Clinical Data-Mining in the Era of Evidence-based Practice

Irwin Epstein, PhD
Rehr Professor of Applied Social Work Research
Silberman School of Social Work
Hunter College of the City University of New York
<iepstein@hunter.cuny.edu>
“An unexamined life is not worth living.”
(Socrates-Athens)

“An unexamined case-record is not worth recording.”
(Epstein-Helsinki)
Workshop Objectives

- To introduce participants to the principles, methods, limitations and uses of CDM
- To describe where CDM “fits” in the broader context of the Evidence-based Practice and Practice-based Research “movements” in social work
- To describe the way CDM has been employed in practitioner-initiated studies and PhD dissertations conducted in social work and allied health settings
- To encourage participants to conceptualize and conduct their own CDM studies and to promote practitioner CDM studies
- To encourage participants to consider CDM as a legitimate PhD dissertation research option
Why Integrate Practice & Practice?

- Accountability
- Profession’s need for an “evidence-base”
- Competition with other professions
- Advances in information technology that make integration easier
- Ethical imperatives
- Need for more “reflective” practitioners
Distinction Between Research-Based Practice & Practice-Based Research

RBP – emphasizes “gold-standard” research strategies in quest of cause-effect knowledge about practice interventions and the outcomes they produce, i.e., to “prove” that practice works.

PBR – uses “practitioner-friendly” research strategies to improve practice and possibly contribute to the knowledge base of the profession.
RBP vs. PBR Conceptions of the Practice-Research Integration

- **Social Science Theory (Deductive)**
- **Privileges RCT’s**
- **Quantitative Measures**
- **Summative**
- **Research-Driven**

- **Practice Wisdom (Inductive)**
- **Rejects RCT’s**
- **Qualitative & Quantitative**
- **Formative**
- **Practice-Driven**
Steps in the EBP Process (Gambrill, 2003)

- Convert practice decision needs into answerable questions
- Locate the “best evidence” with which to answer them
- Critically appraise the evidence for validity, impact & applicability
- Apply the results considering client suitability, values, preferences, etc.
- Evaluate the effectiveness and efficiency (single-system designs)

- Or, have academics construct practice manuals based on “best evidence” for practitioners to implement
EBP “Hierarchy of Evidence”

- RCT
- Quasi-Exp
- Correlational
- Qualitative
- Case Studies
Concerns for Social Work Profession About EBP as a Practice-Research Integration Approach

- Methodologically Hierarchical Rather Than Pluralistic
- Practitioners Treated as Consumers and Appliers Rather Than as Potential Contributors to Knowledge
- Academic Denigration of Practitioners
- Feelings of Disempowerment & Disrespect on the Part of Practitioners
- Practitioner Reactions—Further Research Alienation
Practitioners’ use of research-based principles, designs and information gathering techniques, within existing forms of practice, to answer questions that emerge from practice in ways that inform practice (Epstein, 2001).

Simply stated: “research by practitioners for practitioners”.
“Wheel of Evidence”

- RCT's
- Qualitative
- Case Studies
- CDM’s
- Quasi-Experiments
CDM is a practice-based research strategy by which practitioner-researchers systematically retrieve, codify, analyze and interpret available *qualitative and/or quantitative* data from their own records and reflect on the practice and policy implications of their findings.
Purposes of CDM?

- To Refine & Enhance Practice Wisdom
- To Describe & Evaluate Social Work Practice
- To Promote “Evidence-Informed” Practice Based on Multiple Sources and Types of Evidence
- To Identify Best Practices
- To Promote Practitioner “Reflectiveness”
What Are the Basic Elements of CDM?

- Inductive (begins with practice needs & driven by practice wisdom)
- Quantitative and/or Qualitative
- Retrospective (but can become prospective)
- Descriptive or Quasi-Experimental
- Primarily Formative (but can approach Summative)
Why Mine Clinical Information?

- Current Availability of Rich Clinical Data
- Future Availability of Electronic Records
- Unintrusive
- Non-Reactive
- Relatively Inexpensive
- Efficient Sampling
Why Not?

- Dirty
- Labor Intensive
- Missing Data & Other Ambiguities
- Validity and Reliability Issues
- Key Variables May Not Be Available
- Surfaces Existing Information Systems Problems
Who Can Do CDM?

- Individual workers
- Social work units
- Multi-disciplinary Teams (e.g., Allied Health, Physicians & Social Workers, etc.)
- Social work students at all levels
Practitioner-Initiated CDM Need Studies

- Intimate Partner Violence Risks in OBGYN & Neonatal Clinic Patients (Quantitative)
- Pediatric Diabetes “Frequent Flyers” (Quantitative)
- Fetal Abnormality Study (Qualitative)
- Adolescent Health & Mental Health Risk Studies (Quantitative)
- Early Young Adult Psychosis Study (Qualitative)
- Carers of Elderly Relatives via Telephone Service Requests (PDIA) (Quantitative)
Practitioner-Initiated CDM Monitoring Studies

- Social Work Interventions & Outcomes With Renal Dialysis Patients in USA (Quantitative)
- Comparative Study of Interventions & Outcomes in Renal Dialysis (USA & Israel) (Quantitative).
- Managerial Collaboration in an Australian Emergency Department (Quantitative)
- Brief Intervention Team Services in an Australian Emergency Department (Quantitative).
Practitioner-Initiated CDM Outcome Studies

- Psycho-social Factors in Liver Transplant Mortality (Quantitative)
- Renal Dialysis Interventions & Outcomes (NKF) (Quantitative)
- Multi-Ethnic Study of Adolescent Depression & School Performance ("Cultural" Data-Mining) (Quantitative)
- Adolescent Mental Health Tx Termination Study (Qual/Quant/Qual)
Methodological principles of CDM

7 Peer-reviewed CDM studies conducted & written by practitioners at Mt. Sinai, Australia & Israel on pre-natal risk, juvenile diabetes, adolescent mental health, liver transplant, end-stage renal disease, etc.

Exploration of the use of CDM for creating analogs to RCT’s

- 11 peer-reviewed studies co-authored by combinations of 25 different practitioners on adolescent mental health needs & wants by age, gender & race
- Topics include, safety & violence, mental health, sexuality, education, substance use, racism, family & friends, etc.
- Clinical significance of “Don’t Know”
- A “data-base” isn’t always a “Data-Base”

- 8 peer reviewed articles by Australian Allied Health & Social Work practitioners
- Clinical to administrative practice issues
- Topics including emergency services, music therapy, polio services, rapid response teams, fetal abnormalities, young adult psychiatry, etc.

- 11 CDM studies co-authored by teams of occupational therapists, physical therapists, social workers and speech pathologists
- Topics include post-stroke aphasia, draught & farm family mental health, low back pain, traumatic brain injury, hepatitis C “treatment trifecta”, “thyroid voice”, etc.
Steps In The CDM Process

- Prospect All Data Sources (e.g., case records, medical records, computerized information, etc.)
- Assess Core Samples for Available Variables
- Identify Key Practice Questions That are Answerable
- Consult Research Literature for Prior Studies
- Create Qualitative and/or Quantitative Retrieval Tools
- Make Sampling & Design Decisions
- Take Steps to Promote Reliability & Validity
- Collect & Plan the Analysis
- Analyze Data
- Interpret & Utilize Findings
- Disseminate Findings
Prospecting - What Data Are Currently Available?

- Identify All Current Data Sources Relevant to the Research Question
- Determine Their Accessibility
- Determine Their Connectivity
Consult Previous Research Literature

- Theoretical Perspectives
- Key Variables & Processes
- Comparative Populations
- Types of Data Analysis
- Findings & Implications
Create Information Retrieval Forms Covering:

- Background Factors, i.e., Demographic, Risk and Need Indicators
- Interventions, i.e., Type, Quality, Frequency, Intensity, etc.
- Contextual Factors, i.e, Home, Community, Practice Setting
- Outcomes, i.e, Intentional & Unintentional
Background Factors & Client Characteristics (Independent Variables)

- Demographics
- Service Requests
- Risks & Needs (identified by worker)
- Strengths & Recovery Factors
- Diagnostic Assessments
Interventions (Intervening Variables)

- Types, Frequency & Intensity of Clinical Interventions (dosage)
- Types, Frequency & Intensity of Psycho-Social Services Received
- Material Services Provided & Entitlements Secured
- Types, Frequency & Intensity of Interventions with Family Members
- Types, Frequency & Intensity of Interventions with other Professionals
Client Outcomes
(Independent Variables)

- Attendance, Visitation & Adherence
- Intended Psycho-Social Outcomes
- Intended Behavioral outcomes
- Intended Knowledge Outcomes
- Intended Attitudinal Outcomes
- Unintended Outcomes
- Expressions of Patient Satisfaction
Sampling Decisions

- Sampling Window
- Sampling Stages
- Sample Size
- Sampling Type
Reliability & Validity Issues

- Who Does Data Extraction?
- Promoting Validity & Reliability
- Establishing Validity & Reliability
Types of Data Analysis (Qualitative and/or Quantitative)

- Descriptive
- Cross-sectional
- Longitudinal
- Bi-Variate
- Multivariate
- Experimental Analog (Quantitative)
- Grounded Theory & Phenomenological (Qualitative)
- Mixed Method – (Qualitative & Quantitative)
- Mixed Method – (Available & Original Data)
Descriptive Analysis (Qualitative and/or Quantitative)

- Demographics (who are we serving & who are we not?)
- Psycho-Social Assessments, Needs, Risks, Strengths
- Intervention Types, Frequency, Quality, Intensity
- Patient Outcomes (Intended & Unintended)
- Patient Experience of All of the Above (Qualitative & Quantitative)
Bi-Variate Analysis (Quantitative & Qualitative)

- Relationships Among Patient Characteristics
- Client Characteristics & Worker Interventions
- Worker Interventions & Patient Outcomes
- Client & Worker Theories of Problem Causation and Amelioration (Qualitative)
Multi-Variate Analysis
(Quantitative or Qualitative)

- Interventions & Outcomes by
  - Demographics
  - Diagnostics
  - Risk & Recovery Factors
  - Organization & Contextual Factors
  - Client Tx Adherence
- Integrated Synthesis Via Ethnographic Study (Qualitative)
Interpret, Utilize & Disseminate Findings

- Within One’s Own Practice
- With Other Social Work Team Members (Intra-Professional)
- With Multi-Disciplinary Team Members (Inter-Professional)
- With Other Social Workers in the Agency
- With Other Professions Within the Agency
- With Other Social Workers & Professions Outside the Agency
Recently Completed CDM Doctoral Dissertations

- W. Chan (2007) Predictors of a “Good Death” Among Hong Kong Chinese Patients in a Palliative Care Program
- A. Chow (2005) Bereavement Experience of Chinese Persons in Hong Kong
- D. Hanssen (2003) Intensive Family Preservation Services
- V. Kochkine (2006) Depressive Symptoms & Academic Achievement in Culturally Diverse Adolescents
- D. Mirabito (2000) Adolescent Mental Health Tx Termination
- E. Schwartz (2007) Effective Privatization of a Community Mental Health Agency
Recently Completed CDM Doctoral Dissertations

- M. Petrakis (2007) Suicide Relapse Prevention in an Australian Emergency Department
- B. William-Gray (2008) Accreditation and Organizational Capacity-Building: A Data-Mining Study
Recently Completed CDM Doctoral Dissertations

- G. De Fraia (2011) -- Organizational Responses to Traumatic Events: The Effectiveness of EAP Interventions.
Primary Practice Knowledge Benefits of CDM

- More Comprehensive & Systematic Assessment of Consumer Needs
- More Systematic Information About “Clinical and Program Fidelity”
- Qualitative & Quantitative Information Concerning Consumer Outcomes
- Information About Linkages Between Interventions & Outcomes
- Information About Important Contextual Influences on Service Patterns & Practice Outcomes
“Secondary” Benefits of CDM Studies

- Worker Mindfulness, Cultural Sensitivity & Self-Reflection
- Disciplinary & Inter-Disciplinary Team-Building
- Empowered Feeling Regarding Research Capacity
- Pride In Professionalism
- Intellectual & Emotional Replenishment
Ultimately, CDM Fosters Reflective Practice by Helping Practitioners to:

- Own what they know
- Acknowledge what they don’t know
- Pursue what they need to know
- That is the true “gold standard” of professional practice
And if you want to know how to do it

Available at Amazon.Com & Oxford University Press.Com
Now it’s time for my nap, and….

“That will be the gold standard by which all other naps are judged.”
The End