Physical Therapy in ICU: Past, Present & Future

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Disclosures/COI
• No relevant financial relationships with commercial interests

Learning Objectives
1. Define post-intensive care syndrome (PICS) & understand physical complications of survivors of critical illness
2. Describe a historical perspective for mobilization of patients in the ICU
3. Understand current evidence-based practice for early rehabilitation in the ICU
4. Discuss ideas for future evolution of early rehabilitation of patients with critical illness

Outline
1. PAST: Brief historical perspective
2. PRESENT:
   a) Rationale for PT in ICU: PICS & Patient Video (Garfield)
   b) Evidence for early PT in ICU & Patient Video x2 (Gary x2)
   c) ICU culture change & Structured Quality Improvement
   d) Tips for Success with QI in ICU
   e) Creating the Business Case for PT in the ICU
3. FUTURE:
   a) New areas of research and clinical practice Video
   b) Futuristic Vision: A Hospital with No Beds

1. Historical Notes: Hospitalized pts
• Late in WW II, early ambulation introduced
  – expedited recovery for return to war
  [01903.145374951]
• First conferences & editorials in 1944:
  – “Use and Abuse of Bed Rest” [04903.136172495]
  – “The Evil Sequelae of Complete Bed Rest” [02903.123196951]
  Benefits of early ambulation were clear:
  “First, morale is greatly improved …. General health and strength are better maintained & convalescence is more rapid.”

Historical Notes: ICU patients
Thomas Petty -- Comparing Today vs. 1964
[CHEST 1998;114:360-361]

When we started our ICU in 1964, patients who required mechanical ventilation were awake and alert and often sitting in a chair …

When I make rounds in critical care units these days … I see … paralyzed, sedated patients, lying without motion, appearing to be dead, except for the monitors that tell me otherwise.

Patients … cannot even maintain muscular tone … and muscle atrophy begins.
Historical Notes: ICU Patients
University of Colorado (Phys Therapy 1972;52:519-520)
“The therapeutic value of the early ambulation has been well documented in our ICU by improved sense of well-being and increased general strength”

2. The Present
a) Rationale…
Why interest in Physical Medicine & Rehabilitation in the ICU?

Neuro complications of ICU
Bolton & Young Chest 2007
“As intensivists struggle to overcome other complex ICU problems, nervous system complications are either overlooked or misdiagnosed.”

Consequently, after ICU care:
“the patient is discharged to the ward, where he/she experiences impaired cognition; difficulty dressing, eating, and rising from the bed; shortness of breath; and fatigue. A prolonged stay in a rehab center may be necessary.”

Improving ICU mortality → focus on long-term outcomes

Global Assessment of Outcomes
Herridge NEJM 2003
Lost 18% of body weight in ICU
Functional Outcomes

Herridge NEJM 2003

6MWD improved over 1 year, but still abnormal due to:
- muscle wasting & weakness, foot drop, joint immobility

Improving long-term outcomes after discharge from intensive care unit: Report from a stakeholders' conference
(Crit Care Med 2012; 40:592–509)
Dale M. Needham, MD, PhD; Judy Davidson, DNP, RN; Henry Cohen, PhD; Ronon O. Hopkins, PhD:
new or worsening impairments in physical, cognitive, or mental health after ICU & persisting beyond acute care hospitalization

Patient's Perspective on PICS
6 minute video...

A 39 year old, previously-healthy man describes his ICU stay, and his post-ICU physical, mental, and cognitive impairments, and effects on return to work

Video available at:
www.hopkinsmedicine.org/OACIS

2. The Present
a) Rationale...
How does critical illness contribute to these long-term morbidities?
Weakness after ICU

Two aspects of multi-factorial etiology:

- Critical illness neuromyopathy
- Bed rest associated loss of strength
  - 4-5% per wk in healthy well-nourished subjects


Summary of Mechanisms

- Axons – injury & dysfunction via:
  - inflammation, toxins & direct injury
- Muscles atrophy & dysfunction via:
  - inflammation & inactivity (bed rest)
  - protein breakdown >> protein synthesis
- Reduced cell membrane excitability
  - Na channelopathy


How Bad is Critical Illness & Bed Rest on Muscle?

- 63 MV pt w/ expected survival & ICU LOS >7d
- Assessment of legs muscle wasting via:
  - U/S
  - Biopsy with histology
  - Biochemical analysis of protein balance

Intensive Care Unit–acquired Weakness
Clinical Phenotypes and Molecular Mechanisms
Am J Respir Crit Care Med Vol 187, Iss. 3, pp 238-246
Jane Batlló, Claudia C. dos Santos, Jill I. Cameron, and Margaret S. Herridge

U/S of quadriceps cross sectional area:
- Mean reduction Day 1 to 10: 18%
Physical Therapy in the ICU: Past, Present and Future

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Acute Skeletal Muscle Wasting in Critical Illness

In Single vs Multi-organ fail, decrease at day 7: 3% vs 16%

- Decrease starts early -- at Day 3: 2% vs. 9%

Biopsy of quadriceps:
- CSA decrease by 10%
- Myofiber necrosis in 54% of patients

Biochemical Analysis of Leg protein:
- Day 1-7 protein breakdown increased & synthesis decreased
- Net catabolism was independent of nutritional intake
  - Catabolism incr’d w/ GREATER protein intake in 1st wk

Conclusion:
Early & rapid muscle wasting over first week

U/S CSA
Biopsy CSA
Protein Balance

What about effect on strength & function?

- 222 ARDS survivors:
  - 13 ICU in 4 Baltimore hospital

Serial evaluation of outcomes:
- Inpatient: hospital discharge
- Outpatient: 3, 6, 12, 24, 36, 48, 60 mo.

Arm Muscle Area & ICUAW

AMA lower in patients with ICUAW over 3, 6 &12 mo.

December 17, 2013 44
### Multi-variable Predictors of Decrease in MMT

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time Since Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (per 10 yr)</td>
<td>D/C 3 Mo. 6 Mo. 12 Mo. 24 Mo.</td>
</tr>
<tr>
<td>Duration of ICU bed rest</td>
<td>3% (0,7) 4% (0,8) 9% (1,4) 15% (5,3) 28% (2,5)</td>
</tr>
</tbody>
</table>

### Variables NOT significant in multi-variable model:
- Sex
- Total dose of benzo, narcotic, steroids
- FCI - functional comorbidity
- APACHE II severity of illness
- Proportion of ICU days septic
- Mean blood glucose
- Need for dialysis & days of HD

### Outcomes: With vs. Without ICUAW

- **Grip**<br>SF-36 Phys Func<br>MIP 6MWD

### Early-Onset PT is Beneficial in Hospitalized Patients

- **RCT community acquired pneumonia** (n=485)
  - 3 hospitals in mid-West US
  - Sit OOB &/or walk >20 min. w/in 24 hr of admission vs. usual care
  - Hospital LOS: 5.8 vs. 6.9 days, p<0.05

### Meta-Analysis:

- **RCTs of PT dose** (extra PT vs. std amt of same PT)
- **Pop’n**: adults after acute event, in acute or rehab. setting
  - 16 studies (n=1,699 pts) 3 trials with neuro diagnosis, 3 ortho, 2 CABG, 1 mixed rehab
  - Avg amt of extra PT per day = 19 min (IQR, 15-30 min)
- **Extra PT in RCTs →** Significant improvements in:
  - Walking ability (eg, 6 min. walk, gait velocity)
  - Clinically important increase in SF-36 QOL PF domain
  - Decreased LOS: 1 d (acute setting) & 4 d (rehab.)
- **Subgroup Analysis**: similar size of benefit in acute vs. rehab setting

### Additional Saturday rehabilitation improves functional independence and quality of life and reduces length of stay: a randomized controlled trial

- **RCT**: 6 vs. 5 day/wk PT & OT at 2 Aussie in-pt rehab
  - blinded patient assessments at d/c, 6 mo and 12 mo
  - **N = 996 patients** – very few exclusions (pragmatic)
  - **Results**:
    - **At D/C**: 1 functional independence (FIM & EQ-5D)
    - **6 mo.**: also improvements, but smaller (p<0.06)
    - **↓ LOS**: 21 vs. 23 days (p<0.10)
    - No difference in adverse events
Is EARLY activity in the ICU SAFE?

- 103 ventilated pts admitted over 6 month in 2003
- Multidisciplinary team
- 2 rehab sessions/day with PT, RT, ICU tech

Safety events prospectively defined
- 9 pt w/ 14 adverse event (<1% of activities)
  - 2 SBP <90 mmHg
  - 3 O2 sat <80%
  - 1 nasal feeding tube removal
  - 1 SBP >200 mmHg
- No extubations
- None required added therapy, cost or LOS

Other studies have similar findings

Is early activity in the ICU FEASIBLE?

- 40% of activities done with ETT, including sit on bed, chair & walking
- Patient w/ COPD/pneumonia: A/C, Vt 450cc, FiO2 60%, PEEP 16
Feasibility of PT in MV Patient

1 minute video…

Is early activity in the ICU BENEFICIAL?

Early activity is feasible and safe in respiratory failure patients

Polly Bailey, RN, APRN; George E. Thompson, MD; Vicki J. Speicher, RN, MS; Robert Blair, PT; James Jenkins, PT, Louise Reddy, RN, BSN; Arvyde Storey, RN, BSN; Carmelo Rodriguez, AG; Ramona D. Hopkins, PhD

Crit Care Med 2007 Vol. 35, No. 1

Early intensive care unit mobility therapy in the treatment of acute respiratory failure

Peter E. Morris, MD; Amanda Good, RN; Clifford Thompson, RN; Karen Taylor, MPT, Bethany Harry, MPT; Leah Prenosile, MD; Amelia Rose, RN, MS; Laura Anderson; Shirley Baker, Mary Sanchez; Lauren Pittsley, April Howard, RN, Luc Olson, RN, Susan Locnich, RN, Ronald Small, MBA; R. Duncan Hines, MD; Edward Hentzen, MD

Crit Care Med 2008; 36:2238–2243

Design: non-randomized, controlled trial
Subject: 280 MICU pts req. vent on adm
Intervention:
- Mobility Team (ICU RN, ICU RNA, PT)
  7 d/wk using rehab protocol starting within 48hr of MV

One year follow-up study

- 51% of survivors died or re-admitted
  - 17% died within 1 year
  - 34% at least 1 hospital re-admission
- Early mobility independently associated with decreased 1-yr mortality/re-admission
  - OR (lack of early mobility): 1.77 (1.04 – 3.01)

*Adjusted for body mass index, APACHE II, and vasopressor use in ICU (yes/no)
Early physical and occupational therapy in mechanically ventilated, critically ill patients: a randomised controlled trial

**Lancet May 2009**

**Design:** RCT at U of Chicago & U of Iowa

**Subjects:** 104 MICU patients require MV

**Intervention vs. Control:**
- **Intervention**
  - PT & OT (7/d/wk – on ICU & ward) starting at Day 1-2
  - "Usual care" PT & OT starting at Day 6 -10

**How was PT/OT provided to get benefits?**

- PROM
- AAROM
- AROM
- Bed Mobility
- Transfers (sitting)
- Sitting balance
- ADLs
- Transfers (standing)
- Ambulation

**Benefit is from receiving PT/OT EARLY while on mech. ventilation**

**Intervention**
- N=49

**Control**
- N=55

**Median duration of therapy:**
- After MV (minutes/day) 11 [5 to 20] vs. 10 [0 to 23] (p<0.001)
- During MV (minutes/day) 19 [10 to 29] vs. 0 [0 to 0] (p<0.001)

**Effectiveness of an Early Mobilization Protocol in a Trauma and Burns Intensive Care Unit: A Retrospective Cohort Study**

Diane E. Clark, John D. Lowman, Russell I. Griffin
Helen M. Matthews and Donald A. Reiff

**Phys Ther 2012**

**Design:** Retrospective cohort study at U of Alabama

**Subjects:** 2,176 TBICU pts

**Intervention vs. Control**
- PT consult at adm, with RN/PT progressive mobility n=1132 vs. "Usual care" n=1044
- ~40-100% increase in frequency/intensity of PT Tx

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**Phys Ther. 2013**

- No difference in adverse events
- No difference in mortality, MV or ICU LOS
- Hospital LOS (adj for injury severity): 1.5 day shorter (p>0.05)
- Post-EMP Patients had fewer complications:

**Exercise rehabilitation for patients with critical illness: a randomized controlled trial with 12 months follow up**

Critical Care 2013. 17(R15)

- RCT: 150 pt, ICU >5 d at 1 Aus. ICU
- **Intervention:** Exercise in ICU, ward & out-pt 
  - only 41% completed >70% of out-pt
- **Concl:** no effect on 6MWT & SF-36 PF/QOL
  - Post-hoc: rate of recovery faster in intervention
- **Usual care:** 52% of pt MV>2 d mobilized out of bed
  - vs. 6% in Morris & 0 min/day during MV in Schweickert

**Pt Perspective: Benefit of ICU PT**
2.5 minute video…

**Video available at:**
www.hopkinsmedicine.org/OACIS
2. The Present

c) ICU Culture Change & Structured QI for PT in ICU

Does ICU culture matter?
A study from LDS Hospital …

Using Structured QI to Start Early PM&R:
The JHH MICU Experience

Exposure to rehab in JHH MICU is low:
- PT & OT in only 17% & 20% of ARDS pts
→opportunity for Quality Improvement

A description of one QI model & its results…

“How to” Guide for ICU Rehab

Rehabilitation Quality Improvement in an Intensive Care Unit Setting: Implementation of a Quality Improvement Model
Topics in Stroke Rehab 2010;17:271-281
Dale M. Needham, MD, PhD,*** and Rasha Kapsela, MBBS, MSc

Pronovost, Berenholtz, & Needham. 
Stage 2: Barrier to Activity in ICU
- Time requirements and adequate staffing
- Need for staff training
- Need for teamwork and coordination
- Over-sedation of ICU patients
- Dislodgement of devices (CVC, ETT, feeding tubes)
- Worsening gas exchange
- Unstable hemodynamics
- Inadequate patient comfort, pain control

Stage 3

3. Measure performance
- Select measures (process and/or outcome)
- Develop and pilot test measures
- Measure baseline performance

Example performance measures:
- Proportion of patients ever receiving narcotics or benzos
- Proportion of ICU patients with no therapy
- Safety events during PT
- ICU and Hospital LOS

4 E’s: Engage

Engage stakeholders to understand why interventions important

- Invited patients to return to MICU to share stories (e.g. weakness, physical impairment)
- Share data regarding MICU performance vs peer hospitals.
- Invite guest speakers to discuss their approach

4 E’s: Educate

4 E’s: Execute
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4 E’s: Evaluate

Evaluate:
- regularly assess performance & unintended problems
- Review performance measures at weekly meetings
  - # PT consults completed daily
  - % of treatment with “sitting at edge of bed” or greater
  - MICU & Hospital Length of Stay
- Discuss any problems that arise
- Brainstorm ways to resolve unintended problems

JHH Experience: Feasibility

During 4 month period (May – Aug 2007)
- 2 - 4x incr in PT & OT consult & Tx (vs prior yr)
- Of all PT and OT treatments
  - 68% while ventilated
  - 24% with ETT
  - 13% with femoral line
- New PM&R consults on weak patients

Our Experience with Feasibility

MICU QI project D15
Walked 4 times:
- Max dur’n 10 min
- Max dist. 240 feet
(vs. 3 feet on QI day 1)

Benefits: Sedation & Delirium

- Median RASS score (scale: 0 to -5): -3 to 0 (p<0.05)
- Median drug dose per day (pre-QI vs. QI):
  - Morphine 71 vs. 24 mg per day (p=0.01)
  - Midazolam 47 vs. 15 mg per day (p=0.09)
- Mean daily pain (scale: 0 -10): 0.6 vs. 0.6 (p=0.79)
- Doubled % of ICU days without delirium (21% to 53%, p=0.003)

Potential Benefits to Hospital

Why so many empty MICU beds?
Versus same 4-month period in 2006:
- 20% increase in MICU admissions
- 10% reduction in hospital mortality
- 30% (2.1 day) reduction in MICU LOS
- 18% (3.1 day) reduction in hosp LOS

Average LOS Trend Repeats

Early Physical Medicine and Rehabilitation for Patients With Acute Respiratory Failure: A Quality Improvement Project
Dale M. Needham, MB, PA, Rahul Kangade, MBBS, MS, Jennifer H. Zies, PE, MSP, RN
Presented by Dale M. Needham, MBBS, PA, Elizabeth Colcher, MB, ASSP, Jeffrey R. Pollack, MB, FA, C-R, IDPCC, MD
(SL) AHRF Team, SLP
Archives of Physical Med & Rehab, 2010
Safety - Femoral Line

Prospective study of PT w/ femoral venous, arterial or dialysis

- 101 consecutive MICU patients
  - 253 PT sessions over 210 MICU days
  - Highest activity: sitting or higher on 50% of MICU days
- ZERO catheter related adverse events (prospectively assessed)
  - Bleeding, hematoma, accidental dislodgement/removal, nonfunctioning, limb ischemia
- No CLABSI or retroperitoneal bleeds (retrospectively assessed)

Other recent data...

Safety and Efficacy of Mobility Interventions in Patients with Femoral Catheters in the ICU: A Prospective Observational Study

Prospective study of PT w/ femoral venous, arterial or HD line

- 77 consecutive CVICU patients
  - 210 PT sessions (total of 630 mobility activities)
  - Patients sat in 66% & walked in 9% of mobility activities
- NO catheter related complications
  - Similar to study on prior slide:
    - Bleeding, hematoma, accidental dislodgement/removal, nonfunctioning, change in vascular status & reduced distal perfusion

Safety of Physical Therapy in ICU Patients

A prospective evaluation of 1,110 MICU admissions at Johns Hopkins Hospital

Note: update is so NEW, data not yet published, and Can’t appear in your handout SORRY

2. The Present
d) Tips for Success with QI

14 Factors for Successful Rehab Program

- Designing – 4 Factors
- Conducting – 5 Factors
- Sustaining – 5 Factors

Pearls of Wisdom for Certainty of Success
Designing a QI Project: 4 Critical Success Factors

1. **Engage** senior mgmt & frontline re: why change needed
   - collect prelim data re: magnitude of problem; 1 on 1 mtg w/ leaders

2. **Start only once resources** (human & money) are available

3. **Use structured QI process** for change
   - guarantees success; believe in it!

4. **Integrate** with existing programs where possible:
   a) Cooperate rather than compete
   b) Rally against common external threats

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Conducting a QI Project: 5 Critical Success Factors

1. Identify **multi-disciplinary champions** for QI team
   a) Select strong clinical leader & QI leader
   b) Create & share a vision with team
   c) Empower team to seek problems; and to make changes

2. Start with **pilot test** of 1 unit

3. Create **credible & persuasive data** re: change
   a) Communicate results to influence staff, leaders & budget folks
   b) Measure at *baseline* & during QI (otherwise can’t show improvement)

4. Establish **urgency**, w/ concrete **goals & deadlines**

5. Create **early “wins”** via low-hanging fruit
   a) Share/celebrate successes

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Sustaining a QI Project: 5 Critical Success Factors

Plan for sustainability from start: what must happen to keep it going?

1. **Balance** fidelity of intervention w/hospital-specific circumstance

2. **Institutionalize changes** to consolidate improvements
   (eg, staffing, orientation, training)

3. **Nurture relationships** w/ budget, opinion leader & team member
   a) Maintain enthusiasm & pride

4. **Push for further innovation** and improvement

5. **Adapt**, as needed, to survive

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Overcoming Financial Barrier

Making the business case:
- The qualitative arguments:
  - Improved patient care and outcomes
    - Anecdotes can change minds
    - Patient stories and videos
  - Inequity in care/not meeting the standard
  - Everyone else (name “rival” hospital) is doing it
- The quantitative arguments:
  - Finances: a financial model to help you…
Creation of Financial Model

- Based on:
  1. Costs of implementing program
  2. Reduction in LOS achieved
  3. Per-day costs savings from decreased LOS
  4. Annual number of ICU admissions

1. Costs of Program Implementation

- Personnel, which may include
  - PTs/OTs
  - Rehabilitation aide
  - Program coordinator
  - Physician leader
- Training
- Equipment

2. LOS Reductions

- Reductions achieved in ICU: 20% to 38%
- Reductions achieved in ward: 10% to 25%
- Need a way to quantify these LOS savings
  - How do we determine a per-day cost savings?

3. Per-Day Cost Savings

- Direct-Variable: supply costs for specific services (lab, blood bank, respiratory, etc.)
- Most conservative and accurate
  - No overhead or salaries (short-term savings only)
  - Considers earlier days more costly than later day
  - Decrease LOS results in reduction of LATER day

4. Number of Admissions

- Number of admissions affects:
  - Cost of program implementation
    - More admissions → additional resources needed
  - Total cost savings for an ICU
    - [cost savings for typical pt.] * [total # of admissions]
- We model ICUs of various sizes:
  - 200, 600, 900 and 2000 admissions

Sensitivity Analysis

- ICU Average LOS (days)
  - Conservative Case: 3
  - Average Case: 4.5
  - Best Case: 6.5
- Reduction in Average ICU LOS
  - Conservative Case: 10%
  - Average Case: 20%
  - Best Case: 25%
- Ward Average LOS (days)
  - Conservative Case: 5
  - Average Case: 11.5
  - Best Case: 17.5
- Reduction in Average Ward LOS
  - Conservative Case: 10%
  - Average Case: 15%
  - Best Case: 20%
More Details

ICU Early Physical Rehabilitation Programs: Financial Modeling of Cost Savings*

Robert K. Lord, AIP; Christopher R. Meyers, BS; Radha Korupolu, MBBS, MSc; Earl C. Manthey, BA; Michael A. Friedman, PT, MBA; Jeffrey R. Palmieri, MD; Dale M. Needham, FCA, MD, PhD

(Crit Care Med 2013; 41:717–724)

Excel template for calculations & Users’ Guide:
www.hopkinsmedicine.org/OACIS

3. The Future

a) New Areas of Research & Practice

New Trials of Early Rehab

- Morris (Wake Forest University) NIH R01NR011051
  - NIH-funded 1-site RCT of bid therapy vs. usual care
- Moss (Colorado) NIH R01NR011186
  - NIH-funded RCT of ICU PT in CIP/CIM
- Hart et al (UK)
  - Post-ICU Rehabilitation RCT
- RECOVER RCT (UK) – Tim Walsh et al.
  - Post-ICU Rehabilitation RCT

Rehab Technology for ICU

Technology to enhance physical rehabilitation of critically ill patients
Crit Care Med 2009 Vol. 37, No. 10 (Suppl)
Dale M. Needham, MD, PhD; Alex D. Truong, MD, MPH; Eddy Fan, MD

NMES: Phase II RCTs

Simultaneous stimulation of 3 muscle groups bilaterally in legs
2. The Future

b) A Hospital with No Beds (and no bed rest)

(Thanks to Roger Leib, AIA for slides)

Bedcentricity

a. Orientation of TV
b. Access to TV control/patient intercom

...we tether patient to bed

Tethered patient

Tethered prisoner

Feasibility and observed safety of interactive video games for physical rehabilitation in the intensive care unit: a case series

Wii-hab

Michelle E. Kho PT, PhD,1,2,3, Abdulla Bamloujy HBChB, MPH,4
Jennifer M. Zurn PT, HScPT, ScD,5,6, Dale H. Needham MD, PhD4,7

Why is this the case?

Lack of viable alternative to bed

Don’t Need a “Rolls Royce” Bed
We want you OUT of bed

Need an alternative to bed-based care

Early Mobilization of Mechanically Ventilated Patients: A 1-Day Point-Prevalence Study in Germany

- 116 ICUs in Germany

2. Environment reinforces “sickness model”
Design is telling patient “stay in bed”
Reinforcing “sickness model”

Design is telling *visitors* "keep pt in bed"

...and visitors communicate this back to pt

Alternative to sickness model

Reinforce normal activity - OOB

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3. Design equipment to support movement

Geisinger Medical Center, USA

(CHEST 1975;68:608)

Johns Hopkins MOVER Aid

*Moving* Our patients for *Very* Early Rehabilitation

Project with JHU Biomedical Engineering students

**Walker:**
- emergency seat
- eliminates w/c & staff

**Tower:**
consolidate monitor, pump & vent
only one person req’d

MOVER reduces staff to ambulate a mech vent pt from 4 to 2

Central DuPage Hospital, IL
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Equipment to support movement

Interactive and computer-assisted rehab

4. Move toward continual vs. episodic mobilization

Synthesis

Ideas for moving away from bed-centricity:
1. Recognize environment affects mobility & “sickness model”
2. Move away from “Rolls Royce” bed focused on bedrest
3. Design healing platform & equipment for mobilizing ICU pt
4. Think about continuous vs. episodic movement

The Future is Large-Scale Learning Networks & Collaborations

www.mobilization-network.org

The ICU Recovery Network (IRN) (created via MedConcert)
• To access & contribute to ICU Rehab content: videos, documents, website links, and event information
• To interact w/ other ICU Rehab clinicians from world
• Joining is simple (< 5 min.) – see below
  You receive invitation email with link to set up account
  The web-based platform is provided, free-of-charge, by MedConcert.
  If in U.S. NPI database, your basic info automatically populates.
  If not, you manually enter basic info into web form
  cbenne31@jhmi.edu

Conclusions
• Historical Roots: WWII; creation of ICUs
• At Present, growing evidence:
  – Clear rationale: Post-intensive care syndrome (PICS)
  – Growing RCT evidence & may SAVE costs
  – Structured QI: to change culture & make routine care
• A VERY Bright Future:
  – New research & clinical practice under way
  – Need continued innovative thinking
Questions?

Some members of the OACIS Group at Hopkins