



PIC-ing Up on Post-Intensive Care Syndrome

Current Care Gaps and Strategies for Management

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Pharmacy Grand Rounds
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DISCLOSURE

Relevant Financial Relationship(s)

None

Off Label Usage

None

Learning Objectives

- Describe the incidence and clinical manifestation of post-intensive care syndrome (PICS)
- Review literature examining the long term implications of critical illness
- Discuss current strategies to address care gaps related to PICS symptoms recognition and management

Post-Intensive Care Syndrome, by 'The Book'

“new or worsened impairments in physical,
cognitive, and mental health that remain
after critical illness”

Physical

- Pain
- Weakness
- Muscle loss
- Neuropathy
- Decreased appetite
- Hair loss
- Beau's lines
- (Concomitant comorbidities)

Cognitive

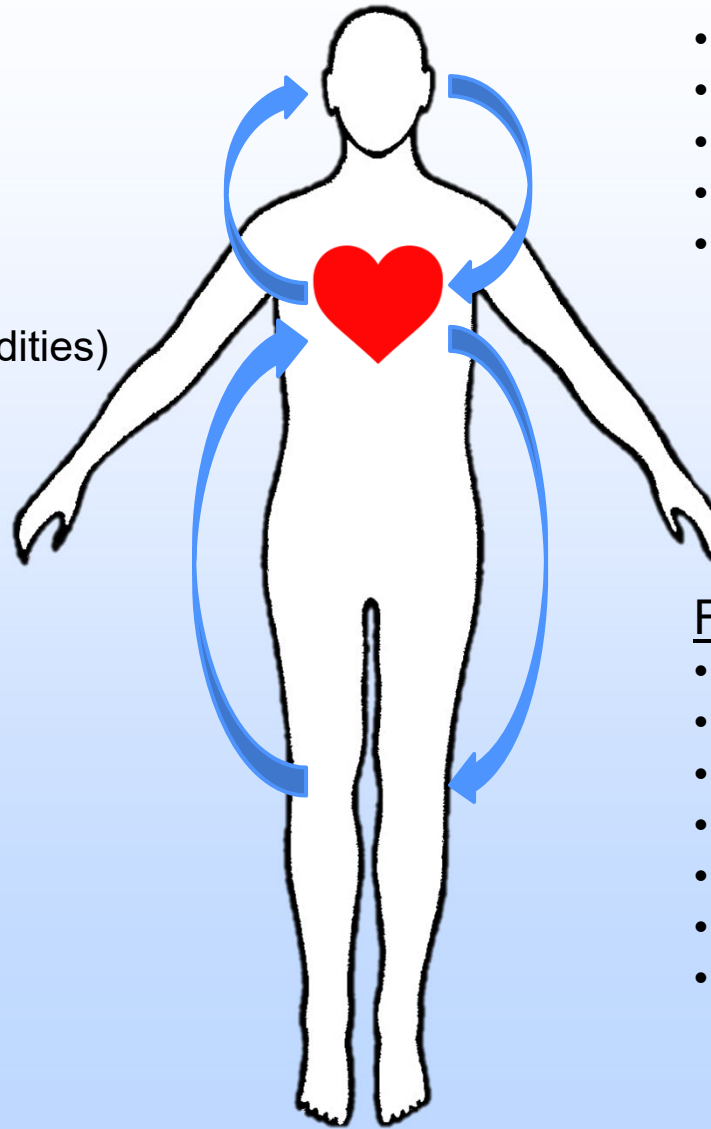
- Memory disorders
- Difficulty with executive function
- Aphasia

Mental Health

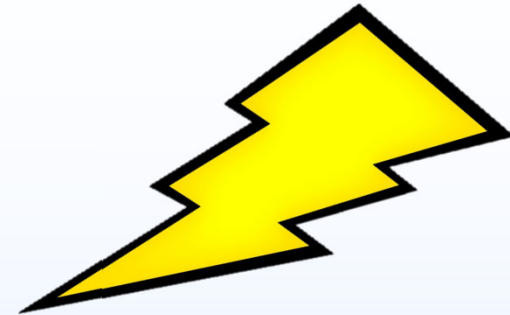
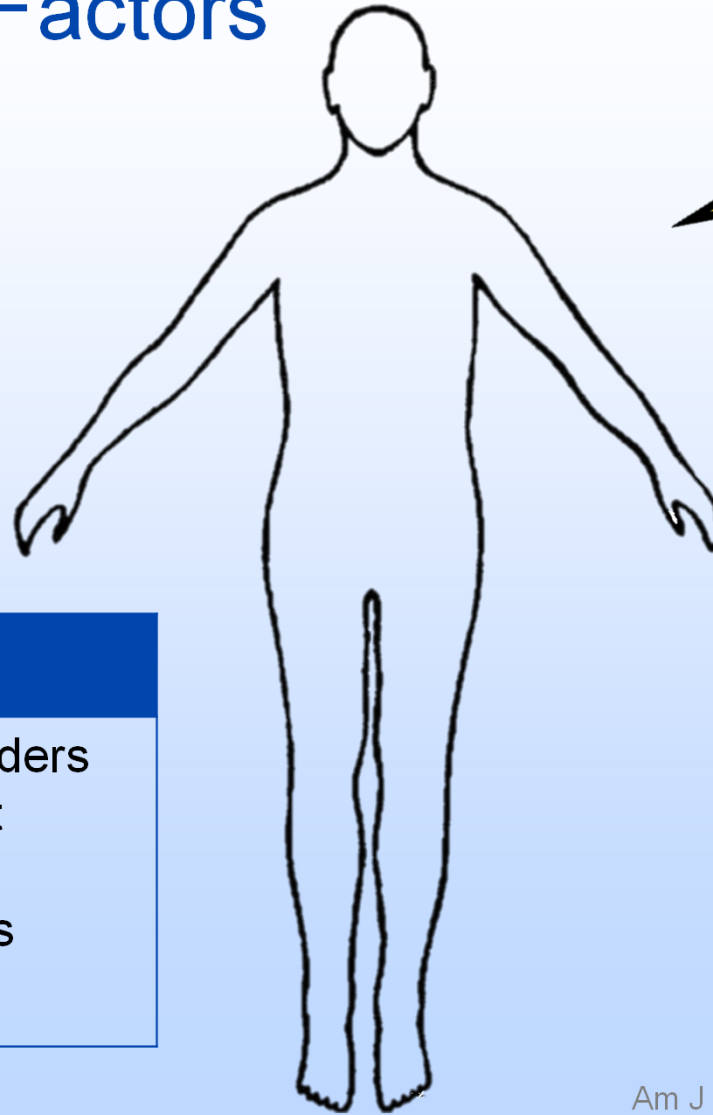
- Anxiety
- Depression
- PTSD
- Insomnia
- Nightmares
- Social isolation

Family – PICS-F

- Sleep disturbance
- Anxiety
- Depression
- Loss of work
- Financial strain
- Breakdown of coping skills
- PTSD



PICS: Risk Factors

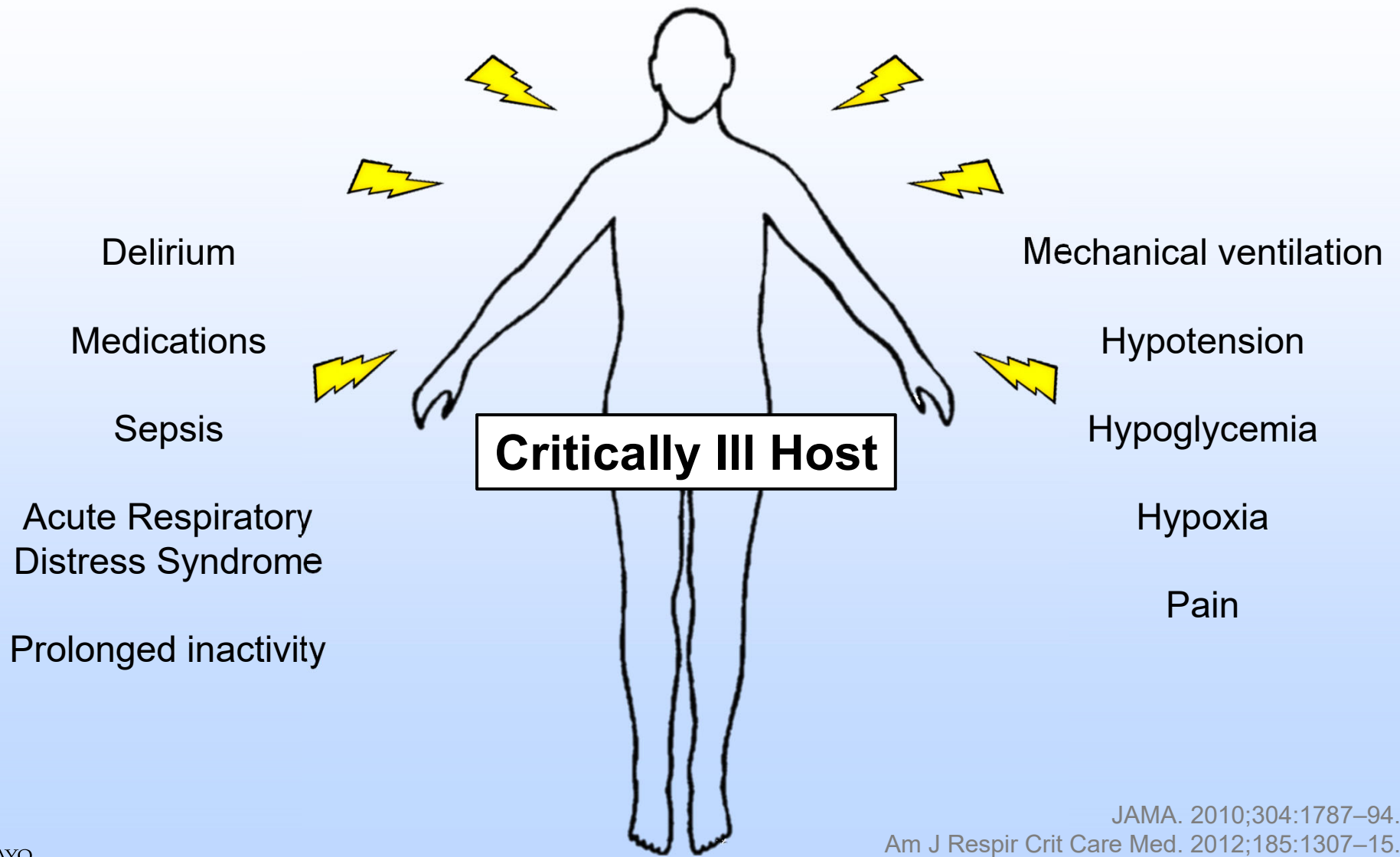


Critical Illness

Host Factors

- Neuromuscular disorders
- Cognitive impairment
- Psychiatric illness
- Multiple comorbidities
- Frailty

PICS: ICU Risk Factors



Delirium and PICS

- Delirium affects ~30-80% of ICU patients
- 80% of individuals with PICS report suffering from delirium at some point during hospitalization

<u>Short Term</u>	<u>Long Term</u>
Family distress	3-fold increase in 6 month mortality
Decreased participation in care	New cognitive impairment in 50% of individuals at discharge
	<u>12 months:</u>
	1/4 patients = mild Alzheimer's
	1/3 patients = moderate TBI
Increase likelihood of new nursing home placement	

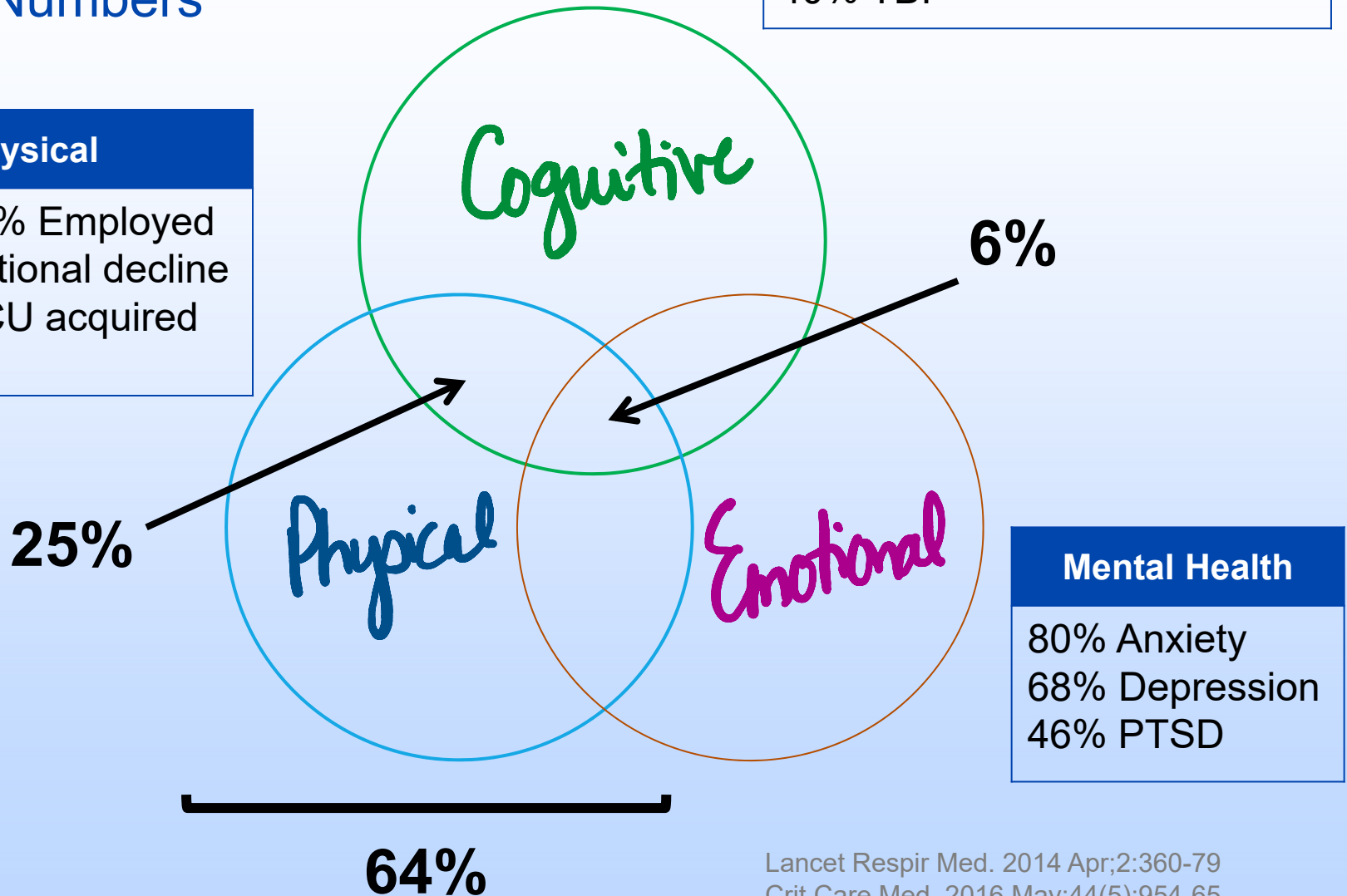
PICS Symptoms: By the Numbers

Physical

70% → 23% Employed
53% Functional decline
25-80% ICU acquired weakness

Cognitive

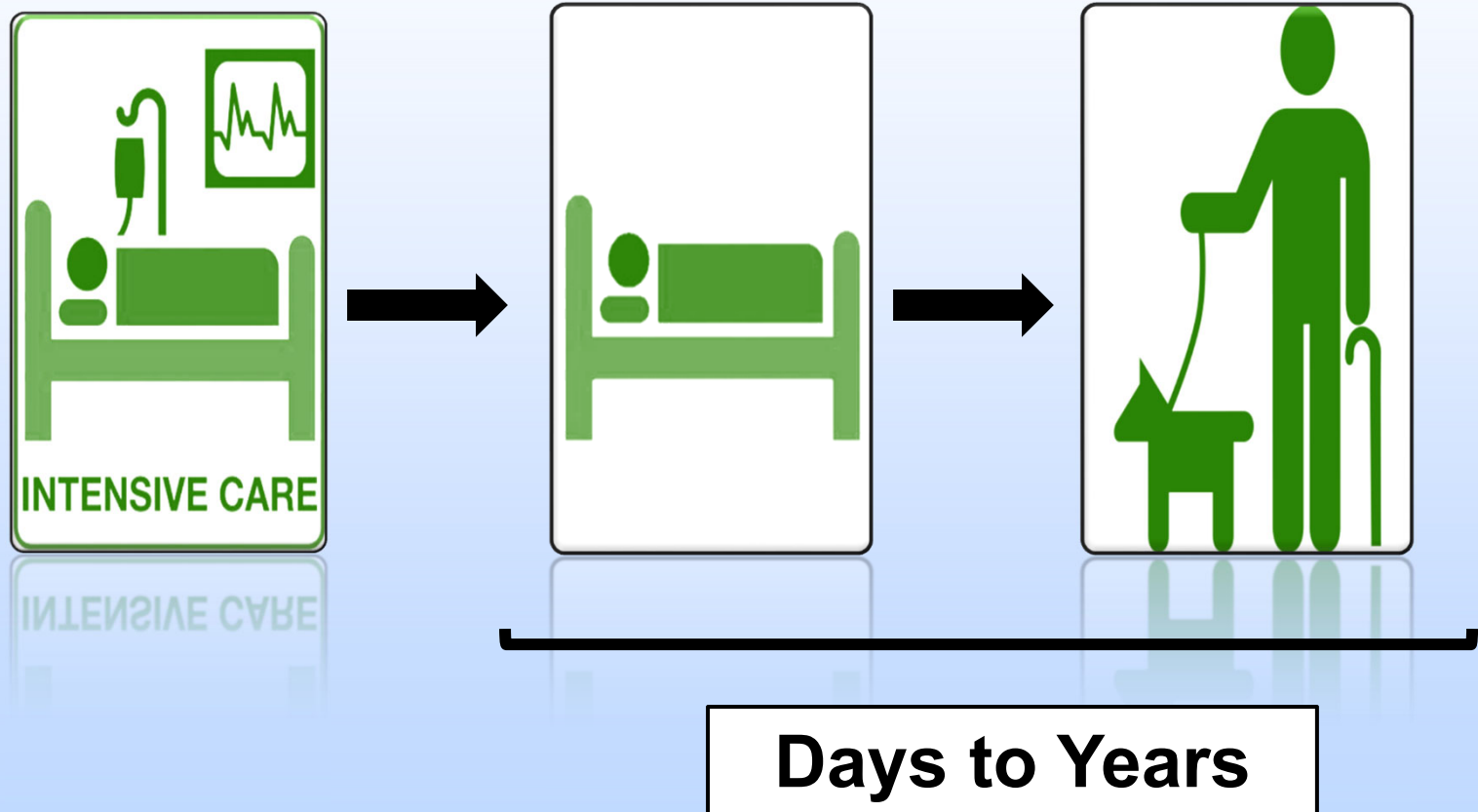
24% Mild/Mod Dementia
40% TBI



Mental Health

80% Anxiety
68% Depression
46% PTSD

Onset



Management

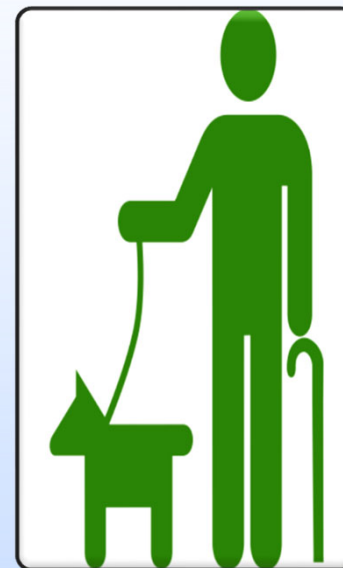
Prevention



INTENSIVE CARE



Treatment



- ABCDEF Bundle
- Delirium treatment, prevention
- Medication management
- Early PT/OT intervention
- ICU diary
- Education, awareness

- Transition to PCP
- Education, awareness
- Support groups
- **Formal post-ICU follow-up clinics**

Multicomponent, Nonpharmacologic Prevention AND Treatment

Recommendation:

We **suggest** using a multicomponent, nonpharmacologic intervention...focused on reducing modifiable risk factors for delirium...

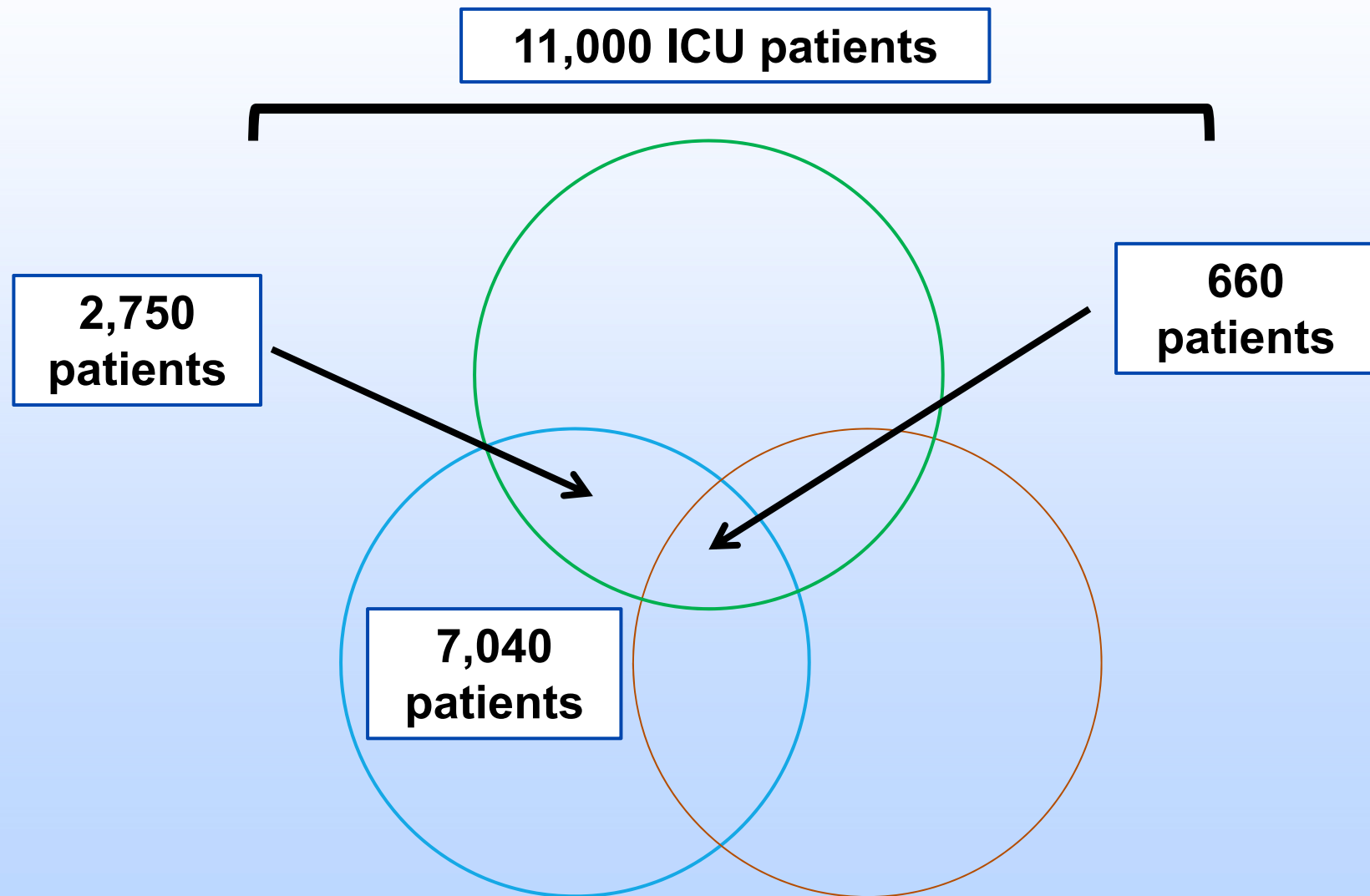
A	B	C	D	E	F
Assessment, prevention, and management of pain	Both spontaneous awakening and breathing trials	Choice of sedation and analgesia	Delirium assessment, prevention, and management	Early mobility and exercise	Family engagement and empowerment

Rationale:

- 2 studies (before-after, cohort), totaling 6,360
- Significant decrease mortality and delirium incidence

The Problem: Snapshot

2018 Mayo Clinic – Rochester



Mayo Clinic: The Solution

Addressing the ICU to Life Transition

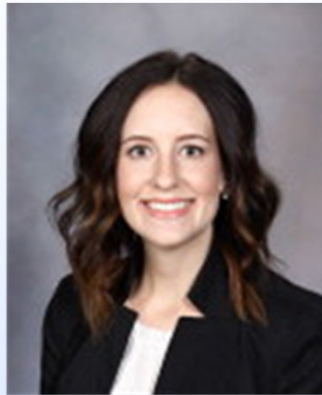
Current Program: Meet the MCIRP Team



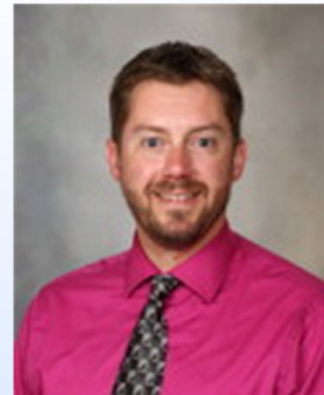
Annie Johnson,
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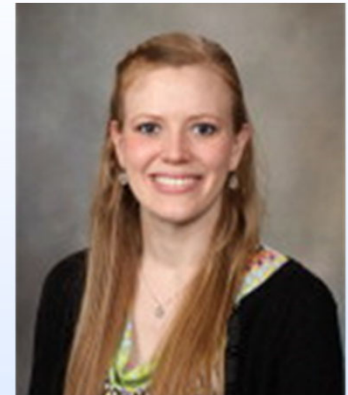
Richard Oeckler,
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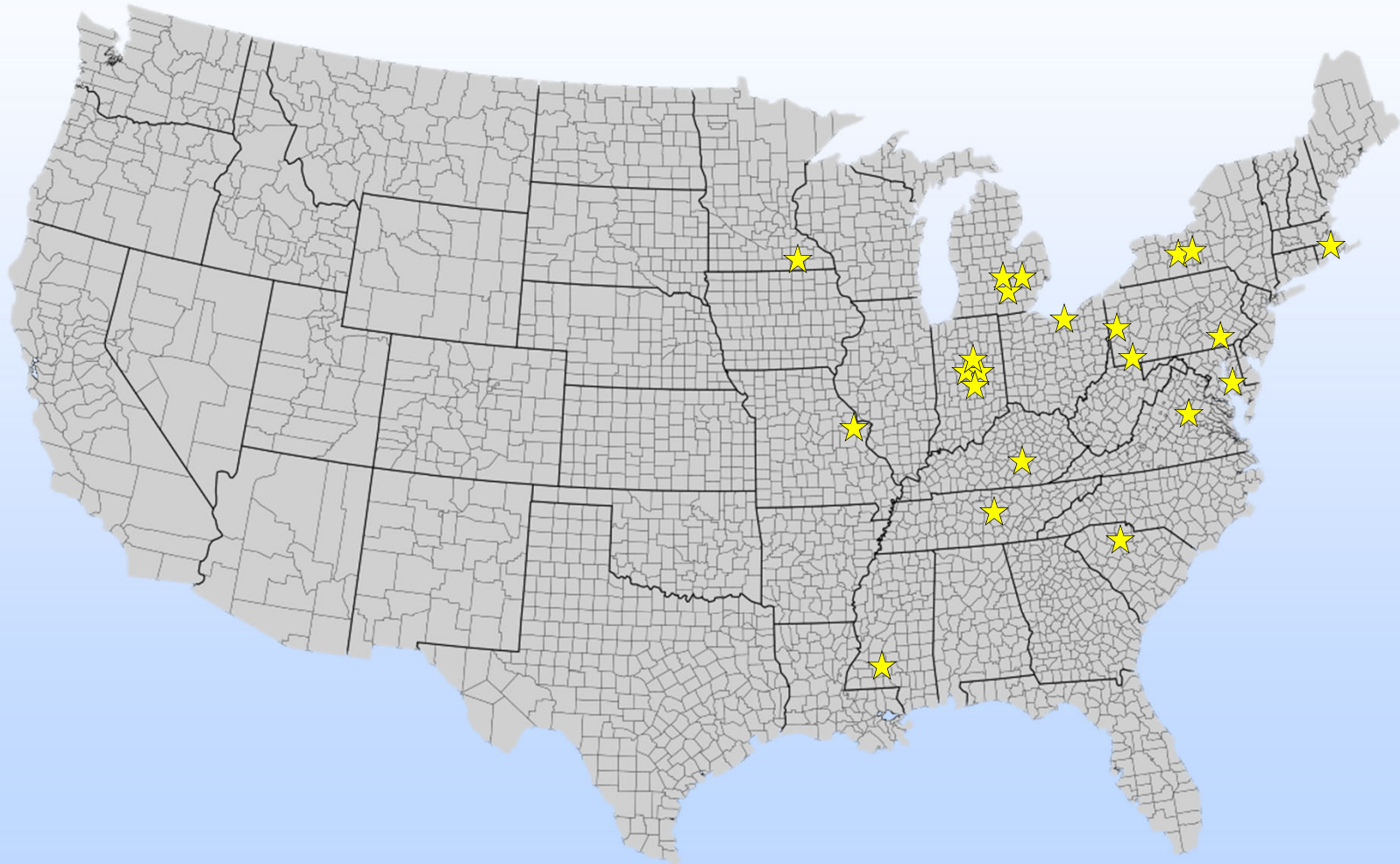


Hannah Lechner,
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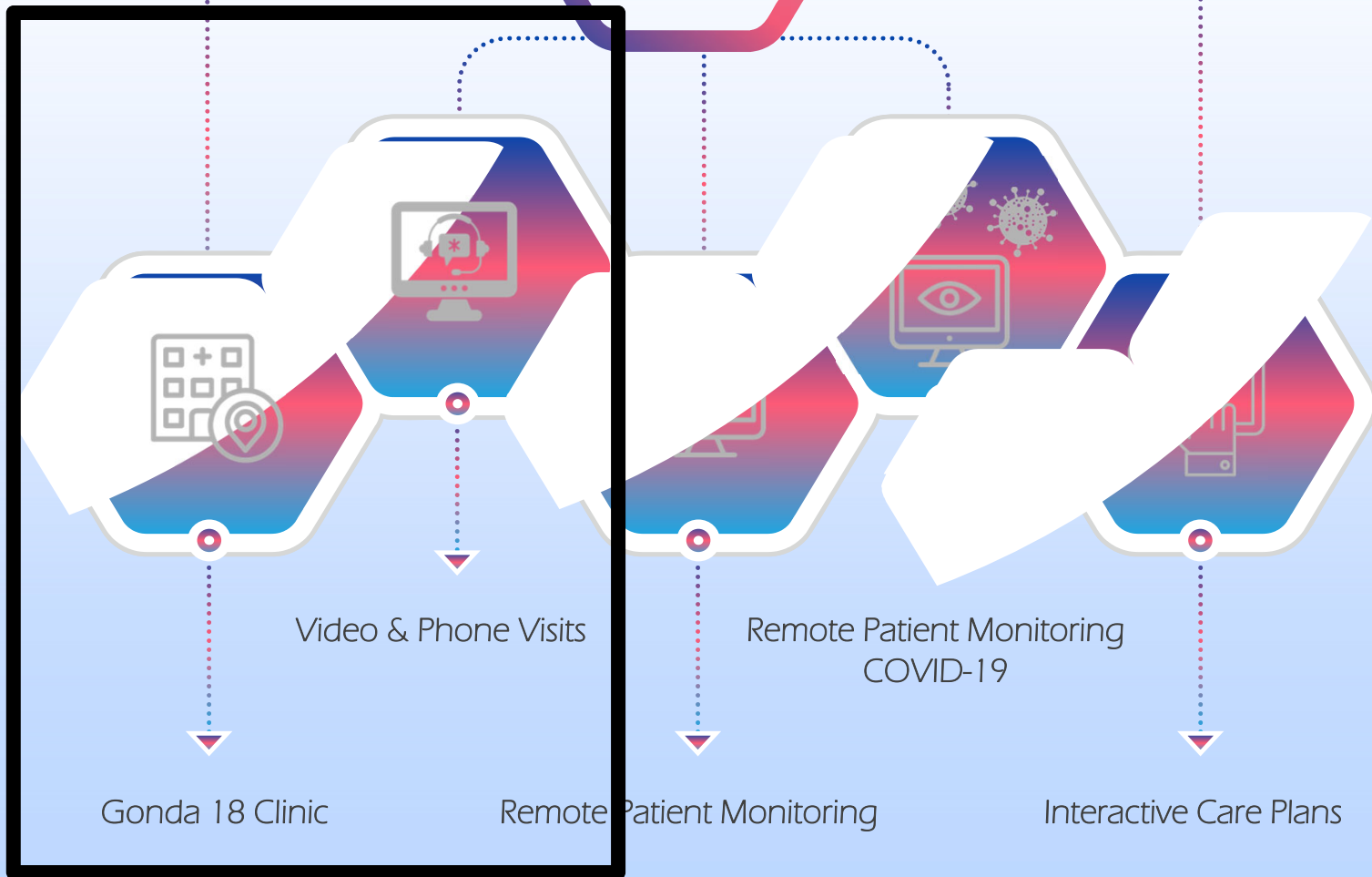


Sarah Burke,
LICSW, MSW

Post-ICU Clinics Around the US



Mayo Clinic ICU Recovery Program



Brick and Mortar Clinic

- Conception, September 2019
 - Midwest Clinical Practice Committee Innovation Award
- **ICU** provider, pharmacist, occupational therapist
- Home = Pulmonary Clinic, Gonda 18
- 3-hour blocked appointments
 - 'one stop shopping'
 - 6 patients/clinic day
- Average 1 clinic day/week

Population

Inclusion

- All ICUs
- ≥ 18 years old & 1 of the following:
 - ICU LOS ≥ 3 days
 - Embedded PT/OT Pt
 - ECMO pt
 - Referred by other service

Exclusion

- Hospice
- Prisoner
- Severe baseline impairments
- Primary substance abuse

Enrollment

- MCIRP Registry
- Referral

Brick and Mortar Clinic



Pre-appointment
questionnaires



Arrives at Clinic



OT Eval



MTM



H&P



Individualized
Recovery Plan

PICS Symptoms: Patient Identification

- Early intervention, key
- Rely on known risk factors
 - Imperfect system
- Balance
 - 'Healthy' dose of ICU
 - Avoid missed opportunities
- Solution?
 - ICU interventions, LOS as surrogate



Population

Inclusion

- All ICU
- ≥ 18 years old & 1 of the following:
 - ICU LOS ≥ 3
 - Embedded
 - ECMO
 - Referred to service

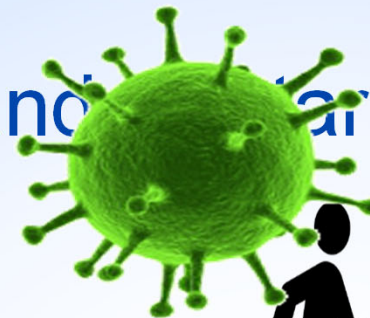
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Brick and Mortar Clinic

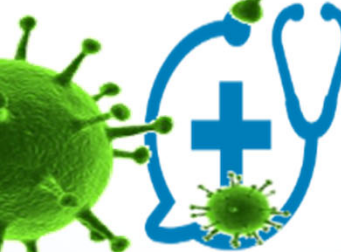


Arrive

OT Eval



MTM



H&P



Individualized
Care Plan



Virtual Visit



OT Eval



MTM



H&P (reported)



Patient at Home



Individualized
Recovery Plan

Virtual visit

Brick and Mortar Carry Over

- Team structure
- Patient population
- Purpose
 - Multidisciplinary evaluation
 - Connection to local care
- Average 1 clinic day/week

Response to Current State

- Visit length, 1-hour
 - Increased efficiency
 - Increased patient volume
- Greater outreach
- Potential for enterprise, health system patient visits
- Billing

Navigating Gaps in Care



Individualized Care Plan

- Screening
- ICU debriefing
- Education
- Specialty consults, referrals
- Diagnostics
- Medical equipment
- Advanced care planning
- Return to work
- **Pharmacist assessment**

ICU Pharmacists and Medication Management

- Prospective, observational cohort study
- Adult patients, referred to a tertiary care center ICU recovery clinic
- Formal ICU pharmacist follow-up as part of the patient visit, n=56
 - Median pharmacist interventions per patient, 4 (IQR=2, 5)
 - All patients had at least 1 pharmacist intervention
 - ADE identified in 9 (16%) patients

Pharmacist Visit

☐ Patient reported problems

☐ Dismissal medication review

- Held/new medications
- Dose changes
- Hospital/ICU carry over (PPI, anti-psychotic, midodrine)

☐ Dose adjustments

- Renal, hepatic dysfunction
- Hemodynamic changes

☐ Drug monitoring

- Labs, levels

☐ Immunization review

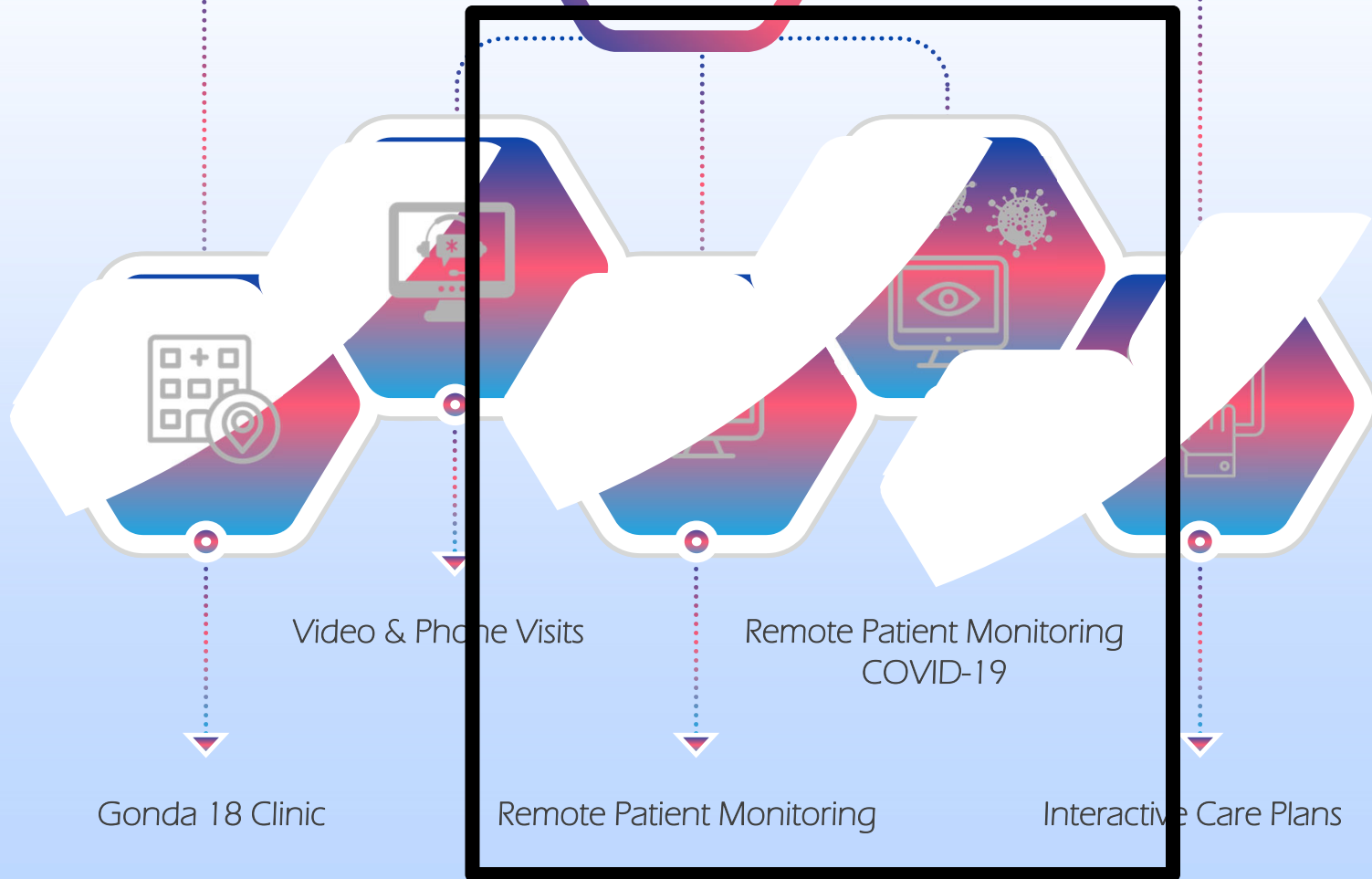
- Influenza
- Zoster
- Pneumococcal

☐ Nicotine cessation

☐ Counseling, education

- AKI

Mayo Clinic ICU Recovery Program



Remote Patient Monitoring

- Patients sent tablet, scale, blood pressure cuff, pulse oximeter
- Daily activities (questions + vitals)
- Nursing support
 - Pending vitals, response to questions
 - Triage to MCIRP team
- Enrollment: ECMO, mechanical ventilation ≥ 5 days, ICU stay + COVID-19
- Participation 30-90 days
- Clinic visit at 2-4 weeks following hospital discharge



RPM Overview



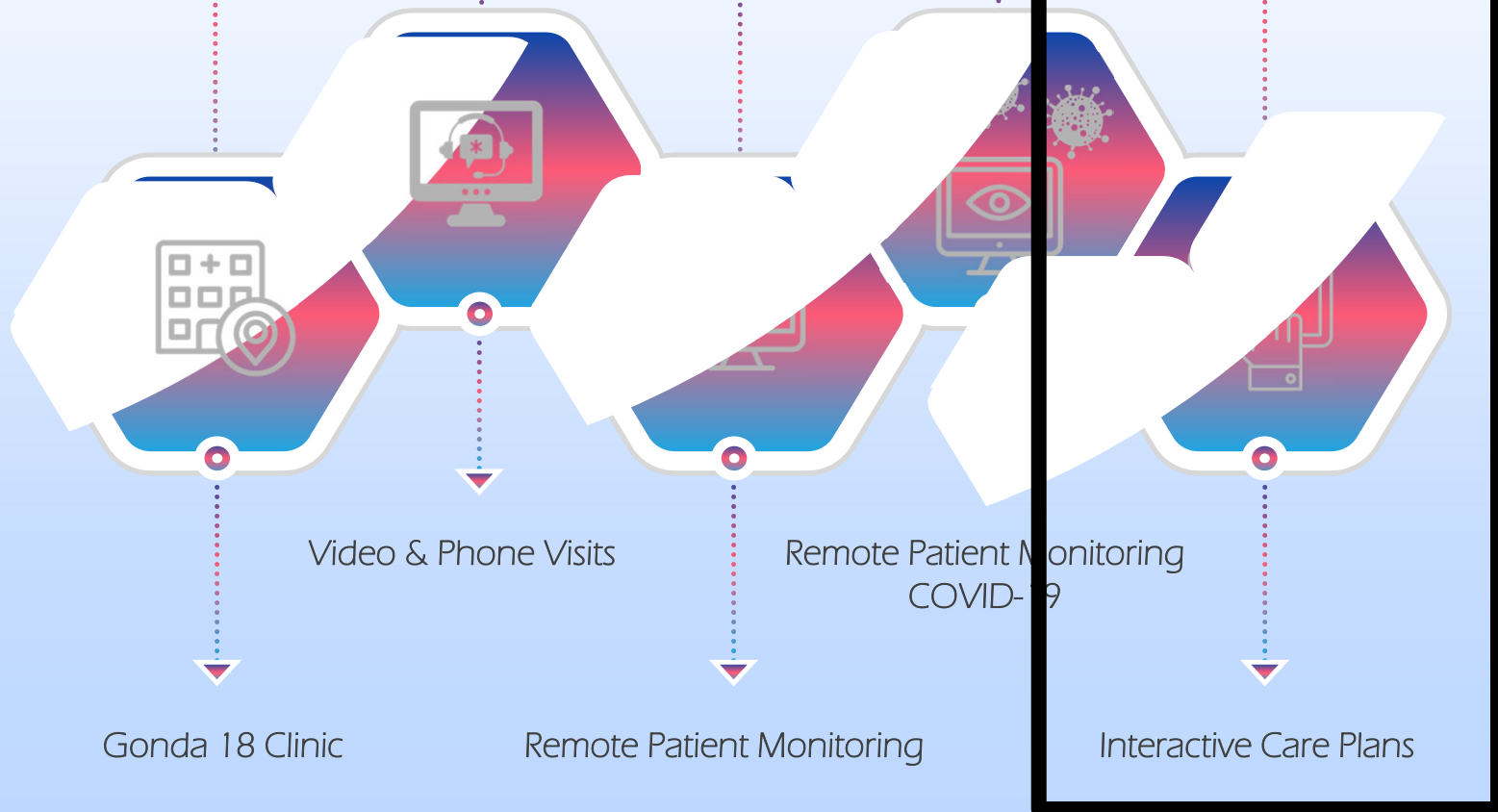
Remote Patient Monitoring

Providing patient support including physiological monitoring, medication management, goal setting, and education. Examples: Remote monitoring of heart failure patients.

BENEFITS

- ✔ Supports patient transitions to home.
- ✔ Provides just-in-time guidance to assist with patient self-care.
- ✔ Allows for early intervention and treatment.

Mayo Clinic ICU Recovery Program



INTERACTIVE CARE PLANS



To-Do List



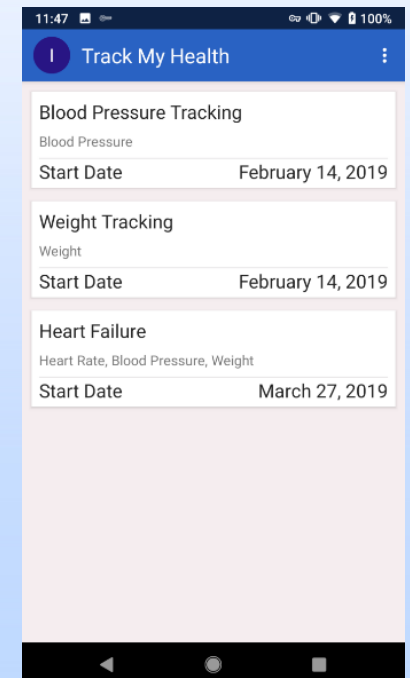
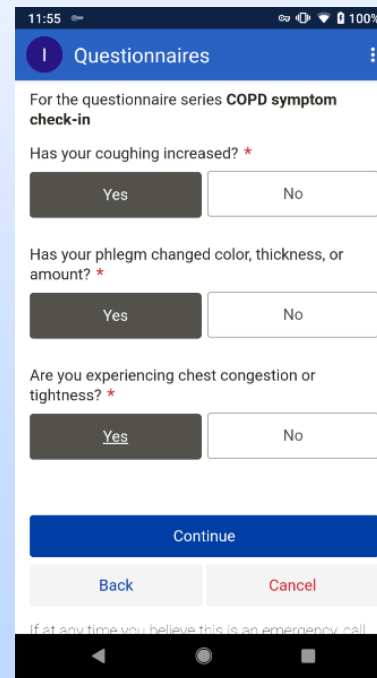
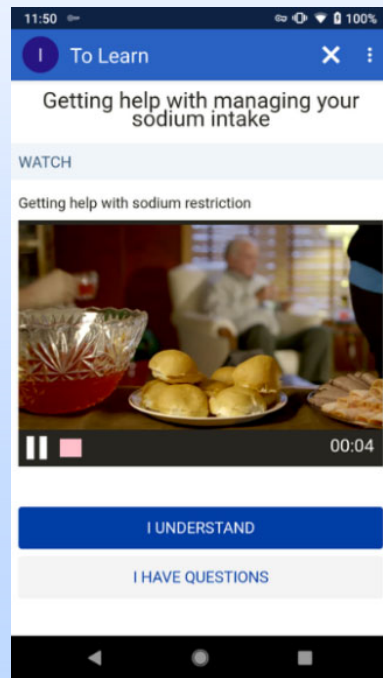
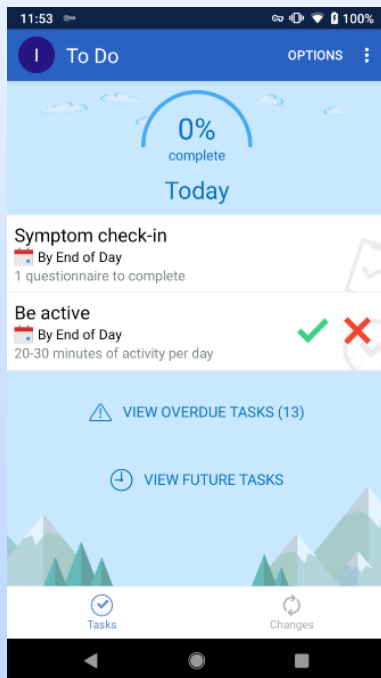
Education



Questionnaires

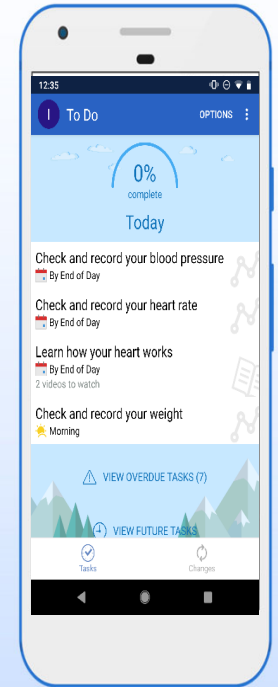


Biometric Data



Interactive Care Plan

- Digitally-enabled extension of care at Mayo Clinic
 - Patient tool for executing provider care plan
 - Increased patient engagement, reduced healthcare utilization
- App responses generate inbasket messages for MCIRP team intervention
- Enrollment: same as clinic pathway
 - Participation 30-90 days
- Clinic visit at 2-4 weeks following hospitalization
 - Future: engage less severe PICS patients, no need for clinic visit



ICU Follow-up Clinic Metrics, In Process

Outcome	Measure
Healthcare Utilization	<ul style="list-style-type: none">• ICU, hospital readmission• ER visits• Morbidity/Mortality
Function	<ul style="list-style-type: none">• Return to work (pre-ICU activity)• Cognitive function• Depression, anxiety, PTSD• Quality of life
Process Measures	<ul style="list-style-type: none">• Patient satisfaction• Diagnoses, referral• Advance care planning• Medication changes, vaccinations
Cost	<ul style="list-style-type: none">• Clinic billing• FTE justification• Downstream revenue• Cost avoidance

Enablers and Barriers to Implementing ICU Follow-up Clinics: MCIRP, A Year in Review

Assets



Interdisciplinary
Teamwork



Established Hospital
Operations



Patient Connection



National/International
Collaboration



Motivated Clinicians



Creative Problem-Solving

Struggles



Stable Funding



Clinic Space



Patient Recruitment



Clinic Attendance

The Future: Local and Beyond

- Improved patient identification
- Mayo Clinic, permanent ICU follow-up clinic
 - Enterprise
 - Health system
- COVID-19, pandemic trauma
- Continued recognition within professional networks – SCCM, CAIRO
- Formal recommendation for ICU follow-up in Surviving Sepsis Campaign?

How can YOU help?

- Encourage ABCDEF bundle usage, delirium prevention
 - Daily medication assessment
- Patient education
 - Mayo Clinic Connect, online support group
 - PICS folders
- Referral
 - Is this patient appropriate for ICU Recovery Clinic?

Post-ICU syndrome is defined by new or worsened impairment in which of the following domain(s)?

- Physical
- Cognitive
- Mental
- All of the above

Delirium is associated with poor outcomes post-hospitalization, including increased risk of mortality.

- True
- False

Which of the following is a barrier to the establishment of post-ICU follow-up clinics:

- Motivated clinicians
- Patient recruitment
- Too much free money
- Established hospital infrastructure

Learning Objectives

After this presentation the learner will:

- ✓ Describe the incidence and clinical manifestation of post-intensive care syndrome (PICS)
- ✓ Review literature examining the long term implications of critical illness
- ✓ Discuss current strategies to address care gaps related to PICS symptoms recognition and management



Questions & Discussion