name
Submit


Google Analytics


RETURN
TO SENDER

Findings (QUANT)

- 778 site visitors with 12,046 page views
- 97% online respondents: “extremely”/”very” useful
- 97% “ “ : “easy”/”ok” to use
- 69% postal respondents: “most useful” after discharge
- Most useful content
  - Other peoples’ experiences
  - Finding out more about ICU
  - Info & advice on common problems after ICU
  - Info & advice on getting help

Findings (QUAL)

- *"Hearing **other peoples' stories** made you realise that other people have gone through this…and been able to get on with their lives again…. That gives you **hope**, which is important"* (patient)
- *"There's…the **financial** and **employment** issues…because you'll be off work for months. The website is very helpful in directing you to **support** for these things."* (patient)
- *"The great thing about the website is that it's available **24/7**, so you can access **information** at any time."* (patient)
- *"It was just as helpful for me as it was for him…because it **helped me understand what he was going through"*** (wife)
- *"I used it to direct a **family member** to counselling. She told me later that it really helped her **cope**."* (ICU nurse)

Research Team

- Dr Pam Ramsay (nurse researcher)
- Prof. Tim Walsh (medic)
- David Hope (Project Manager)
- Dr Eddie Donaghy (Research Fellow)
- Mr Neil Francis & Shaw online (web developers)
- Thanks to patients, family members and ICU staff at Royal Infirmary of Edinburgh

Thank you

p.ramsay@napier.ac.uk

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EMOTIONAL AND COGNITIVE SEQUELAE OF MEDICAL-SURGICAL ICU CARE

Schultz J, Philbrick K, Gajic O, Clark M, Karnatovskaia L

5 November 2016

Division of
PULMONARY &
CRITICAL CARE MEDICINE

Background

- Following ICU discharge, many patients suffer from long-term impairment in the domains of physical, cognitive, and psychological functioning collectively known as post intensive care syndrome (PICS)
- Over half of ICU survivors are reported to have significant psychiatric and cognitive symptoms that appear to diminish little over time

Parker AM, et al. Posttraumatic stress disorder in critical illness survivors: a metaanalysis. Crit Care Med. 2015 May;43(5):1121-9

Rabiee A, et al. Depressive Symptoms After Critical Illness: A Systematic Review and Meta-Analysis. Crit Care Med 2016;44(9):1744-53

Nikayin S, et al. Anxiety Symptoms in Survivors of Critical Illness: A Systematic Review and Meta-Analysis. General Hospital Psychiatry 2016 doi: 10.1016/j.genhosppsych.2016.08.005

Pandharipande PP, et al. Long-term cognitive impairment after critical illness. N Engl J Med. 2013;369(14):1306-16.

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Risk factors

- Psychiatric
  - Prior psychiatric disorders
  - Use of sedating medications (benzodiazepines)
  - Memories of frightening ICU experiences
  - Presence of in-ICU psychologic distress symptoms and delusional experiences
- Cognitive
  - Delirium, Sepsis, ARDS
  - Pre-existing cognitive problems including dementia and alcoholism
- No consistent association with:
  - Severity of disease, diagnosis on admission
  - Length of stay

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Rationale/Objective

- Unclear whether risk of psychocognitive pathology varies by ICU population as most studies report combined data from mixed ICUs
- Most studies report data on patients ≥6 months following hospital discharge
  - Does the psychocognitive picture immediately after the ICU transfer differ from what is observed at follow up?
  - If so, do in-hospital rates of anxiety, depression, or stress differ enough to argue for a more timely psychological support intervention given reported little change over time once the condition is established?

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Patients & Methods

- Inclusion: >18 years old; ICU stay of >48 hours; GCS>13, CAM-ICU negative, ≤2 errors on the 6-item Cognitive Screener
- Exclusion: admitted to the ICU for suicide attempt; known prior cognitive impairment or dementia; prior diagnosis of PTSD; non-English speaking

Callahan CM, et al: Six-item screener to identify cognitive impairment among potential subjects for clinical research. Med Care 2002;40(9):771-781

Patients & Methods

- Within 96 hours of dismissal from the ICU, eligible patients completed:
  - Hospital Anxiety and Depression Scale (HADS; scores ≥8 indicating significant symptoms of anxiety or depression)
  - Impact of Events Scale-Revised (IES-R; scores ≥1.6 indicating significant PTSD symptoms)
  - Montreal Cognitive Assessment-Blind (MoCA-blind; scores <18 indicating cognitive impairment
- Within 3 months of hospital discharge patients repeated above assessment by phone/mail

Tøien K et al. Psychological distress after severe trauma: a prospective 1-year follow-up study of a trauma intensive care unit population. J Trauma. 2010;69(6):1552-9.

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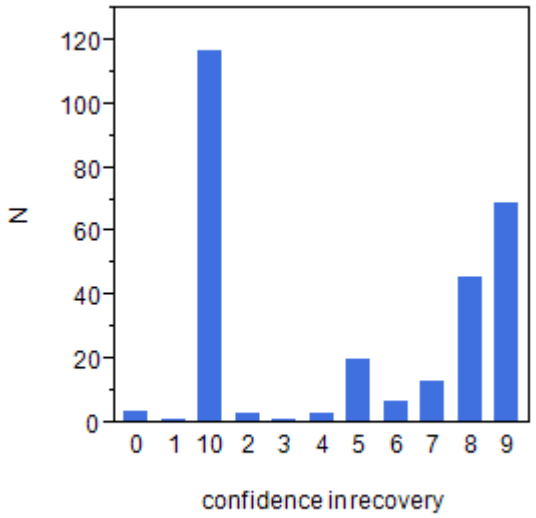
Results - initial assessment

ICU type	Patients Total N=265	HADS-D≥8 N (%)	HADS-A≥8 N (%)	IES-R≥1.6 N (%)	MOCA-blind<18 N (%)
Heme-onc/ transplant	38	15 (39%)	15 (39%)	15 (39%)	18 (47%)
Cardiac MICU	50	17 (34%)	21 (42%)	12 (24%)	27 (54%)
Cardiothoracic SICU	50	19 (38%)	25 (50%)	24 (48%)	27 (54%)
MICU	50	17 (34%)	20 (40%)	16 (32%)	30 (60%)
Trauma SICU	46	16 (35%)	24 (52%)	20 (43%)	26 (56%)
CV SICU	50	20 (40%)	20 (40%)	19 (38%)	30 (60%)

Results

- There was a high prevalence of symptoms of depression (range 34-40%), anxiety (range 39-52%) and PTSD (range 24-52%)
- There was also a high level of cognitive impairment across the ICUs (range 47-60%)



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Results – 3 months f/u

ICU type	Patients Total N=109	HADS-D≥8 N (%)	HADS-A≥8 N (%)	IES-R≥1.6 N (%)	MOCA-blind<18 N (%)
Heme-onc/ transplant	14	4 (29%)	2 (14%)	3 (21%)	1 (7%)
Cardiac MICU	18	6 (33%)	3 (33%)	5 (28%)	6 (33%)
Cardiothoracic SICU	28	5 (47%)	6 (21%)	5 (19%)	6 of 27 (22%)
MICU	15	7 (34%)	5 (33%)	6 (40%)	8 of 12 (67%)
Trauma SICU	11	4 (36%)	3 (27%)	6 (55%)	4 of 10 (40%)
CV SICU	13	3 (23%)	2 (18%)	2 (18%)	4 (36%)

Results - 3 months f/u

- There was a high prevalence of symptoms of depression (range 33-47%) and PTSD (range 18-55%) but less so of anxiety (range 14-33%)
- Prevalence of cognitive impairment across the ICU populations was highly variable (range 7-67%)
- Preliminary data only, awaiting follow up of additional patients

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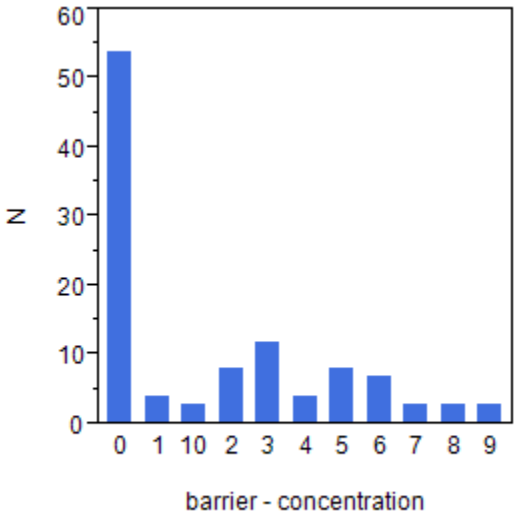
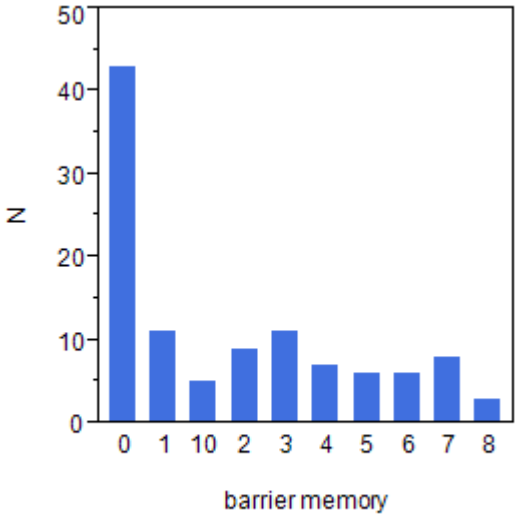
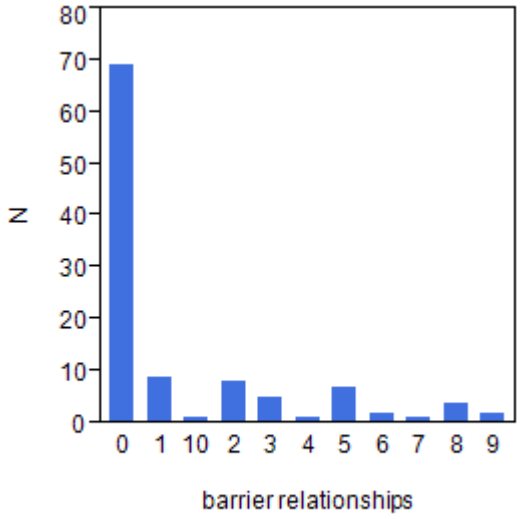
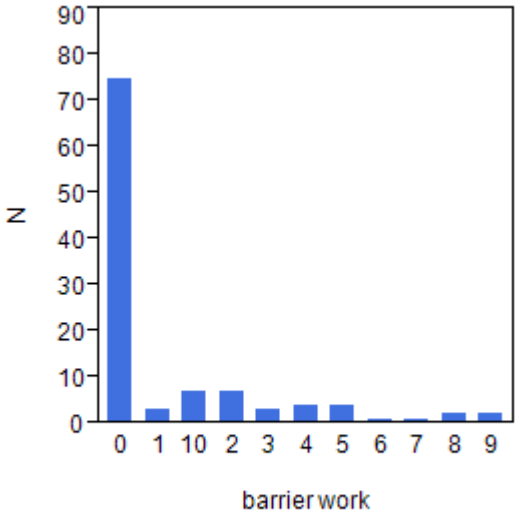
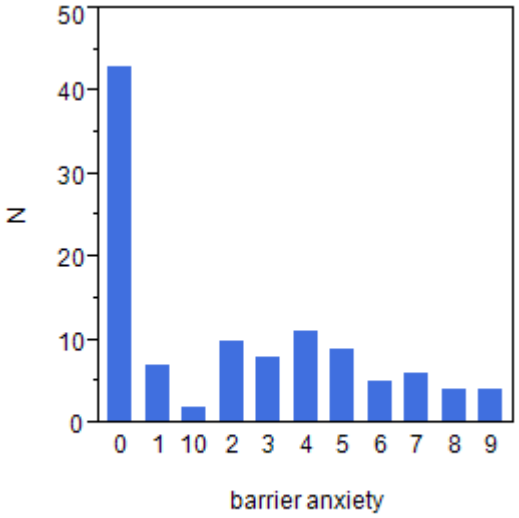
Barriers to recovery 0-10 scale

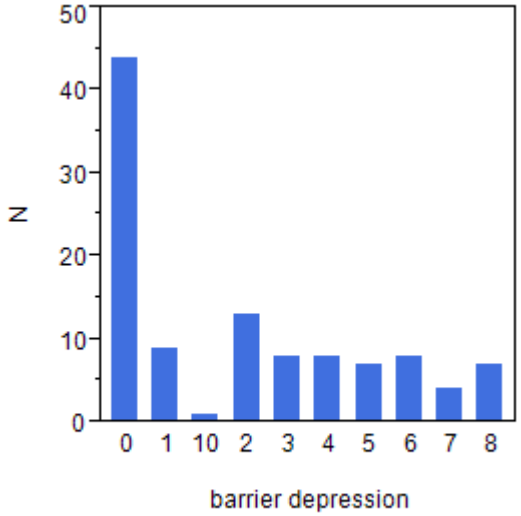




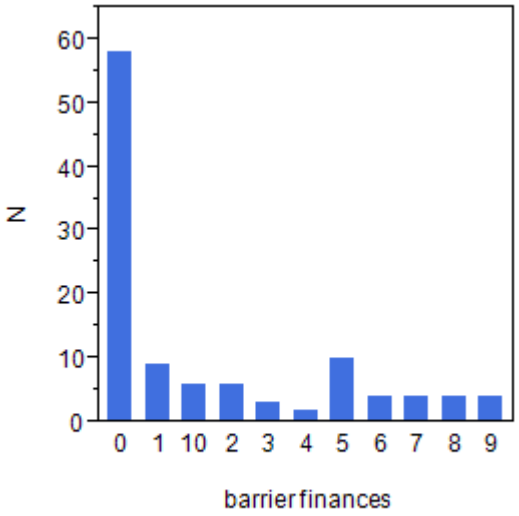


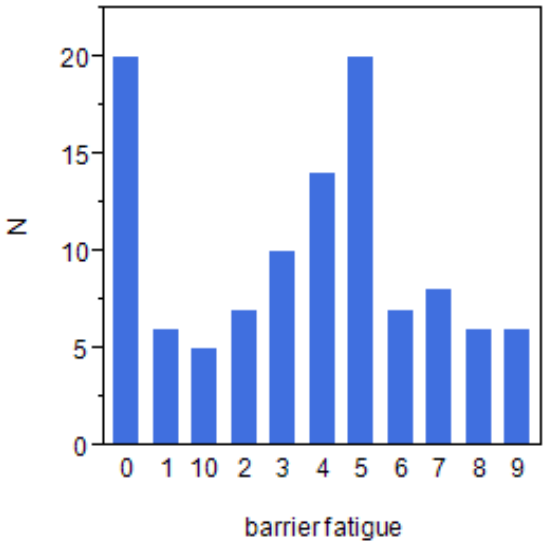


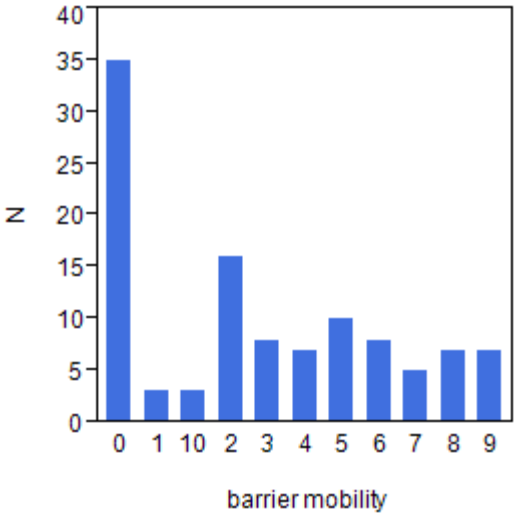




Barriers to recovery 0-10 scale







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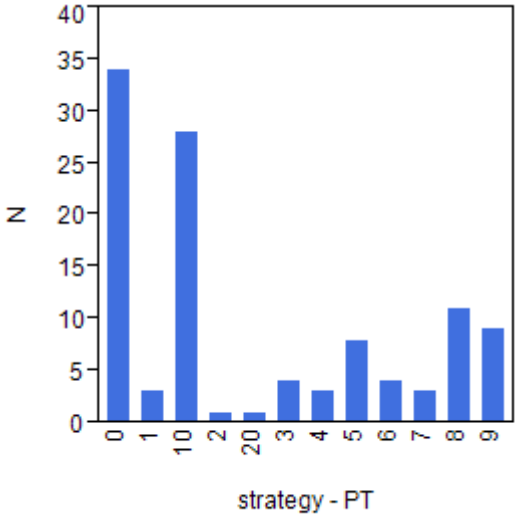
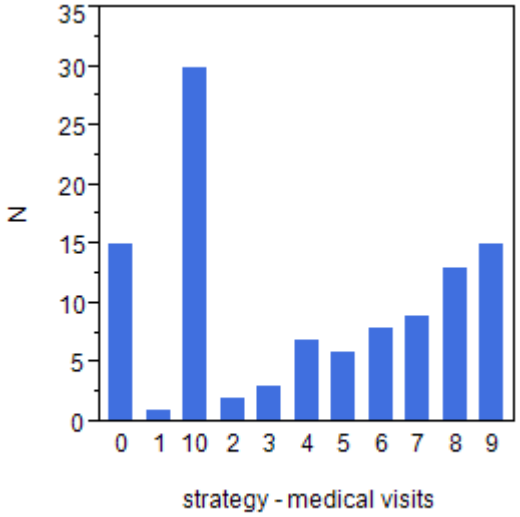
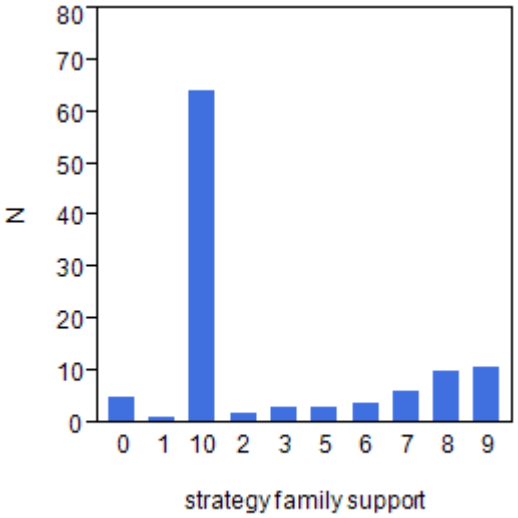
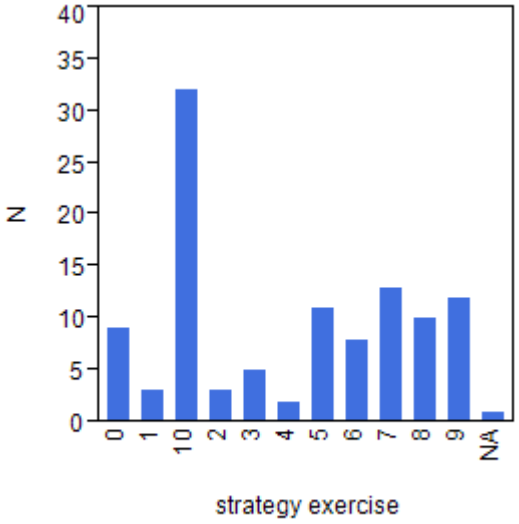
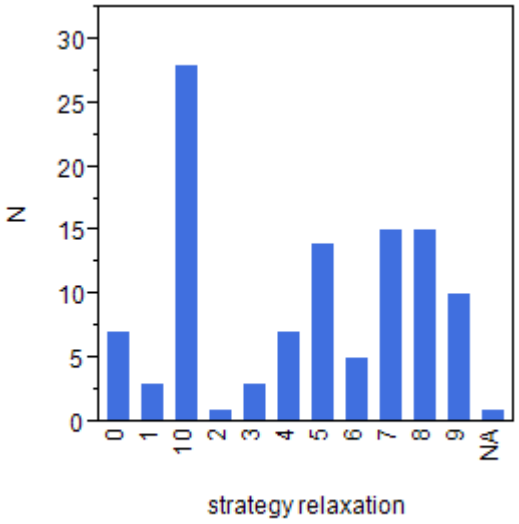
What has helped you most with recovery

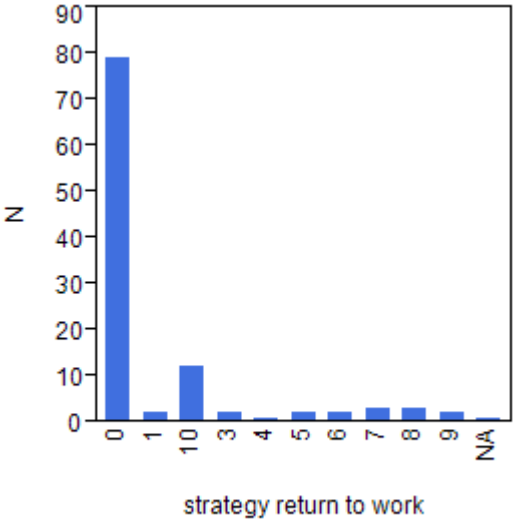












Conclusions

- This is the first study to examine prevalence of psychocognitive morbidity by the ICU population type across six various ICUs at a single hospital
- Initial symptom prevalence appears fairly consistent regardless of the ICU type/patient population
- Data immediately following ICU discharge is similar to previously reported in literature at ≥6 months follow-up
- Our 3 months follow up data is still being collected so stay tuned…

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Conclusions

- May be helpful to emphasize during follow up medical visits/ICU clinics strategies aimed at communication with family and education on relaxation techniques in addition to exercise
- Tailored interventions may also need to be appropriate for individuals with cognitive impairments
- How disruption of physiological processes and altered consciousness due to disease/medications affects the brain and emotional and cognitive function requires further study

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A Financial Model of Cumulative Savings Through Combining Quality Initiatives

Johns Hopkins ICU Rehab Conference

November 2016

Margaret Arnold, PT, CEES, CSPHP

Making the business case for Quality

- Many concurrent initiatives
- Parallel priorities
- Complementary priorities
- Competing or opposing priorities
- Opportunity for staff efficiency and economic benefit through combining initiatives

Modifiable Healthcare Expenses / Costs

- Daily expenses to care for a patient (LOS)
- Added cost of care from preventable conditions
  - VAP/VAE
  - Falls
  - Pressure Ulcers
- Reductions in Reimbursement
  - Value Based Purchasing (VBP)
  - Readmission rates
  - Poor performance for Hospital Acquired Conditions (HAC)
- Staff Efficiency and meeting time

Cost of Care expenses (LOS)

- ICU Cost of care per day
  - Significantly higher on first few days, then levels off
  - Higher for mechanically ventilated patients
  - Total cost versus marginal direct-variable costs

- Hospital Cost per day
  - More stable and significantly lower than ICU
  - Again differences between Total costs and Marginal direct-variable costs (That can be saved through shortening LOS)

1. Kahn JM, Rubenfeld GD, RohrbachJ, & Fuchs BD. Cost Savings Attributable to Reductions in Intensive Care Unit Length of Stay for Mechanically Ventilated Patients. Medical Care 2008, Dec; 46(12): 1226-1233

2. Dasta JF, Mclaughlin TP, Mody SH, Piech CT. Daily Cost of an ICU day. The contribution of Mechanical Ventilation. Crit Care Med 2005 (jun). 33(6); 1266-71

3. http://kff.org/other/state-indicator/expenses-per-inpatient-day/

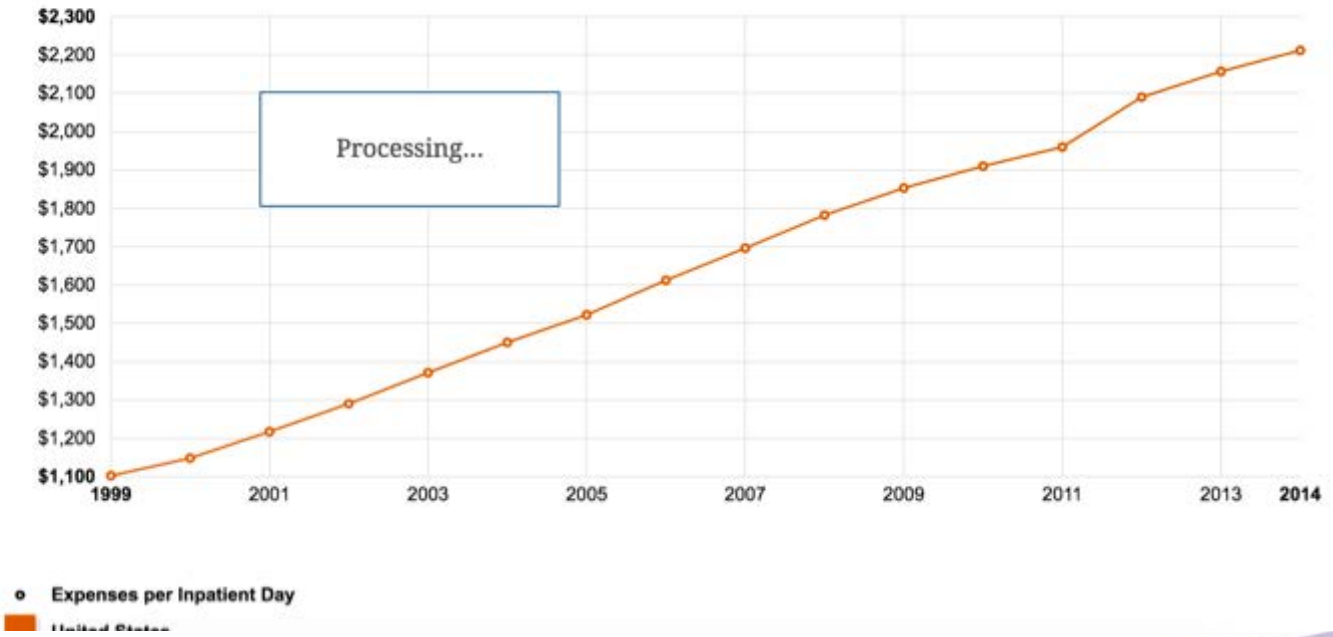
KFF.org | *Hospital Adjusted Expenses per Inpatient Day*

Search KFF.org

THE HENRY J. KAISER FAMILY FOUNDATION

Hospital Adjusted Expenses per Inpatient Day | The Henry J. Kaiser Family Foundation

Timeframe: 1999 - 2014



Source: 1999-2014 AHA Annual survey. Available at http://www.ahaonlinestore.com

Falls

- Incidence
  - 1.7-25 per 1000 patient days (AHRQ)
  - 3.56 (Bouldin et al)
- Average added cost of care per patient fall
  - $13,063.5 (average with or without an injury)

- Morello RT, Barker AL, Watts JT, Haines T, Zavarsek SS, Hill KD, Brand C, Sherington C, Wolfe R, Bohensky MA, Stoelwinder JU. The Extra Resource Burden of In-Hospital Falls: A cost of falls study. MJA 2015. 203(9); 367.e1-367.e8. 11
- Bouldin EL, Andresen EM, Dunston NE, Simon M, Waters TM, Liu M, Daniels MJ, Mion LC, Shorr RI. Falls Among Adult Patients Hospitalized in the US. Prevalence and Trends: J Patient Safety 2013 (Mar). 9(1): 13-7. Doi: 10.1097/PTS.0b013e3182699664
- Quigley P, & White S. Hospital-Based Fall Program Measurement and Improvement in High Reliability Organizations. Online Journal of Issues in Nursing, 2013(May). 18(2): Manuscript 5.

Ventilator-Associated Events / Pneumonia

- Incidence
  - 8.1 per 1000 ventilator days (National Healthcare Safety Network) wide range (1.8-57.6)
- Added cost of care per event
  - $45,609 (average from multiple sources)

- Cook DJ, Walter SD, Cook RJ, Griffith LE, Guyatt GH, Leasa D, Jaeschke RZ, Brun-Buisson C. Incidence of and risk factors for ventilator-associated pneumonia in critically ill patients. Ann Intern Med. 1998;129:433–440. [PubMed]
- Kollef MH, Hamilton CW, Ernst FR. Economic Impact of Ventilator-Associated Pneomonia in a Large Matched Cohort. Infec Control Hosp Epidemiol 2012(March). 33(3): 250-6. Doi: 10.1086/664049
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Pressure Injuries

- Incidence (Stage III and IV)
  - 4.7-32.1
- Added cost of care per case
  - $43,180.00

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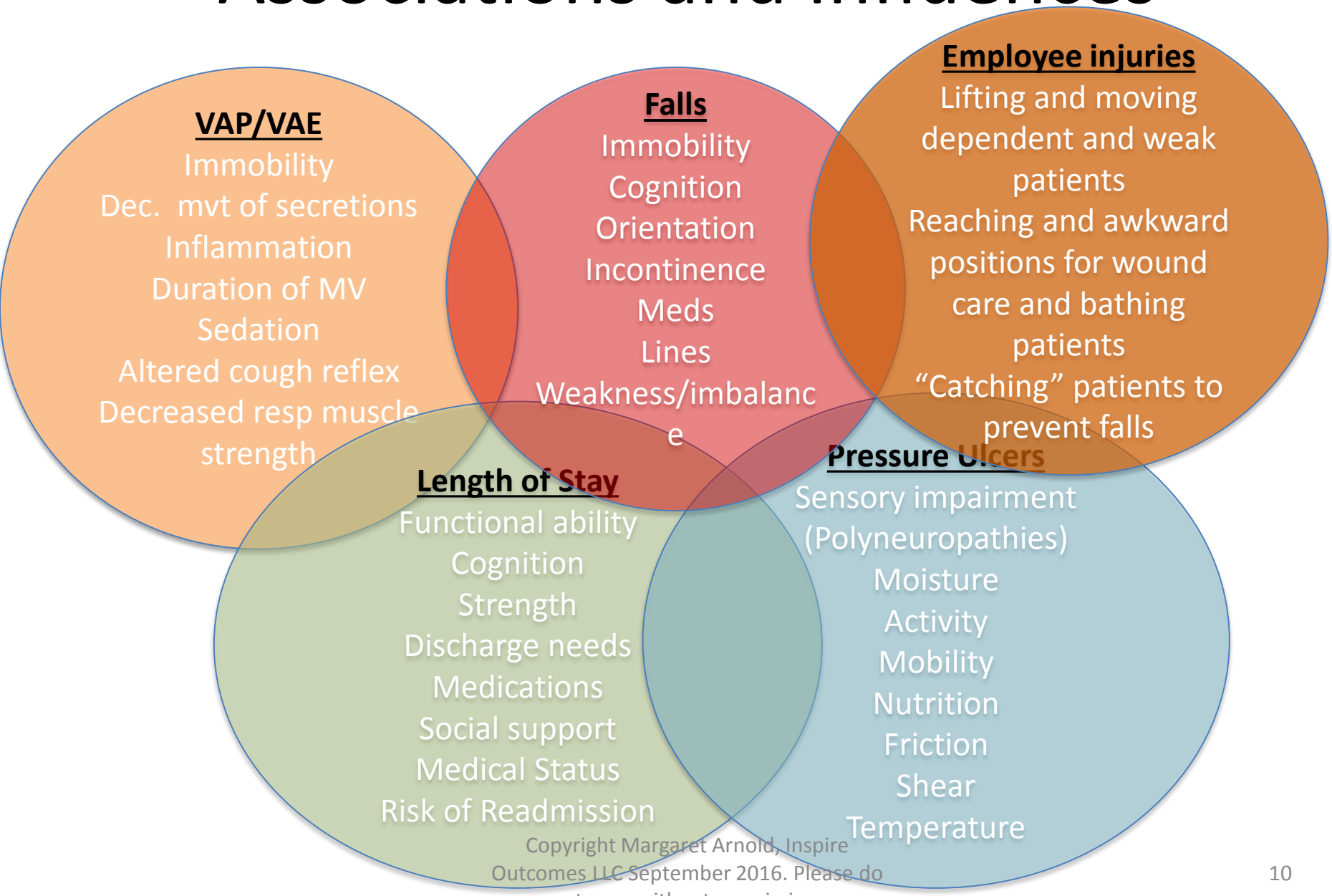
Employee Injuries related to Patient Handling

- Incidence
  - 6.8 injuries per 100 FT workers
  - Overexertion and bodily strain 48% of all injuries
- Average direct costs
  - $15,860 (AON Risk solutions)
- Average indirect costs
  - (OSHA estimates 4-5 times direct costs in indirect costs)

- https://www.osha.gov/dsg/hospitals/
- http://www.aon.com/attachments/risk-services/2012-HC-WorkersComp_Barometer_Report_Abridged.pdf

Associations and Influences



Overlapping Impact of Quality Initiatives

A CULTURE OF MOBILITY

A CULTURE OF PATIENT **AND** EMPLOYEE SAFETY

Initiatives to Reduce Costs and Improve Quality of Care

BETTER FOR PATIENTS!
BETTER FOR HOSPITALS!

IMPROVES

Functional Independence

Sleep Quality

Muscle strength

Likelihood of DC to home or Rehab vs ECF/SNF

Quality of Life

ICU LOS

Hospital LOS

Time on Ventilator

Pressure Ulcers

Ventilator associated events

Readmissions and death

Cost of Care

Hyperglycemia

Inflammation

Delirium

REDUCES

MOBILITY IS LIFE!

Impact of Early Mobility on LOS

1. Ronnebaum JA, Weir JP, Hilsabeck TA. Earlier Mobilization Decreases the Length of Stay in the Intensive Care Unit. *JACPT* 2012; 3(2):204-210
2. Morris PE, Goad A, Thompson C, Taylor K, Harry B, Passmore L, et al. Early intensive care unit mobility therapy in the treatment of acute respiratory failure. *Crit Care Med*. 2008;36: 2238–2243. PMID: 18596631.
3. Routsi C, Gerovasili V, Vasileiadis I, et al. Electrical muscle stimulation prevents critical illness polyneuromyopathy: a randomized parallel intervention trial. *Crit Care* 2010;14(2):R74.
4. Moss M, Nordon-Craft A, Malone D, et al. A Randomized Trial of an Intensive Physical Therapy Program for Acute Respiratory Failure Patients. *Am J Respir Crit Care Med* 2015;In press. DOI: 10.1164/rccm.201505-1039OC
5. Malkoc M, Karadibak D, Yildirim Y. The effect of physiotherapy on ventilatory dependency and length of stay in an intensive care unit. *Int J Rehabil Res.* 2009; 32:85-8.
6. Hashem MD, Parker AM, & Needam DM. Early Mobilization and Rehabilitation of Patients Who Are Critically Ill. *Chest.* 2016 Sep;150(3):722-31. doi: 10.1016/j.chest.2016.03.003. Epub 2016 Mar 18.

Impact of Early Mobility on Ventilator Days and Associated Events

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4. Fraser D, Spiva L, Forman W, & Hallen C. Original Research: Implementation of an Early Mobility Program in an ICU. AJN 2015 (Dec); 115(12): 49-58

Impact of Early Mobility on Falls

1. Fraser D, Spiva L, Forman W, & Hallen C. Original Research: Implementation of an Early Mobility Program in an ICU. AJN 2015 (Dec); 115(12): 49-58
2. Oliver D, Britten M, Seed P, et al. Development and Evaluation of an Evidence-Based Risk Assessment Tool (STRTIFY) to predict which elderly in-patients will fall. Case Control and Cohort Studies. BMJ 1997; 315(7115): 1049-53
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7. See also outvmes at this website: (CSI) http://www.aacn.org/wd/publishing/content/pressroom/pressreleases/2014/feb/csi-north-carolina-hospitals.content?menu=AboutUs

Impact of Early Mobility on Pressure Injuries

- Fraser D, Spiva L, Forman W, & Hallen C. Original Research: Implementation of an Early Mobility Program in an ICU. AJN 2015 (Dec); 115(12): 49-58
- See also outvmes at this website: (CSI) http://www.aacn.org/wd/publishing/content/pressroom/pressreleases/2014/feb/csi-north-carolina-hospitals.content?menu=AboutUs

Impact of Safe Patient Handling Programs on Employee Safety

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2. Li J, Wolf L, Evanoff B. Use of mechanical patient lifts decreased musculoskeletal symptoms and injuries among health care workers. *Injury Prevention (1353-8047).* 2004;10(4):212-216 215p.
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4. Tullar J, Brewer S, Amick BC, III, et al. Occupational safety and health interventions to reduce musculoskeletal symptoms in the health care sector. *Journal of Occupational Rehabilitation.* 2010;20(2):199-219.
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Impact of Safe Patient Handling Programs on Patient Outcomes

1. Alamgir, H., Li O. W., Yu, S., Gorman, E., Kidd, C. 2009 | American Association of Occupational Health Nurses Journal Volume 57, Issue 9, Pages 374-380
2. Flanders, SA, Harrington L, Fowler RJ. Falls and Patient Mobility in Critical Care. Keeping Patients and Staff Safe. AACN Advanced Critical Care 2009; 20(3): 267-276.
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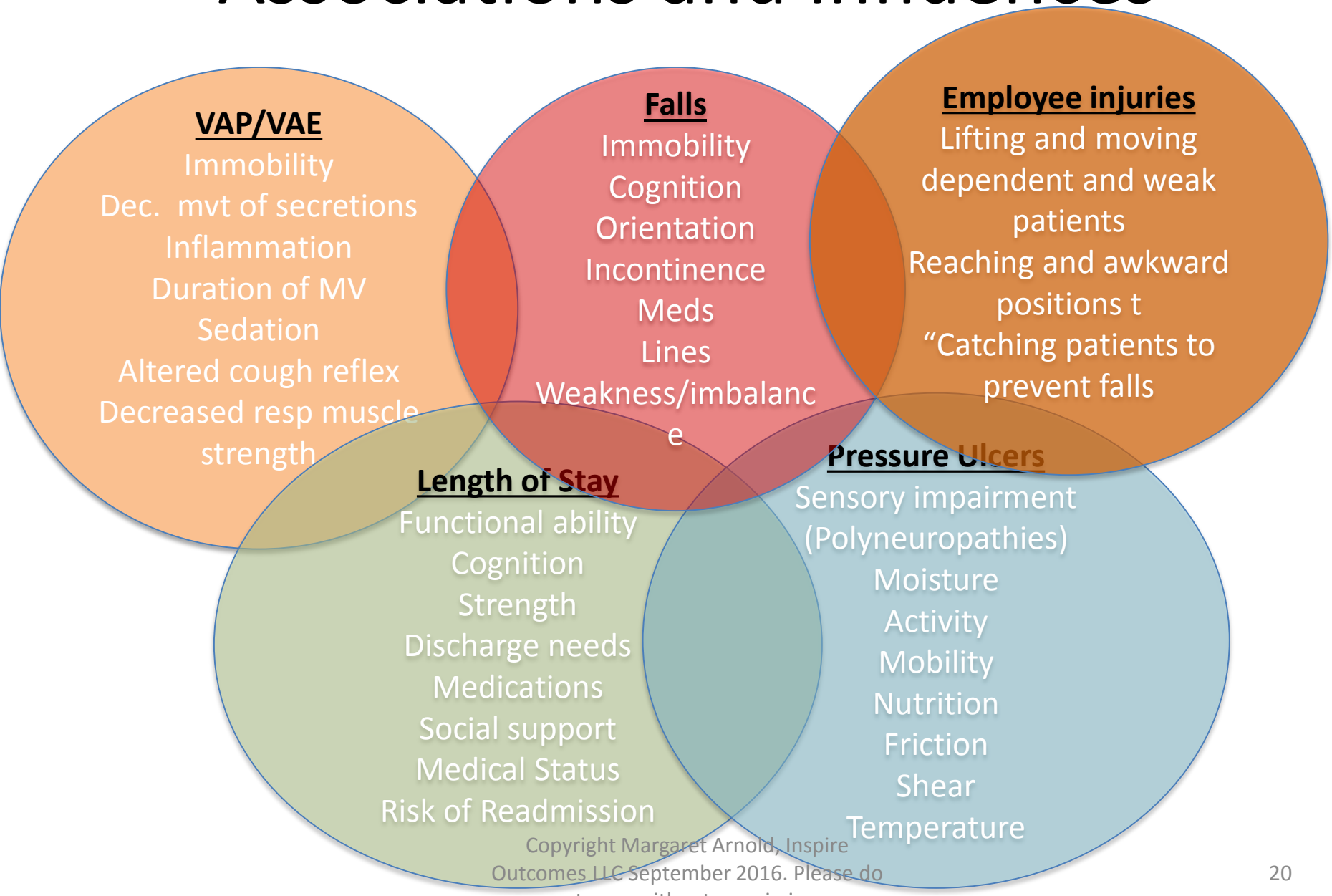
4. Arnold M, Radaweic S, Campo M, & Wright L. Changes in Functional Independence measure ratings associated with a safe patient handling and movement program. *Rehabilitation Nursing*, 2011; 36: 138-144. http://dx.doi.org/10.1002/j.2048-7940.2011.tb00081.x
5. Arnold M, Wilson C, McIlvaine J, Labreche M, and Stevens L. Integrating Mobility and Safe Patient Handling: Practical Considerations for Interdisciplinary Care. AmJSHP June 2015; 5(2): S1-21

Associations and Influences



Total Quality Culture

PATIENT SAFETY and IMPROVED OUTCOMES

Through

EARLY AND CONTINUED MOBILITY

With

STAFF SAFETY DURING PATIENT MOBILITY

By Using

SAFE PATIENT HANDLING TECHNOLOGY

Staff Utilization

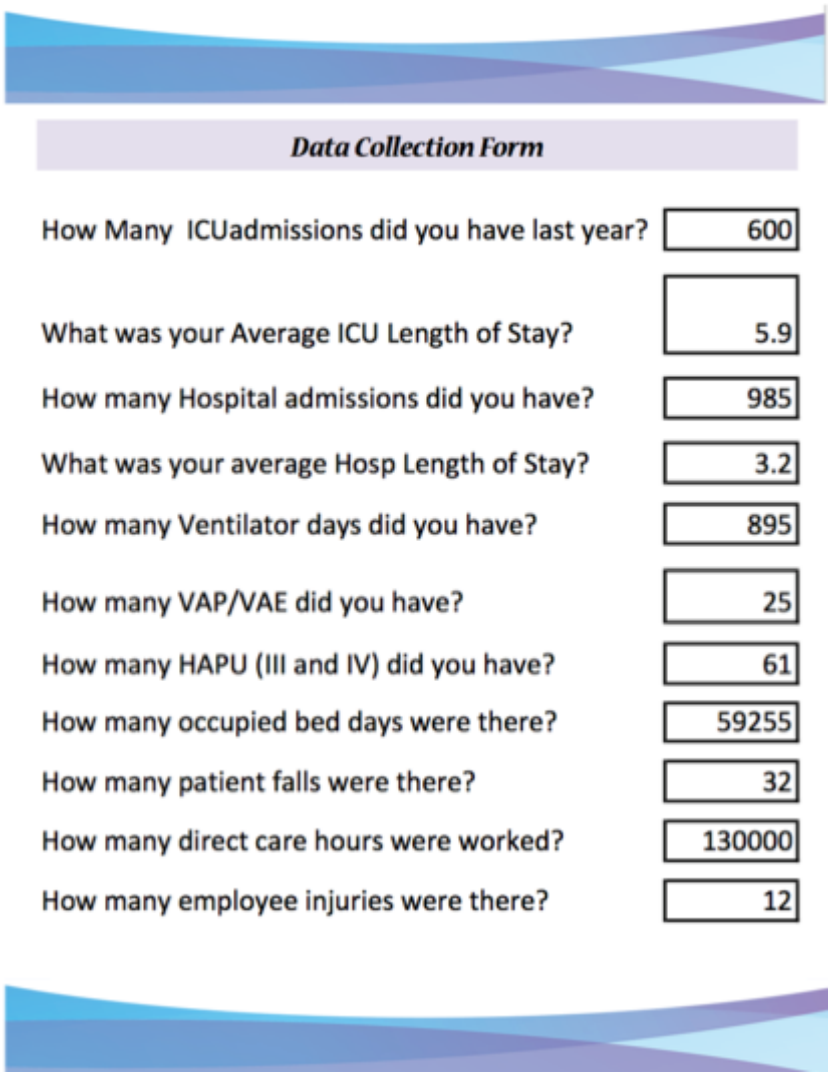
- EM, SPHM, Fall Prevention, Skin teams monthly meetings
- Action plans in between meetings
- Root Cause Analysis, Prevention strategies
- Staff Training
- Data collection, audits, QI projects for each

- What if we could condense and refine?

Example of Staff Efficiency Tool

Comparison of Siloed initiatives versus combined initiative staff activities										
	Number of people	Time per month per person (hrs)	Number of people	Time per month per person (hrs)	Number of people	Time per month per person (hrs)	Number of people	Time per month per person (hrs)	Number of People	Time per month per person
	Early Mobility		Fall Prevention		Wound Care		Safe Patient Handling		Infection Prevention	
Coordinator / Champion time										
Monthly meetings										
Emails, calls, communications										
Developing educational materials										
Staff education (Trainers)										
Staff education (Trainees)										
Audits										
Data collection										
Compiling Reports										
Activities other than education*										
* Planning, implementing changes, addressing barriers, following up on actions, researching options and best practices, reading articles etc.										

Hyperlink to Excel File



Data Collection Form	
How Many ICUadmissions did you have last year?	600
What was your Average ICU Length of Stay?	5.9
How many Hospital admissions did you have?	985
What was your average Hosp Length of Stay?	3.2
How many Ventilator days did you have?	895
How many VAP/VAE did you have?	25
How many HAPU (III and IV) did you have?	61
How many occupied bed days were there?	59255
How many patient falls were there?	32
How many direct care hours were worked?	130000
How many employee injuries were there?	12

Inspired Total Quality Solutions (ITQS) Program Costs

Added Staffing	$180,000.00
Additional Training	$15,000.00
Additional Equipment	$150,000.00
Additional Administration	$2,000.00
External Consultants	$100,000.00
Total Cost of Program	$447,000.00

Summary

- Many individual initiatives to improve quality of care and contain high costs
- Many areas of overlap
- Additional savings may be realized through combining initiatives
- Maximize staff Efficiency and minimize redundancy

Margaret@InspireOutcomes.com

AMAZING THINGS ARE HAPPENING HERE

Implementing an ICU Diary Program Throughout All the ICU's

Cyndy K. Fine, MSN, CRRN

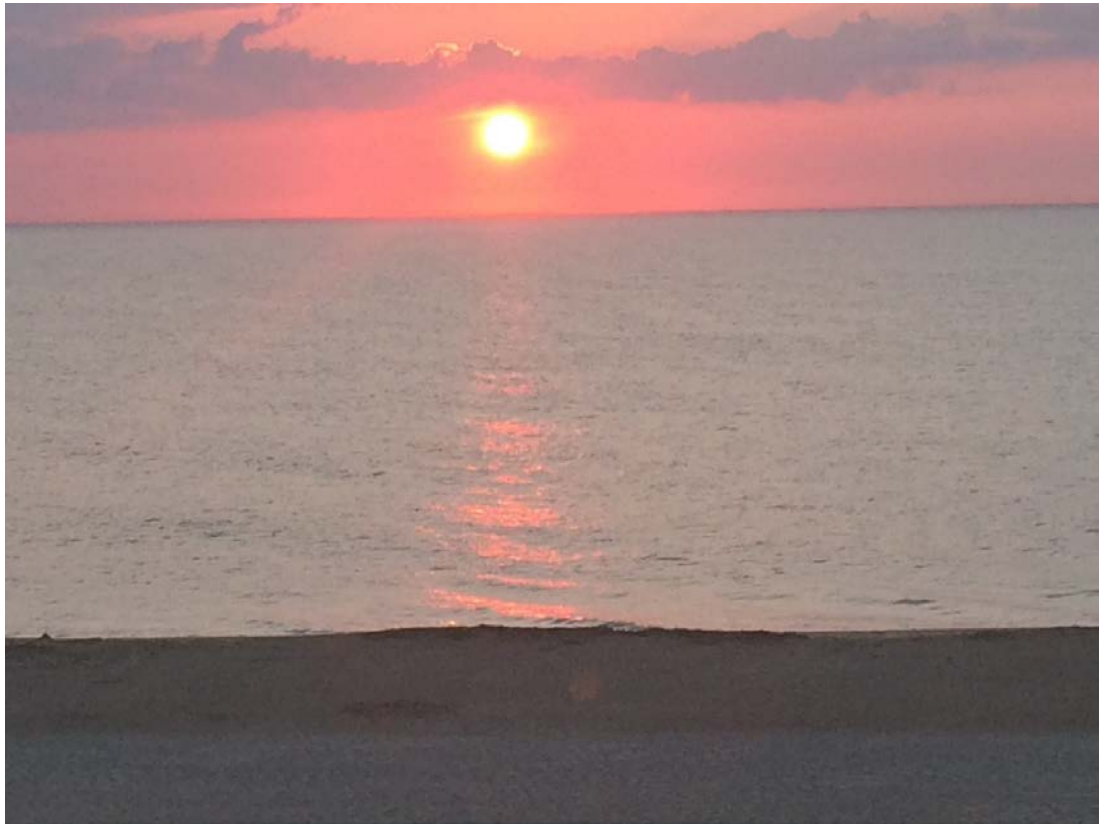
11.04.16

Columbia University
College of Physicians and Surgeons

NewYork-Presbyterian
Columbia University Medical Center

New York Presbyterian Hospital: Columbia Medical Center

Why Even Do an ICU Diary?



History

- Attended the Johns Hopkins Rehab in the ICU Conferences the last two years.

- Reviewed the literature.

- Met as a team and decided:
  - What were the criteria for inclusion in the program
  - Where did we want to start the Program?
  - Timetable for implementation

Inclusion Criteria

- Decided as a team that we would use the criteria that the literature suggested.
  - In the ICU for greater than 72 hours.
  - On the ventilator for 48 hours or greater.

- Decided to pilot in two of our 5 ICU's:

- For the pilot only, the patient and their participating family were English speaking.

Timetable for Pilot

- Decided as a team that we would start in the CTICU.
- Educated staff over 2 week period.
- Implemented the pilot.

Diary was

- Very low cost, low tech and simple to use.
- Included:
  - Page to write on
  - Page titled “All About Me”
  - Place for pictures
  - Article on ICU Diary
  - Pen

Example of Picture we would take….

Results

Had no referrals to the program!

From there:

- Looked at the criteria again.
- Made changes
- Began with a patient that had been in the MICU.

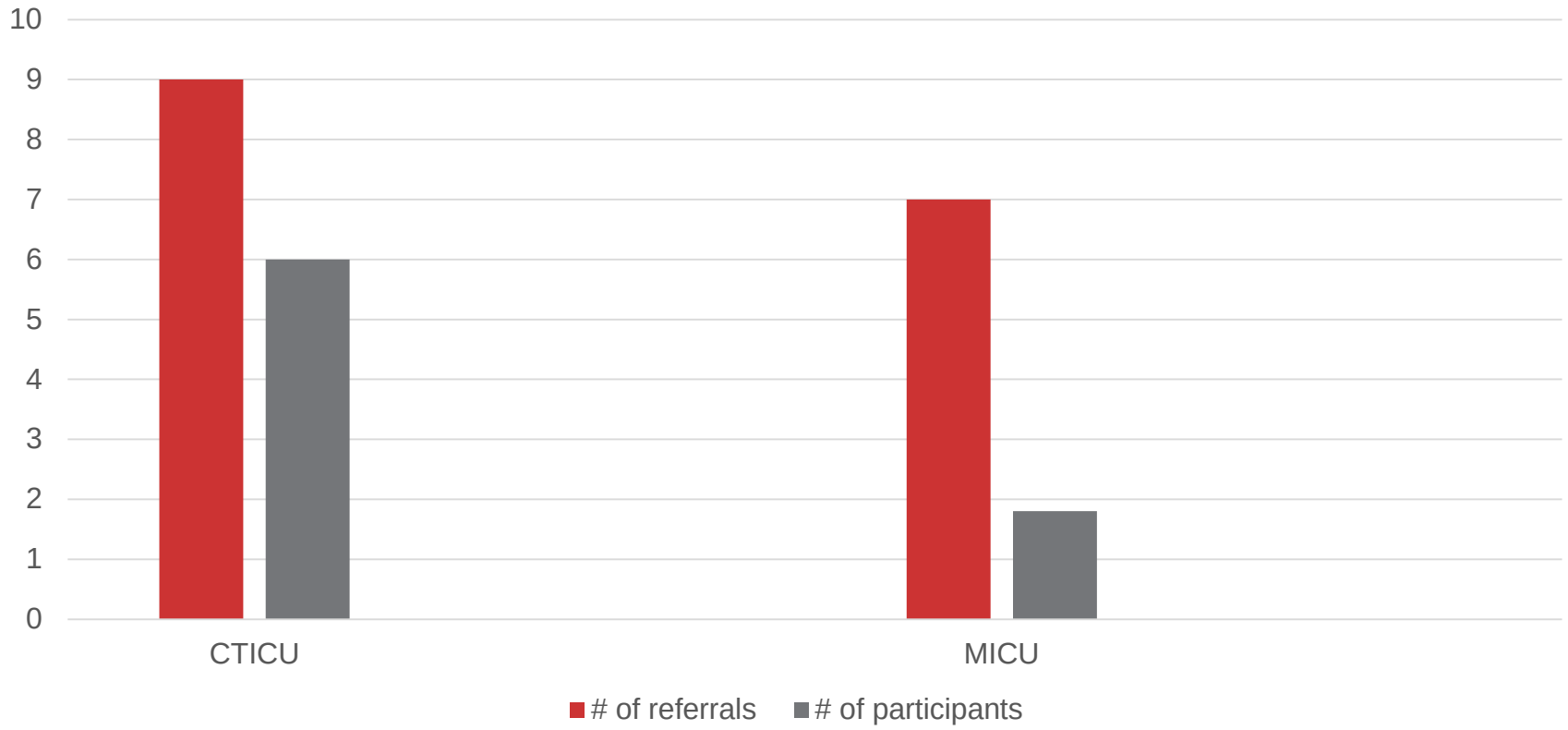
From There

Added the MICU's

At the end of the pilot, we…..

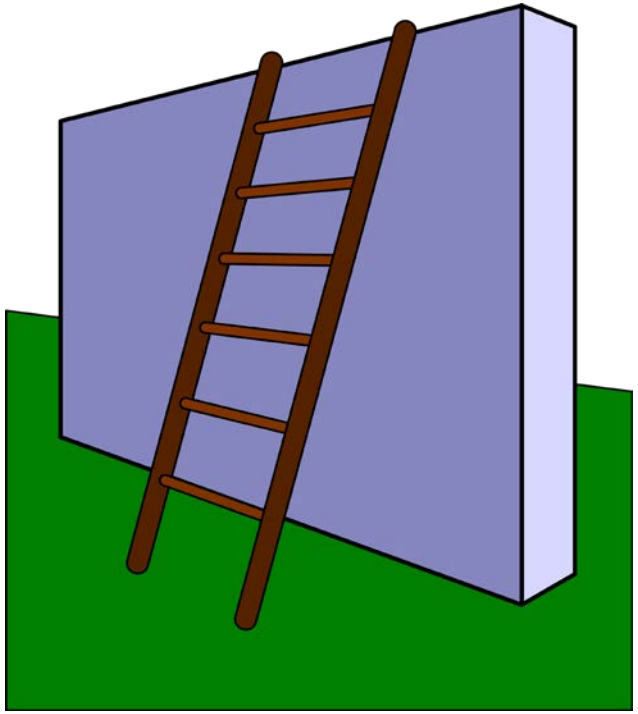
- Looked at our referrals.
- Spoke informally to the patients and families.
- Decided on making changes to inclusion criteria, making them more ICU specific.

Pilot Data: Number of patients referred versus those who participated



Barriers Encountered

- Inclusion criteria.
- Staff reluctance to write in the Diary.
- Staff time to write in the Diary.
- Families reluctant to participate.



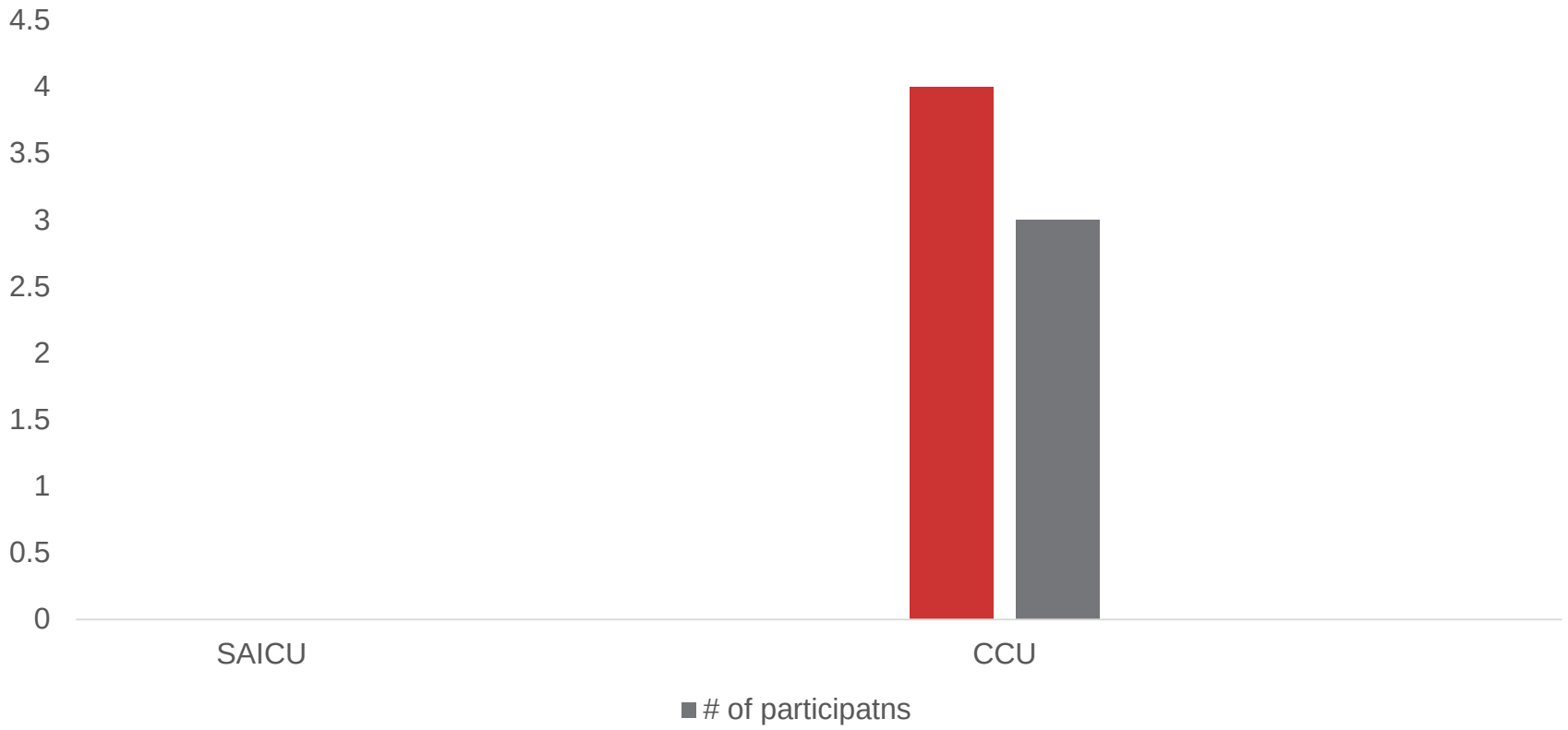
In short, this was a culture change and it would take time.

Implementation in the Other ICU's

- Implemented the program in:
  - SAICU
  - CCU

- Have not implemented the Program in the Neuro ICU

Data: Number of patients referred versus those who participated in Phase Two



Where do we go from here?

- Need to keep educating and re-educating our team.
- Point person is key!
- Some ICU's may be more appropriate than others for the program. Need to look at this.
- Program needs to be encouraged by all.

Thank You!

JOHNS HOPKINS
MEDICINE

Patient outcomes after acute respiratory failure: A qualitative study of survivors' experience using the PROMIS framework

Michelle Eakin, Ph.D

PROMIS Framework

JOHNS HOPKINS MEDICINE

Physical Health	Mental Health	Social Health
• Ability to carry out physical activities • Self-care (activities of daily living) • Vigorous activities that require mobility, strength, or endurance	• Positive and negative emotions • Mood status • Cognitive abilities • Current outlook on life or adaptation to health	• Providing and receiving quality support from family, friends, and others. • Ability to participate in social roles and activities

Objective

Using qualitative methods describe the survivorship experience of acute respiratory failure (ARF) patients within the Patient Reported Outcomes Measurement Information System (PROMIS®) framework.

Methods

- Recruited 48 patients from two ongoing trials
  - ARDS Network Long Term Outcomes Study (ALTOS)
  - Recovery of Muscle after ARF (ROMA) study
- Oral Consent was obtained and semi-structured interview was completed by phone

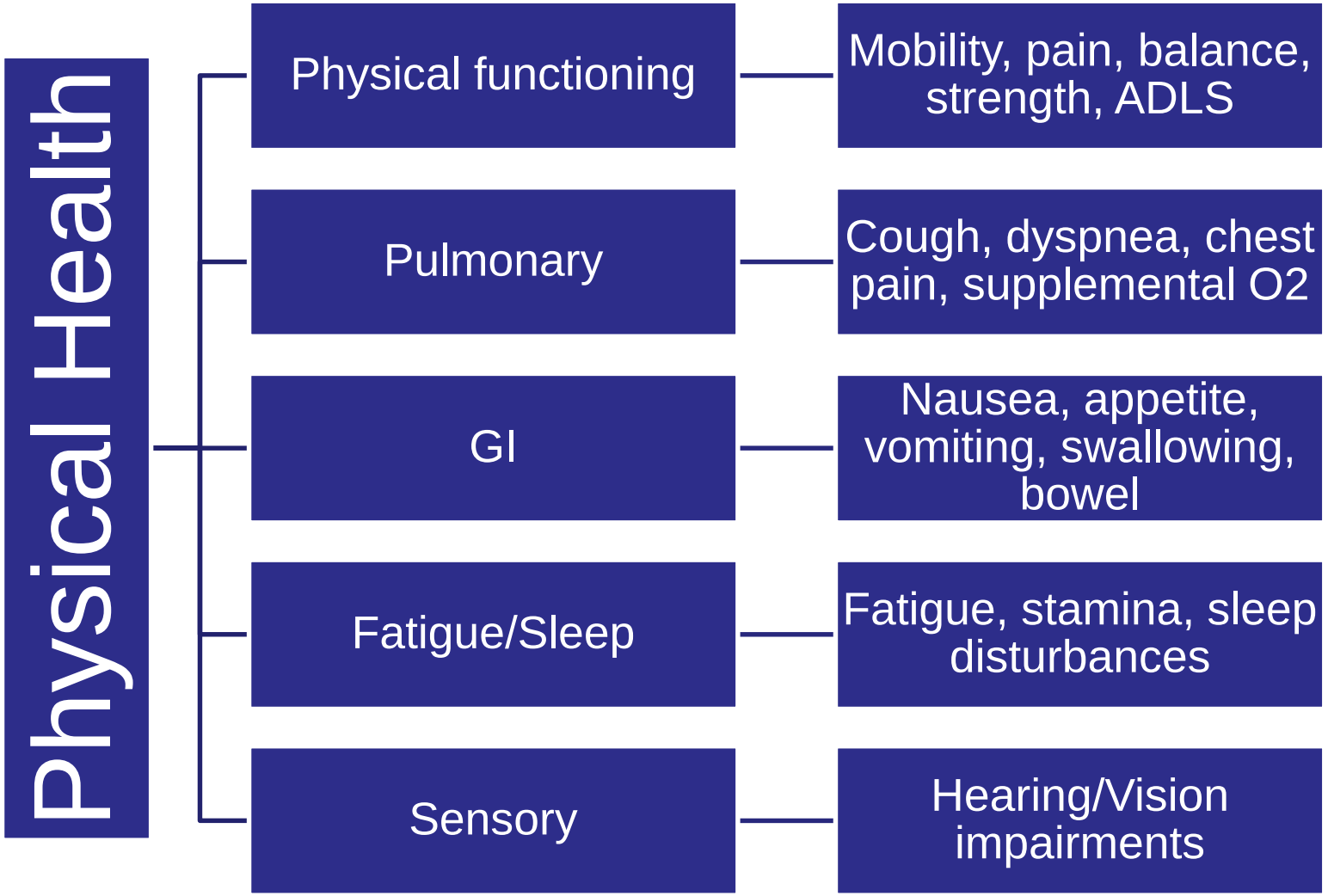
Patient Sample

Age, years	53 (15)
Women, No. (%)	26 (54%)
White, No. (%)	48 (81%)
Prior Residence, Home independently No. (%)	42 (88%)
Body mass index, kg/m^2	32 (8)
Diabetes, No. (%)	15 (31)
APACHE III score	100 (34)
Duration of mechanical ventilation, days	9.8 (10)
ICU length of stay	13 (10)
Hospital length of stay	22 (17)

Overall Health

“Mercifully I have zero memory of those 12 days when I was on the respirator. But the whole experience was just, it may sound crazy, but it was so much worse than the leukemia and the chemo and the bone marrow transplant. Up until that point I would have said that (leukemia) was the high water mark, but the whole ICU stay was just so scary.”

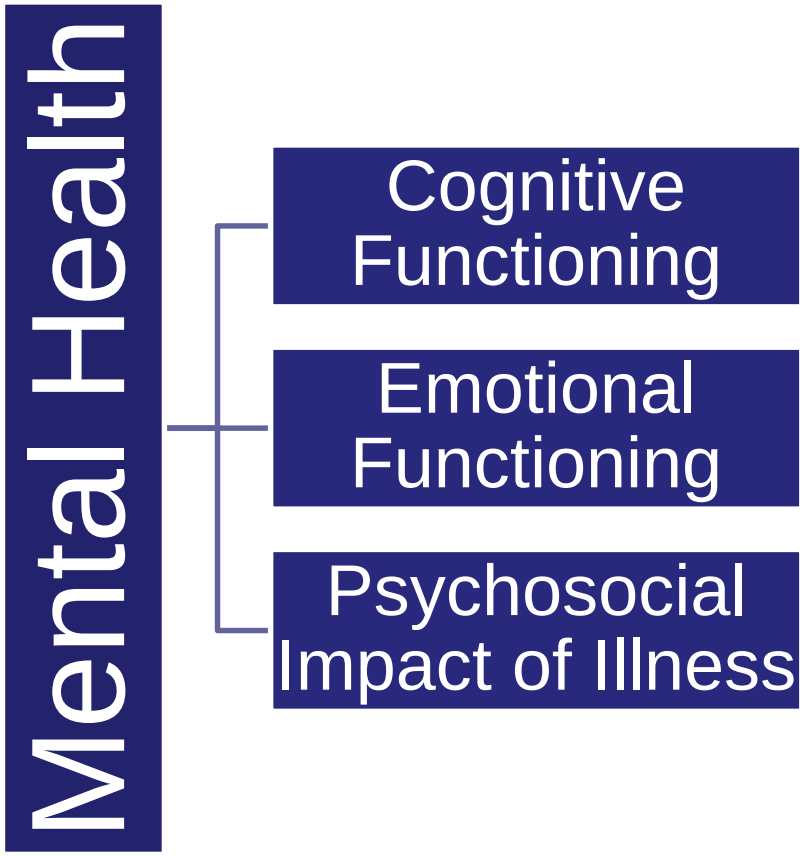
Results- Physical Health



Physical functioning

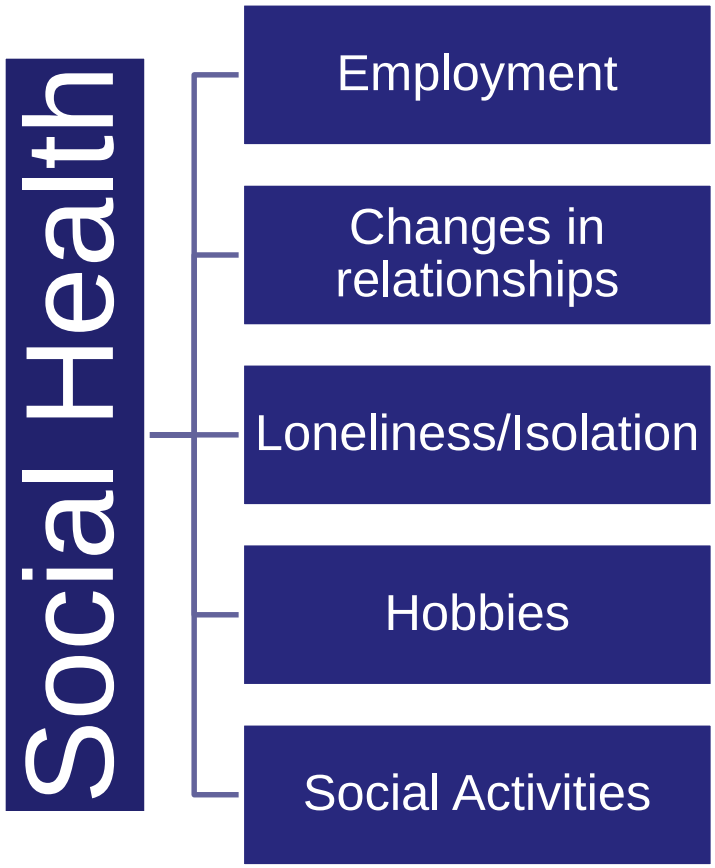
- “Being able to move and do things is the most important thing.”
- “It felt like that were two sections of chain link fence hooked to each lung and I was trying to drag them up a gravel driveway with my lungs.”
- “I feel like I have a 10-foot leash to my saturator.”

Results- Mental Health



- “My thinking is like being in a fog”
- “I'd started to take life a little bit for granted but now I am so extremely grateful to be alive”
- “I am basically a parasite …a parasite that leaves you an emptiness inside”

Results- Social Health



- "I want to go back to work. We had to move from a 2 bedroom to a 1 bedroom because I'm out of work now. I feel like I'm being punished for being sick."

- "He told me if I would live, he would never stop taking care of me …so he has gone out of his way to do all that"

Conclusions

- ARDS survivors reports significant impairments in all domains of PROMIS
- Different coping responses to critical illness with some seeing it as a benefit and others were very distressed.
- Important to consider outcome measures that assess meaningful patient outcomes across all domains

NYU Langone MEDICAL CENTER

Rusk Rehabilitation/
Sala Institute for Patient and Family Centered Care

Early Rehabilitation in the Pediatric Intensive Care Unit: A Quality Improvement Project

11/5/2016

Jodi Herbsman, PT, DPT

HASSENFELD CHILDREN'S HOSPITAL OF NEW YORK AT NYU LANGONE

Presentation Objectives

- Demonstrate how a pediatric early mobilization can be safe and effective
- Identify potential challenges and successes to implementing an early mobilization project in the pediatric intensive care unit (PICU)

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Background

Literature has shown that adult patients who are immobilized, mechanically ventilated and/or sedated for a prolonged period of time, experience:

- Decreased quality of life
- Muscle atrophy
- Impaired cardiopulmonary endurance
- Overall decrease in mobility at discharge and follow up

Research in the pediatric population is limited

Barriers to Mobilization

Identified on Survey

- Knowledge of the importance of early mobilization
- Skills to move critically ill patients
- Comfort level in moving critically ill patients
- Ability to identify patients eligible for early mobilization
- Lack of resources

Key Driver Diagram

SMART Aim

We will increase percent of PICU patients who are mobilized within recommended* time frame from 60% to 80% by June 2016.

*Recommended time frame: 18 hours from PICU admission for non-vented patients, 48 hours from PICU admission for vented patients

Population: PICU patients 18 months and older

Global Aim

Improve patient experience and outcomes, generate cost savings

Key Drivers

- Consistent identification of patients ready to be mobilized and formulation of mobilization plan
- Accurate and timely orders for patients who need to be mobilized
- Consistent use of evidence based weaning and sedation protocols
- Adequate resources available to safely and consistently mobilize patients
- Staff comfortable to safely mobilize patients
- Parent/Family/Patient comfortable mobility process
- Staff understanding benefits of early mobilization

Interventions

- Create, test, an implement use of an algorithm to identify patients eligible for mobilization
- Train staff in use of algorithm
- Update order sets
- Make LIPs aware of change (via e-mail)
- Review and update weaning, sedation/choice of medication protocols based on current evidence Ensure consistent use of updated protocol by LIPs, Nurses and RT
- Assess current resources (time/space/staff)
- Implement patient schedule to maximize use of staff time
- Create a procedure to ensure that all RNs, PCTs, therapists are trained on how to safely mobilize critically ill patients
- Incorporate patient/family concerns re: mobilization in the ICU during rounds and treatment
- Work with FAC and YAC to identify patient/family barriers to mobilization
- Involve CAT, CL, IH for mobilization and prep
- Change culture of early mobility for all team members

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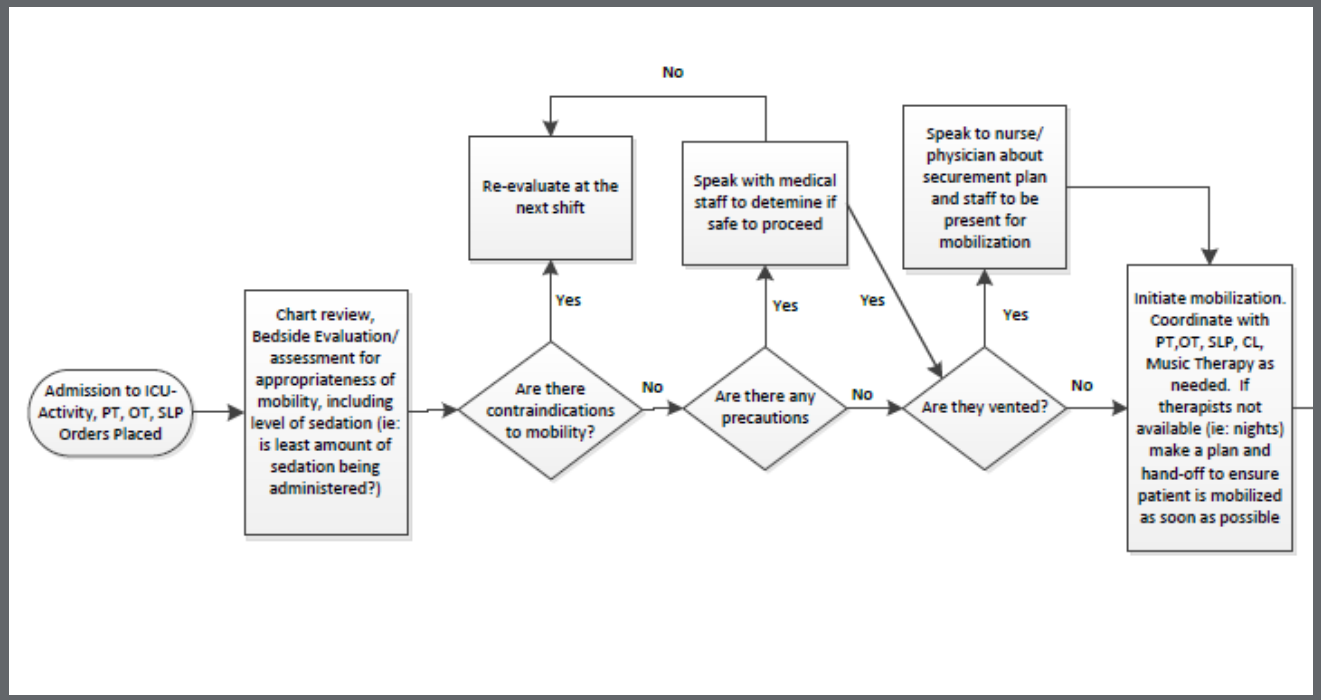
HASSENFELD CHILDREN'S HOSPITAL OF NEW YORK AT NYU LANGONE

Interventions Summary

- Mobilized interdisciplinary team
- PICU admission order set updated
- Algorithm created
- Patient scheduling trialed
- Therapy/Nursing education and training provided (PDSA)
- Family advisor interviews conducted with patients and caregivers
- Family faculty/nursing discussions conducted

Pediatric Mobilization Algorithm

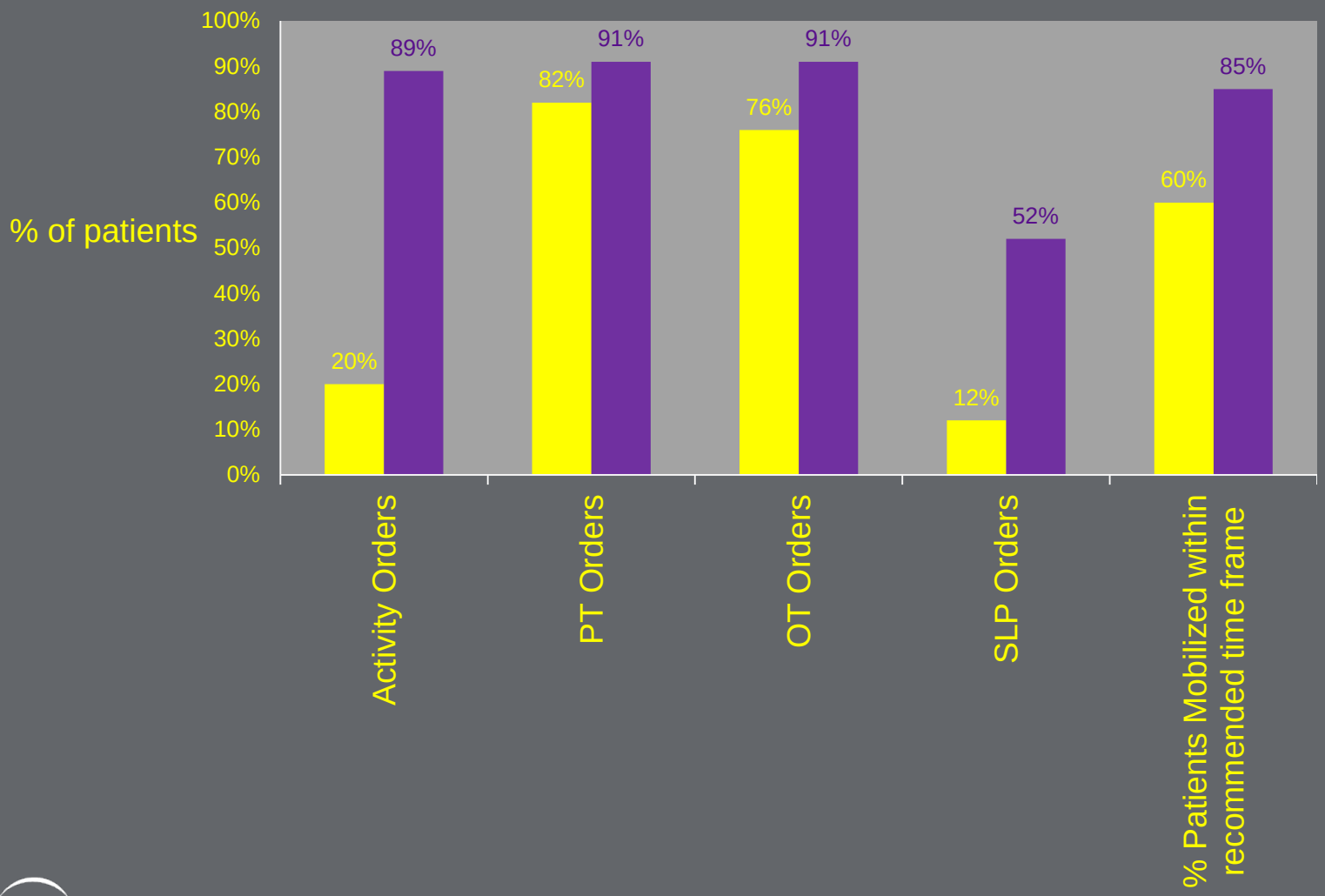
- Contraindications and precautions
- Process to determine eligibility for mobility
- Includes roles of all team members
- Signs of intolerance



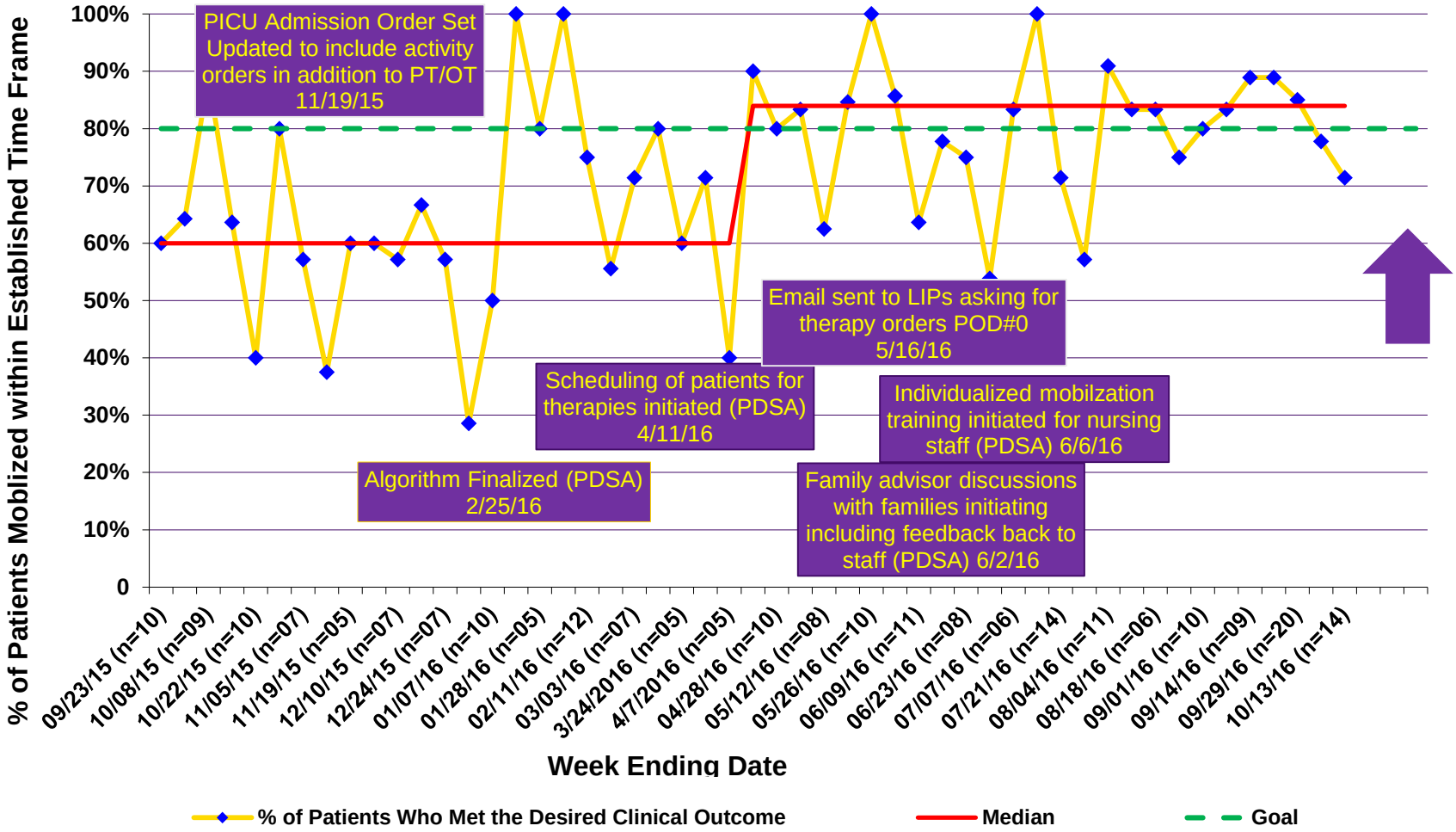
Family Interviews
(interviews done by family advisors)

- Do you understand the roles of PT, OT, SLP?
- Did a staff member ask you if you if your child wanted to “move” today
- Did you “move” today? If not, why?
- Is there anything we could have done to make it easier/more comfortable for your child to move?
- Did the staff member explain the benefits of remaining mobile?
  - Were the benefits clear? If not, how can we make it better?
- Do you know when PT/OT/SLP will be returning to see you?

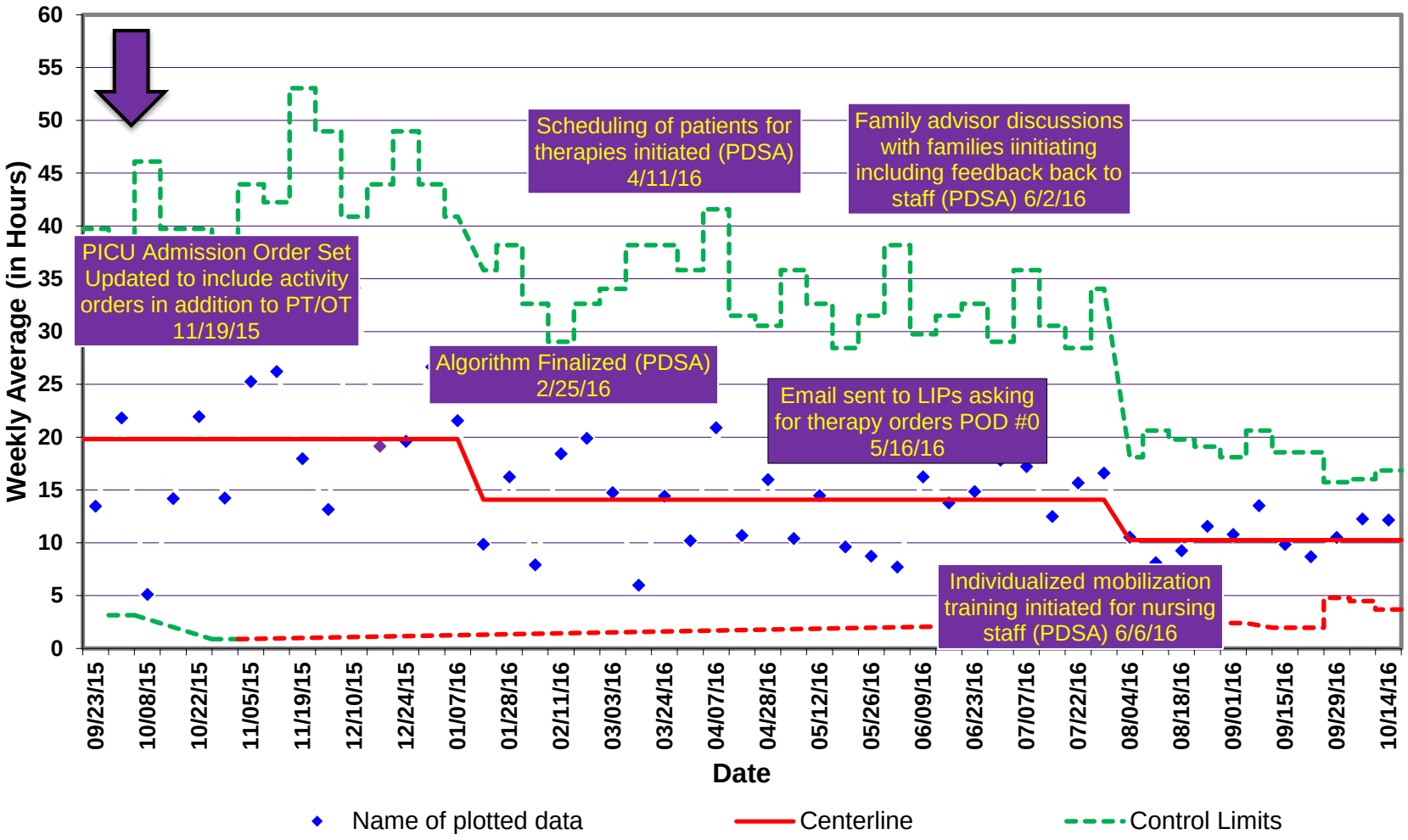
Outcomes- Orders



% of PICU Patients Mobilized 18 Hours+ within Established Time Frame



Time From PICU Admission to First Mobilization



Challenges

- Coordination of the mobilization team in real-time
- Coordination of training
- Changing culture is gradual
- Time and resources
- Documentation consistency

Successes/Wins

- Strong team collaboration (including family advisors)
- Positive feedback from patients and families
- Utilization of improvement science methodology helped team navigate through complex project
- No adverse events

Lessons Learned

Early mobilization in the PICU at is

- Feasible and safe
- Rewarding for all members of the interdisciplinary team
- Benefits of utilizing PDSA cycles (small tests of change)
- Clinical and financial outcomes pending

Acknowledgements

- Yasir Al-Qaqaa, MD
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- Mary Ellen Sheldon, MA, RN-BC
- Lauren Simon, PT, DPT, NCS
- Tina Tan, MS, CCC-SLP, BCS-S
- David Wain, RT

Nottingham University Hospitals NHS Trust

PIM III Score Does Not Predict Rehabilitation Outcome At Hospital Discharge

Susan Bagnall – Senior Physiotherapist

(On behalf of the Children's Therapies team)

Nottingham Children's Hospital

We are here for you

Background

Who we are?

Aim

Method

Results

Conclusion

Where are we based?

Nottingham Children's Hospital

We are here for you

Brain Injury Living Life (BRILL)

Established 2014

Multidisciplinary rehab for children with acute neurological injury

Contributors to UK ROC

Aim

Can we use PIM 3 to predict how much support patients will need to return home?

OBJECTIVE

To explore the relationship between initial presentation and outcome for patients admitted to PICU with a neurological diagnosis, who received rehabilitation from the BRILL team.

Method

Inclusion:

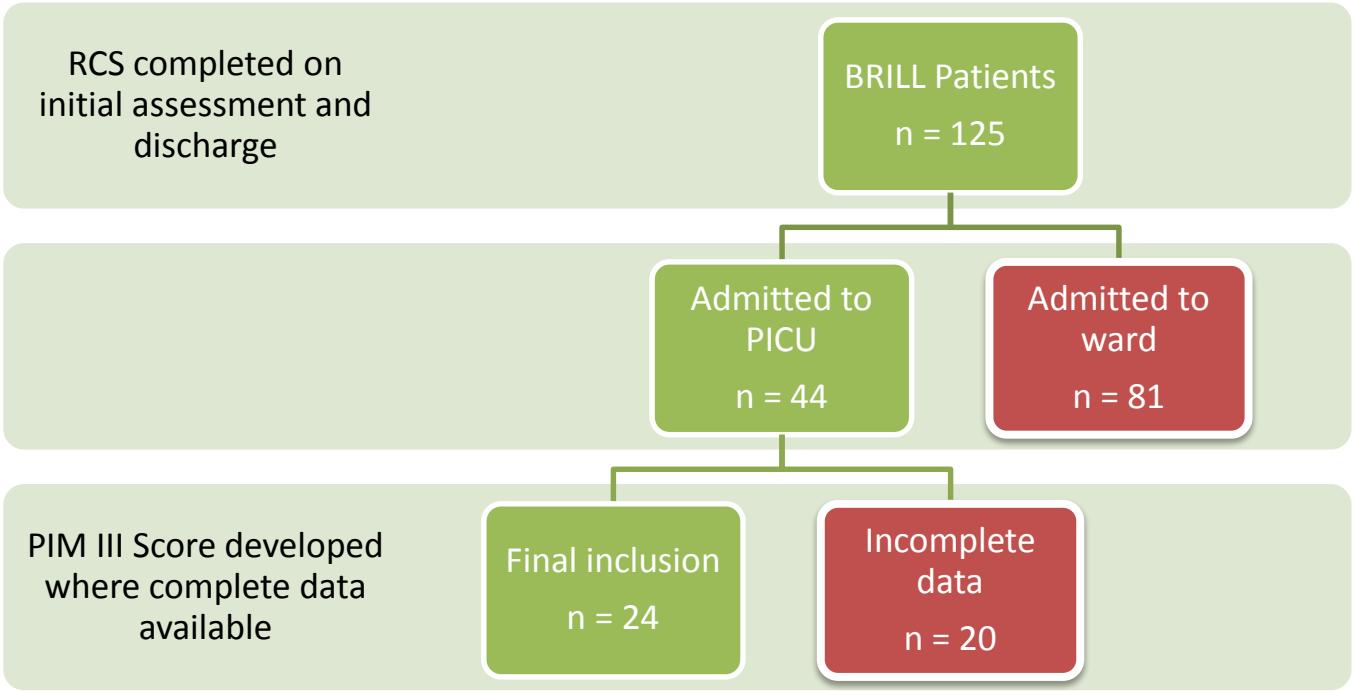
patients who were admitted to PICU and required neuro-rehabilitation provided by the BRILL Team over an 18month period

Data collected:

- admission date
- date of first contact
- Rehabilitation Complexity Scale: Extended (Version 13) scores at discharge
- PIM III score was obtained using the national PICANET database.

Statistical analysis was performed using Statibot.

Inclusion flow diagram



PIM III

Paediatric Index Mortality 3

Value		
Pupils fixed to light		
Elective admission		
Mechanical ventilation (in the 1st hour)		
Absolute value of base excess (mmol/L)		
Systolic Blood Pressure at admission (mmHg)		
Systolic Blood Pressure^2/1,000		
100 x FiO_2 / PaO_2 (mmHg)		
Recovery post procedure?	Yes, recovery from a bypass cardiac procedure	
	Yes, recovery from a non-bypass cardiac procedure	
	Yes, recovery from a noncardiac procedure	
Very high-risk diagnosis	High-risk diagnosis	Low-risk diagnosis

Straney et al. (2013)

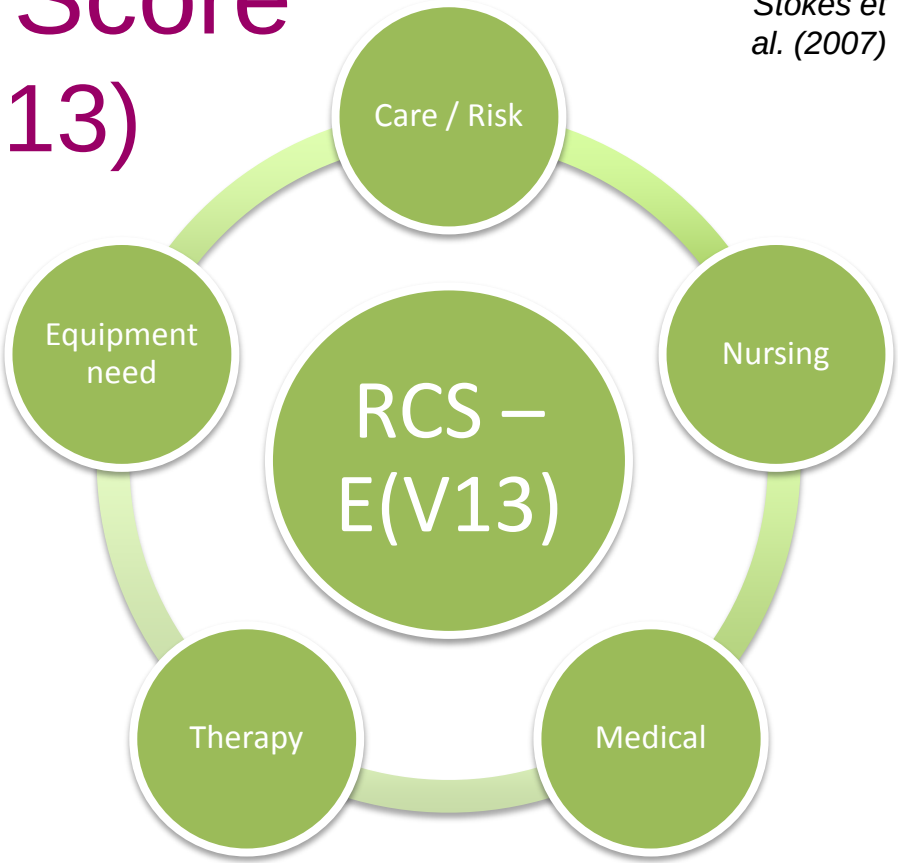
Nottingham Children's Hospital

Rehab Complexity Score – Extended (Version 13)

Turner-Stokes et al. (2007)

Aims to provide basic banding of patient complexity.

The outcome is scored out of 22, with individual domains scored from 0-4.

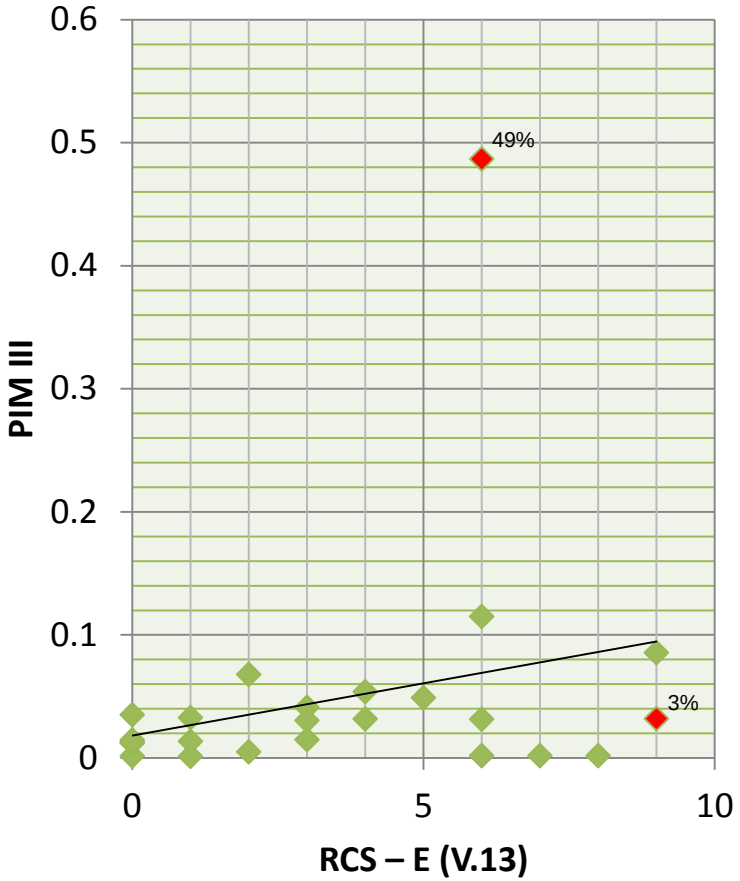


Results

Twenty four eligible patients were identified, (male = 10, median age = 11).

Eleven had trauma related diagnoses, 6 were encephalopathic, 3 had bleeds as a result of AVM and the remainder were of varying diagnosis.

Spearman Rank Correlation analysis of PIM III score and RCS-E (V.13) at discharge demonstrated non-significant positive correlation (n=24, r=0.297, p=0.16.)



Conclusion

Severity of initial presentation measured using PIM III score did not predict outcome of rehabilitation at hospital discharge for patients with a neurological diagnosis

Discussion

Only two patients had a >10% chance of mortality.

Narrowed population

Small single centre cohort

Extrinsic variables

PIM 3 score should not influence rehab intensity

What next?

Expand the study

- **Look at alternative measures:**
  - FIM+FAM
  - PRISM
- **Wider population**

Clinical experience

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Thank you

Nottingham Children's Hospital

We are here for you

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@Rachyk77

@physiogates

@1BAGNALL

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Poster Presentations

5th Annual Johns Hopkins Critical Care Rehabilitation Conference

Baltimore, MD

Steps To Restoring Independence and Dignity Early

Heather Thornton, BSN, RN; Susan Kraeuter, MS, RN; Kelly Turner, RN; Tammy Kessler, RN; David Pearse, MD

Background

"Early mobility for critically ill patients has evolved to become a new standard of care for the intensive care unit (ICU)" (Kleinpell, 2011). Early mobility in the ICU is expected to reduce the patients length of stay and lower the number of readmissions to the hospital. Overall benefits include decreased duration of mechanical ventilation, decreased ICU Delirium, and decreased costs.

Objective

- To identify common ICU safety risks and intervene *early*
- To provide patient-centered care aligned with patient goals and prevent the loss of respect and dignity to ICU patients
- To reduce ICU Delirium, ICU Acquired Weakness, Ventilator Associated Events (VAE), Central Line Associated Bloodstream Infections (CLABSI), Venous Thromboembolism (VTE)

Method

The Medical Intensive Care Unit (MICU) at Johns Hopkins Bayview Medical Center (JHBMC) developed a program to optimize patient care and increase patient safety. Steps To Restoring Independence and Dignity Early (STRIDE) uses a multidisciplinary approach. The STRIDE Coordinator is a registered nurse that works together with the nursing staff, a dedicated Physical Therapist and Occupational Therapist, to provide care to the patients on the unit. The STRIDE Coordinator is responsible for coordinating rehabilitation activities for the critically ill patients. Other disciplines, such as Speech Language Pathology and Respiratory Therapy, are key to optimizing the care of each patient.

Activity and Mobility Program TODAY'S DATE: ____

	HIGHEST LEVEL OF MOBILITY (HLM) Goal: To Maximize Mobility Every Day	✓YESTERDAY'S HLM SCORE	✓TODAY'S GOAL	# OF TIMES HLM MET TODAY (e.g., ///)
24	8 WALKED 250 FEET OR MORE (1+ LAPS ON UNIT)		2+ TIMES	
22-23	7 WALKED 25 FEET OR MORE (WALKED OUTSIDE ROOM)		2+ TIMES	
18-21	6 WALKED 10 STEPS OR MORE (WALKED TO RESTROOM)		2+ TIMES	
13-17	5 STATIC STANDING (1 OR MORE MINUTES)		2+ TIMES	
6-12	4 TRANSFERRED TO CHAIR/COMMODE		2+ TIMES	
AMPAC MOBILITY SCORE→	3 SAT AT EDGE OF BED		2+ TIMES	
	2 TURNED SELF IN BED/ BED ACTIVITIES		2+ TIMES	
	1 LYING IN BED			

Johns Hopkins Highest Level of Mobility (JH-HLM) Scale

The Physical Therapist, Occupational Therapist and STRIDE coordinator on the unit develop an individualized treatment plan for each patient.
They use techniques to promote movement, reduce underlying pain, restore function, and prevent decline in independence.

STRIDE
A multidisciplinary approach to reducing harm in the ICU

Provide Care Aligned with Patient Goals
Include patient and or family in daily rounds

Loss of Respect and Dignity
Access to Care Team, Continuity, Multidisciplinary Rounding, Palliative and Pastoral care, Scheduling

Venous Thromboembolism (VTE)
Prophylaxis, Ongoing risk stratification, Prevent missed phylaxis doses, ultrasound screening of appropriate patients

Central Line Associated Bloodstream Infections (CLABSI)
Hand Hygiene, Chlorhexidine Patches, Full barrier Precautions, Removal of Lines, Central line Checklist Line Cart

Ventilator Associated Events (VAE)
Head of Bed >30, Oral Care with CHG, Spontaneous Awakening & Breathing Trials, Subglottic Suctioning, Lung Protection with low volume ventilation

ICU-Acquired Weakness
Early ambulation, Prospective testing, Family Engagement

ICU Delirium
CAM-ICU, PT, OT, SLP, Sleep enhancement, Pain scores, Family Education, Sedation management

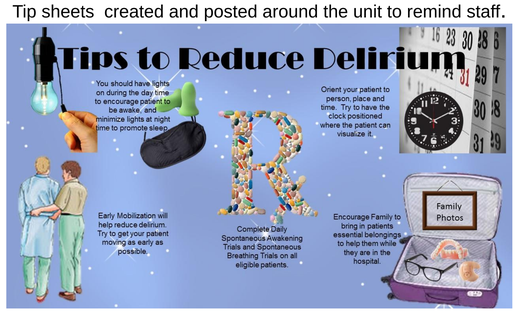
Is your patient eligible for REHAB???

YES unless one of the following conditions exists:

Neuro	RASS -4/-5 RASS +3/+4
Cardio	New DVT w/anti-coagulation < 24 HR Femoral sheath MAP < 55mmHg, *or* Vasopressors increased in past 2 HR, *or* Norepinephrine > 0.15 mcg/kg/min Dopamine > 15 mcg/kg/min Phenylephrine > 1 mcg/kg/min Vasopressin > 0.02 u/min MAP > 140mmHg, *or* Nitroglycerin, Nitroprusside, Nicardipine, Diltiazem, Esmolol, or Labetolol via continuous infusion (any dose)
Resp	Pulse ox < 88% Fi02 > .6 and PEEP > 10cmH20 HFOV Tachypnea > 45 bpm Acidosis pH < 7.25

Patient & Family Communication

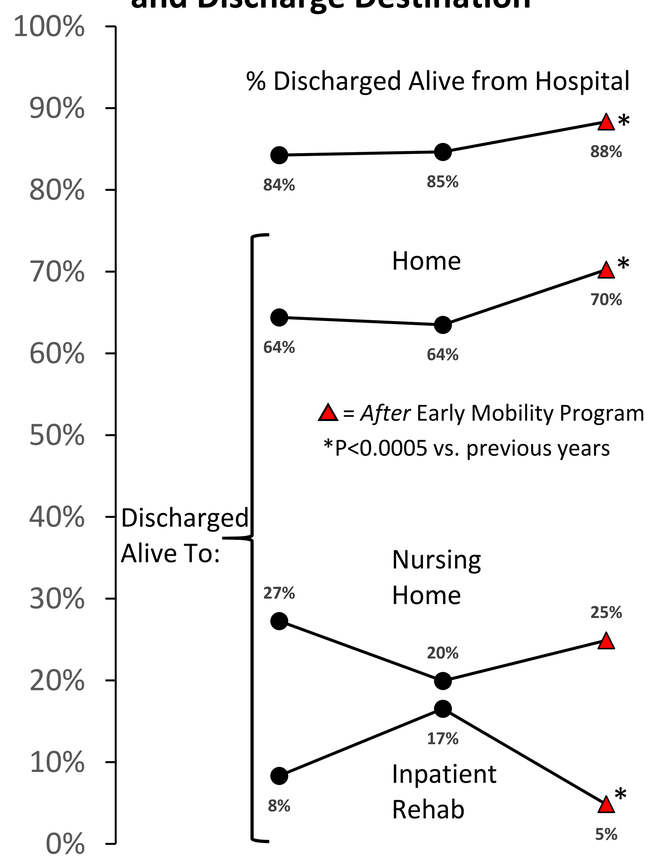
Tip sheets created and posted around the unit to remind staff.



Results

Over the two years before the start of the program, patients had a 16% chance of not surviving their stay in the ICU. After initiation of the program, mortality has decreased to 12%. Prior to the start of this program, 17% of MICU patients went to a rehabilitation facility before going home; that is down to 5%. Over 6,000 patient's charts were reviewed to obtain this data.

Effect of MICU Early Mobility on Survival and Discharge Destination



Significance

The idea of early mobility in the intensive care unit will reduce the patient's length of stay, lower the amount of readmissions to the hospital and decrease the duration of mechanical ventilation on the intubated patients.

Process for performing a SAT/SBT on a ventilated patient in the Medical Intensive Care Unit

Order for Spontaneous Breathing Trial Protocol → Night shift RN and RT collaborate a time for wean trial → RN to perform a spontaneous awakening trial → RT performs a 1 min wean screen → If patient passes wean screen, then placed on SBT by daytime RT → Timely evaluation by medical team to determine extubation

Reference:
Kleinpell, R. (2011, September). *How Early Should We Mobilize ICU Patients?* http://www.medscape.com/viewarticle/750458

Sensory Intervention Model for Acute Delirium

Katie Walker, OTR/L

BaylorScott&White | ALL SAINTS MEDICAL CENTER FORT WORTH

Abstract

The pathogenesis of delirium is poorly understood despite being one of the most common complications experienced by hospitalized clients, with negative effects and costly outcomes being widely researched and documented. The mainstay of the prevention and treatment of delirium is the cessation or minimization of risk factors, in addition to non-pharmacological interventions. With the complexity of biochemical derangement, potential causes, and cognitive/behavioral changes, it has proven challenging to provide effective education to staff and family members regarding the care of their loved ones with acute delirium.

In response, a learning model based upon each of the senses has been conceptualized. Clients in acute delirium experience an altered perception of sensory and environmental input, with special needs for sensory modulation. This model has potential to meet the need for quick and effective training, pending further QI development.

Objectives

1. Anticipate the effects of delirium and sedation practices on therapy interventions
2. Learn to identify symptoms of delirium
3. Design specific rehab treatment plans tailored to a patient dealing with delirium by utilizing the 5 senses.

What to T.H.I.N.K. about Delirium

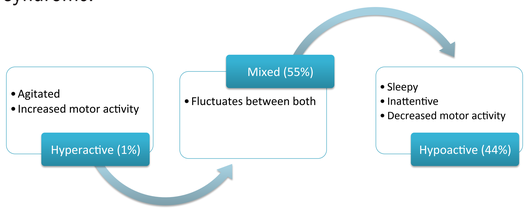
T	Toxic situations: CHF, shock, dehydration, deliriogenic meds new organ failure (i.e. liver/kidney)
H	Hypoxemia Haloperidol or Seroquel (consider requesting)
I	Infection/sepsis Inflammation Immobilization
N	new Infection Non-pharmacologic interventions (think about the senses)
K	K+ or other electrolyte and metabolic problem

Background

Delirium is defined as a transient, usually reversible, cause of cerebral dysfunction and manifests clinically with a wide range of neuropsychiatric abnormalities.[1] The clinical hallmarks of delirium are decreased attention span and a waxing and waning type of confusion.[1]

Delirium can occur at any age, but it occurs more in patients who are elderly and have compromised mental status. More specifically, it affects 2:3 ICU patients,[7] and 1:6 general hospital ward patients.[9] Risk factors include age, history of hypertension, mechanical ventilation, higher APACHE score, benzodiazepines and opiates, and vitamin deficiency.[3,7,8,11,12]

Patients with delirium are more likely to be hospitalized 10 days longer,[2] have longer days requiring mechanical ventilation,[2,7] have a higher six month mortality rate[2], and have short and long term cognitive deficits up to 2 years post.[2] Costs in excess of $164 billion per year are a result of this preventable syndrome.[5,10]



Assessments

Mini-Cog: identifies patients at high risk for in-hospital delirium.

CAM-ICU: nonverbal assessments to evaluate the important features of delirium in critical care patients, especially those on mechanical ventilation.

CAM-S: measures the severity of delirium in hospitalized patients (short form).

FAM-CAM: screening tool that interviews caregivers.

The Sour Seven Questionnaire: screening tool for untrained informal caregivers.

Treatment Suggestions

- Familiar faces/objects
- Family photos
- Don't avoid eye contact
- Natural, indirect light
- Glasses

- Salivation triggers parasympathetic system
- Cleaning mouth
- Moisturizing lips
- Ice water
- Tepid water
- Lemon water
- Correct dehydration

- Hearing aids (check batteries)
- Disimpaction of ear wax
- Minimize unnecessary noise
- Talk to the patient, use their name
- Avoid abstract concepts/watch phrasing
- Limit auditory stimuli to one source at a time

- Address pain using a scheduled protocol
- Timely removal of catheters/restraints
- Early mobilization and engagement in activity
- Physical contact/massage
- Joint compression
- Weighted blankets

- Promote smells such as: lemon, familiar smells (e.g. pet's blanket)
- Repress smells such as: bowel movements, body odor, infection, trash

Other Suggestions Include:

- Providing cognitively stimulating activities multiple times/day
- Repeated reorientation
- Nonpharmacological sleep protocol (warm tea, blankets, etc)
- Engaging in typically normal tasks
- Don't shy away from listening or letting them tell you about their experience. Encourage processing.

Clinical Relevance

- The acute care length of stay is brief and evidence shows that 1 in 10 clients with acute delirium is discharged home with delirium.
- Delirium is preventable in 30-40% of cases.[4,6]
- The majority of individuals affected demonstrate a mix of symptoms that are both hyperactive and hypoactive.
- Therapists are uniquely equipped with the skill set to address these impairments, promote interdisciplinary collaboration, and minimize the burden that co-morbidities of delirium carry.
- This non pharmacological approach can be implemented in a variety of settings by all healthcare professionals and family members.

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The "ECMO Snorkel". ECMO Mobilization Made Safe and Easy

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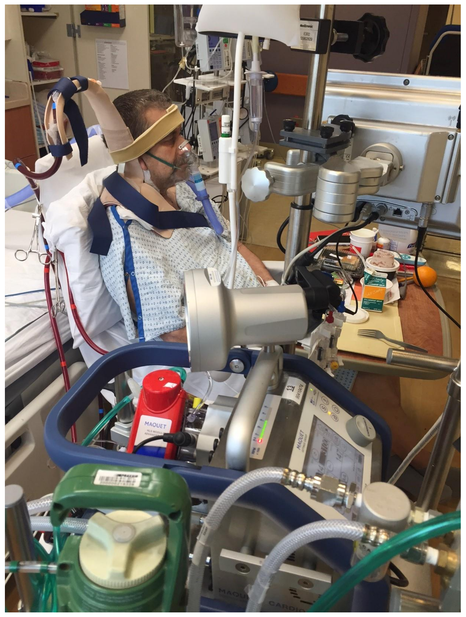
Lead Physical Therapist: Cardiac Intensive Care
New York Presbyterian Hospital/Columbia University Medical Center

Abstract

As early mobility programs across the nation and world continue to push the boundaries of what is possible, safety remains paramount. To that end, the ECMO "Snorkel" was developed to enhance the safety and feasibility of mobilizing some of our most challenging patients including the so called "ambulatory" ECMO patient.

In patients with large bore cervical cannulas it is extremely important to provide adequate stabilization to prevent inadvertent dislodgement or kinking. The ECMO "Snorkel", a novel device created from heat moldable thermoplastic, is worn by the ECMO patient during mobilization. It can stabilize the cannula to such a degree that no other external support is required, thereby freeing up the hands of the clinician.

At our institution we have had a great deal of success safely mobilizing pediatric and adult patients with the ECMO "Snorkel" without adverse events.



NewYork-Presbyterian
Columbia University Medical Center

RUSK REHABILITATION

NYU Langone MEDICAL CENTER

Establishing a Patient-Provider Communication Program in the Pediatric Intensive Care Unit (PICU)

Tami Altschuler, MA, CCC-SLP, Tina Tan, MS, CCC-SLP, BCS-S,
Mary Ellen Sheldon, MA, RN-BC, Tiffany Folks, RN, BSN

Communication Challenges

- Children in pediatric intensive care units (PICUs) may experience difficulty with verbal communication due to:
  - intubation/tracheotomy
  - neurological conditions
  - pre-existing communication deficits
  - language barriers

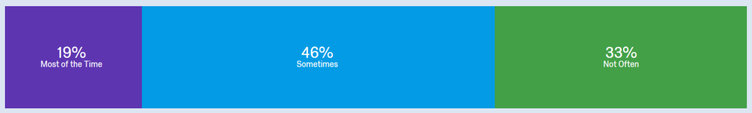
- Being unable to communicate:
  - is emotionally frightening
  - leads to an increase in sentinel events
  - may result in medical errors
  - can extend lengths of stay

- The Joint Commission set a new standard for patient-provider communication effective 2012.

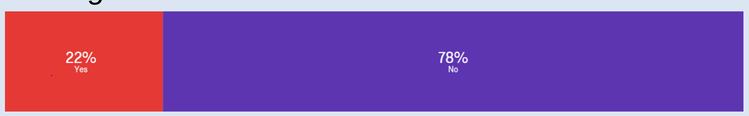
Perceptions

Survey distributed to all providers with direct patient contact in the PICU prior to program initiation. Notable results below:

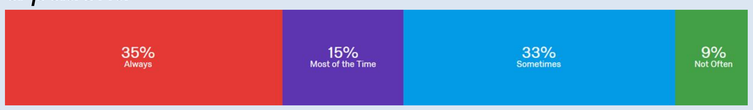
The communication needs of patients who are non-verbal are being met:



Percentage of staff who have received AAC training:



Quality of care declines when staff cannot understand a patient.



Intubated patient using "BIGMack" switch to request need for suctioning during co-treat with PT/OT as part of Early Mobility project.

Interventions

- Grant funding was awarded to establish a PICU Communication Toolkit with range of low-technology to high-technology augmentative and alternative communication (AAC) supports.

- All PICU staff trained on communication supports and strategies by SLP.

- Use of Toolkit prompts referrals to receive AAC intervention with SLP.

- Coordination of services with PT/OT/SLP to promote communication intervention with early mobility.

Progress to Date

- PICU staff are actively utilizing the Toolkit.

- Monthly referral rate for AAC evaluations has doubled.

- Children are being referred earlier, i.e. while they are still intubated and emerging from sedation.

- Culture change: PICU staff are advocating for patients to receive communication supports.

Next Steps

- Expand upon Communication Toolkit to include additional items to better address motor and sensory limitations.

- Extend program to the adult population to target critically ill patients in the ICUs.

- Post survey for one year follow-up.

- Explore options for ongoing nursing education during new employee orientation.

Established a high-technology AAC system with switch access for a patient pre-operatively (tracheotomy placement) with voice/message banking

Reference: Costello, Patak, Pritchard (2010)

Contact: Tami.Altschuler@nyumc.org

Mobilization of a Patient on Venoarterial Extracorporeal Membrane Oxygenation As a Bridge to Lung Transplant: A Case Report

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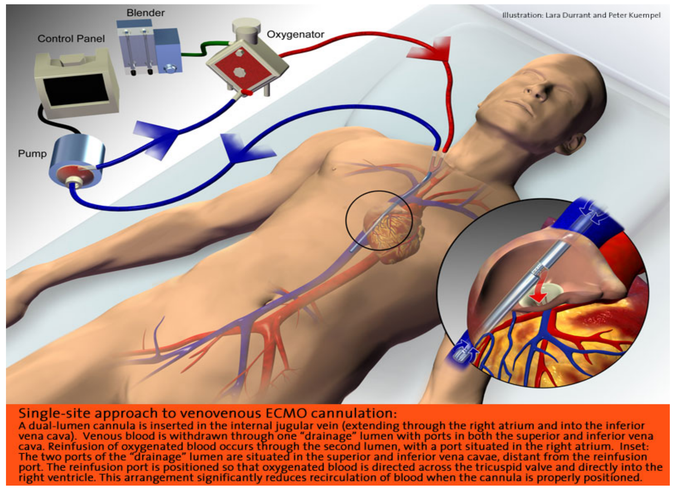
Introduction: Extracorporeal membrane oxygenation (ECMO) is an intervention that can provide cardiac and pulmonary support to the patient whose heart and lungs are not functioning adequately to meet the metabolic needs of the body. The circuit draws blood from a central vein along a membrane where the blood is oxygenated & carbon dioxide is removed. The blood is then returned to the patient via a central vein (VV ECMO) or artery (VA ECMO).



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ECMO was initially used with the pediatric population. In 1971 it was first used to successfully support an adult victim of a motor vehicle accident who had sustained multiple fractures and developed ARDS [1]. The patient was supported for 3 days on ECMO.

The past decade has seen an increasing number of institutions which have used ECMO to extend the life expectancy of patients with end stage lung disease, thus increasing their chance of surviving to transplant (bridge to transplant) . The use of ECMO in this population permits a patient who might otherwise be tethered to a ventilator and confined to bed, to sit at the side of the bed, stand, get out of bed to a chair and ambulate with considerably less symptoms. This promotes a sense of well-being, allows the patient to maintain their functional mobility and prevents the deleterious effects of bedrest while they await lung transplant.

Objective: The purpose of this case report is to demonstrate the feasibility of mobilizing a patient on VA ECMO over a period of four months.

Hospital Course: 55 year old female with a history of nonspecific interstitial pneumonia and secondary pulmonary hypertension who presented to our ED with disease progression, worsening right heart failure and a pericardial effusion. She was transferred to the medical intensive care unit where she was placed on high flow nasal cannula and managed initially with diuretics & inotropes. She continued to deteriorate clinically despite the addition of inhaled nitric oxide, iloprost and a continuous furosemide drip. On day 22 she deteriorated further requiring cannulation with VA ECMO with an upper body configuration: right internal jugular vein to innominate artery.

She participated in daily or twice daily physical therapy sessions (6 days/week) while on VA ECMO, with the focus being either walking in the hallway or on a treadmill (longest distance in hall was 1,000 feet; longest distance on treadmill approximately 1,500 feet). She was maintained on VA ECMO for 126 days. On day 148 she underwent bilateral lung transplant and was weaned off of ECMO 4 days later (day 152). On day 167 she was transferred to inpatient rehabilitation. She was discharged home on day 186.

Discussion: The patient participated in 170 physical therapy sessions while receiving VA ECMO. During 94 of those sessions she ambulated. During the initial weeks on ECMO, she ambulated in the hallway (patient's preference), but as her clinical status grew more tenuous, her activity was confined to walking on a treadmill placed adjacent to her bed. She ambulated on 87% of eligible days while on VA ECMO (physical therapy available only 6 days/week)

Conclusion: Select patients on VA ECMO can participate in daily physical therapy, including ambulation, with the assistance of an experienced, multidisciplinary team. This is a resource intense undertaking. Access to a bedside treadmill may allow a medically complex patient to continue to ambulate when it is no longer feasible to ambulate in the hallway.

References

1. Hill et al. NEJM 1972; 286: 629-634

NewYork-Presbyterian
Columbia University Medical Center

Shifting Drivers: Positive Outcomes of Converting from System-Driven to Value-Driven Practice in an ICU

Doug Benson DPT • Derek Furze PT • Joshua Johnson DPT
Christopher Noren OTR/L • Robin Marcus PT, PhD

University of Utah Hospital and Department of Physical Therapy
Salt Lake City, Utah

Purpose

The Surgical Intensive Care Unit (SICU) at the University of Utah Hospital (UUH) was once considered a lower-priority area as related to acute physical therapy's allocation of time and resources. This led to nominal physical therapy services and devalued opinions of the role therapy played as a member of the critical care team and the need for change was apparent.

Methods

RECOGNITION: An honest assessment of the interdisciplinary relationships and therapy practice patterns within the existing SICU culture

"I have been disappointed by how little it has been emphasized here…"
Anonymous MD; >5 yrs in SICU at UUH

"…occasional team member."
Anonymous RN; >5 yrs in SICU at UUH

- *How does the current system drive daily decisions?*
- *Could converting to a new model positively influence these devalued opinions and ultimately lead to physical therapy becoming a more integral member of the critical care team?*
- *What would that new model look like?*

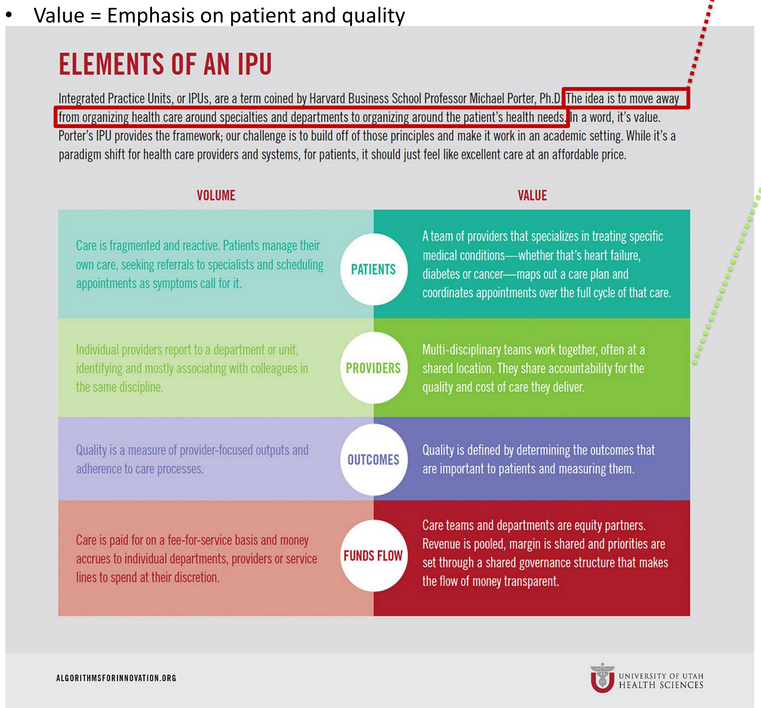
LEARNING: Acknowledging specific points of evidence and support that encouraged and inspired a need for change:

Influence from National Vision

- National conference attendance and publications[1-3]
- Position statement on Value vs. Productivity Measurement in Acute Care Physical Therapy from the Academy of Acute Care Physical Therapy Value/Productivity Task Force[3]

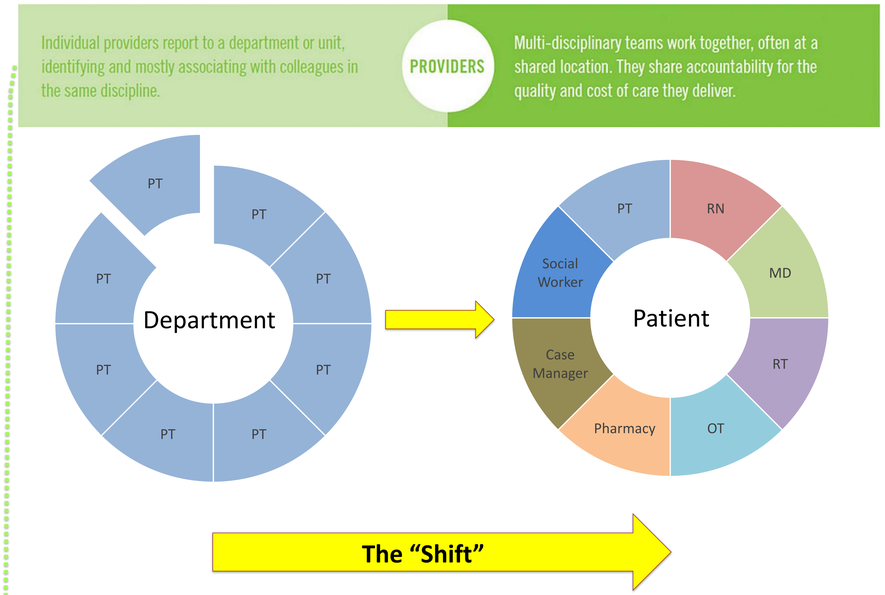
Influence from University of Utah Health Care Vision

- Publications and recognition citing UUH, specifically Vivian S. Lee, MD, PhD, MBA and Senior Vice President for Health Sciences[4]
- Introduction to the idea of an Integrated Practice Unit (IPU) model as put forth by UUH[5]
- System = Emphasis on department and volume
- Value = Emphasis on patient and quality



IMPLEMENTATION: Fully immersing in an IPU model of care with daily decisions being driven by patient-centered outcomes rather than engrained provider-focused practice patterns

"The idea is to move away from organizing health care around *specialties and departments* to organizing around the *patient's health needs*."



Organize:

- Procure support from upper management
  - Clearly explain intentions and invite collaboration for transitioning to a new role within the IPU
  - Clarify autonomy and set up new accountability structure
  - Maintain transparency between manager and practitioner
- Communicate intentions for change to the department

Immerse:

- Permanently assigned therapists:
  - Dedicated and committed to the unit
  - Resourceful and autonomous
  - Focused and flexible
- Physically present on the unit the entire workday allowing for maximal availability for patient care

Build:

- Clearly define our role and clinical expertise through education, demonstration, and transparent ownership
- Invest time to learn roles of other team members within the IPU
- Establish a culture of patient-centered interdisciplinary practice patterns

Provide:

- Recalibrate clinical judgement and practice patterns
- Be a catalyst for patient mobility goals
- Institute triaging based on need of patient through metrics obtained in EMR (LOS, AM-PAC, acuity)
- Focus on meeting outcomes by increasing frequency and duration
- Evolve and expand role through personal skill development

ASSESSMENT: At 6 months, a brief questionnaire was developed by a third party to evaluate any change in perceptions of the role and value of a critical care therapist amongst other members of the treatment team

Results

Title	Time Working in SICU (yrs)			
	1-2	2-5	>5	TOTAL
MD	2	-	8	10
RN	4	4	7	15
HCA/CNA	1	-	-	1
TOTAL	7	4	15	**N = 26**

Table 1 – Survey Demographics

"Compared to this time last year…"	S. A.	A	N	D	S.D.	% A or S.A
I better understand role of PT in the ICU	4	15	7	0	0	**73%**
There are better patient outcomes with PT	16	7	3	0	0	**88%**
I am more likely to collaborate with PT	14	5	6	1	0	**73%**
PT treatment time has increased	15	8	3	0	0	**88%**
PT intensity has increased	16	7	3	0	0	**88%**
Patients achieve better mobility than anticipated	15	5	6	0	0	**77%**
I am confident in the therapist's skills that work in my unit	13	7	6	0	0	**77%**
PT adds value	18	4	4	0	0	**84%**

Table 2 – Survey Results (N=26). (S.A.)=Strongly Agree, (A)=Agree, (N)=Neither Agree nor Disagree, (D)=Disagree, (S.D.)=Strongly Disagree

"Physical therapists seem more involved. Patients are doing more, mobilizing earlier, all to the benefit of the patients."
Anonymous MD; >5 yrs in SICU at UUH

"Consistent involvement of PT with our patients has improved greatly. It is noticeable when PT is not available because they have become an expected part of our interdisciplinary team…"
Anonymous RN; >5 yrs in SICU at UUH

Conclusion

Careful thought should be given to current practice patterns in the ICU with a greater emphasis on providing value-driven care. The results of this project illustrate that by applying an ongoing strategy of recognition, learning, implementation, and assessment, a cultural change can occur and a physical therapist can truly become a more integral member of the critical care team

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Physical Therapy Management of a Critically Ill Infant After Cardiac Surgery: A Case Report.

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JOHNS HOPKINS MEDICINE
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Introduction

This case report describes the physical therapy management of an infant with a congenital heart defect (CHD) through the first palliative surgery until her discharge.

- A review of the literature identifies treatment interventions and early mobility after cardiac surgery for children and adults but no specific management that can guide the treatment in the infants.
- Medical interventions have advanced the treatment of infants with congenital heart disease (CHD) and increased the survival rate.
- The stress generated by surgery and surrounding interventions can contribute to prolonged ventilation, increased morbidity, and a prolonged hospital stay which can lead to new challenges for families and the multidisciplinary team.
- Physical therapy can assist and help with diminishing the use of sedation and assisting in parent education for these patients.

Objectives

The primary aim:

- To present the management and delineation of appropriate physical therapy intervention in an infant needing cardiac surgery and complex medical management through the hospitalization until her discharge home.

The secondary aim:

- To validate the importance of collaborative work with nursing on parental involvement and education for quality maternal–infant interactions that are critical factors in the development of infant regulatory function.

The tertiary aim:

- To outline the active involvement of physical therapy assisting in safe early mobility to enhance postural lung drainage, decrease the influence of primitive reflexes, and diminish motor imbalances that have been identified in infants in the intensive care unit, decreasing potential risk for developmental delay.

Case description

- A female born at 38 weeks with hypoplastic left heart syndrome (HLHS).
- She underwent a Norwood procedure at five days of life with delayed sternal closure on postoperative day 2.
- She failed the first attempt of extubation on postoperative day 3.
- Her postoperative course was complicated by wound dehiscence ten days after chest closure, treated with a wound vac.
- A failed Oral-Pharyngeal Motility Study complicated her progress.

Assessment

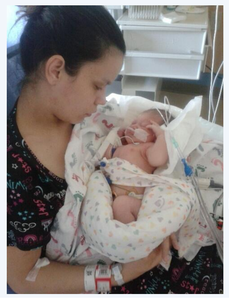
- The TIMP (Test of Infant Motor Performance) is the test of choice for this population.
- It gives measurements to identify postural control-stability and infant's reactions to visual and auditory stimuli. The TIMP was performed at two days and again at nine weeks of age.
- Evaluation of the Tonic Labyrinthine and Symmetrical tonic neck reflex were based on the primitive reflex profiles (PRP), as clinically these two primitive reflexes have been considered the most sensitive indicators of early motor abnormality.
- Education of the parents was evaluated through the ability to provide repeat demonstration of developmental activities, range of motion, and handling of their baby during daily care.
- Parent education to identify better positioning provided through a chart with seven pointers.

all we do. all for kids.™

Interventions

Physical therapy management was divided in three stages with different targeted goals. The treatment was based on the patient's needs at the moment of intervention and according to the stage during the hospitalization.

Stages	Period	Goals	Interventions
I	Assessment day, until surgery	Maintain the infant in a stable physiological state	Parent education: recognize the baby's behavioral cues, needs for baby to sleep, facilitated tucking as an effective strategy in attenuating their infants' physiologic and behavioral responses to minor pain and stress situations, facilitating sleeping, feeding, and establishing routines in the intensive care units. Education on positioning that decreases the influence of the primitive reflexes (like the TLR in extension) thus promotes relaxation and a state of deeper sleep, Parents were encouraged to hold their infant in a tucked-in position when possible, (Picture 1), hold her skin to skin according to her medical stability.
II	After surgery until patient was weaned off the ventilator support	Weaning from ventilator support while maintaining a stable physiological state.	Post op: Assisting nurse positioning the infant to facilitate posterior chest expansion with supporting rolls on the side and obtaining a shoulder position in 30-degree flexion and 20-degree abduction as possible. The head was positioned in the midline of the body, and the pelvis in slight retroversion, close to a tucked in position (Picture 2). After chest closure, it became necessary to focus on positioning to facilitate diaphragmatic breathing with a bed inclination of 30-degree angle and boundaries to promote relaxation (Picture 3). Facilitation of supported upright position for postural drainage in preparation for weaning respiratory support (Picture 4). A positioning pillow was used to bring patient to a 45-degree angle after extubation. In this supported position, the muscles of shoulder elevation and scapular retraction were gently lengthened as the caregiver passively lowered and adducted the shoulders as well as protracted the scapulae. With the use of these accessory respiratory muscles limited, the infant experienced upper extremity movement toward the midline while performing diaphragmatic breathing.
III	After patient no longer required respiratory support.	Manage problems related to feeding, positioning, and irritability	Assisting with positioning to manage gastroesophageal reflux disease and feeding problems, relaxation to decrease irritability, and parent education to incorporate developmental positioning handling and play at care time.



Picture 1
Holding her baby in a tucked position

Picture 2
Tucked positioning

Picture 3
Supported inclined 30 degree angle with close to body boundaries.

Picture 4
Upright position for postural drainage in preparation to wean respiratory support.

Picture 4

Results

Table 1: TIMP (Test of Infant Motor Performance) Results

Test Date	Adjusted age	Raw	Z	Percentile	Age Equivalent	Per Standard	Tester
01/18/2015	40-41 weeks PCA	53	-0.75	0-24th percentile	36-37 weeks PCA	Low average	AMJ
03/18/2015	9 weeks Post term	101	+0.44	50-74th percentile	8-9 weeks Post term	Average	AMJ

Conclusions

The physical therapy intervention program provided to this infant with HLHS exemplifies strategies that may apply to infants with complex CHD. The need for decreased morbidity with early mobility and improved sensorimotor development in this population make it imperative that the physical therapist collaborates with the multidisciplinary team.

The parental education and involvement appears to enhanced the level of confidence of the parents at the time to take their baby home.

Limitations of this case report are related to the objective determination of the optimal frequency and duration of intervention for infants with complex CHD. Challenges related to the implementation of a physical therapy program in an infant with complex CHD include the need for strong lines of communication with the multidisciplinary team to clearly associate the importance of each component of therapy to the outcome of the infant, for clustering care and fostering sleep.

Combining Quality Initiatives: Increase Efficiency and Effectiveness

Margaret Arnold, PT, CEES, CSPHP Inspire Outcomes LLC, and Jennifer McIlvaine, PT, MSPT, CSPHA, Duke Health

Background

- Multiple patient and staff safety initiatives aim to improve quality and outcomes, and reduce cost of care
- Heavy economic burden on healthcare facilities with competing initiatives
- This poster presents a model of a collaborative approach to improve efficiency and effectiveness to achieve the goals

Opportunities

- Consistent terminology to enhance communication
- Identify complementary activities and potential for collaboration
- Better understanding of inter-disciplinary roles and objectives of each initiative
- Prioritize actions and risk by viewing the WHOLE patient from a systems perspective
- One team with both joint and initiative-specific activities with opportunity for focus teams
- Reduce committees from 5 to 1 with one set of meetings, agendas, action items, interventions , and training
- Each discipline has increased awareness of the impact of actions in one initiative on other initiatives
- Improved team cohesiveness for the patient: "Everyone is on TEAM PATIENT"

Example: Consider HOB angle for skin health vs respiratory function

Comparison of Siloed Initiatives Versus Combined Initiative Staff Activities

	Number of people	Total hours per month	Number of people	Total hours per month	Number of people	Total hours per month	Number of people	Total hours per month	Number of People	Total hours per month	Grand Total Hours
	Early Mobility		Fall Prevention		Skin Care		Safe Patient Handling		VAE/VAP Prevention		All
Coordinator / Champion time											
Monthly meetings											
Emails and calls											
Staff education (Trainers)											
Staff education (Trainees)											
Audits and reports											
Activities other than education*											
Total (Facility 1)	13	48	19	60	1	40	12	80	0.5	20	280.5
Total (Facility 2)	0	0	85	212.5	N/A	N/A	138	759	N/A	N/A	1194.5

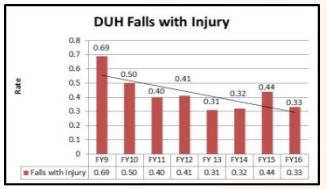
* Planning, implementing changes, addressing barriers, following up on actions, researching options and best practices, reading articles etc.

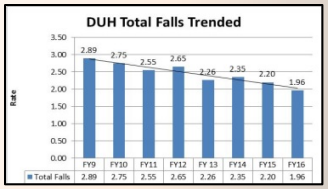
Duke Health Initiative: Duke MOVES

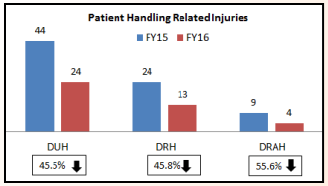
(Move Often, Very Early, and Safely)

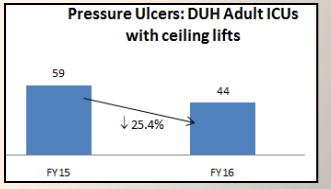
- Combined SPHM, EM, and Fall prevention safety initiatives
- Created inter-disciplinary oversight committee
- Clarified role descriptions and policies
- Adopted use of Bedside Mobility Assessment Tool to identify appropriate equipment for each patient to meet care goals
- Updated equipment inventory with consideration for EM
- Enhanced website for committee updates and training materials
- Annual workshop and quarterly meetings

OUTCOMES









- Decreased total and injurious falls
- Decreased staff injuries related to patient handling
- Decreased pressure ulcers in ICU with ceiling lifts
- Improved time management by reducing 3 committees to 2
- Plans to combine other safety initiatives

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"Running a Marathon Without Training"...Hospital Course and Outcomes of 5 Patients Admitted With ARDS Requiring ECMO

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OBJECTIVES

This case examines 5 patients admitted to Lehigh Valley Hospital with ARDS requiring ECMO. The purpose of this case study is to describe the functional milestones, the outcomes and the adaptations required to rehabilitate these patients.

METHODS

See Table 1

This retrospective case study describes 5 patients (all female, average age 44 +/- 13 years old) admitted with ARDS (2 Influenza A, 2 Influenza A/H1N1, 1 pneumonia). All patients required ECMO support (average 28 +/- 25 days), experienced prolonged mechanical ventilation (average 51 +/- 46 days) and ICU stay (average stay 62 +/- 52 days). Post ECMO, patients' demonstrated severely impaired lung function with compliance 16 +/- 5 cm and Pa/FiO2 ratio of 139 +/- 28. Rehabilitation included average of 27 +/- 17 physical therapy (PT) visits.

RESULTS

See Table 2

FSS-ICU rose from average of 2 +/- 1 on the first PT visit post ECMO to 25 +/- 6 on the last PT visit before leaving the ICU. 4 of the 5 patients went home from the hospital (and the fifth went home after a 1 month stay in acute inpatient rehab).

CONCLUSIONS

Patients recovering from ARDS have difficulty achieving textbook weaning values due to the stiffness of the lung and respiratory muscle weakness. In this report, patients had lung compliance about 5% of normal. Delirium/impaired arousal, vital signs outside of traditional accepted ranges and increased work of breathing make initiation of weaning and/or mobility difficult. Interdisciplinary communication set clinical endpoints that allowed progression in weaning as well as initiation of reconditioning through progressive mobility. Individual prolonged weaning plans (*see Table 3*) were created for each patient and the ICU team agreed that heart rates of up to 150 bpm, oxygen saturation of 85% and respiratory rates of 45 would be acceptable during strenuous activity (*see Table 4*). In conclusion, knowledge of underlying lung pathology, interdisciplinary communication and early initiation of mobility was crucial to enabling these critically ill patients to progress through their hospital stay and return home.

Table 1. Description

Pt #	Age d/c	Gender	Admit Dx	ECMO Days	Compliance Post ECMO	P/F Post ECMO	Vent Days	ICU Days	Hospital Days	Trach?	Pt Visits	1st EOB Hospital Day	1st OOB Hospital Day	1st Walk Hospital Day
1	25	F	H1N1/ARDS	71	12	151	127	154	154	Y	56	65	72	109
2	58	F	H1N1/ARDS	24	18	113	59	54	76	Y	28	40	33	43
3	39	F	ARDS/PNA	21	18	175	24	33	41	Y	15	25	27	31
4	54	F	FluA/ARDS	19	22	147	24	36	55	Y	21	24	27	28
5	45	F	FluA/ARDS	6	9	107	19	35	56	Y	16	25	25	25

Table 2. Outcomes

Pt #	FSS-ICU Post ECMO	Hospital Day		FSS-ICU Last ICU	Hospital Day	Discharge Destination
1	3	72		25	149	Acute Rehab
2	1	26		24	54	Home
3	1	24		20	33	Home
4	2	22		19	34	Home
5	1	12		35	37	Home

Table 3. Prolonged Weaning Guidelines (hours trach collar/day)
Only advance to next day if patient successfully tolerates current day

Day #	OPTION A	OPTION B	OPTION C
1	2 hrs AM & 2 hrs PM	2 hrs AM	1 hr AM
2	4 hrs AM & 4 hrs PM	2 hrs AM & 2 hrs PM	1 hr AM & 1 hr PM
3	6 hrs AM & 6 hrs PM	4 hrs AM & 2 hrs PM	1.5 hr AM & 1.5 hr PM
4	8 hrs AM & 4-6 hrs PM	4 hrs AM & 4 hrs PM	Once tolerating continue weaning following Option B
5	12 hrs AM	8 hrs AM & 4 hrs PM w/ 12 hr rest	
6	16 hrs AM	12 hrs AM w/ 12 hr rest period	
7	24 hrs	16 hrs AM w/ 4 hr rest period	
8	36 hrs	20 hrs AM w/ 4 hr rest period	
9	48 hrs	24 hrs	
10		36 hrs	
11		48 hrs	

Table 4. Acceptable Vital Signs During Strenuous Activity

HR less than 150
SaO_2 greater than 85
Respiratory Rate less than 45

Carolinas HealthCare System

A Multi-Professional Approach to Optimize Outcomes in Patients Weaning from Mechanical Ventilation: Quality Improvement Project

Michael Davis BSc., Michelle Anderson DPT, Colleen Karvetski PhD, and Justin Swartz MD

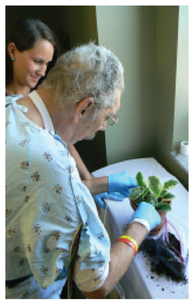
Purpose

In 2010, review of administrative data suggested excessive hospital length of stay (LOS) for patients who required placement of a tracheostomy to help facilitate weaning from mechanical ventilation. As a quality improvement project, we set out to build a multi-professional team to focus on mobility efforts and ventilator weaning. A literature review revealed early mobility in the critically ill patient population is feasible, safe, cost effective, and improves patient outcomes.(1-3) This was utilized as the foundation for this project. With high level administrative support, in October 2011 the Respiratory Specialized Care Unit (RESCU) team was created to assist clinical case management by focusing on this patient group that generally had limited community resources.

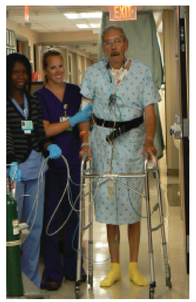
Methods

- The Plan-Do-Study-Act Model was utilized as part of continuous quality improvement methodology to facilitate process improvement.

- We utilized Premier's Quality Advisor database to build baseline data on patients who had been transferred to our Progressive Care Unit (PCU) where the excessive LOS was thought to reside. All patients had undergone tracheostomy during the ICU stay but still required mechanical ventilation.
- Afterwards, the database was utilized to guide quality improvement.
- The Team that focused on mobility and ventilator weaning included:



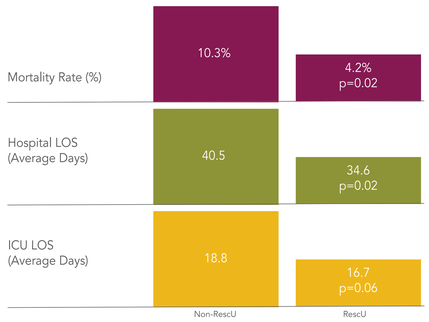
- Respiratory Therapy
- Physical Therapy
- Occupational Therapy
- Speech Therapy
- Nutrition
- Pulmonologist
- Nurse Manager
- Clinical Supervisors
- Staff Nurses
- Clinical Case Management

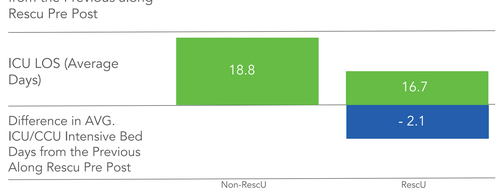


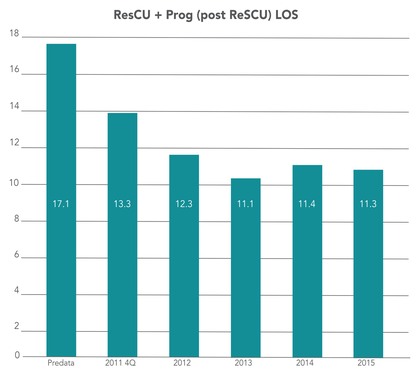
- Each discipline reported on rounds facilitating daily discussion of barriers.
- Monthly team meetings were established to review the process and discuss outcomes gleaned from the Redcap database.
- Processes were created or modified to optimize patient care and team workflow.

Results

- Average hospital LOS was reduced (5.9 days)
- Average ICU LOS was reduced (2.1 days)
- Average PCU LOS was reduced (17.1 to 11.3 days)
- 30-day readmission rate was reduced (14.6% to 9.3%)
- Hospital mortality rate was reduced (10.3% to 4.2%)
- In the years 2014-2015, more than 75% of patients left PCU completely weaned from mechanical ventilation.
- Disease severity was similar between the 2 groups.
- Cost avoidance was estimated to be **$1.73 million dollars.**







Discussion

- The success of the project shows that providing a focused, multi-professional team approach in coordinating therapeutic interventions for mechanically ventilated patients reduces hospital length of stay and contributes to improved patient outcomes.
- This is highlighted be the reduction in length of stay while also decreasing readmission rate and mortality.
- We feel the reduction in ICU LOS, PCU LOS and variable cost per encounter is evidence that the multi-professional approach decreases burden on the limited ICU and hospital resources despite being a labor intensive process.
- The unexpected finding of a reduction in hospital mortality warrants further investigation.
- The notable decrease in RT costs while PT/OT/SLP therapy costs increased (felt to be due to increased demand for therapy presence in the ICU) is attributed to synergy produced between therapies and the improvement in respiratory status as patients mobilize.
- The care coordination through a multi-professional rounding approach has been sustained since inception in October 2011 due to our ongoing hospital administration's' support and the perception by clinical staff that coordinated care is more efficient and improves teammate satisfaction.
- Foremost in our lessons learned is that coordinated workflow, perpetual communication, and unrelenting commitment to removing the barriers that prevent a patient from walking out the front door of the hospital are paramount.

Conclusion

In creating a sustainable, multi-professional team to coordinate rehabilitation and mobilization efforts with ventilator weaning, we successfully reduced the hospital length of stay for patients who required tracheostomy during their ICU stay. Most of the patients had limited community resources, and, thus, their recovery and ventilator liberation was to happen because of the teams efforts. Without administrative support, this project would not have been possible. We feel confident there are other patient groups who can also benefit from this care delivery model.

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A special thank you to Dr. Colleen Karvetski for her expertise, work, and diligence in the data processing and graphic displays included within this project.

Rehabilitation in the Intensive Care Units at Mount Sinai: A Quality Improvement Project

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INTRODUCTION

Immobilization may lead to long lasting impairments in physical, cognitive, and psychological functioning[1]. It has been shown that early mobilization within 48 hours of admission to a medical ICU decreases length of stay and mortality while improving outcomes, functionality, and self care at discharge[2]. Benefits of early mobilization for mechanically ventilated patients also include decreased readmissions, increased strength, increased independence in activities of daily living, and significant cost savings[3].

Previous early mobilization programs in the ICU have been successfully instilled in the MICU[2,3] and Cardiovascular ICU[4]. There are exceedingly few projects and studies on early mobilization outside of a MICU population. Our project shows that early mobilization is feasible and safe across all types of intensive care units.

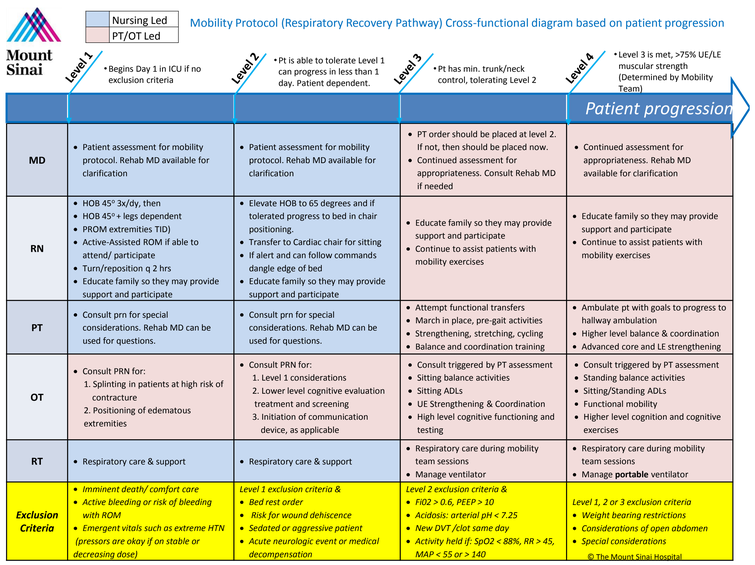
SETTING

- Mount Sinai Hospital - 1,171 bed tertiary care teaching center in New York City
- 60,000 inpatient admissions annually
- In 2015 there were 1,296 admissions to the ICUs that required mechanical ventilation
- MSH has a total of 5 intensive care units with a total of 69 beds
- SICU, NSICU, CCU, CSICU, MICU

RESPIRATORY RECOVERY PATHWAY

- Fall of 2014, there was a hospital-wide initiative created to focus on improved care for critically ill and mechanically ventilated patients.
- Outcomes, quality of care, and early mobilization initiated
- Multidisciplinary committee formed
- Patients targeted: Diagnostic related group (DRG) code levels 3 and 4: tracheostomy due to prolonged mechanical ventilation
- 5 ICUs targeted, 63% of those patients in DRG codes 3 and 4 had excess length of stay totaling 5,995 days in 2014

MOBILITY PROTOCOLS

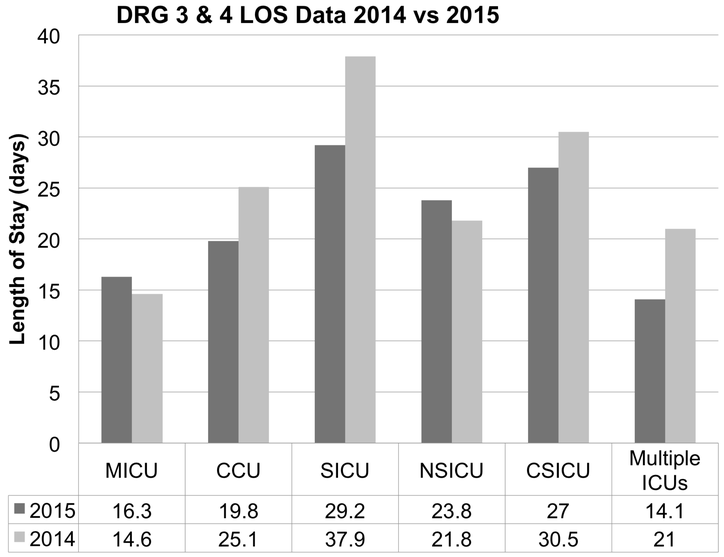


FUNCTIONAL MILESTONES

	Total Billed Tx	Dangle	Stand	Transfer to Chair	Ambulation
MSH Total	266	176	85	37	37
MSH Total Rx		66.2%	32.0%	13.9%	13.9%
MSH Medium and High Level ICU Patients		96.8%	77.4%	51.6%	51.6%
John's Hopkins		77.0%	49.0%		13.0%
Chicago Medical Center & Iowa State		69.0%	33.0%	33.0%	15.0%

- Comparison of functional milestones of DRG 3 and 4 patients at MSH and those functional milestones of recent, landmark projects on early mobilization in the ICUs.
- MSH Total Rx refers to all mobility levels of DRG 3 and 4 treatments and MSH Medium and High Level ICU patients refers to those DRG 3 and 4 patients at mobility levels 3 and 4.

OUTCOMES



- Left: Changes in average length of stay for patients coded DRG 3 and 4 across all ICUs for the calendar years 2014 and 2015. Patients that stayed in more than one ICU were categorized as Multiple ICUs.
- Below: Changes in Number of Cases and Excess Days for patients coded DRG 3 and 4 across all ICUs for the calendar years 2014 and 2015. The number of excess days decreased by 3,090 in 2015 as compared to 2014.

	Number of Cases	Excess Days
2015	317	2,865
2014	309	5,955

CONCLUSION

- Our project shows that early mobilization is feasible and safe across all types of intensive care units.
- Nursing buy-in is important to success of the unit
- Decreased LOS for DRG 3 & 4 diagnoses significantly reduced hospital costs
- Functional outcomes data is similar to other previous studies
- By delivering a higher quality of care, reducing overall average length of stay, and cutting excess days in half, we were able to deliver higher quality of care to a larger number of patients in need.

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Occupational Therapy in the Neuro Critical Care Unit: Use of Cycle Ergometry for Early Upper Extremity Rehabilitation in a Critically Ill Patient with Stroke

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Background and Purpose:

- Early upper extremity (UE) rehabilitation after stroke is often overlooked in critical care settings
- UE cycle ergometry is inexpensive, simple and is proven to improve force production and function of the shoulder, elbow and hand in patients with chronic stroke
- Purpose of this case report is to determine the feasibility and safety of the use of UE cycle ergometry in a critically ill patient with stroke

Methods:

- Case report of an 82 year old male admitted to the Neuro Critical Care Unit (NCCU) with right cerebellar hemorrhage with difficulty weaning off the ventilator
- Bedside UE Cycle Ergometer (MOTOmed Letto 2, RECK-Technik GmbH & Co) was performed
- Passive and active motor settings was used for bilateral UE cycling
- Pre- and post-intervention, the following parameters were measured:
  - Hemodynamic monitoring
  - Ability to follow verbal/visual commands
  - Arousal (JFK-CRS Subtest)

Fig 1. UE Cycle Ergometry

Table 1: Hemodynamic and cycling parameters

Trial	Active Cycling (minutes)	Passive Cycling (minutes)	Pre-Intervention Vitals			Post-Intervention Vitals		
			BP (mmHg)	HR (beats/min)	O2 Saturation (%)	BP (mmHg)	HR (beats/min)	O2 Saturation (%)
1	0:00	9:04	105/51	65	100	120/55	67	98
2	25:25	0:18	135/72	66	100	113/73	70	100
3	20:36	0:11	127/56	60	100	132/67	53	100
4	4:53	7:33	109/64	60	100	102/58	58	100

BP = Blood Pressure; HR = Heart Rate, Ventilator settings: Trial 1, 3, & 4- Mode: Pressure Support (PS), PEEP: 5, PS: 10, Fraction of Inspired Oxygen Concentration (FiO2): 40%; Trial 2- Mode: Assist Control, Respiratory Rate: 12 , PEEP: 5 , FiO2: 40% ,

Results:

- Patient underwent four trials of UE cycling during the NCCU stay
- UE cycle ergometry was initiated on Day 28 of NCCU stay
- No change observed in the hemodynamic status pre- and post-intervention
- Arousal level and command following pre and post intervention remained unchanged during all trials

Discussion and Conclusion:

- Initial findings suggest UE cycle ergometry is a feasible intervention for early UE rehabilitation in a critically ill patient with stroke
- This technology may serve as a viable treatment modality as we attempt to initiate restorative therapies earlier in the stroke recovery period
- Future studies should collect a larger sample size with randomization to study the efficacy of this intervention using sensitive outcome measures that are relevant to OT practice

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RUSK REHABILITATION

NYU Langone MEDICAL CENTER

VITALS: A Toolkit for Developing an Occupational Therapy Program in the ICU

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Objectives

1. Increase awareness of the evolving occupational therapy role in the ICU setting through current research and clinical practice.
2. Facilitate staff orientation and education through the use of a mentoring process.
3. Illustrate the feasibility of implementing traditional occupation-based interventions in the ICU setting.

Method: Multi-Phase Mentorship

- The competency process begins with a two-part **lecture** reviewing current literature, lab values and implications, medication, oxygen delivery, lines/tubes/drains, precautions, delirium, and ICU-specific equipment.
- The trainee completes a **pre-competency ICU survey** to assess comfort level with various ICU-required skills.
- There are three different phases to the **clinical mentoring** aspect of the competency. In Phase 1, the trainee observes patient sessions with a mentor. In Phase 2, the trainee co-treats with the mentor. In Phase 3, the trainee evaluates patients with the mentor in close proximity for safety considerations. The mentor is responsible for providing the trainee with direct and timely feedback after each training session.
- Concluding the competency, the trainee takes an **interactive oral examination** and completes the **post-competency ICU survey** to assess for changes in comfort level and knowledge.

Occupation-based Interventions

- Seated self care for patient with femoral arterial line.
- Out of bed → chair transfer for patient with swan-ganz catheter.
- Occupational profile assessment for patient while receiving CRRT.
- Standing grooming at sink-side for patient with multiple chest tubes and pacing wires.
- Pre-LVAD assessment (near visual acuity, grip/pinch strength, cognitive assessment, hands-on practice) for patient with IABP.
- Cognitive screening for ICU-acquired delirium using the CAM/CAM-ICU.
- Early mobility for patients on mechanical ventilation (including collaboration with Respiratory Therapy).

VITALS Chart Review		
V*entilation*	***I****maging*	***T****ubes, Lines, Drains*
<u>First line options</u>: 1. Standard nasal cannula: low flow oxygen, 1-6 L/min. 2. Venturi mask: high-flow enriched oxygen. Provides fraction of inspired oxygen (FiO2) 24%-40%. <u>Second line options</u>: 1. Simple face mask: FiO2 40%-60%. 2. Nonrebreathing face mask: FiO2 up to 90%. 3. Reservoir cannula: improves oxygen delivery efficiency. 4. High-flow humidified oxygen: nasal or transtracheal. Delivers oxygen comfortably from 30-60 L/min. <u>Non-invasive ventilation</u>: 1. Continuous Positive Airway Ventilation: provides continuous positive pressure, e.g. CPAP. 2. Bi-level Positive Airway Ventilation: provides pressure on inspiration and expiration, e.g. BiPAP. <u>Invasive ventilation</u>: 1. Mechanical Ventilation: non-weaning modes (e.g. continuous mechanical) vs. weaning modes (e.g. continuous spontaneous).	1. Chest X-Ray (CXR): e.g. identifying pulmonary edema or atelectasis. 2. Ultrasound (US): e.g. ruling out deep vein thrombosis (DVT). 3. Magnetic Resonance Imaging (MRI): e.g. identifying new brain bleed. 4. Computed Tomography (CT): e.g. identifying pulmonary embolism (PE).	1. Central venous line (CVL): ensure dressing is secure. 2. Arterial line (A-line): avoid joint flexion at insertion site. 3. Venous and arterial femoral catheters: okay for out of bed activity; avoid prolonged hip flexion. 4. Femoral hemodialysis catheter: okay for out of bed activity once catheter has been in place 24 hours. 5. Femoral intra-aortic balloon pump (IABP): defer out of bed activity. 6. Pulmonary artery catheter (i.e. swan-ganz): okay for out of bed; use caution with upper extremity range of motion. 7. Transvenous or epicardial pacemaker: okay for out of bed activity with stable underlying rhythm. Defer out of bed with dependent rhythm. 8. Extracorporeal membrane oxygenation (ECMO): okay for in-bed activities. If not single bicaval, defer out of bed. 9. Continuous renal replacement therapy (CRRT): okay for out of bed activity. 10. Endotracheal tube (ETT): okay for out of bed as long as FiO2 and positive end-expiratory pressure (PEEP) are within institution specific parameters. 11. Tracheostomy Tube: okay for out of bed activity. Notify RN immediately if loosened or dislodged during session.
A*ctivity Orders*	***L****ab Values*	***S****edatives and Vasopressors*
• Bedrest: may be indicated with a new DVT or PE, cerebrospinal fluid leak, or internal bleed; clinical discussion is warranted. • Out of bed, up ad lib, or 'other.'	1. Hemoglobin <7: consider therapy in bed only; consider trend, plans for blood transfusion, or norms for specific patients/diagnoses. 2. Hematocrit <24: consider therapy in bed only; consider trend, plans for blood transfusion, or norms for specific patients/diagnoses. 3. International normalized ratio >5: consider therapy in bed only; consider trend, norms for particular patients, and if patient is anti-coagulated. 4. Potassium >5: consider therapy in bed only; assess trend, check recent EKG, and read Cardiology note. 5. Sodium <130 or >150: consider therapy in bed only; assess trend, check recent EKG, read Cardiology note, and assess mental status changes. 6. Troponin I >0.04 with upward trend: assess for changes in EKG, read Cardiology note, and consider demand ischemia. Defer therapy until peaked.	1. Vasopressors (e.g. norepinephrine, phenylephrine, or vasopressin): consider medical hold when mean arterial pressure (MAP) <60, and/or if patient is on >2 pressors. 2. Sedatives (e.g. propofol, dexmedetomidine, or fentanyl): consider medical hold if patient is obtunded and/or medical team is unable to safely reduce sedation for therapy.

Results

- We have found it feasible to train 7 of 11 therapists in a one-year time frame.
- With familiarity in specialized medical equipment, medication, and the ability to recognize changes in medical status, occupational therapists can implement their skill set to the critical care setting.

Conclusions

- Using an organized, systematic approach, occupational therapists can become competent to treat in the ICU.
- With the appropriate education and training, occupational therapists can continue to overcome perceived barriers (e.g. mechanical ventilation) to early occupational therapy intervention.
- Occupational therapist competency can lead to increased referrals, reduction of hospital costs, increased interdisciplinary involvement (e.g. rounds), and increased transdisciplinary research opportunities (e.g. delirium).

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