Post-Intensive Care Syndrome

Sarah Bloom MSN, AGACNP-BC
Assistant in Anesthesiology
Division of Critical Care Medicine
Vanderbilt University Medical Center, Nashville, TN
Critical Care in 2016

Long-Term Quality of Life Among Survivors of Severe Sepsis: Analyses of Two International Trials*

Sachin Yende, MD, MS1,2; Shamly Austin, PhD, MHA1,3; Andrew Rhodes, MD4; Simon Finfer, MD, FCICM5; Steven Opal, MD6; Taylor Thompson, MD7; Fernando A. Bozza, MD, PhD1,8; Steven P. LaRosa, MD9; V. Marco Ranieri, MD10; Derek C. Angus, MD, MPH1

A  Patients functional and living independently before severe sepsis hospitalization

- 6 month (n=580)  1 year (n=448)

<table>
<thead>
<tr>
<th>Issue</th>
<th>6 months</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>37.4</td>
<td>31.7</td>
</tr>
<tr>
<td>Selfcare</td>
<td>20.5</td>
<td>14.7</td>
</tr>
<tr>
<td>Usual care</td>
<td>43.7</td>
<td>32.3</td>
</tr>
<tr>
<td>Anxiety or Depression</td>
<td>29.5</td>
<td>25</td>
</tr>
<tr>
<td>Pain or discomfort</td>
<td>41.4</td>
<td>35.2</td>
</tr>
</tbody>
</table>

B  Patients less than 45 years

- 6 month (n=78)  1 year (n=65)

<table>
<thead>
<tr>
<th>Issue</th>
<th>6 months</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>17.9</td>
<td>13.8</td>
</tr>
<tr>
<td>Selfcare</td>
<td>30.6</td>
<td>21.5</td>
</tr>
<tr>
<td>Usual care</td>
<td>33.3</td>
<td>35.4</td>
</tr>
<tr>
<td>Anxiety or Depression</td>
<td>38.5</td>
<td>29.2</td>
</tr>
<tr>
<td>Pain or discomfort</td>
<td>29.5</td>
<td>25.4</td>
</tr>
</tbody>
</table>

C  Patients without chronic disease

- 6 month (n=217)  1 year (n=169)

<table>
<thead>
<tr>
<th>Issue</th>
<th>6 months</th>
<th>1 year</th>
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<tr>
<td>Mobility</td>
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Defining Post-ICU Syndrome

“New or worsening impairments in physical, cognitive or mental health status arising after critical illness and persisting beyond acute care hospitalization. The term can be applied to a survivor (PICS) or family member (PICS-F).”

Conceptualizing PICS

Post Intensive Care Syndrome (PICS)

- Family (PICS-F)
  - Mental Health
    - Anxiety/ASD
    - PTSD
    - Depression
    - Complicated Grief

- Survivor (PICS)
  - Mental Health
    - Anxiety/ASD
    - PTSD
    - Depression
  - Cognitive Impairments
    - Executive Function
    - Memory
    - Attention
    - Visuo-spatial
    - Mental Processing Speed
  - Physical Impairments
    - Pulmonary
    - Neuromuscular
    - Physical Function

Global Cognition Scores in Survivors of Critical Illness

Long-Term Cognitive Impairment after Critical Illness

Adjusted RBANS Global Cognition Score at 12 Mo

N = 382
P = 0.04

Days of Delirium
Depression, post-traumatic stress disorder, and functional disability in survivors of critical illness in the BRAIN-ICU study: a longitudinal cohort study

<table>
<thead>
<tr>
<th>Feature</th>
<th>3mo Post-ICU</th>
<th>12mo Post-ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>• 30% (no depression history)</td>
<td>• 29% (no depression history)</td>
</tr>
<tr>
<td></td>
<td>• 52% (history of depression)</td>
<td>• 43% (history of depression)</td>
</tr>
<tr>
<td>Post-traumatic stress disorder (PTSD)</td>
<td>• 7% related to critical illness</td>
<td>• 7% related to critical illness</td>
</tr>
<tr>
<td></td>
<td>• 19-29% (symptoms of PTSD)</td>
<td>• 19-28% (symptoms of PTSD)</td>
</tr>
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<table>
<thead>
<tr>
<th>Feature</th>
<th>Prevalence Observed</th>
</tr>
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<tbody>
<tr>
<td>*Anxiety</td>
<td>23-48% have symptoms</td>
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ICU Diaries

- Two RCTs completed
- ICU diaries as “intervention” to aide in psychological recovery
- Short term reduction in PTSD symptoms & severity
- Over time differences between groups difficult to detect
- No agreed-upon standard for diary use

Neuropsychological Impairments Among Survivors and QOL

Physical Impairments

- ICU-Acquired Weakness
  - Critical-illness polyneuropathy
  - Critical-illness myopathy
- Estimated to occur in 25-80% of patients
- 23% ICU survivors (in patients without pre-existing functional disability)
- Half of ARDS survivors not return to work by 1-year follow-up
- 5-year outcomes of ARDS survivors
Preventing ICU-acquired Weakness

- Early mobility
- Decrease sedation
- Optimize functional status while inpatient
- Outpatient rehab services

Early combined cognitive & physical rehabilitation in the ICU:

☑ Feasible
☑ Safe
☐ Effective at improving outcomes for critically-ill patients during or after hospitalization
PICS-F

• Anxiety present in 10-75% of family
• PTSD symptoms 8-42% of family
• 33% of family require medication for anxiety or depression
• Prolonged complicated grief

Family members experienced less stress when their loved-ones had made their potential end-of-life wishes clear.
Survival IS NOT a Patient-Centered Endpoint

QOL after ICU survival; managing patient and family expectations and providing education.

Image from: Greyson, S.R., & Detsky, A.S., Journal of Hospital Medicine, 2015; 10:(10);697-700.
Cost of PICS

- Employment interruptions
- Profound dependencies
- Caregiver burden
- Inpatient rehab, long-term acute care costs
- Home care
- Hospital re-admissions
Barriers to Effective PICS Treatment

• Awareness: risk factors, screening tools, referrals for follow-up care
• Silos among providers
  – Interrupted communication among stakeholders
  – Effective care transitions
  – THRIVE
• Epidemiology & long-term outcomes research
• Survivor support networks, social media outreach, patient education (public health attention)
Who should treat PICS?

- Advance Practice Nurse/Physician Assistant
- Critical Care Nurse
- Dietitian
- Physical Therapist
- Neuropsychologist
- Occupational Therapist
- Clinical Pharmacist
- Palliative Care Specialist
- Speech Language Pathologist
- Social Work/Case Manager
- Primary Care Provider(s)
- Pulmonary Critical Care Physician
- Rehabilitation Medicine Specialist

Huggins, E.L. et al., AACN Adv Crit Care 2016; 27(2):204-211
Is outpatient follow-up the answer for how to treat PICS?

The PRaCTICaL study of nurse led, intensive care follow-up programmes for improving long term outcomes from critical illness: a pragmatic randomised controlled trial

Effect of a Primary Care Management Intervention on Mental Health-Related Quality of Life Among Survivors of Sepsis A Randomized Clinical Trial

Post-ICU Clinics

• Evidence demonstrating benefit has been disappointing
• No standard model for post-ICU clinic approach to care
• In the United Kingdom, 30% of ICUs have follow-up clinics
• Interdisciplinary approach may be beneficial
• Outcomes-based research needed to guide further recommendation
The ICU Recovery Center at Vanderbilt
Clinic Interventions

**Medical Intensive Care Unit’s Nurse Practitioner**
- Discusses work status and supports persons involved in care
- Ensures that services arranged for at discharge are received; for example, access to medications and/or home health (notifies case manager as indicated)
- Educates patient and patient’s family, health promotion, tracheostomy/wound care, nutritional assessment
- Reviews level of independence for activities of daily living with patient and patient’s family

**Clinical Pharmacist**
- Medication reconciliation
- Vaccine review/recommendation (eg, influenza and pneumococcal)

**Neurocognitive Psychologist**
- Screens for presence of anxiety, depression, and/or posttraumatic stress disorder
- Therapeutic dialogue, referrals for ongoing therapy

**Pulmonary Critical Care Physician**
- Reviews and interprets 6-minute walk and spirometry results with patient and patient’s family
- Compiles recommendations from each clinician and reviews final plan with patient and/or patient’s family

**Case Manager**
- Accesses medications and durable medical equipment as indicated
- Follows up with home health services if needed

*Figure 1*: Roles of various clinicians in constructing patients’ plan of care.

Image from: Huggins, E.L. et al., AACN Adv Crit Care 2016; 27(2):204-211
Future Research

### ICU and Hospital Stay

<table>
<thead>
<tr>
<th>Pathogenesis of PICS</th>
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<tbody>
<tr>
<td>• Risk factors</td>
</tr>
<tr>
<td>• SOI</td>
</tr>
<tr>
<td>• Duration of risk exposure</td>
</tr>
<tr>
<td>• Comorbid conditions</td>
</tr>
<tr>
<td>• Genetics</td>
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Screening for “high-risk” patients with validated tool (using EMR)

Educations initiatives (patients, families, providers, etc)

Prevention strategies

### After Hospitalization

<table>
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<th>Research with optimal cohort retention</th>
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<tr>
<td>Outcomes assessment metric (consensus?)</td>
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<tr>
<td>Improve understanding of recovery trajectory</td>
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<tr>
<td>Economic effect</td>
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Take Home Points

• PICS is a big deal for patients
• Families are affected by ICU too
• Transparency with patients and families
  – (both what we know & don’t know)
• Consider risk factors for PICS
  – (especially during handoffs)
• Research is needed to guide patient/family-centered outcomes
  – Not just survival!
References

Educational Resources

• www.myicucare.org
• www.icusteps.org
• www.icudelirium.org
• www.mobilization-network.org
• www.improvedLTO.com
• www.hopkinsmedicine.org/pulmonary/research/outcomes_after_critical_illness_surgery
Post-Intensive Care Syndrome: Questions/Comments

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