

Post Intensive Care Syndrome (PICS)

LAUREL STEPHENSON, MD

STACY JEPSEN, MSN, RN, ACNS-BC, CCRN

PICS & PICS-F

Post Intensive Care Syndrome (PICS) is defined as new or worse physical, cognitive, or mental impairments after critical illness or intensive care.

- Leads to- Intensive care unit (ICU) acquired weakness, cognitive dysfunction, anxiety, depression, or posttraumatic stress disorder, decreased quality of life, physical disability
- Symptoms often persist long after patient returns home

Can also be seen in caregivers of survivors- PICS-family

Admission to ICU with a critical illness and delirium are the two risk factors most closely associated with risk for developing PICS.

Other risk factors thought to contribute to the development of PICS include: mechanical ventilation during the ICU stay, older age, ICU stay >48 hours, a diagnosis of sepsis, ARDS, and use of sedative medications.

Bloom, et. al. (2020); Sanjay, et. al. (2011)

PICS Epidemiology

~5.7 million ICU admissions, ~4.8 million survivors annually in US

True PICS prevalence in survivors unknown; estimated $\geq 50\%$ will develop some component of PICS

Marra et al (2018):

- Multicenter cohort study (n= 406)
- 3 and 12 months post discharge 64% and 56% patients had 1 or more PICS problems present
- 25% and 21% had PICS problems in 2 or more PICS domains
- 6% and 4% had problems in all 3 domains
- The more years of education, more likely to be PICS free at 3 and 12 months (p<0.001)

Marra, et. al. (2018); UpToDate (2022)

PICS Background

2010- syndrome named and defined

- ‘New or worsening impairments in physical, cognitive, or mental health status arising after critical illness and persisting beyond acute care hospitalization. Can be applied to survivors or family members.’
- Naming of impairments post critical illness would facilitate awareness, screening, and studies around epidemiology, pathophysiology, treatment, and prognostication

2012- proposed development of International Classification of Disease (ICD) billing code for PICS (target ICD-11)

- Currently state- code individual manifestations (anxiety, depression, insomnia)
- Limits the national/international prevalence and epidemiology tracking of syndrome

Needham, et. al. (2012); Elliot, et. al. (2014)

PICS Recognition/Assessment

Clinical tools for assessment of PICS:

- 2019 Jeong and colleagues developed and evaluated Post-Intensive Care Syndrome Questionnaire (PICSQ)
 - 18 items, 6 items each mental, cognitive, physical
 - Reliable and valid self reporting measurement tool
 - Limitation- single country, survivors who agreed to participate
- 2019 Wang and colleagues evaluated face to face administration of Health Aging Brain and Care Monitoring Self Report (HABC-M SR)
 - 27 item questionnaire (6- cognitive, 11 functional, 10 psychological)
 - Functional and psychological subscales correlated, cognitive subscales had limitations

Wang, et. al. (2019); Jeong, et. al. (2019)

COVID-19 Impact

- First identified in November 2019 as a novel Coronavirus
- March 6, 2020 first case identified in Minnesota
- As of April, in Minnesota, there have been:
 - 1.4 million cases of COVID 19
 - 61,732 hospitalizations
 - 11,416 ICU admissions
 - 12,424 deaths
- Patients with COVID experience a variety of long-term effects and health related changes:
 - Fatigue
 - Anxiety and depression
 - Sleep difficulties
 - Dyspnea
 - Persistent changes in pulmonary function and loss of exercise tolerance

Lancet 2021; 397: 220-232

PICS Prevention/Treatment

- ABCDEF Bundle
- ICU Diaries
- Peer Support
- PICS Clinic/Post ICU Clinic

Lee, et. al. (2020); Devlin, et. al. (2018)

ABCDEF Bundle- An evidence-based interprofessional approach to symptom assessment, prevention, and management during critical illness.



ASSESS, PREVENT, AND MANAGE PAIN
Understand pain and find tools for its assessment, treatment and prevention.



BOTH SAT AND SBT
Both Spontaneous Awakening Trials and Spontaneous Breathing Trials



CHOICE OF ANALGESIA AND SEDATION
Understand the importance of defining the depth of sedation choosing the right medication.



DELIRIUM: ASSESS, PREVENT AND MANAGE
Understand delirium risk factors and find tools for its assessment, treatment and prevention.



EARLY MOBILITY AND EXERCISE
ICU early mobility involves more than changing the patient's position.



FAMILY ENGAGEMENT AND EMPOWERMENT
Involving the family in patient care can help recovery.

ABCDEF Bundle and Effect on PICS

Quality improvement project by Lee and colleagues aimed at improving the use of the bundle elements (n= ~200 critically ill patients)-

Conclusion: The ABCDE bundle in the ICU helped prevent PICS by reducing deep sedation and immobilization among intensive care patients.

Impact: The ABCDE bundle was a suitable tool to support evidence-based practice in intensive care patients, including oversedation and immobilization, which is related to the prevention of PICS.

Lee, et. al. (2020)

ICU Diaries

- Use of ICU diaries, written by staff members and families, support patient's understanding of what occurred and may alleviate their psychological suffering.
- A tool to improve patient's factual memory of the ICU stay - reduce psychological effects
 - Brings context to distorted or absent memories of the ICU
- Decrease anxiety, depression and improve health-related quality of life
- May result in less posttraumatic stress disorder among relatives of ICU patients

Nydahl, et. al. (2020); McIlroy, et. al. (2019)

Peer Support Groups

“process of providing empathy, offering advice and sharing stories between ICU survivors.....founded on the principles that both taking and giving support can be healing, if done with mutual respect”

Hypothesis of peer support- building social relationships with mutual influence on well-being and health.

Peer support groups for patients with cancer and depression have shown benefit related to recovery and self-management.

Peer support principles- acceptance, respect with dignity, mutual responsibility, trust/integrity

Hope, et. al. (2021); McPeake, et. al. (2019); Mikkelsen, et. al. (2016)

Peer Support Groups

SCCM Thrive Peer Support Collaborative- study aim “investigate the value of peer support as a mechanism for recovery”

- Study based on development stage (stage 2a of IDEAL framework) to report on sites approach looking at technical, safety, successes and barriers

Models:

- Community based
- Psychologist-led outpatient
- Models-based within ICU follow-up clinics
- Online (Mayo Health PICS Blog)
- Group-based within ICU (aimed at caregivers)
- Peer mentor models

Common barriers:

- Recruitment
- Adequate personnel and training
- Sustainability/funding
- Risk management
- Measuring success

McPeake, et. al. (2019)

Critical and Acute Illness Recovery Organization (CAIRO)

A global collaborative of multidisciplinary groups dedicated to improving outcomes for ICU survivors and their families.



Mission

Our mission is to promote and support global collaboratives to advance innovations in critical and acute illness recovery through:

- Outreach and Education
- Policy and Advocacy
- Research and Evaluation



Vision

We envision a world in which the critical care community can effectively meet the needs of critical and acute illness survivors and their loved ones.

17 Peer Support Collaborative sites (9 in US)

35 Post ICU Clinic Collaborative sites (28 in US)

<https://sites.google.com/umich.edu/cairo>

PICS Clinic/ICU Recovery Clinic

- Development of ICU Recovery clinics started 20 years ago in the UK
- Smaller scale ICU recovery clinics are starting in the US
- Given the unique challenges faced by ICU survivors, a unique clinic experience with different aims is needed to provide support and care
- Evaluation of patient interest in clinics suggests a currently unmet need
- Goal of clinics, organizational structure and evaluation of outcome metrics remain undefined

ACCN 2016; 27: 204-211

PICS Clinic Vision

- Multidisciplinary clinic
 - Intensivist
 - Pharmacist
 - Neuropsychiatry
 - Nursing
- Clinic will be able to accommodate multiple providers, evaluations and identify needs of the patient, with appropriate referrals and counselling

Consult Criteria

- ICU survivorship, with expected survival for an additional 6 months
 - AND any of the following:
 - Prolonged ICU stay (>7 days) with diagnosis of ARDS or sepsis
 - Prolonged mechanical ventilation (>96 hours)
 - ECMO
- Identification of patients during ICU stay
 - RN care coordinator meets with pt and family prior to discharge
 - If discharging to home, will have follow up visit scheduled prior to discharge
 - Rehab or other discharge, will coordinate with facility to schedule follow up

Clinic Care Model

- Similar to the clinic started in Vanderbilt in 2011, and modeled after our local Memory Care Clinic
- Multidisciplinary, staged visit, anticipated length of visit ~2 hours
 - Team Huddle to start the day
 - Check in, vitals, initial post-ICU evaluation
 - Meet with pharmacist
 - Medication reconciliation, discussion regarding adverse effects, med issues, vaccinations
 - Meet with neuropsychiatrist
 - Detailed testing regarding cognitive function, psychiatric symptoms
 - Meet with intensivist
 - Review current health status, barriers to full functioning, identify any potential interventions

Process/Outcome Measures

- Capture and follow up with at least 160 qualified patients within the first 12 months of operation, including successful:
 - Identification and referral of ICU patients meeting criteria
 - Inpatient referral for PICS consult completed by RN care coordinator and Social Worker
 - PICS clinic appointment scheduled or at d/c from secondary facility
 - 70% show rate for clinic appointment
- Readmission rates, mortality at level of or below matched peers
- Completion of:
 - PICSQ, neuropsych testing and self reported survey reflective of PICS
 - Post visit survey 90-100 days following visit with reassessment of quality of life measures

Next Steps

- **Finalize funding**
 - Real world issues of funding, billing, provider compensation, and defining target population persist but are not insurmountable
- **Finalize outcome measurements**
 - Identify previously validated tools to measure PICS
 - Identify validated tools to assess patient centered outcomes following clinic visit
 - Identify measurable success to show financial value of a clinic
- **Staffing and referral initiation**
 - RN care coordinators, Social Workers, and PICS RN staff
- **Open the clinic!**

References

Bloom S., Stollings J., Kirkpatrick O., Wang L., Byrne D., Sevin C., Semler M. (2019) Randomized clinical trial of an ICU recovery pilot program for survivors of critical illness. *Critical Care Medicine*. 47(10):1337-1345

Davidson J., Harvey M., Schuller J., Black G. (2013). Post-intensive care syndrome: What to do and how to prevent it. *American Nurse Today*. 8(5); 32-37.

Desai S., Law T., Needham D. (2011) Long-term complications of critical care. *Critical Care Medicine*. 39(2): 371-379.

Devlin J. W., Skrobik Y., Gélinas C., Needham D. M., Slooter, A. J. C., Pandharipand, P. P., et. al. (2018). Clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. *Critical Care Medicine*. 46(9):49.

Elliott D., Davidson J., Harvey M., Bemis-Dougherty, A., Hopkins R., Iwashyna T., et. al. (2014). Exploring the scope of post-intensive care syndrome therapy and care: Engagement of non-critical care providers and survivors in a second stakeholder meeting. *Critical Care Medicine*. 42(12):2518-2526.

Hope, A., Johnson, A., McPeake, J., Felt, H., Sevin, C., Mikkelsen, M., et. al. (2021) Establishing a peer support program for survivors of COVID-19: A report from the critical and acute illness Recovery organization. *American Journal of Critical Care*. 30(2): 150-154.

Jeong Y., Kang J. (2019) Development and validation of a questionnaire to measure post-intensive care syndrome. *Intensive Critical Care Nurse*. 55: 1-7.

References

Lee YM., Kim K., Lim C., Kim J. (2020) Effects of the ABCDEF bundle on the prevention of post-intensive care syndrome: A retrospective study. *Journal of Advanced Nursing*. 76(2):588-599.

Marra A., Pandharipande P., Girard T., Patel M., Hughes C., Jackson J., et. al. (2018) Co-occurrence of post-intensive care syndrome problems among 406 survivors of critical illness. *Critical Care Medicine*. 46(9): 1393-1401.

McIlroy P., King R., Garrouste-Orgeas M., Tabah A., Ramanan M. (2019) The effect of ICU diaries on psychological outcomes and quality of life of survivors of critical illness and their relatives: a systematic review and meta-analysis. *Critical Care Medicine*. 47(2): 273-279.

McPeake J., Hirshber, E., Christie L., Drumright K., Haines K., Hough C., et. al. (2019) Models of peer support to remediate post-intensive care syndrome: A report developed by the Society of Critical Care Medicine thrive international peer support collaborative. *Critical Care Medicine*. 47: e21-e27.

Mikkelsen, M., Bunnell, A., Jackson, J., Christie, L., Hopkins, R., Greenberg, S., et. al. (2016) Peer support as a novel strategy to mitigate post-intensive care syndrome. *AACN Advanced Critical Care*. 27(2): 221-229.

Needham D., Davidson J., Cohen H., Hopkins R., Weinert C., Wunsch H., et. Al. (2012) Improving long-term outcomes after discharge from intensive care unit: Report from a stakeholders' conference. *Critical Care Medicine*. 40(2):502-509.

References

Nydahl P., Egerod I., Hosey M., Needham D., Jones C., Bienvenu OJ. (2020) Report on the third international intensive care unit diary conference. *Critical Care Nurse*. 40(5): e18-e27.

Pun, B., Balas M., Barnes-Daly MA., Thompson J., Aldrich M., Barr J., et. al. (2018) Caring for critically ill patients with the ABCDEF Bundle: Results of the ICU liberation collaborative in over 15,000 adults. *Critical Care Medicine*. 47(1): 3-14.

SCCM (2021) Post-intensive care syndrome clinic lessons learned from three centers. *Critical Connections*. Accessed March 24, 2022 at <https://sccm.org/getattachment/f3242060-d8b9-4835-b1e4-0e8d502ad56a/Post-Intensive-Care-Syndrome-Clinics-Lessons-Lear>

UpToDate (2022) Post-intensive care syndrome (PICS). Accessed March 24th, 2022.

Wang S., Allen D., Perkins A., Monahan P., Khan S., Lasiter S., et. al. (2019) Validation of a new clinical tool for post-intensive care syndrome. *American Journal of Critical Care*. 28(1): 10-18.

Minnesota Department of Health website, accessed 4/8/2022 [Situation Update for COVID-19 - Minnesota Dept. of Health \(state.mn.us\)](https://www.health.state.mn.us/covid19/situationupdate/)

Huang, Huang, Wang, Li, Ren, Gu, Kang, Guo, Liu, Zhou, Luo, Huang, Tu, Zhao, Chen, Xu, Li, Li, Peng, Li, Xie, Cui, Shang, Fan, Xu, Wang, Wang, Zhong, Wang, Wang, Zhang, Cao. 6-month consequence of COVID-19 in patients discharged from hospital: a cohort study. *Lancet* 2021 Jan 16; 397(10270): 2022-232.