Strategies for Enhancing Sepsis Survivorship

Hallie Prescott, MD, MSc

Ohio Hospital Association

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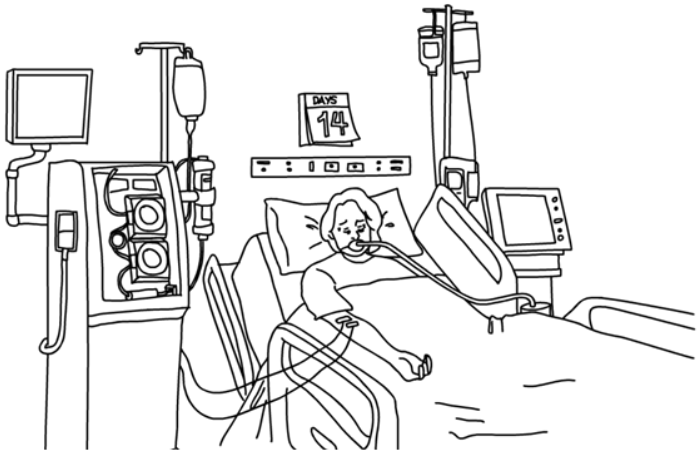
Last Time



July Conclusions

- Sepsis survivors face heightened risk for death. 1 in 5 sepsis survivors with a late death attributable to sepsis.
- Over half of patients acquire new physical disability.
- Cognitive decline common; ~15% with mod-severe impairment
- Anxiety, depression, PTSD each affect ~1/3 of survivors – but not necessarily worse after sepsis.
- Healthcare use and readmission are common. Often due to the same “usual suspects”—that we know how to treat: infection, CHF, AKI, COPD, aspiration.
- Risk for Infection, AKI, aspiration, and CV events are increased in sepsis survivors.

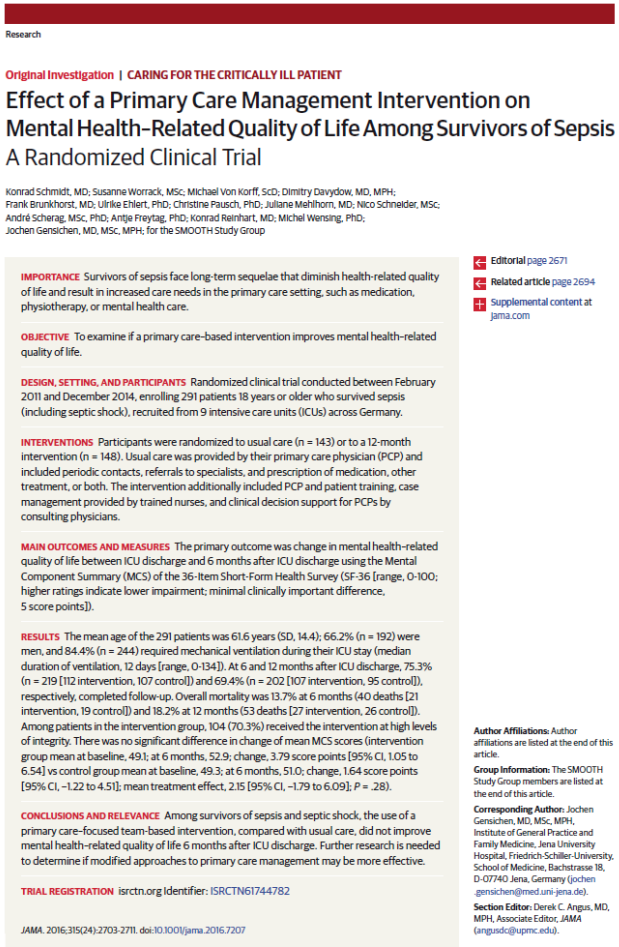
Question

What can we do to improve long-term survivorship after sepsis?

Outline

- Review the (small) evidence base of post-hospital interventions for survivors of sepsis / critical illness.
- My “Top 8” list

SMOOTH Study



Research

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of a Primary Care Management Intervention on Mental Health–Related Quality of Life Among Survivors of Sepsis

A Randomized Clinical Trial

Konrad Schmidt, MD; Susanne Worrack, MSc; Michael Von Korff, ScD; Dimitry Davydow, MD, MPH; Frank Brunkhorst, MD; Ulrike Ehlert, PhD; Christine Pausch, PhD; Juliane Mehlhorn, MD; Nico Schneider, MSc; André Scherag, MSc, PhD; Antje Freytag, PhD; Konrad Reinhart, MD; Michel Wensing, PhD; Jochen Gensichen, MD, MSc, MPH; for the SMOOTH Study Group

IMPORTANCE Survivors of sepsis face long-term sequelae that diminish health-related quality of life and result in increased care needs in the primary care setting, such as medication, physiotherapy, or mental health care.

OBJECTIVE To examine if a primary care–based intervention improves mental health–related quality of life.

DESIGN, SETTING, AND PARTICIPANTS Randomized clinical trial conducted between February 2011 and December 2014, enrolling 291 patients 18 years or older who survived sepsis (including septic shock), recruited from 9 intensive care units (ICUs) across Germany.

INTERVENTIONS Participants were randomized to usual care (n = 143) or to a 12-month intervention (n = 148). Usual care was provided by their primary care physician (PCP) and included periodic contacts, referrals to specialists, and prescription of medication, other treatment, or both. The intervention additionally included PCP and patient training, case management provided by trained nurses, and clinical decision support for PCPs by consulting physicians.

MAIN OUTCOMES AND MEASURES The primary outcome was change in mental health–related quality of life between ICU discharge and 6 months after ICU discharge using the Mental Component Summary (MCS) of the 36-Item Short-Form Health Survey (SF-36 [range, 0-100; higher ratings indicate lower impairment; minimal clinically important difference, 5 score points]).

RESULTS The mean age of the 291 patients was 61.6 years (SD, 14.4); 66.2% (n = 192) were men, and 84.4% (n = 244) required mechanical ventilation during their ICU stay (median duration of ventilation, 12 days [range, 0-134]). At 6 and 12 months after ICU discharge, 75.3% (n = 219 [112 intervention, 107 control]) and 69.4% (n = 202 [107 intervention, 95 control]), respectively, completed follow-up. Overall mortality was 13.7% at 6 months (40 deaths [21 intervention, 19 control]) and 18.2% at 12 months (53 deaths [27 intervention, 26 control]). Among patients in the intervention group, 104 (70.3%) received the intervention at high levels of integrity. There was no significant difference in change of mean MCS scores (intervention group mean at baseline, 49.1; at 6 months, 52.9; change, 3.79 score points [95% CI, 1.05 to 6.54] vs control group mean at baseline, 49.3; at 6 months, 51.0; change, 1.64 score points [95% CI, −1.22 to 4.51]; mean treatment effect, 2.15 [95% CI, −1.79 to 6.09]; $P = .28$).

CONCLUSIONS AND RELEVANCE Among survivors of sepsis and septic shock, the use of a primary care–focused team-based intervention, compared with usual care, did not improve mental health–related quality of life 6 months after ICU discharge. Further research is needed to determine if modified approaches to primary care management may be more effective.

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Supplemental content at jama.com

Author Affiliations: Author affiliations are listed at the end of this article.

Group Information: The SMOOTH Study Group members are listed at the end of this article.

Corresponding Author: Jochen Gensichen, MD, MSc, MPH, Institute of General Practice and Family Medicine, Jena University Hospital, Friedrich Schiller University, School of Medicine, Bachstrasse 18, D-07740 Jena, Germany (jochen.gensichen@med.uni-jena.de).

Section Editor: Derek C. Angus, MD, MPH, Associate Editor, *JAMA* (angusdc@upmc.edu).

- RCT of a primary care-based intervention
- 291 Sepsis survivors, recruited from 9 ICUs in Germany
- Intervention:
  - PCP & patient education
  - Case management by critical care nurses, focusing on symptoms
  - Clinical decision support by intensivist
- Primary Outcome: Mental Health-related QOL at 6 months
- Secondary: 32 measures as 6 and 12 months.

SMOOTH Study Results

- Primary Outcome (Mental Health) – no difference
- Secondary Outcomes
  - Survival
  - QOL (SF-36 Subscales)
  - Mental Health (depression, PTSD, cognition)
  - Self health-assessment
  - Healthcare Utilization
  - Functional outcomes → 5 measures with significant treatment effect
    - Median ADL capabilities at 6 and 12 months, ~1 ADL better
    - Lower disability and better physical function at 6 months
    - Less insomnia at 12 months

RCTs of Post-Discharge Rehab

Improvements are generally small and not sustained.
Studies were all <200 patients.

Study	Intervention	Control	Outcome
Jones, et al. 2003	6-wk self-help rehabilitation manual	ICU follow-up program with 2 ward visits, 3 calls, and ICU follow-up clinic visit at 2 and 6 mos.	Faster improvement in physical function (SF-36).
Elliot, et al. 2011	8-wk home PT (3 visits) and rehabilitation manual.	Routine PCP follow-up.	No significant treatment effect, but post-hoc analysis showed possible benefit.
Jackson, et al. 2012	12-wk home cognitive, physical, and functional rehab.	Usual care.	Improved executive and physical function (Tower test, functional activities questionnaire).
Batterham, et al. 2012.	8-wk PT program	Usual care	Improved anaerboic threshold at 9 weeks.

RCTs of ICU Follow-up, Case Mgmt

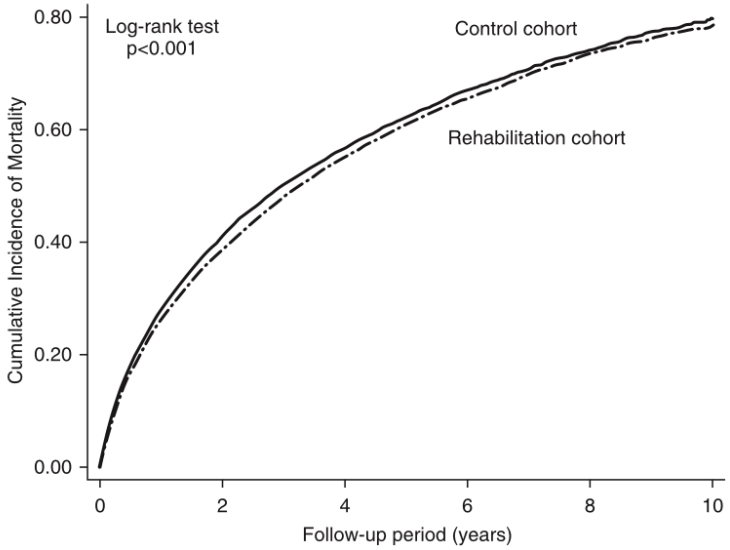
No treatment effect.

Study	Intervention	Control	Outcome
Daly, et al. 2005 Douglas, et al. 2007	2-month disease mgmt program including care coordination, family support, education, and treatment monitoring by APRN, with geriatrician and pulmonary support.	Usual care	No difference in readmission or time to readmission. Fewer days spent readmitted 11.4, vs 16.7, *p*=0.03.
Cuthbertson, et al. 2009	RN-led ICU follow-up clinic at 3 and 9 mos	Usual care	No significant treatment effect for mortality, QOL, anxiety, or depression.
Jensen, et al. 2016	RN-led ICU follow-up clinic at 1-3 mos. and 2 phone calls.	Usual care.	No significant treatment effect for QOL, anxiety, depression, or sense of coherence.

Association of Post-Discharge Rehabilitation with Mortality in Intensive Care Unit Survivors of Sepsis

Pei-wen Chao[1,2*], Chia-Jen Shih[3,4*], Yi-Jung Lee[4,5], Ching-Min Tseng[4,6], Shu-Chen Kuo[4,7,8], Yu-Ning Shih[9], Kun-Ta Chou[4,10], Der-Cherng Tarng[4,11], Szu-Yuan Li[4,11], Shuo-Ming Ou[4,11,12], and Yung-Tai Chen[4,13]

- observational study of over 30,000 sepsis survivors
- rehabilitation associated with a survival benefit to 10-years (aHR=0.94, p<0.001)



Interim Conclusions

- Existing studies show possible, small benefits, largely isolated to functional outcomes.
- Best practices for enhancing sepsis survivorship have not been defined.

My “Top 8” List
for enhancing survivorship
after sepsis

1. Timely and Effective Sepsis Treatment

- Broad-spectrum Abx
- 30ml/kf IVF if SBP<90 or lactate>2
- Source control

Evidence: Time to treatment associated with ↓ mortality.

- Seymour, *et al. NEJM*. 2017
- Liu, *et al. AJRCCM*. 2017

1. Timely and Effective Sepsis Treatment, cont'd

- Broad-spectrum Abx
- 30ml/kf IVF if SBP<90 or lactate>2
- Source control

Evidence: Health system-wide QI targeting these elements is associated with reduced mortality.

- Miller, *et al. AJRCCM*. 2013
- Liu, *et al. AJRCCM*. 2016

2. Avoidance of Iatrogenic Harms

A: Assess and treat pain
B: Both SAT and SBT
C: Choice of sedation / analgesia
D: Delirium screening and prevention
E: Early mobility
F: Family Engagement and Empowerment

Evidence:
Girard, *et al. Lancet*. 2008. Combined SAT & SBT; NNT= 7 patients.

3. Early Mobility

Early mobility, to the goal of ambulation on mechanical ventilation, should be initiated as early as possible.

Evidence:

Schweickert, *et al. Lancet.* 2009. Indep fxn in 58% vs 35%, p=0.02

4. Pay Attention to Discharge Medications

4. Pay Attention to Discharge Medications, 2

- Chronic medications <u>discontinued</u>
  (e.g. synthroid, gastric acid suppression, anticoagulants, and statins.)

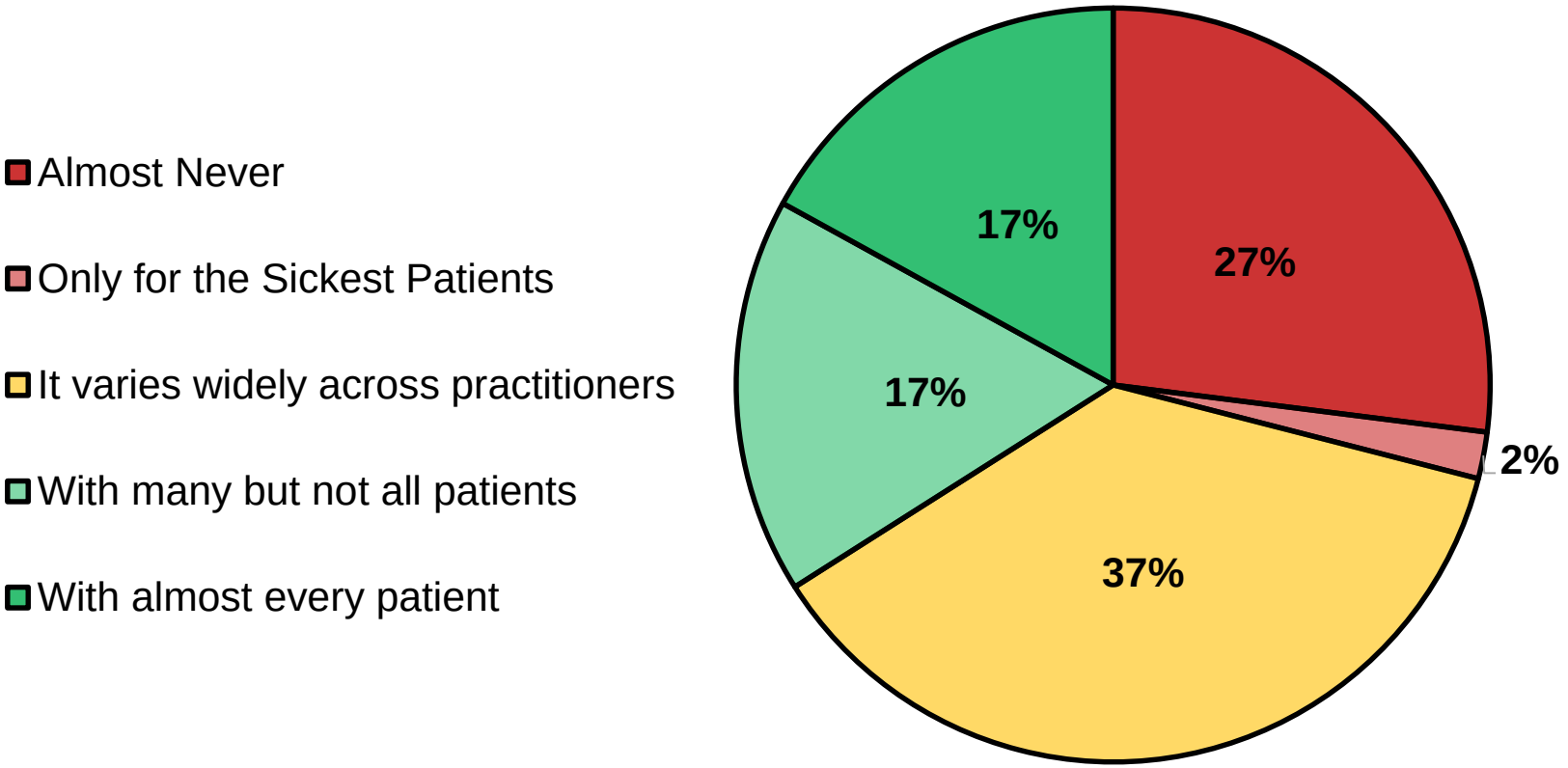
4. Pay Attention to Discharge Medications, 3

- Chronic medications <u>discontinued</u>
  (e.g. synthroid, gastric acid suppression, anticoagulants, and statins.)
- Acute medications <u>continued</u>
  (eg. antipsychotics, antidepressants, benzodiazepines, gastric acid suppression, inhalers)

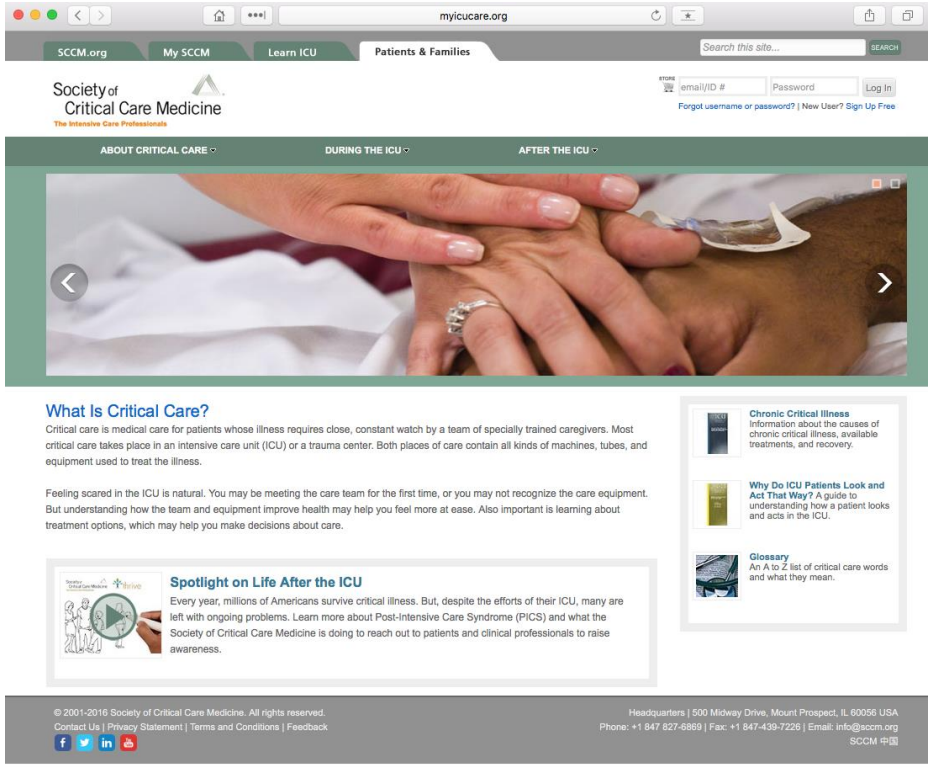
Bell, *et al*. *JAMA*. 2009.
Morandi, *et al. J Am Geriatric Soc*. 2013.
Scales, *et al. J Gen Intern Med*. 2016.

5. Prepare Patients

"Do medical teams in your ICU have formal discussions with patients or family members regarding challenges or changes to their lives after ICU discharge?"



5. Prepare Patients, cont'd



<u>Available videos on SCCM site:</u>

"THRIVE: Redefining Recovery"

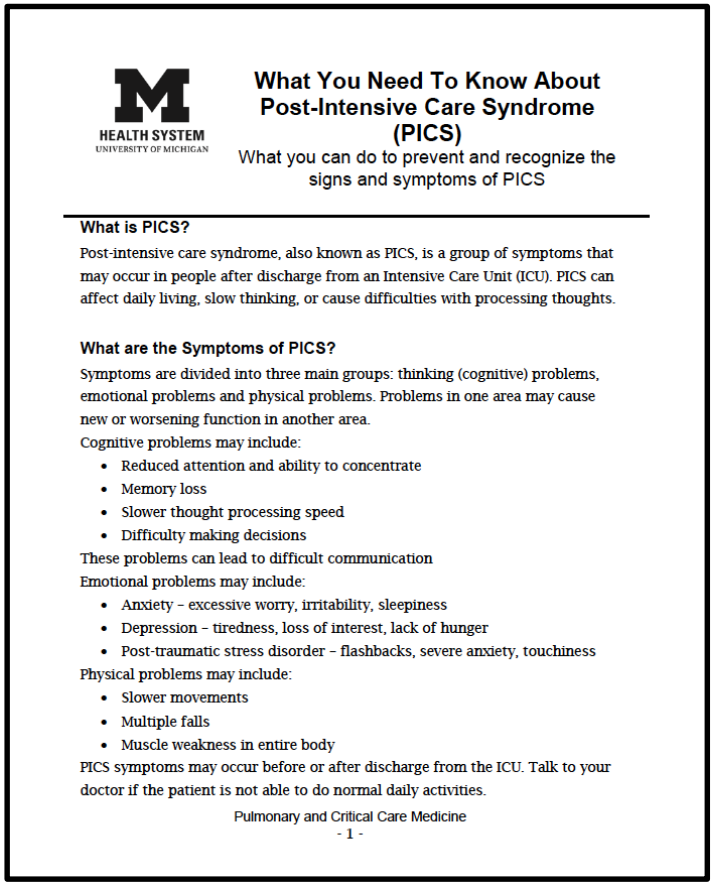
"Discharge from the ICU"

"Pediatric Post-Intensive Care Syndrome"

"Pediatric PICS and Family"

"Wellness after the ICU"

5. Prepare Patients: Other resources



HEALTH SYSTEM
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What You Need To Know About Post-Intensive Care Syndrome (PICS)

What you can do to prevent and recognize the signs and symptoms of PICS

What is PICS?

Post-intensive care syndrome, also known as PICS, is a group of symptoms that may occur in people after discharge from an Intensive Care Unit (ICU). PICS can affect daily living, slow thinking, or cause difficulties with processing thoughts.

What are the Symptoms of PICS?

Symptoms are divided into three main groups: thinking (cognitive) problems, emotional problems and physical problems. Problems in one area may cause new or worsening function in another area.

Cognitive problems may include:

- Reduced attention and ability to concentrate
- Memory loss
- Slower thought processing speed
- Difficulty making decisions

These problems can lead to difficult communication

Emotional problems may include:

- Anxiety – excessive worry, irritability, sleepiness
- Depression – tiredness, loss of interest, lack of hunger
- Post-traumatic stress disorder – flashbacks, severe anxiety, touchiness

Physical problems may include:

- Slower movements
- Multiple falls
- Muscle weakness in entire body

PICS symptoms may occur before or after discharge from the ICU. Talk to your doctor if the patient is not able to do normal daily activities.

Pulmonary and Critical Care Medicine

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5. Prepare Patients: Other resources, cont'd

Patient education websites:

Post-Sepsis:

Sepsis Alliance home page (www.sepsisalliance.org) Hundreds of patient profiles, indexed by key words.

Post-Critical Illness:

Health Talk home page (www.healthtalk.org) 27 video profiles and 87 articles on critical illness

ICUsteps home page (www.icusteps.org) informational site and ICU and common illnesses

6. Focus on the “Big 5” after discharge

6. Focus on the “Big 5” after discharge, [2]

Table. Most Frequent Readmission Diagnoses After Hospitalization for Severe Sepsis

Diagnosis[a]	Severe Sepsis (n = 2617)	
	No. of Survivors	% (95% CI)
Sepsis	167	6.4 (5.4-7.3)
Congestive heart failure	144	5.5 (4.6-6.4)
Pneumonia	92	3.5 (2.8-4.2)
Acute renal failure	87	3.3 (2.6-4.0)
Rehabilitation	74	2.8 (2.2-3.5)
Respiratory failure	65	2.5 (1.9-3.1)
Complication of device, implant, or graft	52	2.0 (1.5-2.5)
COPD exacerbation	49	1.9 (1.4-2.4)
Aspiration pneumonitis	47	1.8 (1.3-2.3)
Urinary tract infection	44	1.7 (1.2-2.2)

6. Focus on the “Big 5” after discharge, [3]

Infection

CHF Exacerbation

Acute Renal Failure

COPD Exacerbation

Aspiration Pneumonitis

6. Focus on the “Big 5” after discharge, 4

Infection → confirm/update vaccines, council patients, eval s/s of infection

CHF Exacerbation

Acute Renal Failure

COPD Exacerbation

Aspiration Pneumonitis

6. Focus on the “Big 5” after discharge, 5

Infection → confirm/update vaccines, council patients, eval s/s of infection

CHF Exacerbation → med rec/titration, consider change to gfr, LVEF

Acute Renal Failure

COPD Exacerbation

Aspiration Pneumonitis

6. Focus on the “Big 5” after discharge, [6]

Infection → confirm/update vaccines, council patients, eval s/s of infection

CHF Exacerbation → med rec/titration, consider change to gfr, LVEF

Acute Renal Failure → med rec/titration, monitoring

COPD Exacerbation

Aspiration Pneumonitis

6. Focus on the “Big 5” after discharge, 7

Infection → confirm/update vaccines, council patients, eval s/s of infection

CHF Exacerbation → med rec/titration, consider change to gfr, LVEF

Acute Renal Failure → med rec/titration, monitoring

COPD Exacerbation → med rec/titration of inhalers, respiratory suppressants

Aspiration Pneumonitis

6. Focus on the “Big 5” after discharge, 8

Infection → confirm/update vaccines, council patients, eval s/s of infection

CHF Exacerbation → med rec/titration, consider change to gfr, LVEF

Acute Renal Failure → med rec/titration, monitoring

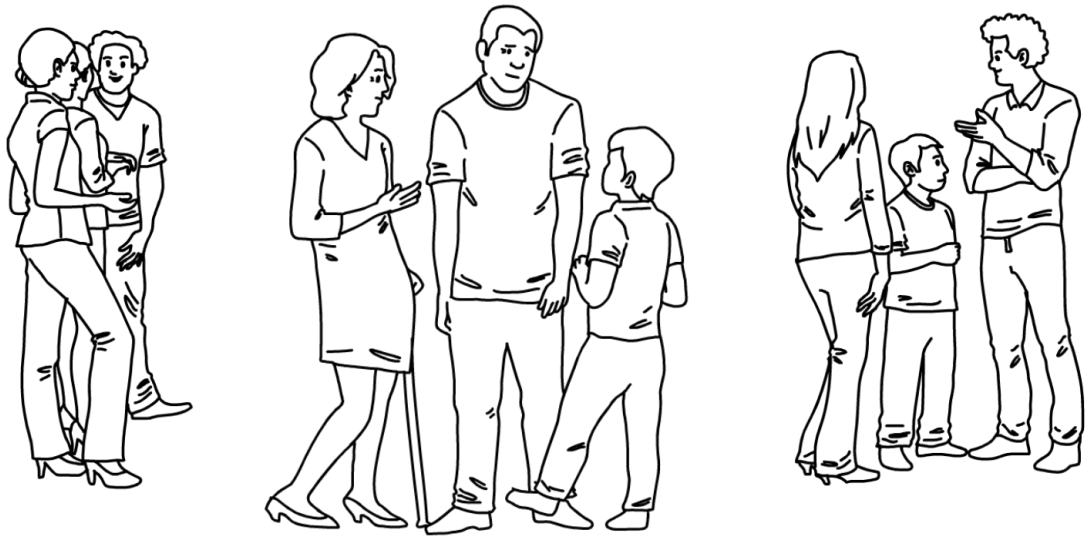
COPD Exacerbation → med rec/titration of inhalers, respiratory suppressants

Aspiration Pneumonitis → consider formal SLP eval/tx for dysphagia, weakness, cognitive impairment, and/or ”recurrent pneumonia”

7. Empower Patients to Help Each Other

thrive

Peer Support Groups



7. Empower Patients to Help Each Other, 2

Upcoming Virtual Support Groups

Weekly virtual support groups offer an option to call in or use video conferencing, if your computer has a camera.

Every Wednesday

Join via Phone
Dial: +1 646 558 8656 (US Toll) or +1 408 638 0968 (US Toll)
Meeting ID: 186 888 525
International numbers available: https://zoom.us/zoomconferencehtht

Join via Video using Zoom
https://zoom.us/j/186888525

Closed group: “THRIVE for ICU patients/families”

8. Increase Function: Use It or Lose It

- Screen for functional impairment at hospital discharge and first outpatient follow-up:
  - E.g. ADL limitations, 6 minute walk, Timed Up and Go test

- Address new weakness and functional impairment
  - Structured exercise program
  - Physical therapy
  - Occupational therapy
  - Cardiac or pulmonary rehabilitation

Top 8 List for Enhancing Survivorship

1. Timely and effective inpatient sepsis treatment
2. Avoidance of iatrogenic harms
3. Early mobility
4. Attention to discharge meds (reconcile and titrate)
5. Prepare patients about what to expect
6. Focus on “Big 5” causes of preventable readmission
7. Peer Support
8. Promote functional recovery

Other Things to Keep in Mind….

- For patients declining prior to sepsis, it may be appropriate to focus on palliation.

Other Things to Keep in Mind … 2

- Be weary of the “kitchen sink” approach

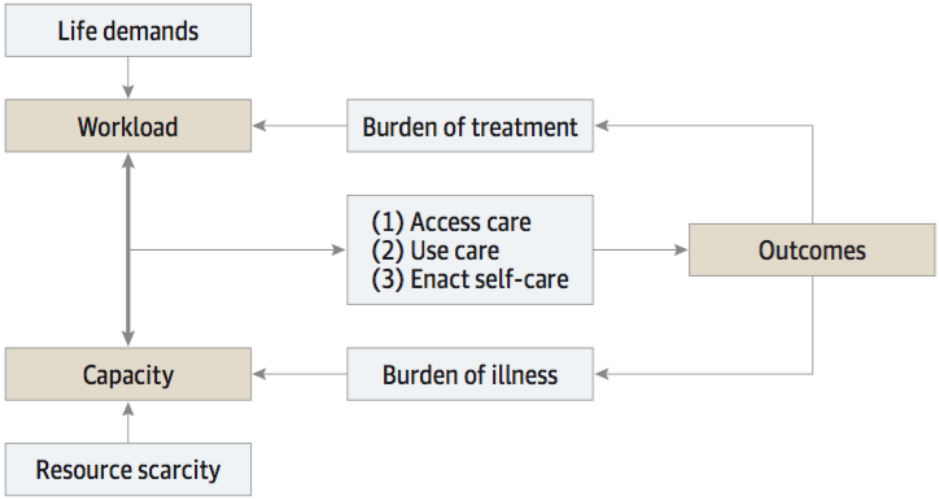
Plan:
New psychotropic medications
Referral to mental health professionals
ICU follow-up Clinic
Cognitive Therapy
Physical Therapy
Occupational Therapy
Speech Therapy
Pulmonologist
PCP
Cardiologist
Nephrologist
Endocrinologist

Other Things to Keep in Mind … 3

Workload: all the work of being a patient; efforts to understand and plan care, enroll support of others, access and use healthcare services

Capacity: quality and availability of resources to carry out the work of being a patient.

Figure 1. The Cumulative Complexity Model



Patient context is represented as a balance between workload and capacity. This balance must be optimized to ensure care effectiveness and improve outcomes. In turn, the outcomes achieved feed back to affect the workload-capacity balance.

Leppin, *et al. JAMA Internal Med.* 2014.

Top 8 List for Enhancing Survivorship, 2

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9. Consider palliative approach
10. Avoid the “kitchen sink” approach

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Questions

@hallieprescott hprescot@med.umich.edu