Post-Intensive Care Syndrome

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Growing Interest in ICU Survivors

![Graph showing the increase in citations over years with a total of 1631 citations.](image)
Annually
3.5 Million People Survive a Critical Illness
Melissa and Doug’s Story: Introduction

www.ICUdelirium.org
Post-Intensive Care Syndrome (PICS)

• The term **PICS** was agreed on as the recommended term at a 2010 SCCM Task Force Meeting.

• Describes **new** or **worsening impairments** in **physical, cognitive, or mental health status** arising after critical illness and persisting beyond acute care hospitalization.

PICS – Three Areas of Impairment

- Physical
- Mental Health
- Cognitive
PICS model

- Family
  - Mental health
    - Anxiety/ASR
    - Depression
    - PTSS, PTSD
    - Complicated grief
  - Decreased quality of life

- Post-intensive care syndrome
  - Patient
    - Mental health
      - Anxiety/ASR
      - Depression
      - PTSS, PTSD
    - Cognitive impairment
      - Executive function
      - Memory
      - Attention
    - Physical impairment
      - Pulmonary
      - Neuromuscular
    - Decreased quality of life

References:
Functionally Impaired

- Pulmonary
- Neuromuscular
Physical Component

- 60%–80% of patients are functionally impaired
- ICU-acquired weakness (diffuse, symmetric, generalized muscle weakness)
  - Critical illness polyneuropathy
  - Critical illness myopathy
  - Prolonged neuromuscular blockade
  - Disuse atrophy
- Lung capacity/volume impairment
- Impaired activities of daily living (ADLs)

Cognitively Impaired

- Executive Function
- Memory
- Attention
Cognitive Morbidity

- Hopkins 2005
- Mikkelsen 2009
- Unroe 2010
- Jackson 2003
- Girard 2010
- Jones 2006
- Sukantar 2005

Percent Impaired

ARDS
Chronically Critically Ill
General Medical

0 10 20 30 40 50 60 70 80 90 100
Cognitive Impairment

- 50%–70% of patients are cognitively impaired
- Deficits
  - Executive function
  - Memory
  - Attention

Cognitive Impairment

• Extremely prevalent 1 year after hospital discharge
  – 34% with scores similar to Traumatic Brain Injury
  – 24% with scores similar to Alzheimer’s disease

• Delirium in the ICU was an independent risk factor for long-term cognitive impairment

• Affects all age ranges

Poor Mental Health

- Anxiety
- Depression
- PTSS
- PTSD
# Psychological Morbidity

## Table 2. Measurements of Psychiatric Symptoms/Syndromes, Ordered by Follow-Up Time

<table>
<thead>
<tr>
<th>Psychiatric Condition</th>
<th>Study</th>
<th>Instrument</th>
<th>Follow-Up (months)</th>
<th>n at Follow-Up</th>
<th>Mean/Median</th>
<th>Cut-Off Score</th>
<th>Point Prevalence (%)</th>
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<tbody>
<tr>
<td><strong>Depression</strong></td>
<td>Hopkins et al. 2004 (10)</td>
<td>BDI</td>
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<td>Weinert et al. 1997 (12)</td>
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<td><strong>PTSD</strong></td>
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<td>Schelling et al. 1998 (14)</td>
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<td>Stoll et al. 1999 (15)</td>
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Daydow et al., *Psychosom Med.* 2008
Mental Health Component

Patients
- 10%-40% of patients experience mental health deficits
- Deficits include
  - Anxiety
  - Depression
  - Posttraumatic stress disorder (PTSD)

Family
- Depression
- Anxiety
- PTSD
- Complicated grief

Mental Health

- Poor mental health common among ICU survivors
  - Depression 37% at 3 months and 33% at 1 year
  - PTSD 7% at both 3 months and 1 year—double that of the general population (3%)

- Depression is driven by physical symptoms
  - ADL disability
  - IADL disability

Melissa and Doug’s Story: Life After the ICU

www.ICUdelirium.org
What can we do?

- Key strategies
  - Maximize mobility
  - Minimize delirium
  - Enhance coping skills

- Interventions in both settings
  - Front-end strategies (in the ICU)
  - Back-end strategies (after the ICU and after the hospital)
The ABCDE Bundle

- **A** - Awakening and Breathing Coordination
- **B** - Delirium Identification and Management
- **C** - Early Mobility

- Evidence based bundle of ICU practices
- Elements supported by PAD guidelines
- Purpose: to align and support the
  - People
  - Processes
  - Technology

The ABCDE Bundle

ABC
Awakening and Breathing Coordination

D
Delirium Identification and Management

E
Early Mobility

F
Family Involvement

G
Good Handoff Communication

H
Hand the Patient/Family Written Information

Physical

Maximize Mobility
The ABCDE Bundle

**ABC**  Awakening and Breathing Coordination

**D**  Delirium Identification and Management

**E**  Early Mobility

**F**  Family Involvement

**G**  Good Handoff Communication

**H**  Hand the Patient/Family Written Information


Early Mobility in the ICU

Early physical and occupational therapy in mechanically ventilated, critically ill patients: a randomised controlled trial


- Early exercise = progressive mobility
- Study design: paired SAT/SBT protocol with PT/OT from earliest days of mechanical ventilation

Wake Up, Breathe, and Move
Early Mobility Study Results

Return to independent functional status at d/c
- 59% in intervention group
- 35% in control group (p=.02)

# Early Mobility Study Results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Intervention (n=49)</th>
<th>Control (n=50)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functionally independent at discharge</td>
<td>29 (59%)</td>
<td>19 (35%)</td>
<td>0.02</td>
</tr>
<tr>
<td>ICU delirium (days)</td>
<td>2.0 (0.0-6.0)</td>
<td>4.0 (2.0-7.0)</td>
<td>0.03</td>
</tr>
<tr>
<td>Time in ICU with delirium (%)</td>
<td>33 (0-58)</td>
<td>57 (33-69)</td>
<td>0.02</td>
</tr>
<tr>
<td>Hospital delirium (days)</td>
<td>2.0 (0.0-6.0)</td>
<td>4.0 (2.0-8.0)</td>
<td>0.02</td>
</tr>
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<td>Hospital days with delirium (%)</td>
<td>28 (26)</td>
<td>41 (27)</td>
<td>0.01</td>
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<tr>
<td>Barthel index score at discharge</td>
<td>75 (7.5-95)</td>
<td>55 (0-85)</td>
<td>0.05</td>
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<tr>
<td>ICU-acquired paresis at discharge</td>
<td>15 (31%)</td>
<td>27 (49%)</td>
<td>0.09</td>
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<tr>
<td>Ventilator-free days</td>
<td>23.5 (7.4-25.6)</td>
<td>21.1 (0.0-23.8)</td>
<td>0.05</td>
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<tr>
<td>Length of stay in ICU (days)</td>
<td>5.9 (4.5-13.2)</td>
<td>7.9 (6.1-12.9)</td>
<td>0.08</td>
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<tr>
<td>Length of stay in hospital (days)</td>
<td>13.5 (8.0-23.1)</td>
<td>12.9 (8.9-19.8)</td>
<td>0.93</td>
</tr>
<tr>
<td>Hospital mortality</td>
<td>9 (18%)</td>
<td>14 (25%)</td>
<td>0.53</td>
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</tbody>
</table>

Protocol for early mobility therapy

Admit to ICU

Level I
- Unconscious
  - MT: Passive ROM 3x/d
  - MT: q2Hr turning

Level II
- Conscious
  - Passive ROM 3x/d
  - q2Hr turning
  - Active Resistance PT

Level III
- Conscious
  - Passive ROM 3x/d
  - q2Hr turning
  - Active Resistance PT

Level IV
- Conscious
  - Passive ROM 3x/d
  - q2Hr turning
  - Active Resistance PT

Discharge to floor bed

PT = Physical Therapy
MT = Mobility Team

Can move arm against gravity
Can move leg against gravity

Cognitive

Minimize Delirium
The ABCDE Bundle

ABC
Awakening and Breathing Coordination

D
Delirium Identification and Management

E
Early Mobility

F
Family Involvement

G
Good Handoff Communication

H
Hand the Patient/Family Written Information

Pain, Agitation, and Delirium Are Interrelated

SECOND OPINION

WHAT WOULD HELP MRS. JOHNSON TO BREATHE EASIER?

LESS CIGARETTES?

LUNG LAVAGE?

INHALERS?

EYE CONTACT WOULD BE A GOOD START!
Confusion Assessment Method (CAM & CAM-ICU)

**Feature 1:** Acute change or fluctuating course of mental status

And

**Feature 2:** Inattention

**Feature 3:** Altered level of consciousness

**Feature 4:** Disorganized thinking


Ely, et. al. CCM 2001; 29:1370-1379.4

Ely, et. al. JAMA 2001; 286:2703-2710.5
No Straight Paths

• No specific treatment recommendations
• No magic drug
• Strategy more than agents
• Removing cause more than treating the symptoms

Results – No clean & simple protocols or order sets
Helpful Approach to Delirium Management

- Stop
- THINK
- Lastly Medicate
Do you need to Stop anything?

• Especially consider **sedatives**

• Is patient on minimal amount necessary?
  – Review medications
  – Doses adjusted for elderly, renal failure, liver failure

• Do sedatives need titrated/changed?

What to THINK if positive for delirium

**Toxic Situations**
- CHF, shock, dehydration
- Deliriogenic meds (tight titration)
- New organ failure (liver, kidney, etc)

**Hypoxemia;**

**Infection/sepsis (nosocomial), Immobilization**

**Nonpharmacological interventions**

**K+ or Electrolyte problems**

www.icudelirium.org
PAD Treatment of Delirium Recommendations

- There is **no published** evidence that treatment with **haloperidol** reduces the duration of delirium in adult ICU patients (No Evidence).

- **Atypical antipsychotics** may reduce the duration of delirium in adult ICU patients (C).

- We **do not** recommend administering **rivastigmine** to reduce the duration of delirium in ICU patients (–1B).

Mental Health

Enhance Coping Skills
The ABCDE Bundle

ABC
Awakening and Breathing Coordination

D
Delirium Identification and Management

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Help Set Realistic Expectations

- Little appreciation for critical illness as a traumatic stressor (even sophisticated patients)
- Provide education to help adjust expectations
  - Brochures on what to expect after discharge
  - Websites with patient/family-centered info
  - Signs of depression, anxiety, and PTSD
- Consider creating educational materials for discharge packets
Promote Reality Sorting Strategies

• Encourage family to help the patient sort out reality

• Facilitate this reality sorting and memory enhancement

• ICU diaries

Jones, C et al. Critical Care 2010: 14; R168
ICU Diaries

• Decreased the incidence of PTSD following ICU stay* (given 1 month after discharge)

• Calendar of events and/or milestones

• Photographs

• Entries from staff and family

• Utilize printed templates or websites

• http://www.icu-diary.org

*Jones, C et al. Critical Care 2010: 14; R168
Back End Strategies: After the ICU

- **Post-ICU care:**
  - Need rehabilitation staff to coordinate the post-ICU care.
  - Barriers to this may be:
    - Limited awareness of long-term consequences
    - No rehabilitation pathway for post-ICU (e.g., stroke and traumatic brain injury)
    - Limited exposure to critical care issues

- **What can we do?**
  - Increase awareness—spread the word!
  - Educate folks in our institutions
  - Encourage rehab services to check out resources from SCCM

Back End Strategies: After the Hospital

- Callback numbers
  - “If you are having problems call this number....”
- Follow-up phone calls
  - Checking in to see if patient has followed up with PCP
  - List of referral services within hospital system
- ICU follow-up clinics
  - Staffed with interdisciplinary ICU clinicians

Vanderbilt POST-ICU Recovery Clinic

Interdisciplinary Compositions
Melissa and Doug’s Story: Recommendations for Others

www.ICUdelirium.org
Online Resources

Families and Patients
- www.ardsusa.org
- www.ICUdelirium.org
- www.sepsisalliance.org
- www.myicucare.org/Adult-Support/Pages/Post-intensive-Care-Syndrome.aspx
- http://icusteps.org

Healthcare Professionals
- www.nice.org.uk/CG83
- http://www.icu-diary.org
Summary: PICS

- Physical
- Mental Health
- Cognitive
Questions?

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www.ICUdelirium.org