The Nurse as a Research Leader

Kathy Mussatto, PhD, RN
Nurse Scientist
Herma Heart Center
Children’s Hospital of Wisconsin
Outline

- History and definition of nursing research
- Contributions to pediatric health issues
- Levels of nursing participation in research
- National nursing research priorities
Definition of Nursing Research

- A scientific process that validates and refines existing knowledge and generates new knowledge that directly and indirectly influences nursing practice.

The Practice of Nursing Research: Conduct, Critique, and Utilization
Susan K. Grove, 2005, Elsevier
History of Nursing Research

- Florence Nightingale
  - Reformer
  - Reactionary
  - Researcher
Florence Nightingale

- Crimean War 1853-56
- Collected data
- Discovered that more soldiers died from infection than battle wounds
- Used statistics and graphs to present data
- Based practice on research findings
Nursing Research Contributions in Pediatrics

- Preparation for procedures
- End of life care
- Quality of life
- Family adaptation
- Parental presence
- Development of parenting skills for complex infants
- Pain management
- Adolescent self-management, adherence and transitions
- Impact of APNs
- Many other examples…..
Levels of Participation in Research

- Contribution of data
- Evaluation and application of evidence
- Design, conduct and/or participate in research from a nursing perspective
Contribution of Data

Research is the process of turning data into information.
Evaluation and Application of Evidence

The average length of time between knowledge discovery & its utilization is 20 years!
Evaluation and Application of Evidence

- Translation of research findings to Evidence Based Practice occurs through formal, systematic processes

- Need to review findings from multiple studies to have confidence that an intervention causes changes in outcomes
The Keystones of Evidence

Evidence – Based Practice

- Patient Concerns
- Clinical Experience
- Best Practices
- Clinical Data and Research

_Evidence-Based Practice in Nursing and Health Care_, Malloch & Porter-O’Grady, 2006
Design, conduct and/or participate in research

Research Team roles -
- Perform study related procedures
- Data collection
- Screen/recruit/consent subjects
- Study coordinator
- Co-Investigator
- Principal Investigator
Why Do We Do Research?

Describe
Explain
Predict
Control
The Phenomena of Interest to our Specialty
The Problem

- High mortality following stage 1 surgical palliation of hypoplastic left heart syndrome (HLHS)
Phenoxybenzamine Improves Systemic Oxygen Delivery After the Norwood Procedure

James S. Tweddell, MD, George M. Hoffman, MD, Raymond T. Fedderly, MD, Stuart Berger, MD, John P. Thomas, Jr, MD, Nancy S. Ghanayem, MD, Maryanne W. Kessel, RN, and S. Bert Litwin, MD

Cardiothoracic Surgery, Department of Surgery, and Departments of Anesthesia, Pediatrics, Critical Care, and Pediatric Cardiology, Medical College of Wisconsin, Children’s Hospital of Wisconsin, Milwaukee, Wisconsin

Explain

Venous Saturation and the Anaerobic Threshold in Neonates After the Norwood Procedure for Hypoplastic Left Heart Syndrome

George M. Hoffman, MD, Nancy S. Ghanayem, MD, John M. Kampine, MD, Stuart Berger, MD, Kathleen A. Mussatto, BSN, S. Bert Litwin, MD, and James S. Tweddell, MD

Departments of Anesthesiology, Pediatric Critical Care Medicine, Pediatric Cardiology, and Cardiovascular Surgery, Children’s Hospital of Wisconsin and Medical College of Wisconsin, Milwaukee, Wisconsin

Improved Survival of Patients Undergoing Palliation of Hypoplastic Left Heart Syndrome: Lessons Learned From 115 Consecutive Patients

James S. Tweddell, George M. Hoffman, Kathleen A. Mussatto, Raymond T. Fedderly, Stuart Berger, Robert D. B. Jaquiss, Nancy S. Ghanayem, Stephanie J. Frisbee and S. Bert Litwin

*Circulation* 2002; 106 (Suppl): I82-9.
Control

Home surveillance program prevents interstage mortality after the Norwood procedure

N. S. Ghanayem, MD<sup>a,b,f</sup>
G. M. Hoffman, MD<sup>b,d</sup>
K. A. Mussatto, BSN<sup>a,f</sup>
J. R. Cava, MD<sup>b,c</sup>
P. C. Frommelt, MD<sup>b,c</sup>
N. A. Rudd, MSN<sup>c</sup>
M. M. Steltzer, MSN<sup>c</sup>
S. M. Bevandic, BSN<sup>c</sup>
S. J. Frisbee, MS<sup>f</sup>
R. D. B. Jaquiss, MD<sup>a</sup>
S. B. Litwin, MD<sup>c</sup>
J. S. Tweddell, MD<sup>c</sup>

Management of Infants With Hypoplastic Left Heart Syndrome
Integrating Research Into Nursing Practice

Deborah Soetenga, RN, MS
Kathleen A. Mussatto, RN, BSN
It Takes a Team -
The Research Team

- Jim Tweddell, MD – Surgery
- Robert Jaquiss, MD – Surgery
- Bert Litwin, MD – Surgery
- Stu Berger, MD – Cardiology
- Ray Fedderly, MD – Cardiology
- Peter Frommelt, MD – Cardiology
- Joe Cava, MD – Cardiology
- John Thomas, MD – Cardiology
- George Hoffman, MD – Anesthesiology
- John Kampine, MD – Anesthesiology
- Nancy Ghanayem, MD – Critical Care
- Kathy Mussatto, RN – Nursing
- Maryanne Kessel, RN - Nursing
- Nancy Rudd, RN – Nursing
- Michelle Steltzer, RN – Nursing
- Sarah Bevandic, RN – Nursing
- Deb Soetenga, RN – Nursing
- Stephanie Frisbee, MS – Statistician
Multiple perspectives make for better research!

- Medicine
- Surgery
- Nursing
- Psychology
- Neurology
- Speech
- Physical Therapy
- Education
- Nutrition

- Critical Care
- Anesthesiology
- Perfusion
- General Pediatrics
- Pulmonology
- Nephrology
- Hematology
- Respiratory Therapy

…and many others
Keys to Success

- Well-defined roles
- Regular meetings and communication
- Mutual goal setting
- Valuing different perspectives
- Access to high-quality data and the tools to turn it into information
- Constructive criticism
Opportunities for Collaboration

Children's Research Institute, Marquette University, UW-Milwaukee create nursing research consortium

Objectives of the PNRC include:
• Promoting and conducting nursing research.
• Enhancing the capacity to use evidence-based practice.
• Soliciting funds to support clinical research.
Purpose

- To develop collaborations amongst nursing researchers and advanced practice nurses at children’s hospitals.
- Share nursing research findings from children’s hospitals around the United States.
- Explore the roles of Director of Nursing Research and Nurse Scientists and how these roles interact with staff.
Find your niche

Special Interest Groups

- Pain
- Quality of Life
- Injury Prevention
Opportunities:

- partner with existing networks,
- capitalize on existing patient samples or data sets
- volunteer for writing committees
NINR Research Emphasis

- Promoting Health and Preventing Disease
- Improving Quality of Life
- Eliminating Health Disparities
- Setting Directions for End-of-Life Research
Conclusions

- Nursing participation in research has a long history.
- Nurse-led research has made many contributions to improved understanding of health issues for patients and families.
- There are multiple levels of nursing participation in research.
- It takes a team – Join one or form one!
- National level research priorities are ripe for contribution from nurse research leaders.
Nursing Research is a fusion of science and service to the patient.
Managing an Interdisciplinary Research Program

Julie Slicker MS RD CSP CD CNSC
Quality, Outcomes & Research Manager
Herma Heart Center
Children’s Hospital of Wisconsin
Outline

• Personal traits of a productive researcher
• Characteristics of a productive research environment
• Resource utilization
• Project evaluation criterion
• National multidisciplinary research teams
Team Members

• Personal motivation
• Research training / Mentorship
• Academic Values
• Networking
• Substantial uninterrupted time
Productive Research Environment

- Clear goals
- Research emphasis
- Culture
- Group climate
- Assertive participative governance
- Decentralized organization

- Communication
- Resources
- Size, age and diversity
- Rewards
- Recruitment and selection
- Leadership
Managing Resources

- Research Intake Form / Budget
- Weekly 1:1 meetings with research staff
- Monthly team meetings
- Mode of distributing information
  - Faculty meetings
  - Newsletter
  - Email
  - Website
Managing Resources

• Resource utilization
• Backup Resources
  – IRB
  – Grants/Contracts
  – Scientific writing
  – Biostatistics
  – FDA
  – Data extraction
  – Registry management
• Ranking studies
  – I: Exempt studies
  – II: Registries
  – III: Onsite databanks
  – IV: Diagnostics/Imaging
  – V: Device / Intervention
Research intake form helps formulate a plan and tests study design
Budgeting time & $$ to allocate resources effectively

<table>
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<th>Personnel (IRB document creation, data/specimen collection, etc.)</th>
<th>See column H for Effort Estimate Grid</th>
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| Supplies                |        |        |        |        |       |
|                        |        |        |        |        |       |

| Equipment               |        |        |        |        |       |
|                        |        |        |        |        |       |

| Travel                  |        |        |        |        |       |
|                        |        |        |        |        |       |

| Consultants             |        |        |        |        |       |
|                        |        |        |        |        |       |

| Other                   |        |        |        |        |       |
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<th>REVENUE/(SHORTFALL=Cost Sharing)</th>
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Contact Julie Slicker [266-2884, jslicker@chw.org] for assistance in filling in the budget.
National Pediatric Cardiology Feeding Work Group

JCCHD identified a need for improving growth & nutrition in infants with single ventricle anatomy

- Leaders selected
- Additional centers asked to participate
  - Central site set runs logistics
  - Purpose / study design planned

- Discuss findings
- Choose Journal
- Background written
- Sub group summaries
- Writing committee

- Levels of evidence ranked
- Sub-groups present findings
- Data analyzed

- Conference calls
- Tasks assigned
- Support
- Systematic Review

The Research Cycle:
- Identify research area
- Design research study
- Carry out research
- Analyse research results
- Publish research results
Putting it together

• Individuals work together to form a TEAM
• Teams are effective only if they have the appropriate support
  • Managing people & resources efficiently

= SUCCESS
# Collaborative Interdisciplinary Research Teams: Keys to Success

<table>
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<tr>
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<tbody>
<tr>
<td>Kathleen Mussatto, PhD, RN</td>
<td>Nurse Scientist, Herma Heart Center, Children's Hospital of Wisconsin, <a href="mailto:kmussatto@chw.org">kmussatto@chw.org</a></td>
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<tr>
<td>Mary Krolikowski, MSN, RN</td>
<td>Research Nurse II, Herma Heart Center, Medical College of Wisconsin, <a href="mailto:mkrolikowski@chw.org">mkrolikowski@chw.org</a></td>
</tr>
<tr>
<td>Raymond G Hoffmann, PhD</td>
<td>Professor of Biostatistics in Pediatrics, Associate Director, Quantitative Health Sciences, Medical College of Wisconsin, <a href="mailto:rhoffmann@mcw.edu">rhoffmann@mcw.edu</a></td>
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<tr>
<td>Julie Slicker, RD</td>
<td>Quality, Outcomes and Research Manager, Herma Heart Center, Children’s Hospital of Wisconsin, <a href="mailto:jslicker@chw.org">jslicker@chw.org</a></td>
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## The Nurse as a Research Leader
- Examples of nursing research contributions to pediatric health issues
- Levels of participation in research for nurses
- Research teams
- Natl. Institute of Nursing Research priorities

## The Nurse Coordinator Role in Interdisciplinary Studies
- Roles and Responsibilities
- Strategies for working effectively with study sponsors and local investigators
- Collaborating with peers at multiple centers

## The Statistician's Contribution to Interdisciplinary Research
- Value of early involvement
- Evaluating nursing processes and outcomes
- Statistical approach to nursing questions - qualitative and quantitative methods

## Managing an Interdisciplinary Research Program
- Team members
- Project evaluation criteria
- Resource management
Different Research Questions lead to Different Hypotheses
Choosing a Hypothesis

- Has it Been Done Before?
  - It takes just as much effort to collect the data for a study that is **clinically unimportant** as for a study that has **great clinical significance**
  - Choose your goal carefully
  - Search the literature
The Study Design is Crucial

- Different Groups – two or more
  - Time to effective dose by genetic status (++, +A, AA)
- Same Patient Group(s) – pre-post
  - Same patient pre-post anesthetic
  - New process or treatment vs old (separated in time)
- Relationships within a Patient Group
  - Correlation between LOS after HLHS surgery and cognitive development
  - The effect of different feeding strategies on LOS
Treatment Comparison Studies Have a STRONG Patent Selection bias
Quality Data: The Key to any Study

- Train multiple observers to agree on test data
- Try to make the sampling times comparable
- Use RedCap not Excel

**Surveys:** Designing a good survey is a project
- **Content Validity:** Use Experts in the field
- **Construct Validity:** Is it similar to something else
  - E.g. Self-report vs. Structured interview by psychologist
- **Reliability:** Do you get the same answers twice? (repeatability)
- **Pre-test** to prevent problems
Sample Size and Statistics

Sample Size Rules of Thumb:

- 15 subjects for a pilot study (estimates and CI)
- 30 subjects for a large effect (40% difference or 0.7 units on a Likert scale)
- 60 subjects for a medium effect (25% difference or 0.5 units on a Likert scale)

Statistics: Data is seldom Normal!

- t-tests if normal data
- Non-parametric tests if not
- Paired-test vs. Independent sample test
- Longitudinal studies are different!
References:

- www.bmj.com/about-bmj/resources-readers/publications
  - Statistics at Square One
  - Epidemiology for the Uninitiated
- Sage University Press:
  - Survey Questions: Handcrafting the Standardized Questionnaire. Converse JM and Presser S
  - Reliability and Validity Assessment. Carmines EG and Zeller RA