Networks for Clinicians: A Clinical Laboratory

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Registries for Robust Evidence

• While RCTs are essential for establishing efficacy of interventions, they cannot address all needs
  – Timely determination of safety and effectiveness of different interventions used in diverse “real-world” patients and settings
  – Increasing interest in the role of observational studies, including registries
A patient registry for evaluating outcomes is “an organized system that uses observational study methods to collect uniform data (clinical and other) to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure, and that serves a predetermined scientific, clinical, or policy purpose(s).”
Early observational research and registries during the 2009–2010 influenza A pandemic

Robert A. Fowler, MD, MS; Steven A. R. Webb, MD, MPH, PhD; Kathy M. Rowan, PhD; Charles L. Sprung, MD; B. Taylor Thompson, MD; Adrienne G. Randolph, MD, MSc; Philippe Jouvet, MD, PhD; Stephen Lapinsky, MB, BCh; Lewis Rubinson, MD, PhD; Jordi Rello, MD, PhD; J. Perren Cobb, MD; Todd W. Rice, MD; Tim Uyeki, MD; John C. Marshall, MD

• Observational research helps to guide initial and subsequent clinical responses during a pandemic
• Shared case–report forms/web entry for use by national and international research groups
  – ARDSNet, ANZICS, CCCTG, ESICM, PALISI, Spanish H1N1 Study Group, UK ICNARC
Referral to an Extracorporeal Membrane Oxygenation Center and Mortality Among Patients With Severe 2009 Influenza A(H1N1)

GenMatch matching

Proportion Surviving

Time From Study Entry, d

No. at risk
ECMO-referred patients: 75 69 66 64 62 61 59 58 58 58
Non-ECMO-referred patients: 75 45 44 44 42 42 42 42 42 42

UK H1N1 ECMO registry + UK SwiFT Study
An NHLBI Workshop Report

Beyond Mortality
Future Clinical Research in Acute Lung Injury

Roger G. Spragg¹, Gordon R. Bernard², William Checkley³, J. Randall Curtis⁴, Ognjen Gajic⁵, Gordon Guyatt⁶, Jesse Hall⁷, Elliott Israel⁸, Manu Jain⁹, Dale M. Needham³, Adrienne G. Randolph¹⁰, Gordon D. Rubenfeld¹¹, David Schoenfeld¹², B. Taylor Thompson¹³, Lorraine B. Ware², Duncan Young¹⁴, and Andrea L. Harabin¹⁵

NHLBI Workshop

Comparative Effectiveness Research in Lung Diseases and Sleep Disorders
Recommendations from the National Heart, Lung, and Blood Institute Workshop

Tracy A. Lieu¹,², David Au³, Jerry A. Krishnan⁴, Marc Moss⁵, Harry Selker⁶, Andrea Harabin⁷, Virginia Taggart⁷, Alfred Connors⁸, and the Comparative Effectiveness Research in Lung Diseases Workshop Panel*
Limitations/Other

• Careful interpretation of results
  – Causality – may require complex analyses
  – Selection bias/confounding by indication
  – Loss to follow-up
  – Missing data
  – Data quality

• 2 efforts needed
  – Methodological research to increase understanding of what “high quality” data/evidence from these sources
  – Strength and limitations of different types of
The Toronto ICU Registry (TICUR) Project
A Work in Progress...
Objective

• To create a high quality registry of mechanically ventilated patients through city-wide collaboration of academic health centres performing uniform data collection
  – Minimum data set – all patients
  – Modular data sets
  – Centrally-trained/quality-assured study assistants
Inputs

• Minimum data sets collected daily in ICU for all eligible patients
  – Demographics, ICU admission diagnosis, severity of illness

• Modular data sets
  – Investigator-initiated
  – Hypothesis-driven
  – Time-limited
Outputs

• Epidemiology
  – MV, ARDS, specific therapies/interventions, outcomes

• Prevention
  – Risk factors for progression/development of ARDS
  – Linkage to population-level administrative data

• Biomarker/Genetic Analyses
  – Link phenotypic data to biological specimens (BAL, blood) obtained in subset of patients

• Pilot Data
  – Proof of concept/hypothesis for future grants/clinical trials

• Quality Improvement
Initial Focus

• Understanding barriers to early rehabilitation in mixed medical–surgical ICUs
• Tidal volumes and outcomes in spontaneously-breathing patients with ARDS
• Prospective evaluation of the Berlin ARDS definition
Future Considerations

• Cumulative reporting of utilization statistics with trend analysis over time
• First-pass “reality checking” of novel research findings
• Ongoing estimates of disease epidemiology and outcomes through linkage to other prospective clinical research
• Research into outcome methodology and statistical processes
• Expand to include community partners
Comprehensive Programs

- Hypothesis generation
  - identification of questions from registry (e.g., increased mortality associated with after-hours ICU discharge)
- Small-scale pilot study of key issues
- Large-scale multicentre exploration of issues in greater depth, to test generalizability of ideas developed
- Interventions targeting systematic issues as a result of those findings and determination of effectiveness of the intervention
- Post-implementation and post-publication surveillance
Potential Barriers

• Funding/registry infrastructure
  – Start–up
  – Sustainability
• Information technology
• Consent/ethics approval
  – Biological specimens
  – Patient identifiers for future data linkage
• Data collection/training/quality
Epidemiological Approaches to Heart Disease: The Framingham Study

THOMAS R. DAWBER, M.D., GILCIN F. MEADORS, M.D., M.P.H., AND FELIX E. MOORE, JR.


As one by-product of this investigation it will also be possible to study the efficiency of various diagnostic procedures in finding heart disease or as indicators of the subsequent development of heart disease. (These findings, of course, have important bearing on the question of including tests for heart disease in mass screening programs.) A second by-product will be data on prevalence and incidence of cardiovascular diseases.
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Questions?

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