Start Walking: Improving Outcomes through Use of an Early Progressive Mobility Program

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Challenge, Journey, Evolution

- Everest is 29,035 ft... 5 ½ miles
- 7,001 summits through August 2015
- 1923-1999: 1,169 summits; 170 deaths; 14.5% mortality rate
- 2000-2015: 5,832 summits; 112 deaths; 1.9% mortality rate

- Mortality rates in patients admitted to adult ICUs average 10% to 29%
- Study shows decrease in ICU length of stay, falls post ICU, and hospital length of stay
- Ultimately reduce readmissions and the mortality rate based on ICU stay
Study & Education Goal

• This study is looking at active progressive mobility for the patient to prevent deconditioning and the resultant negative outcomes, such as falls and increased length of stay.
• In this session, you will learn about early progressive mobility and its benefits for patient’s outcomes.
• You will learn about a progressive mobility program that followed the patients throughout their hospital stay.
Participants in the Study

• Study Principle Investigator: Theresa Murray
• Co Investigators: Marianna Schneider, Sue Heinzman, Deb Ferguson
• Rehabilitation Study Team: Wilfredo Geronimo PT, Janet Dawes OTR, Marcia Shumaker OTR
• Erin Gill RN, Miranda Bailey RN, Ebony Brown RN
• Physician Champion: Bassam Helou
• All CHE inpatient staff who help mobilize patients are involved in this study. The progressive mobility protocol will start in the ICU and transition with the patient as he/she moves across the acute care continuum at Community Hospital East
Rehab supports

• Labor team supported the study by approving .6 FTE of PT OT just for the critical care unit
• They saw all patients but only employed the EPM program on even number room patients who were consented to be in the study. This was our randomization plan.
• PT OT then followed the patients throughout the hospitalization of the study patients, and completed the vast majority of the documentation
• Critical care unit staff satisfaction with having rehab staff dedicated to the unit was OVER the top
“It may seem a strange principle to enunciate as the very first requirement in a Hospital that it should do the sick no harm.”

Florence Nightingale

Advocacy = Safety
PICS-Physical Dysfunction

- Less than 10% of patients on mechanical ventilation for > 4 d are alive and fully independent 1 yr later.
- Caregiver assistance ranging from assistance with activities of daily living to full care is required by patients 1 yr later.
- Half of patients with adult respiratory distress syndrome have not returned to work 1 yr later.
- ICU-acquired weakness that can persist for years can develop in 25–80% of those with sepsis or on mechanical ventilation for > 4 d.

PICS: Cognition & Mental Illness

• Cognitive impairment that can persist for years develops in 30–80% of patients
• Symptoms of depression occur in 8–57% of patients and may take months to improve
• Symptoms of anxiety occur in 23–48%
• Symptoms of posttraumatic distress syndrome occur in 10–50% of patients and may persist for years

Patient Risk Factors

- Immobility
- Number of days on mechanical ventilation/VAE’s
- Length of stay in the ICU
- Heavy sedation
- Delirium *mobility
- Hypoglycemia
- Hypoxia
- Sepsis
- ARDS

The Cost of Surviving ICU Care

- Higher 5 year mortality (32.2% vs 22.7%)
- Greater hospital resource use defined as mean hospital readmission rate (4.8 vs. 3.3/person over five years)
- Comorbidities/pre-ICU hospitalizations stronger predictor of hospital resource use than acute illness
- 51% higher mean 5 year hospital cost ($23,608 vs $16,913/patient)
- After adjustment for co-morbidities, resource use persisted
“Four Cornerstones for Success”

- Evidence Based Practice
- Inter-Professional Teams
- Reduction of Practice Variation
- System Collaboration
Outcomes of A Progressive Mobility Program

- ↓ incidence of skin injury
- ↓ time on the ventilator
- ↓ incidence of VAP
- ↓ days of sedation
- ↓ delirium
- ↑ ambulatory distance
- Improved function

Thomsen GE, et al. CCM 2008;36:1119-1124
Winkelman C et al, CCN,2010;30:36-60
Early ICU Mobility Therapy

Results

• Baseline characteristic similar in both groups
• Protocol group:
  – Received as least 1 PT session vs. usual care (80% vs. 47%, p ≤ .001)
  – Out of bed earlier (5 vs. 11 days, p ≤ .001)
  – Reduced ICU LOS (5.5 days vs. 6.9 days, p = .025)
  – Reduced Hospital LOS (11.2 days vs. 14.5 days, p = .006)
  – No adverse outcomes;
    • Most frequent reason for ending mobility session was patient fatigue
• Cost
  • Average cost per patient was $41,142 in the protocol group
  • Average cost per patient was $44,302 in the control group

Early Physical and Occupational Therapy in Mechanically Ventilated Patients

- Prospective randomized controlled trial from 2005-2007
- 1161 screen, 104 patients mechanically ventilated < 72hrs, functionally independent at baseline met criteria
- Randomized to:
  - early exercise of mobilization during periods of daily interruption of sedation (49 pts)
  - daily interruption of sedation with therapy as ordered by the primary care team (55 pts)
- Primary endpoint: number of patients returning to independent functional status at hospital discharge able to perform activities of daily living and walk (independently)

ABCDE Bundle Reduces Ventilation, Delirium & ↑OOB

- 18 month, prospective, cohort, before-after study
- 5 adult ICU's, 1 step down, 1 oncology unit
- Compared 296 patients (146 pre-bundle) & 150 post bundle
- Intervention: ABCDE
- Measured:
  - For mechanical ventilation patients (187) examined ventilator free days
  - All patients examined incidence of delirium, mortality, time to discharge and compliance with the bundle

New ABCDEF

A: Assess prevent and manage pain
B: Both SAT and SBT
C: Choice of sedation and analgesia
D: Delirium assess prevent and manage*
   role of Mobility in literature and recommendations from AACN and SCCM
E: Exercise and mobility
F: Family engagement and empowerment

lculiberation.org
Determining Readiness

- Perform Initial mobility screen w/in 8 hours of ICU admission & Reassess mobility level at least q 24 hrs (recommended at shift change)

- PaO2/FiO2 ≥ 250
- Peep <10
- O2 Sat ≥ 90%
- RR 10-30
- No new onset cardiac arrhythmias or ischemia
- HR >60 <120
- MAP >55 <140
- SBP >90 <180
- No new or increasing vasopressor infusion
- RASS ≥ -3

No

Patient is unstable, start at Level I & progress


Yes

Patient Stable, Start at Level II & progress
# The Progressive Mobility Continuum

## Progressive Mobility Program

<table>
<thead>
<tr>
<th>Patient Assessment</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
<th>Level V</th>
</tr>
</thead>
<tbody>
<tr>
<td>START HERE</td>
<td>RASS 3 to 3</td>
<td>RASS 3 &amp; up</td>
<td>RASS 1 &amp; up</td>
<td>RASS 0 &amp; up</td>
<td>RASS 0 &amp; up</td>
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### MOBILITY SCREEN

- HbO2/HbS ≤ 200
- PaO2 < 100
- SaO2 < 90%
- RR 10-30
- No new onset cardiac arrhythmias or ischemia
- HR < 60 or >120
- MAP > 35 or < 40
- SBP > 90 or < 60
- No new or increasing vasoconstrictor infusion
- RASS > 5

### Goals

- **Level I**: Clinical stability; passive ROM (PT/OT consult PINS)
- **Level II**: Upright sitting; increased strength and moves arm against gravity
- **Level III**: Increased trunk strength, moves legs against gravity, readiness to weight bear, and perform some ADLs
- **Level IV**: Stands w/min to mod assist, able to march in place, weight bear and transfer to chair, and perform some ADLs
- **Level V**: Increase distance in ambulation and ability to perform some ADLs

### MOBILITY SCREEN

- Maintain HbO2 ≥ 30%
- PT/OT consult PINS
- Q2hr turning with assist device
- Q2hr turning by self or with turn assist device
- Q2hr turning by self or with turn assist device

### Activities

- 1. HbO2 ≥ 70% for 15 min
- 2. HbO2 ≥ 90%, legs in dependent position ≥ 15 min
- 3. HbO2 > 90%, legs in dependent position ≥ 15 min
- 4. Step (6) in full chair mode for ≥ 30 min ≥ 3x per day

### Progression

- Progress to Level II
- Progress to Level III
- Progress to Level IV
- Progress to Level V

### Notes

- You start at Level I and progress.
- For each position/activity change allow 5-10 minutes for equilibration before determining the patient is tolerant.
- If the patient is intolerant of current mobility level activities, reassess and place in appropriate mobility level.

### Mobility

- Is the responsibility of the RN w/ assistance from the RTs, UAP, PT/OT. PT/OT may assist with placement to the appropriate mobility level, always prioritizing patient and provider safety. Placement is based on clinical judgment.
The Progressive Mobility Continuum

**Level I**
RASS -5 to -3

- Goal: Clinical Stability, Passive ROM, (PT/OT consult PRN)

- Maintain HOB $>30^\circ$

- "PROM 2X/d performed by RN, or UAP"

- CLRT/Pronation initiated if patient meets criteria based on institutional practice

- OR

- Q 2 hr turning with assist device
Do We Even Achieve the Minimum Mobility Standard... “Q2 Hours”?
The Progressive Mobility Continuum

Level II

RASS -3 & Up

Goal: Upright sitting; increase strength & moves arm against gravity
PT/OT consult prn

ACTIVITY:
Q 2 hr turning with assist device

*Passive /Active ROM 3x/d

Progressive Bed Positioning
1. HOB 45º X 15 min.
2. HOB 45º, Legs in dependant position X 15 min.
3. HOB 65º, Legs in dependant position X 15 min.
4. Step (3) & full chair mode X20 min

Or
Full assist into cardiac chair with turn/assist or air transport device 2X/day

Mobility is the responsibility of the RN w/assistance from the RTs, UAP, and PT/OT. PT/OT may assist the team with placement to the appropriate mobility level, always prioritizing patient and provider safety. Placement is based on clinical judgement.
Goal: Increased trunk strength, moves leg against gravity and readiness to weight bear

PT: active resistance 1x per day, strength exercises; OT: consult PRN

**ACTIVITY:**
Q 2 hr turning by self or with assist device

Sit on edge of bed w/RN, PT, RT assist X 15 min.
Or
Pivot to regular chair 2X/d with gait belt, SPD and chair alarm
Out of Bed Technology
## The Progressive Mobility Continuum

### Level IV

**RASS 0 & up**

**Goal:** stands w/ min. to mod. assist, able to march in place, weight bear and transfer to chair

**PT & OT each daily**

**ACTIVITY:**

Q 2 hr turning by self or with assist device

Sitting on edge of Bed with RN, PT, RT present and stand with gait belt assist 3x daily or

Regular chair 3x per day with gait belt, SPD and chair alarm
The Progressive Mobility Continuum

Level V
RASS 0 & up

Goal: Increase distance in ambulation & ability to perform some ADLs

PT & OT each daily

ACTIVITY:
Self or assisted Q 2 hr turning

Up to regular chair
Min. 3X/day with SPD & chair alarm

Meals will be consumed while dangling on edge of bed or in regular chair with SPD & chair alarm

Ambulate with gait belt progressively longer distances with less assistance x3/day with RN/PT/RT
Even if you are on the right track, you will get run over if you just sit there.

Will Rogers
Progressive Mobility: Use of Technology to In-Bed & Out of Bed Mobility

Journey to tolerating upright position, turning, tilt, sitting, standing and walking and out of bed chair sitting can occur quicker through the use of technology.
Early Mobility: Can We Do It? Is it Safe?
Challenges to Mobilizing Critically Ill Patients

- Human or Technological Resources
- Knowledge/Priority
- Hemodynamic instability
- Staff engagement
- Safety
Safety

- > 1% adverse events during 1449 sitting, standing and walking sessions with patients on ventilators.
- Underwent daily sedation interruption followed by PT & OT daily until achieving physical function independence
  - Safety events occurred in 16% of all sessions
    - Loss of 1 arterial line, 1 nasogastric tube, 1 rectal tube
      - Therapy was stopped on 4% of all sessions for vent asynchrony, agitation, or both
      - Delirium present 53% of the time during therapy sessions

It Takes a Village For Sustainability

1. Necessary Components for Early Rehab
   - Buy-in
   - Multiple disciplines
   - Team communication
   - Opinion leader
   - Individual discipline champion
   - Dedicated rehab personnel
   - Equipment
   - Sedation practice
   - Administrative funding

2. Implementation Strategies
   - Team center approach
   - Staff education
   - Strength & quality of evidence

3. Perceived Barriers
   - Increase workload
   - Safety concerns

4. Positive Outcomes
   - Improved patient outcomes
   - Staff satisfaction
   - Changed culture
   - Financial savings

2015 Falls of Patients who have been in ICU
N= 30
What about falls during the study?

Total Falls of Patients who have been transferred from the ICU

- 2015: 30
- 2016: 17

47.0%
What about the study patients???

Only 2 patients fell!!
Length of Stay Aspects
Control group vs. Study group

ICU LOS
- Control: 5.8
- Study: 7.1

Vent LOS
- Control: 7.3
- Study: 5.3

Hospital LOS
- Control: 10.5
- Study: 8.3
Additional Patient Outcomes

Discharge Status

<table>
<thead>
<tr>
<th>Discharge Status</th>
<th>Control</th>
<th>Intervention</th>
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</thead>
<tbody>
<tr>
<td>Home</td>
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<td>10</td>
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<tr>
<td>Home with help</td>
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<tr>
<td>Acute Rehab</td>
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<td>7</td>
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<tr>
<td>LTAC/OSH</td>
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<td>4</td>
</tr>
<tr>
<td>ECF</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>RHC</td>
<td>8</td>
<td>9</td>
</tr>
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</table>
When would NOW be a good time to do this?

It is not enough to do your best, you have to know what to do and then do your best.

E Deming