Clinical and Translational Science Awards (CTSA) Program in Mayo Clinic

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Modern Health Care = ?

- EBM
- Eminence-Based Medicine

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Modern Health Care = ?

- EBM
  = Evidence-Based Medicine

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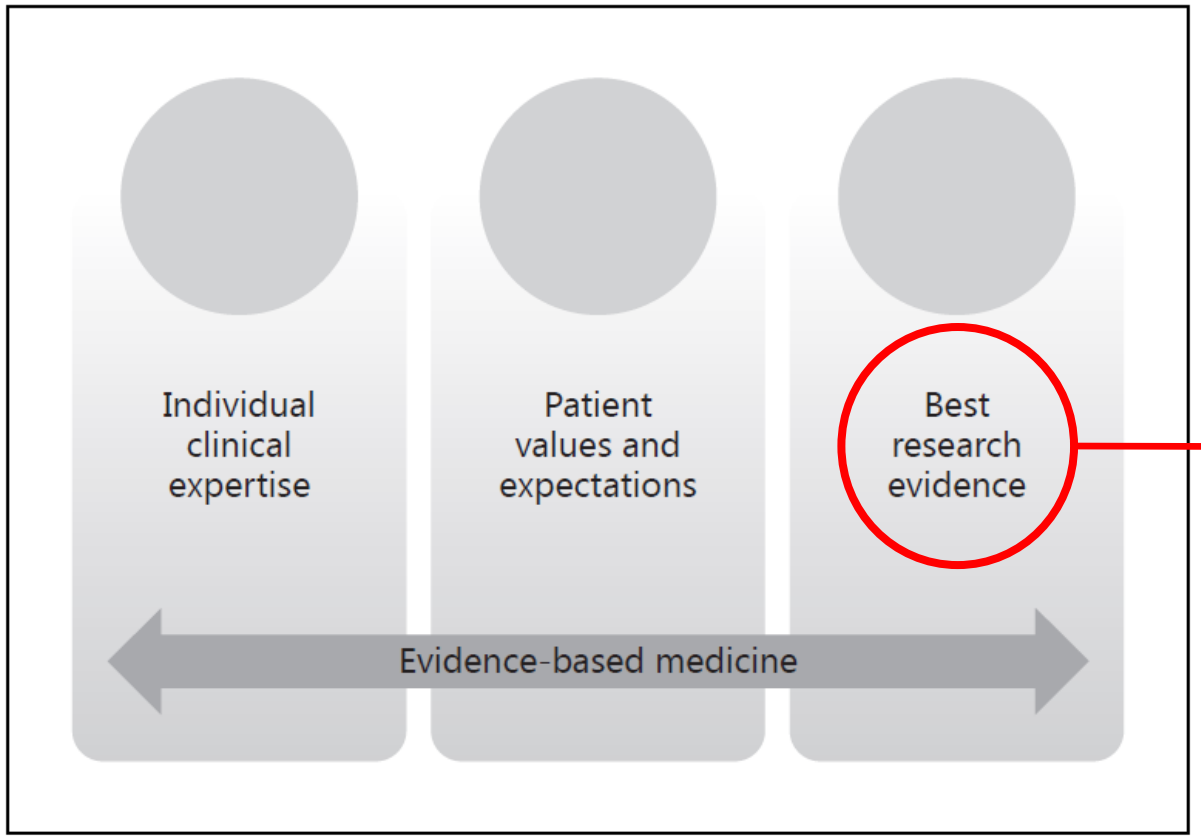
- EBM
  = Evidence-Based Medicine
  - The use of mathematical estimates of the risk of benefit and harm, derived from high-quality research on population samples, to inform clinical decision-making in the diagnosis, investigation or management of individual patients
- The use of figures derived from research on populations to inform decision about individuals
- Focused, systematic enquiry aimed at generating new knowledge

Triads of EBM



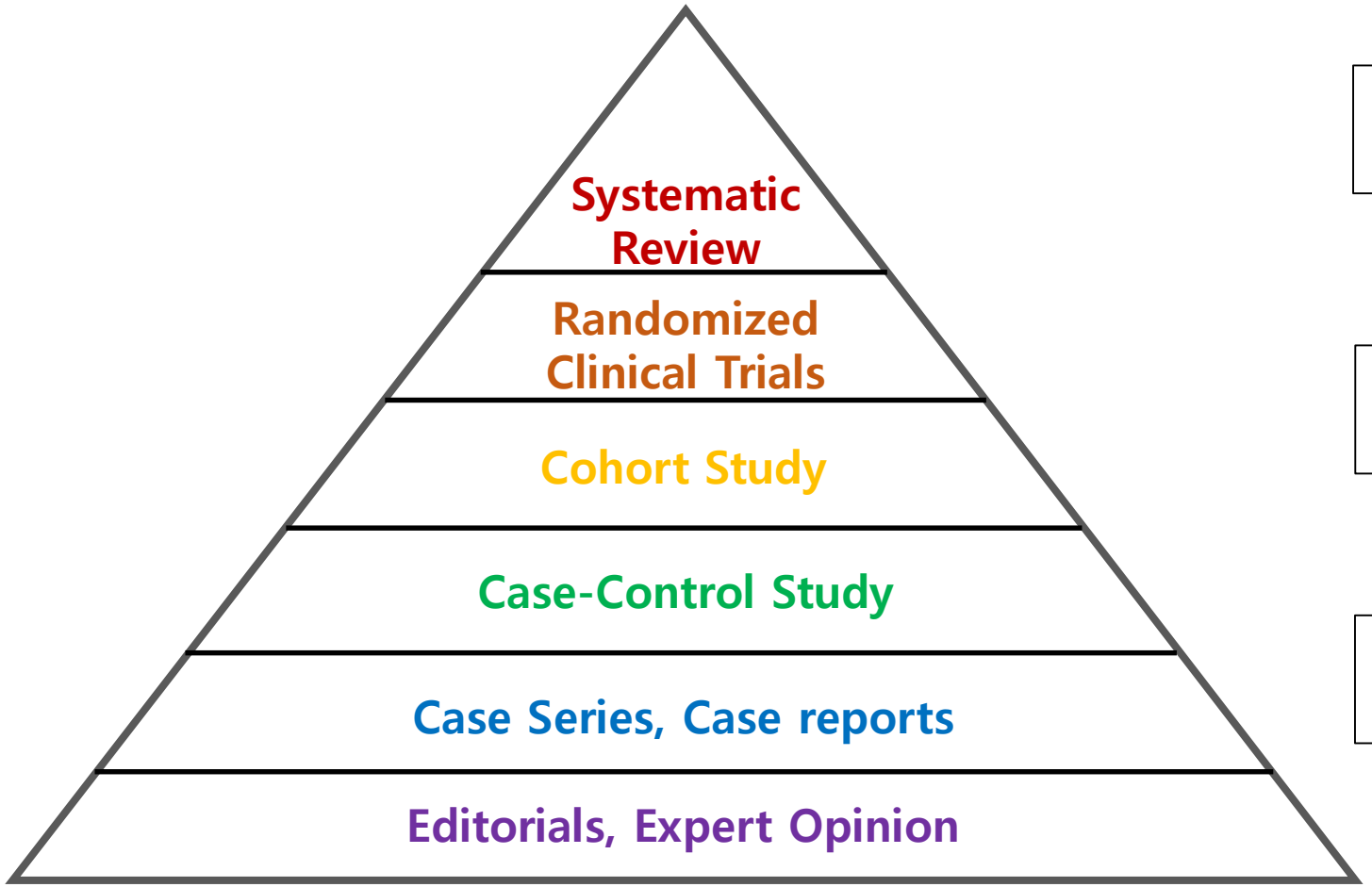
Basic Research

Translational Research

Clinical Research

Fig. 1. Elements of the evidence-based medicine triad (expertise, values, and evidence) play a similar role in health decision-making.

Hierarchy of Evidence (Research Design)



Ethics & Regulations

Epidemiology

Statistics

What is CTSA?

- Advancing the science of medicine by;
  - ✓ Conducting biomedical research to produce the treatments and medicines of the future
  - ✓ Training and mentoring the next generation of doctors and scientists who will lead the research and health care teams of tomorrow
- Focusing on speeding the movement (translation) of scientific discoveries into effective, accessible medical treatments that improve health.
- Education and career development programs in clinical and translational science that span the career spectrum.
- Developing clinical and translational science as a field of study.

CCaTS program in Mayo Clinic

- **C**enter for **C**linical **a**nd **T**ranslational **S**cience
  - CCaTS Postdoctoral Certificate Program
    - Basic course for Clinician, 1 year (4 Quarters)
    - USD 5,000
    - Required stay during program
  - CCaTS Master's Program
    - Advanced course, 2 years (8 Quarters or more)
    - USD 10,000
    - Possible to transfer after completion of Certificate course to Master's Program
    - Required stay more than 1 year during program
- One of Clinical and Translational Science Awards (CTSA) program, funded by NIH, 58 institutes in US

What is CCaTS; Certificate program

- Main Themes (7 Required Credits + min. 5 Electives)
  - ✓ Epidemiology (2 Credits) / Statistics (2 Credits) / Research Ethics, Methods and Regulation (3 Credits)
  - ✓ Writing Biomedical Publication workshop
- Research proposal – Research manuscript

Responsible Conduct of Research	
Introduction to Clinical Epidemiology (Epi I)	Clinical Epidemiology II (Epi II)
	Statistics in Clinical Research (Stats I)
Clinical Research Protocol Development	

What is CCaTS; Master's Degree program

- Main Themes (16 Required Credits + min. 8 Electives)
  - ✓ Epidemiology (4 Credits) / Statistics (7 Credits) / Research Ethics, Methods and Regulation (5 Credits)
  - ✓ Writing Biomedical Publication / Winning Grants Workshops
- Research proposal - Thesis proposal - Written Comprehensive Exam - Final Oral Examination

Responsible Conduct of Research	Regulatory Issues in Clinical Research
Introduction to Clinical Epidemiology (Epi I)	Clinical Epidemiology II (Epi II)
Advanced Applied Epidemiological Methods (Epi III)	Statistics in Clinical Research (Stats I)
Utilizing Statistics in Clinical Research	Introductory Statistical Methods II (Stats II)
Critical Appraisal of Statistical Methods in the Medical Literature (Stats III)	
Clinical Research Protocol Development	Clinical Trials: Design and Conduct

Elective Courses in CCaTS program

- Clinical Trials
- Community-Engaged and Health Disparities Research
- Clinical Epidemiology
- Biomedical Informatics
- Translation
- Quantitative and Qualitative Methods
- Health Services and Comparative Effectiveness Research

Elective Courses in CCaTS program

- Clinical Trials
  - ✓Complementary and Alternative Medicine
  - ✓Principles and Practices of Pediatric Research
  - ✓Science Beyond the Lab: Intersections of Science, Society and Policy
  - ✓Methods and Foundations in Biomedical Ethics
  - ✓Biomedical Ethics II
  - ✓Biomedical Ethics III
  - ✓Advanced Topics in Clinical Trials: Protocol Development and Implementation

Elective Courses in CCaTS program

- Community-Engaged and Health Disparities Research
  - ✓What Researchers Need to Know About Community-Engaged Research
  - ✓What Researchers Need to Know About Eliminating Health Disparities
- Clinical Epidemiology
  - ✓GI Population Sciences
  - ✓Genetic Epidemiology: Association Studies
- Biomedical Informatics
  - ✓Medical Informatics for the Clinical Researcher
  - ✓Health Information Technology Evaluation: Clinical Informatics Methods

Elective Courses in CCaTS program

- Translation
  - ✓Epigenetics & Epigenomics: Impact on Translational Research and Future Medical Practice
  - ✓Medical Epigenetics and Epigenomics Journal Club
  - ✓Independent Study for Laboratory Methods
  - ✓Hepatobiliary Pathobiology
  - ✓Pathophysiology of Digestive Disease
  - ✓Applied Enteric Neurosciences in Health and Disease
  - ✓Case Studies in Translation
  - ✓Regenerative Medicine

Elective Courses in CCaTS program

- Quantitative and Qualitative Methods
  - ✓Logistic Regression
  - ✓Propensity Scoring Methods
  - ✓Survival Analysis
  - ✓Managing and Displaying Data
  - ✓Qualitative Research Design, Methods, and Analysis
  - ✓Introduction to Survey Research

Elective Courses in CCaTS program

- Health Services and Comparative Effectiveness Research

✓Independent Study for Clinical Practice Issues

✓Systematic Reviews and Meta-Analyses

✓Medical Decision Making

✓Evidence-based Medicine for Clinical Researchers

✓Diagnostic Testing Strategies

✓Introduction to Psychological and Behavioral Measurement

✓Behavioral Interventions in Clinical Research

✓Social & Behavioral Foundations of Health in Health Sciences Research

✓Economic Evaluation in Health Care

✓Introduction to Health Care Systems Engineering: Optimization

✓Introduction to the U.S. Health Care System

✓Secondary Data Analysis

Personal Impressions

- It's the thirsty man who digs the well.
- From Basic to Advanced
- Future directions in Korea
  - Epidemiology >> Statistics
  - Ethics >> Epidemiology & Statistics