Embedding Type 1 Research in the Clinical Program:
The Intensive Medicine Clinical Program Research Development Team

Raj Srivastava, MD, MPH
Assistant Vice President of Research
Medical Director, Office of Research
Embedded Research Model

Intensive Medicine Research Development Team

Research Hypothesis

Study Design/Method

Data Collection

Analyses

Publish/Share

Clinician

Researcher

Informatics

Analyst

Informaticist

Statistician

Project Mgr.

iCentra

EDW

New Data Elements

Behavioral Health

Cardiovascular

Intensive Medicine

Oncology

Pediatrics

Primary Care

Surgical Services

Women & Newborns

Musculoskeletal

Neurosciences
What We’ve Done So Far

1. Assembled Research Development Team
2. Guiding Principles
3. Clinical Questions Vs. Clinical Program Priorities
4. Scoring Criteria
5. Proposed Studies
6. Scientific Review
7. Defined Processes for Research Types
Research Development Team (RDT)

- Raj Srivastava, MD, MPH
  AVP, Research
- Alan Morris, MD
  Pulmonary
- Brad Isaacson, PhD, MBA, MSF
  Office of Research
- Colin Grissom, MD
  Critical Care
- James Orme, MD
  Critical Care
- Lydia Dong, MD, MS
  Intensive Medicine
- Nancy Nelson, RN, MS
  Intensive Medicine
- Peter Haug, PhD
  Medical Informatics
- Russ Miller, MD, MPH
  Critical Care
- Stan Huff, MD
  Critical Care
- Terry Clemmer, MD
  Critical Care
- Todd Allen, MD
  Healthcare Delivery Research
- Tom Graydon, MBA
  Pulmonary
Guiding Principles

- Research should link to our mission of helping people live the healthiest lives possible
- Embed research in our clinical care delivery system
- Ensure that research studies are measuring patient and cost outcomes
- Design research studies to answer clinically relevant questions that help determine best practices
- Study the impact of system-wide implementation of best practices
- Recruit world class clinicians to Intermountain Healthcare
- Appropriately budget, monitor, and be accountable to research, clinical, and operational leadership
- Maintain an appropriate balance of Types I, II, III and IV research studies with support
Research should **link to our mission** of helping people live the healthiest lives possible

**Embed research** in our clinical care delivery system

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## Intensive Medicine Clinical Program Research Study

### Study Proposal Scoring Criteria

<table>
<thead>
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<th>Criteria</th>
<th>1</th>
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<tr>
<td>Relevance to IMCP</td>
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<td>Ability to achieve good science</td>
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<td>Scalable across the multiple institutions</td>
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<td>Important and achievable clinical impact</td>
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<td>Adherence to the principles of replicability</td>
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<td>Exciting and important to our clinical colleagues</td>
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<td>Achievable link to iCentra</td>
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<tr>
<td>Potential link to outside funding</td>
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<tr>
<td><strong>Total Score</strong></td>
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Implementation of a Best Practice Care Bundle in Critically Ill Patients
Russ Miller, MD, MPH

Implementation of an ePneumonia Tool Across All of Intermountain Healthcare
Nathan Dean, MD; Todd Allen, MD; and Brandon Webb, MD

Implementation of Lung Protective Ventilation in Patients with Acute Respiratory Failure
Colin Grissom, MD
**Patient Treatment**

**CONTROL**
- Standard Treatment
  - Patients transferred directly to floor
    - Patient experiences
      - Confusion
      - Noise
      - Sleep Interrupted
      - Delirium
      - Drugs
      - Scared
    - Ongoing Coma and Delirium free days

**EXPERIMENTAL**
- Evidence-Based Best Practice Bundle
  - Patient is transferred to floor after bundle process is followed
  - Ongoing coma-and-delirium free days

**Improved Patient Outcome from Bundle**
When patient returns home, they experience less confusion, fewer medical errors, fewer falls, and attend doctor appointments.

**ABCD Bundle Will Be Deployed Across Intermountain Healthcare**
- A: Assess for, prevent, and manage pain
- B: Both spontaneous awakening trial (SAT) and spontaneous breathing (SBT) trials
- C: Choice to use and of analgesia and sedation
- D: Delirium assessment, prevention, and management

### Intensive Care Unit Clinical Trial – ABCD Bundle

- **Intensive Medicine**
- **22K** Patients admitted to IMED
- **10 ICUs** Patients admitted
- **Home**
  - Patient confused, medical errors, falls, and misses doctor appointments
- **Improve Patient Outcome from Bundle**
  - When patient returns home, they experience less confusion, fewer medical errors, fewer falls, and attend doctor appointments.
Implementation of an ePneumonia Tool Across All of Intermountain Healthcare

**Significant Impact Pneumonia Treatment**

- Improved antibiotic utilization
- Lower mortality rates
- Shorter length of hospital stay

**CONTROL**

- Standard Care
  - X-Rays and other tests
  - Traditional treatment determined by individual clinician

**EXPERIMENTAL**

- ePneumonia Tool, electronic decision support
  - Real time clinical decision support
  - Web-based electronic tool to guide diagnosis, risk stratification, and treatment
  - More accurate predictors of antibiotic resistance
  - Integration with iCentra

**Patient Treatment**

- Intensive Medicine
  - 4 Central Region Emergency Depts. 2011
  - All Central Region Facilities 2015
  - System-Wide 2016
Implementation of Lung Protective Ventilation in Patient with Acute Respiratory Failure

Significant Improvement in Patient Outcomes
• Improvement in ventilator free days
• Improved discharge disposition
• Decreased mortality
• Shortened hospital length of stay
• Improved quality of life

CURRENT STATE
20% ED and ICU at ≤ 6 ml/kg PBW
22% ED and 18% ICU at > 8 ml/kg PBW

EXPERIMENTAL
Implement ARDS Network 6 ml/kg PBW protocol across intermountain system
• Standardized computerized lung protective ventilation
• Controlling initial tidal volumes
• Provide electronic decision report for:
  • Management of ventilation
  • Oxygenation
  • Weaning
Scientific Review Committee

and Scorecard

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Institution</th>
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<tbody>
<tr>
<td>Andrew Knighton</td>
<td>PhD, CPA, Intermountain Healthcare</td>
</tr>
<tr>
<td>Ben Horne</td>
<td>MPH, PhD, Intermountain Healthcare</td>
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<tr>
<td>Flory Nkoy</td>
<td>MD, MS, MPH, UofU School of Medicine</td>
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<tr>
<td>Jay Berry</td>
<td>MD, MPH, Boston Children's Hospital</td>
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<tr>
<td>Kim Brunisholtz</td>
<td>PhD, Intermountain Healthcare</td>
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<td>Lucy Savitz</td>
<td>PhD, MBA, Intermountain Healthcare</td>
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<tr>
<td>Mike Silver</td>
<td>MPH, HealthInsight</td>
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Other Designations for Final Outcome:
- AB: Abstention
- CF: Conflict of Interest
- DF: Deferred
- ND: Not Discussed
- NP: Not Present
- NR: Not Recommended for Further Consideration

To Table >>
Types II, III and IV Research

Improving patient outcomes

Publishing
Type I Research
(with Types II and III)

Improving patient outcomes
Reducing costs
Publishing

Disseminate across Intermountain Healthcare system
Patient and cost outcomes in a fee for value market