

The Enigma of Evidence-Based Practice: Are We Really Evidence-Based in Our Practice?

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Definitions of EBP

EBP is defined as "the integration of best research evidence with clinical expertise and client values."

Sackett D, et al. Evidence-based medicine. How to practice and teach EBM (pp. 4). London: Churchill Livingstone, 2000.

Evidence-based medicine is the "conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients."

Sackett DL, et al. Evidence based medicine: what it is and what it isn't. BMJ. 1996;312:71-2.

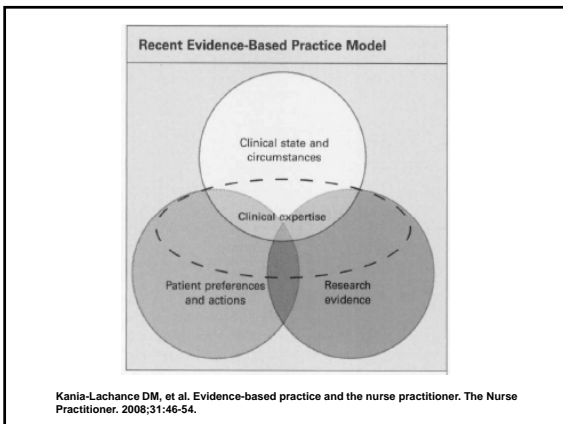
Definitions of EBP in Nursing

Evidence-based nursing:

A process of finding, appraising and applying a scientific evidence to the treatment and management of health care.

Evidence-based practice:

Method of problem-solving that involves identifying a clinical problem, searching the literature, evaluating the research evidence, and deciding on the intervention.



Confusion about Research Utilization (RU) and EBP

- RU & EBP are often used interchangeably, but they are not synonymous
- EBP is a more general term encompassing evidence broader than research findings and thus includes RU
- EBP includes the preferences and values of the patient & family in the process
 - While clinicians may utilize the best evidence available, the application and outcomes can differ based on the patients' values, preferences, concerns, and expectations

Factors Influencing Use of Research in Practice

Barriers
Research-related
Organizational
Nurse-related
Professional

Facilitators
Clinical relevance
Environment
Resources
Academic/practice links
Access to literature

Translating Research and Evidence into Practice

- While we have a growing evidence base, knowledge does not appear to be efficiently translated into practice
- One reason may be that the implementation of evidence into practice is not like the “flow of water” from researcher to practitioner
- It's more like a “contact sport” necessitating challenge, negotiation, and overcoming various boundaries, objects & players (Greenlaugh et al., 2004)

Types of Practice

- Research-based Practice
- Best Practice
- Knowledge-based Practice
- Data-driven Practice
- Evidence-based Practice

Research-based Practice

- Application of findings from a study(s) that:
 - is well-designed
 - is of acceptable quality
 - has meaningful results
 - has findings that are generalizable
 - can or has been replicated

Best Practice

- Practice defined by regulatory, accreditation agencies, and professional standards
- Practice that may not have compelling evidence or research to support it
- Practice that has tradition and an extensive documentation of proven effectiveness
- Practice based on sound rationales and "good clinical sense"

Examples:

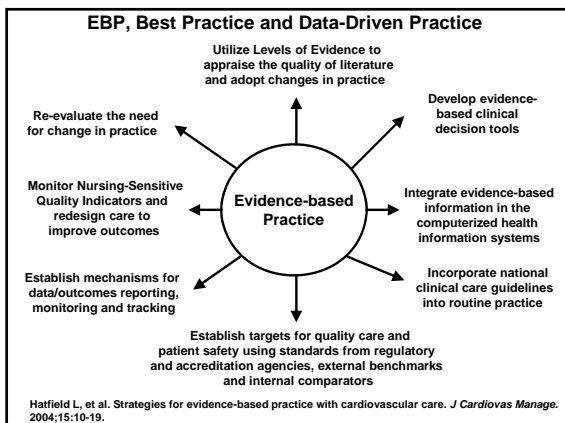
- assess pain regularly
- inform patients of their rights to adequate pain control

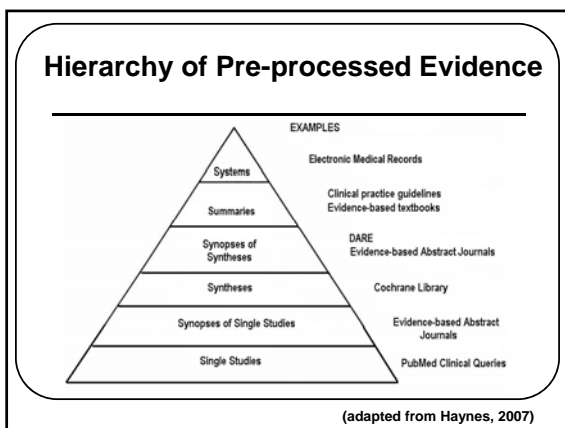
Knowledge-based Practice

- Derived from information from:
 - textbooks
 - educators
 - educational programs
 - experience
- Knowledge-based practice is not always EBP!

Data-driven Practice

- Internal validation studies/projects
- Performance Improvement (PI) initiatives/projects
- Benchmarking studies/projects





DARE: Database of Abstracts of Reviews of Effects

Centre for Reviews and Dissemination

Search: diabetes exercise

diabetes exercise: 105 documents found

Select	Database	Title	Year published	Author	Source
<input type="checkbox"/>	DARE	Pharmacological and lifestyle interventions to prevent or delay type 2 diabetes in people with impaired glucose tolerance: systematic review and meta-analysis	2007	Gilkes C L, Abajns K R, BMJ Lambert P C, Cooper R J, Sutton A J, Hsu R T, Nishi K	BMJ
<input type="checkbox"/>	DARE	Aerobic exercise and HDL-C: a meta-analysis of randomized controlled trials	2006	Kelley G A, Kelley K S	Atherosclerosis
<input type="checkbox"/>	DARE	A systematic review of motivational interviewing in physical health care settings	2006	Knight K M, McCosker L, British Journal of Health Dickens C, Bundy C	Psychology
<input type="checkbox"/>	DARE	The "relativ" efficacy of involving family in psychosocial interventions for chronic illness: are there added benefits to patients and family members?	2005	Martini L M	Families, Systems, and Health

www.crd.york.ac.uk/crdweb/

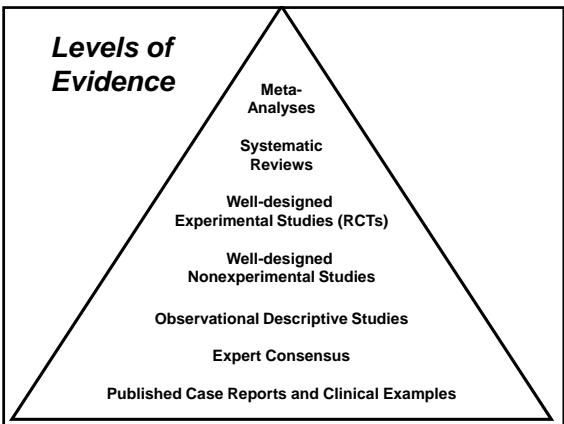
Systems that Support EBP: Clinical Decision Support Systems (CDSS)

“Decision support services that match information from individual patients with the best evidence from research that applies.”
(Haynes, 2007)

Do CDSSs Improve Practitioner Performance?
Results of a Systematic Review

- 48 of 71 (68%) CDSS demonstrated practice improvements
- 75% of interventions succeeded when the decision support was provided to clinicians automatically, whereas none succeeded when clinicians were required to seek out advice from the system
- Integrated systems of charting or order entry systems were more successful
- **Take home message?**

Kawamoto K, et al. Improving clinical practice using clinical decision support systems: a systematic review of trials to identify features critical to success. *BMJ*. 2005;330:765.



The Strongest Level of Synthesis: A Meta-Analysis

- An exhaustive review of the literature
- An integration of results to:
 - Examine research studies and pool data for statistical analyses
 - Formulate statistical conclusions about contradictory research-based information
 - Answer important questions about practice
 - Generalize conclusions

Systematic Reviews

Systematic consolidations of the literature on a specific topic:

- Comprehensive identification of studies
- Review of study relevance
- Evaluation of methodological quality
- Extraction of data
- Analysis of data
- Drawing conclusions

Systematic Reviews

Advantages

- Identifies pertinent research
- Compiles published research according to:
 - specific areas of study
 - historical or chronological evaluation
- Uncovers deficient areas of research

Disadvantages

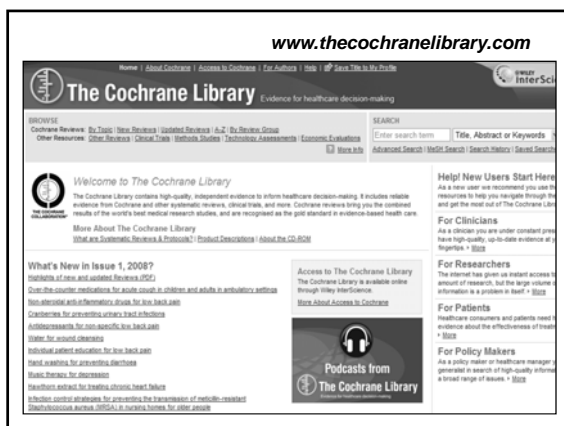
- May be biased
- May not be exhaustive
- Lacks criteria for selecting research
- May not critique the quality of research
- Fails to outline approaches for resolving contradictory evidence

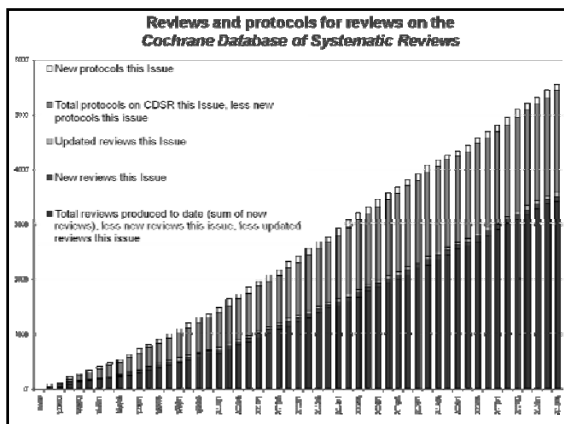
Where can you find meta-analyses and systematic reviews?

The Cochrane Collaboration

- Based on the best available information about healthcare interventions
- Cochrane Library published quarterly and available both on CD-ROM and the Internet
- Individuals and groups conduct these systematic reviews
- Guidelines are available on how to conduct a Cochrane Systematic Review
- Withdraws are issued regularly when evidence changes
- Published in multiple language translations

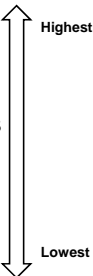
<http://www.cochrane.org/reviews/clintro.htm#reviews>





Other Levels of Evidence


- Well designed nonexperimental studies
- Observational descriptive studies
- Expert consensus
- Published case reports and clinical examples



Is a Review any Good?

The FAST Method: Questions

- **F**inding: Did they find most studies?
- **A**ppraisal: Did they select good ones?
- **S**ynthesis: What does it all mean?
- **T**ransferability of results



Five Limitations Can Reduce the Quality of Evidence

- Study limitations
- Inconsistent results
- Indirectness of evidence
- Imprecision – Includes study instruments or ways variables are measured
- Publication bias (this can be commercial bias)

Is finding all published studies enough?

A key problem with finding all the studies is "publication bias."

FACT: "Negative" studies are less likely to be published than "Positive."

- How does this happen? Well, its mostly the authors not submitting their negative studies rather than journals rejecting them.
- In a follow-up of 737 studies submitted to the ethics committee at the Johns Hopkins hospital positive studies were 2.5 times more likely to be SUBMITTED more than negative (Dickersin, JAMA, 1992)

EBP or Consensus Practice Guidelines

- Typically developed by expert panels
 - Researchers
 - Clinicians
 - Methodologists/Process Facilitators
- Agreement about rating/grading system(s) to be used
- Appraised by scientific rigor and methodologies used
- Informs readers how the evidence was identified, collected, and evaluated
- Includes recommendations for practice – the obvious
- Includes an extensive review process by external experts

Controversial Areas for Evidence

- What is "expert consensus?"
 - Survey of professional organization members or opinion leaders to arrive at consensus
 - Review of evidence by external experts
 - Peer review
 - Public commentary
- Who are the experts?
- Does clinical experience constitute evidence?

Evidence Rating and Grading Systems BMJ Levels of Evidence

- GRADE System
- http://clinicalevidence.bmj.com/cweb/about/search_process.jsp

Strength of Recommendation Taxonomy (SORT):

Strength of Recommendation	Definition
A	Recommendation based on consistent and good quality patient-oriented evidence *
B	Recommendation based on inconsistent or limited quality patient-oriented evidence *
C	Recommendation based on consensus, usual practice, opinion, disease-oriented evidence, and case series for studies of diagnosis, treatment, prognosis, or screening

Study Quality	Type of Study		
	Diagnosis	Treatment / Prevention / Screening	Prognosis
Level 1 Good quality patient-oriented evidence	<ul style="list-style-type: none"> Validated clinical decision rule Systematic Review (SR)/meta-analysis of high quality studies ** High quality diagnostic cohort study ** 	<ul style="list-style-type: none"> SR/meta-analysis of RCTs with consistent findings High quality individual RCTs ** All or none study ** 	<ul style="list-style-type: none"> SR/meta-analysis of good quality cohort studies Prospective cohort study with good follow-up
Level 2 Limited quality patient-oriented evidence	<ul style="list-style-type: none"> Unvalidated clinical decision rule SR/meta-analysis of lower quality studies or studies with inconsistent findings Lower quality diagnostic cohort study or diagnostic case-control study ** 	<ul style="list-style-type: none"> SR/meta-analysis of lower quality clinical trials or of studies with inconsistent findings Lower quality clinical trial ** Cohort study Case-control study 	<ul style="list-style-type: none"> SR/meta-analysis of lower quality cohort studies or with inconsistent results Retrospective cohort study or prospective cohort study with poor follow-up Case-control study Case series
Level 3 Other evidence	Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (symptomatic or physiologic outcomes only), and case series for studies of diagnosis, treatment, prognosis, or screening.		

Ebell MH, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence. *J Am Board Fam Pract.* 2004;17:59-67.

Ratings of Levels of Evidence in a Nursing Paradigm

Level of Evidence	Feasibility F (1-4)	Appropriateness A (1-4)	Meaningfulness M (1-4)	Effectiveness E (1-4)	Economic Evidence EE (1-4)
1.	Metasynthesis of research with unequivocal synthesized findings	Metasynthesis of research with unequivocal synthesized findings	Metasynthesis of research with unequivocal synthesized findings	Meta-analysis (with homogeneity) of experimental studies (eg RCT) with concealed randomization OR One or more large experimental studies with narrow confidence intervals	Metasynthesis (with homogeneity) of evaluations of important alternative interventions comparing all clinically relevant outcomes against appropriate cost measurement, and including a clinically sensible sensitivity analysis
2.	Metasynthesis of research with credible synthesized findings	Metasynthesis of research with credible synthesized findings	Metasynthesis of research with credible synthesized findings	One or more smaller RCTs with wider confidence intervals OR Quasi-experimental studies (without randomization)	Evaluations of important alternative interventions comparing all clinically relevant outcomes against appropriate cost measurement, and including a clinically sensible sensitivity analysis
3.	a. Metasynthesis of research with credible synthesized findings b. One or more single research studies of high quality	a. Metasynthesis of research with credible synthesized findings b. One or more single research studies of high quality	a. Metasynthesis of research with credible synthesized findings b. One or more single research studies of high quality	a. Cohort studies (with opinion group) b. Case-control c. Observational studies (without control group)	Evaluations of important alternative interventions comparing a limited number of appropriate cost measurement, without a clinically sensible sensitivity analysis
4.	Expert opinion	Expert opinion	Expert opinion	Expert opinion, or physiology bench research, or consensus	Expert opinion, or based on economic theory

http://www.joannabriggs.edu.au/pdf/JBIReviewManual_CIP11449.pdf

ASA Evidence Grading/Rating System

Category A: Supportive Literature. Randomized controlled trials report statistically significant (P < 0.01) differences between clinical interventions for a specified clinical outcome.

Level 1: The literature contains multiple randomized controlled trials, and the aggregated findings are supported by meta-analysis.	Level 2: The literature contains multiple randomized controlled trials, but there is an insufficient number of studies to conduct a viable meta-analysis for the purpose of this Advisory.	Level 3: The literature contains a single randomized controlled trial.
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Category B: Suggestive Literature. Information from observational studies permits inference of beneficial or harmful relationships among clinical interventions and clinical outcomes.

Level 1: The literature contains observational comparisons (e.g., cohort, case-control research designs) of two or more clinical interventions or conditions and indicates statistically significant differences between clinical interventions for a specified clinical outcome.	Level 2: The literature contains noncomparative observational studies with associative (e.g., relative risk, correlation) or descriptive statistics.	Level 3: The literature contains case reports.
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ASA Evidence Grading/Rating System

Category C: Equivocal Literature. The literature cannot determine whether there are beneficial or harmful relationships among clinical interventions and clinical outcomes.

Level 1: Meta-analysis did not find significant differences among groups or conditions.	Level 2: There is an insufficient number of studies to conduct meta-analysis and (1) randomized controlled trials have not found significant differences among groups or conditions or (2) randomized controlled trials report inconsistent findings.	Level 3: Observational studies report inconsistent findings or do not permit inference of beneficial or harmful relationships.
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Category D: Insufficient Evidence from Literature. The lack of scientific evidence in the literature is described by the following terms.

Silent: No identified studies address the specified relationships among interventions and outcomes.	Inadequate: The available literature cannot be used to assess relationships among clinical interventions and clinical outcomes. The literature either does not meet the criteria for content as defined in the "Focus" of the Advisory or it does not permit a clear interpretation of findings due to methodologic concerns (e.g., confounding in study design or implementation).
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EBP or Consensus Practice Guidelines should inform readers about the process

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graph TD
    A[Guidelines Steering Committee Selects Topic] --> B[Guideline Panel Selected]
    B --> C[Preliminary Pathway Derivation]
    C --> D[Institutional Review]
    D --> E[Guideline Revision]
    F[Collation] --> E
    E --> G[Final Guideline]
    G --> H[Continuous Review]
    H --> E
    
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National Cancer Center Network Guidelines Development Process
http://www.nccn.org/professionals/physician_gls/about.asp

Critiquing Clinical Practice Guidelines

Guidelines make explicit recommendations and are based upon some evidence. Evaluation includes appraisal of the following items:

<http://onsopcontent.ons.org/toolkits/evidence/Process/guidelines.shtml>

- The guideline specificity and population to whom it will be applicable
- All relevant options and outcomes are specified with decision-making points apparent
- Process to identify, select, and combine evidence is described and makes sense.
- Includes most recent findings (e.g., is current)
- Process of peer review and evaluation specified
- Recommendations are practical and clinically relevant
- Recommendations are strong (strength of evidence described)
- Guideline responds to a clinical problem
- Recommendations are applicable to patients in your current setting
- Use of recommendations would lead to identifiable outcomes that could be measured

AGREE – Appraisal of Guidelines Research and Evaluation

- International collaboration of researchers and policy makers involving more than 10 countries
- Administered by the Health Care Evaluation Unit at St George's Hospital Medical School in London
- Seeks to improve the quality and effectiveness of clinical practice guidelines
- Establishes a shared framework for their development, reporting and assessment of guidelines

AGREE – Appraisal Criteria

- **Scope and purpose**
- **Stakeholder involvement**
- **Rigor of development**
- **Clarity and presentation**
- **Applicability**
- **Editorial independence (conflict of interest)**

<http://www.agreecollaboration.org/pdf/agreinstrumentfinal.pdf>

Obstacles to the Quality of Evidence for EBP

- Experts

- Industry
 - Pharmaceutical enticements
 - Pharmaceutical CME/CE
 - Pharmaceutical research

- Investigator self-interest

Evidence-Based Practice Resources

CLINICAL PRACTICE GUIDELINES	
Site/URL	Description
Agency for HealthCare Research and Quality (AHRQ) www.ahrq.gov	Evidence Report Topics, Evidence Technical Reviews and Clinical Guidelines
National Guideline Clearinghouse www.guideline.gov	A public resource for evidence-based clinical practice guidelines and measurement tools. NGC is sponsored by the Agency for Healthcare Research and Quality (AHRQ)
National Quality Measures Clearinghouse www.qualitymeasures.ahrq.gov	A public resource for evidence-based clinical practice guidelines and measurement tools. NGC is sponsored by the Agency for Healthcare Research and Quality (AHRQ)

Evidence-Based Practice Resources

SPECIALTY-SPECIFIC GUIDELINES	
Site/URL	Description
National Comprehensive Cancer Network (NCCN) www.nccn.org/index.html	Cancer care guidelines
Primary Care Clinical Practice Guidelines http://medicine.ucsf.edu/resources/guidelines	Guidelines and resources
Internet Stroke Center www.strokecenter.org/ebtcd-03/index.html Available from Washington University	Evidence-based guides to specific aspects of stroke care
American Academy of Pediatrics www.aap.org/policy/paramtoc.html	Guidelines for pediatric specialty
AGREE Collaboration www.agreecollaboration.org	Guideline appraisal instrument and list of guidelines that have been appraised.

Evidence-Based Practice Resources

GENERAL SITES WITH EXCELLENT LINKS TO OTHER EBP SITES

Site/URL	Description
Academic Center for Evidence-Based Nursing (ACE) University of Texas Health Center, San Antonio www.acestar.uthscsa.edu	Comprehensive list of EBP Resources
Centre for Health Evidence Canadian Office of Health www.cche.net/che/home/asp	Users Guides for EBP series from JAMA. How to critique and use different types of evidence articles.
Centre for Evidence-Based Nursing, University of York www.york.ac.uk/healthsciences/centres/evidence/cebn.htm	Lists of pertinent systematic reviews and research reports
Centre for Evidence-Based Medicine (CEBM) www.cebm.net	How-to's for every step in EBP process. Numerous slide resources and information on flawed studies.

Evidence-Based Practice Resources

SYSTEMATIC/INTEGRATED REVIEWS

Site/URL	Description
Cochrane Library www.cochranelibrary.com/cochrane	Systematic reviews and guidelines. Generally medically-oriented but considered the gold-standard of such reviews. (Can browse titles and get abstracts and Penn holds a license for obtaining these.)
Database of Abstracts of Reviews of Effects (DARE) www.nhsrtd.york.ac.uk/welcome.htm	Systematic Reviews produced and maintained by the National Health System's Centre for Reviews and Dissemination.
ONS EBP Online Resource Center Available on ONS website www.ons.org	Late 2003 a new area on website provides a list of integrated reviews pertinent to cancer care.

Evidence-Based Practice Resources

GENERAL SITES WITH EXCELLENT LINKS TO OTHER EBP SITES

Site/URL	Description
Joanna Briggs Institute www.joannabriggs.edu.au/about/home.php	Australia-based EBP privately owned site—some free pages and some subscriptions; nursing and allied health topics
Advanced Practice Nursing www.enursescribe.com/advanced_practice_nursing.htm	Privately owned site with many pertinent sources.

Evidence-based Practice or Not?

- Turning patients every two hours
- Head of the bed elevated 30° to prevent VAP
- Walking up a flight a steps before being able to tolerate sexual activity after a MI
- Sucrose as analgesic for infant pain
- Monitoring patients every hour for the first 12 hours after initiating continuous epidural infusions

Evidence Source Equation

- Scientific Evidence + Clinician Experience + Patient Preferences = EBP
- EBP process begins with the:
 - Clinical inquiry process
 - Collective expertise and reasoning among experts
 - Critical appraisal of evidence for scientific merit, strength, validity and applicability to clinical care

Can we infuse evidence into practice, or will the power of tradition prevail?

Though some scientists, particularly the older and more experienced ones, may resist indefinitely, most of them can be reached in one way or another. Conversions will occur a few at a time until, after the last holdouts have died, the whole profession will again be practicing under a single, but now different, paradigm.

Thomas Kuhn, 1962
