National Institutes of Health

Translational Research: How Research Informs Evidence-Based Practice and Practice Change

2014 Nursing Research Symposium: Improving Patient Outcomes through Quality Improvement, Evidence-Based Practice and Research

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Program Director
National Institute of Nursing Research

National Institute of Nursing Research

Overview

- Introduction to the structure of NIH and NINR
- Generate a discussion surrounding the meaning of translation and how we can move translation into a transformative approach for active implementation.
- Real world translation….a story

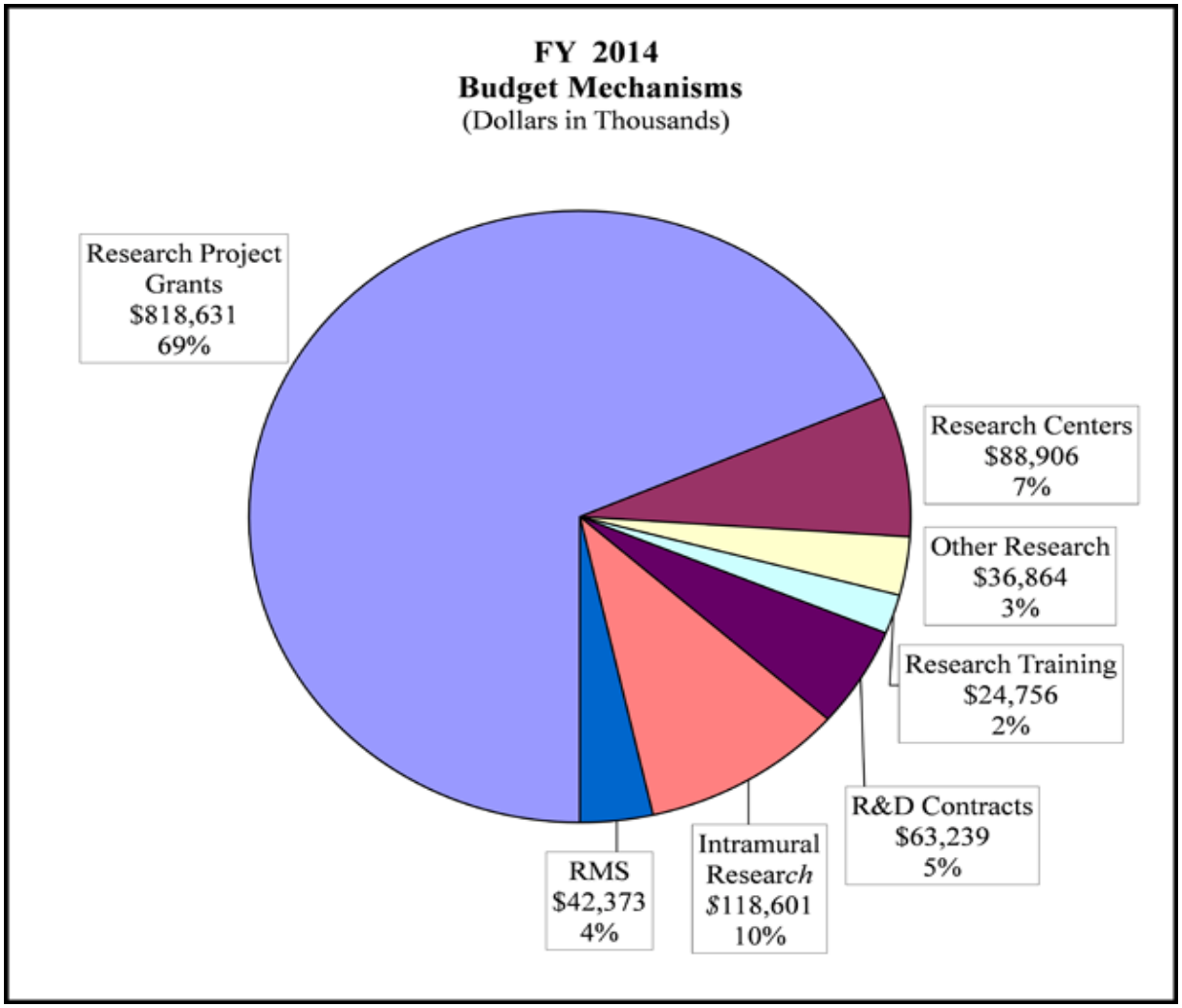
The National Institutes of Health (NIH)

The NIH Mission

Science in pursuit of fundamental knowledge about the nature & behavior of living systems & the application of that knowledge to enhance health, lengthen life, & reduce illness & disability.

www.nih.gov/about/mission.htm

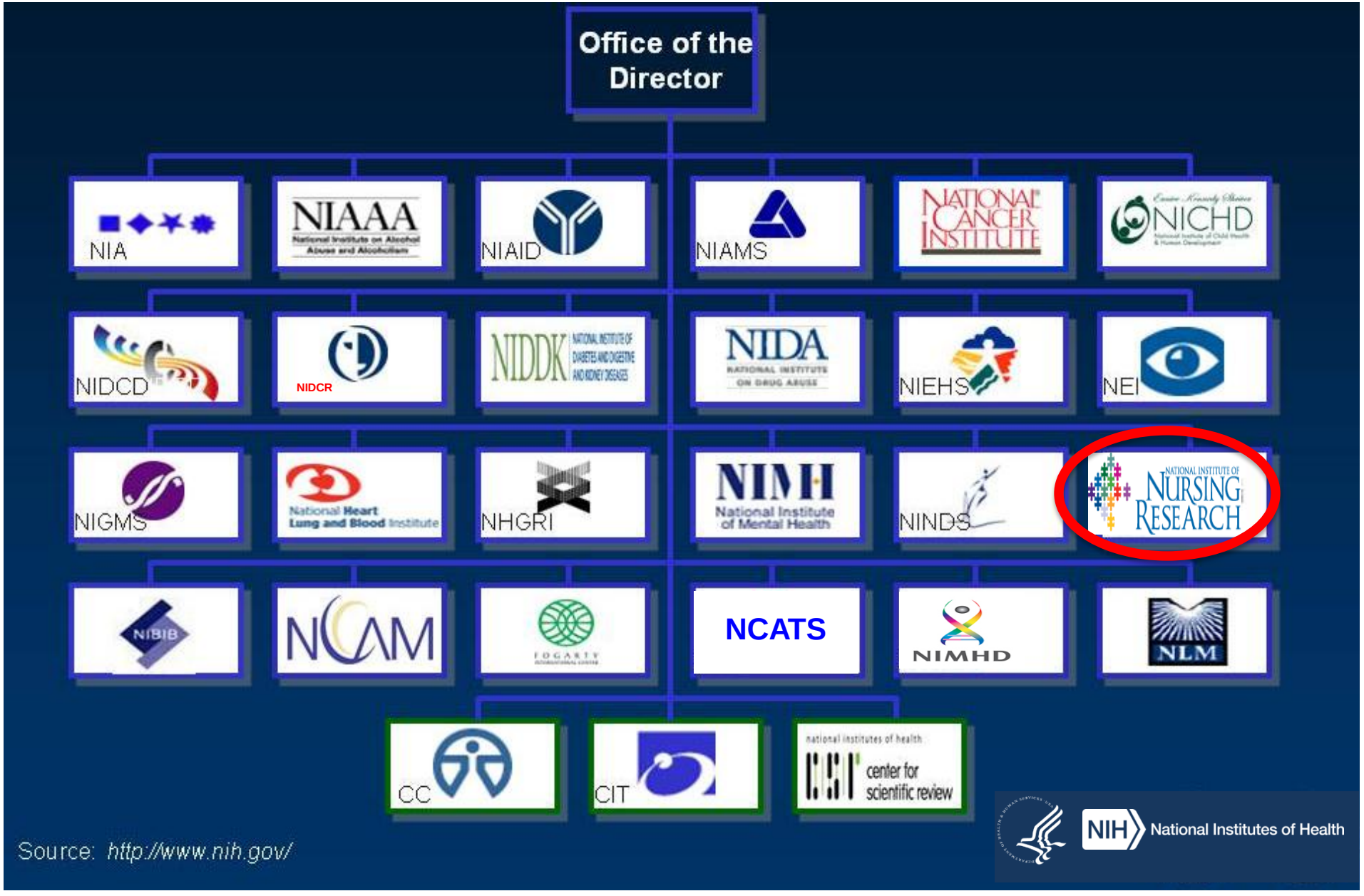
NIH Budget



http://www.nia.nih.gov/about/budget/2013/fiscal-year-2014-budget/fy-2014-budget-graphs

Celebrating 60 years at the NIH Clinical Center

The National Institutes of Health (NIH)



Source: *http://www.nih.gov/*

NIH National Institutes of Health

NINR: History, Mission & Strategic Plan

National Institute of Nursing Research

November 1985
Formal authorization of NCNR at NIH

April 1986
NCNR established at NIH

December 1986
Members of the NCNR Advisory Council appointed

February 1987
1st meeting of the NCNR Advisory Council

June 1993
NCNR officially elevated to Institute status

NINR and Nursing Research

NINR Mission

To promote and improve the health of individuals, families, and communities.

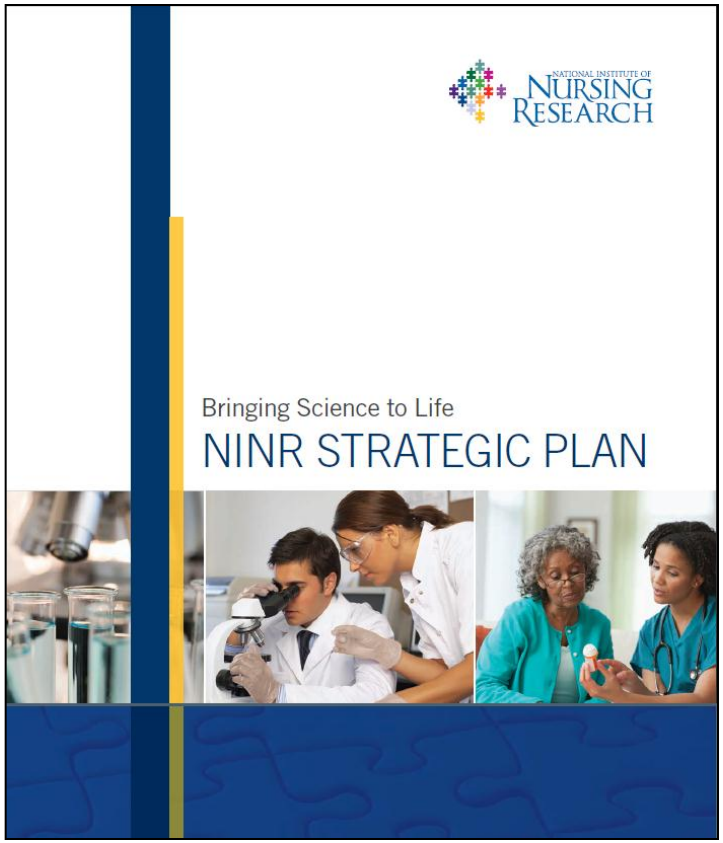
NINR: History, Mission & Strategic Plan

NINR science offers unique expertise within the NIH with our focus on the *science of health*:

- **Inclusive of full life-course through end-of-life**
- **Encompasses spectrum of health & settings of care**
- **Promotes multi/interdisciplinary & team science**
- **Person- & family-centered**
- **Community-engaged research**
- **Cultivates partnerships, collaboration & leadership**

NINR and Nursing Research

NINR Strategic Plan: Meeting the Challenges



Science that invests in:

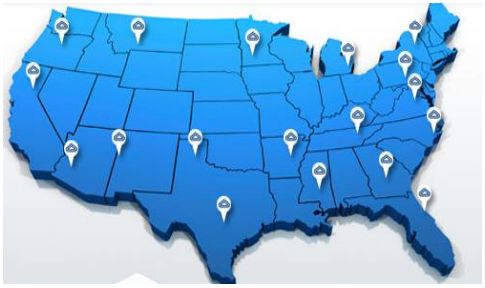
- **Health Promotion and Disease Prevention**
- **Advancing the Quality of Life: Symptom Management**
- **Palliative and End-of-Life Care**
- **Innovation**
- **Training Nurse Scientists**

NINR: History, Mission & Strategic Plan

Scientific Focus Areas to Implement NINR's Strategic Plan

- **Symptom Science**
- **Wellness**
- **Self-Management**
- **End-of-Life & Palliative Care**

NINR's Areas of Research



NINR Extramural Research

- Primarily at universities and health science centers
- Cross-cutting, interdisciplinary research

http://www.ninr.nih.gov/ResearchAndFunding/DEA/

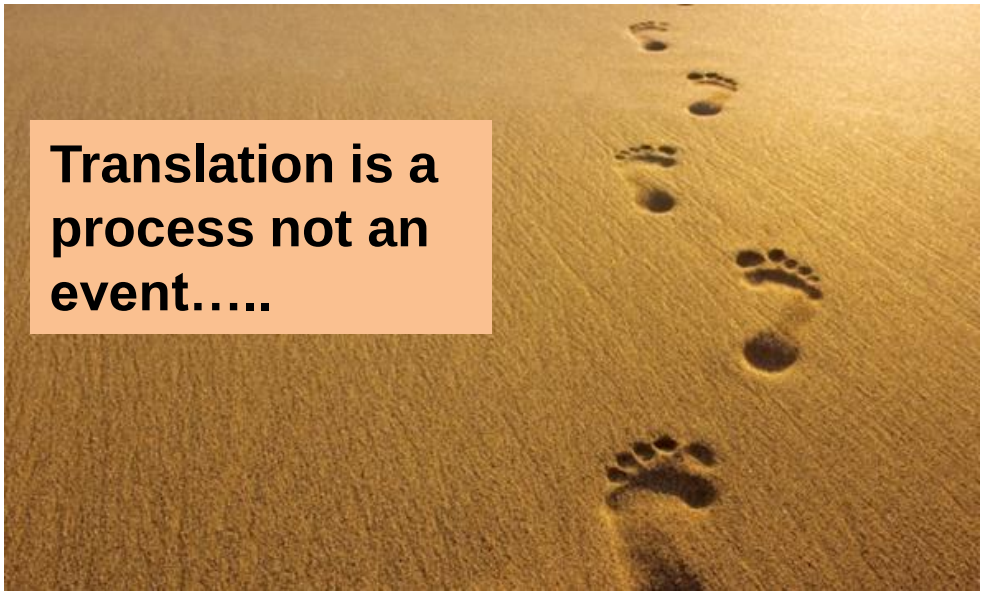
NINR Intramural Research

- On the NIH campus in Bethesda, Maryland
- Collaborative research in symptom management, TBI, and genomics
- Training at all career levels

http://www.ninr.nih.gov/ResearchAndFunding/dir/

What If……

You could translate the evidence from a research question into practice that improves health outcomes of individuals and/or their families?



What is Translation?

“Bench to Bedside?”

Translational Research?

Translation is NOT…….

Translational Research

“Translational research means different things to different people, but it seems important to almost everyone”.

Steve Woolf, 2008

“It appears that translation in the 1970s morphed into research utilization in the 1980s and into evidence-based practice in the 1990s, with some re-acquaintance with translation again in the first years of the 21st century”.

Pam Mitchell, 2004

Translation: The problem

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

The Quality of Health Care Delivered to Adults in the United States

Elizabeth A. McGlynn, Ph.D., Steven M. Asch, M.D., M.P.H., John Adams, Ph.D., Joan Keesey, B.A., Jennifer Hicks, M.P.H., Ph.D., Alison DeCristofaro, M.P.H., and Eve A. Kerr, M.D., M.P.H.

ABSTRACT

BACKGROUND

We have little systematic information about the extent to which standard processes involved in health care — a key element of quality — are delivered in the United States.

METHODS

We telephoned a random sample of adults living in 12 metropolitan areas in the United States and asked them about selected health care experiences. We also received written

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Nursing Science Translation

Basing nursing practice on research findings is essential and not new to nursing

Almost 140 years ago Florence Nightingale stressed translation (the use of evidence)

Nursing Science Translation

It was not until the 1950's and 1960's that nursing research became a priority..

- **Introduced to the undergraduate level**
- ***Nursing Research* was first published in 1952**

In 1956 the editor of *Nursing Research*, Virginia Henderson, was quoted:

"It must be assumed by the researcher who must make known the results of research; by professional organizations through periodicals, meetings, and conferences; by faculties of schools where students expect to find curricula based on the latest research findings; by officials of nursing services who are responsible for seeing that patient care is based on the latest and most accurate knowledge concerning nursing; **and by every individual professional nurse whose responsibility it is to use reported research to improve her own work**".

That was almost 60 years ago…..

Translating Research to Practice

Jean E. Johnson, Ph.D., R.N., F.A.A.N.

The translation of research to practice is a responsibility of practitioners. The responsibility for nursing care and whether or not that care is influenced by knowledge from scientific investigations rests with each practitioner. A practitioner as a professional person is accountable for the quality of her or his practice; a nurse researcher as a professional is accountable for the quality of her or his research. The researcher is held accountable by scientific criteria and for the potential relevance of the research to nursing functions. The researcher cannot be held accountable for the use or misuse of the new knowledge generated. However, retrospective evaluation of the contribution of research to nursing will be influenced by both the quality of the research and whether the knowledge influenced the quality of nursing care provided to the public.

Johnson, J., 1979, Journal of Professional Nursing

News from NINR

Translational research and nursing science

Patricia A. Grady, PhD, RN, FAAN

- Pursue new ways of thinking and working.
- Pay attention to the interface
- Educate, educate, educate

Pasteur noted generations ago, there is a link between "science, and the application of science." In a recent interview with *The New York Times*, National Institutes of Health (NIH) Director Dr. Francis S. Collins acknowledged the importance of disciplines such as biochemistry and genetics, but stated, "We are not the National

Early models portrayed translational research as a linear, unidirectional process that moved research findings in discrete steps from the laboratory through Phase I or Phase II trials to Phase III trials, before moving to general clinical practice or to broader populations and community settings.

Grady, Nursing Outlook 2010;58:164-166.

Gap in Translation

"It took 264 years to implement the use of citrus juice on British ships from the time it was discovered as a prevention for scurvy"

Glaser, E.M. Abelson, N.H., & Garrison, K.N. (1983). Putting knowledge to use. San Francisco: Jossey-Bass.

Research Utilization Gap

Time span between Research and Utilization

Research	Year idea generated	Year 1st realization	Duration in Years
Pacemaker	1928	1960	32
Electrophotography	1937	1959	22
Oral Contraceptive	1951	1960	9
Hybrid Corn	1908	1933	28

Glaser, E.M. Abelson, N.H., & Garrison, K.N. (1983). Putting knowledge to use. San Francisco: Jossey-Bass.

Research Utilization

Comparison of a replicated study to the original study

Position for IM Injections	Brett, 1987 (n=216)	Coyle & Sokop, 1990 (n=113)
Aware of findings	44%	34%
Persuaded that the finding was useful	34%	21%
Sometimes used intervention	29%	4%
Always used intervention	10%	22%

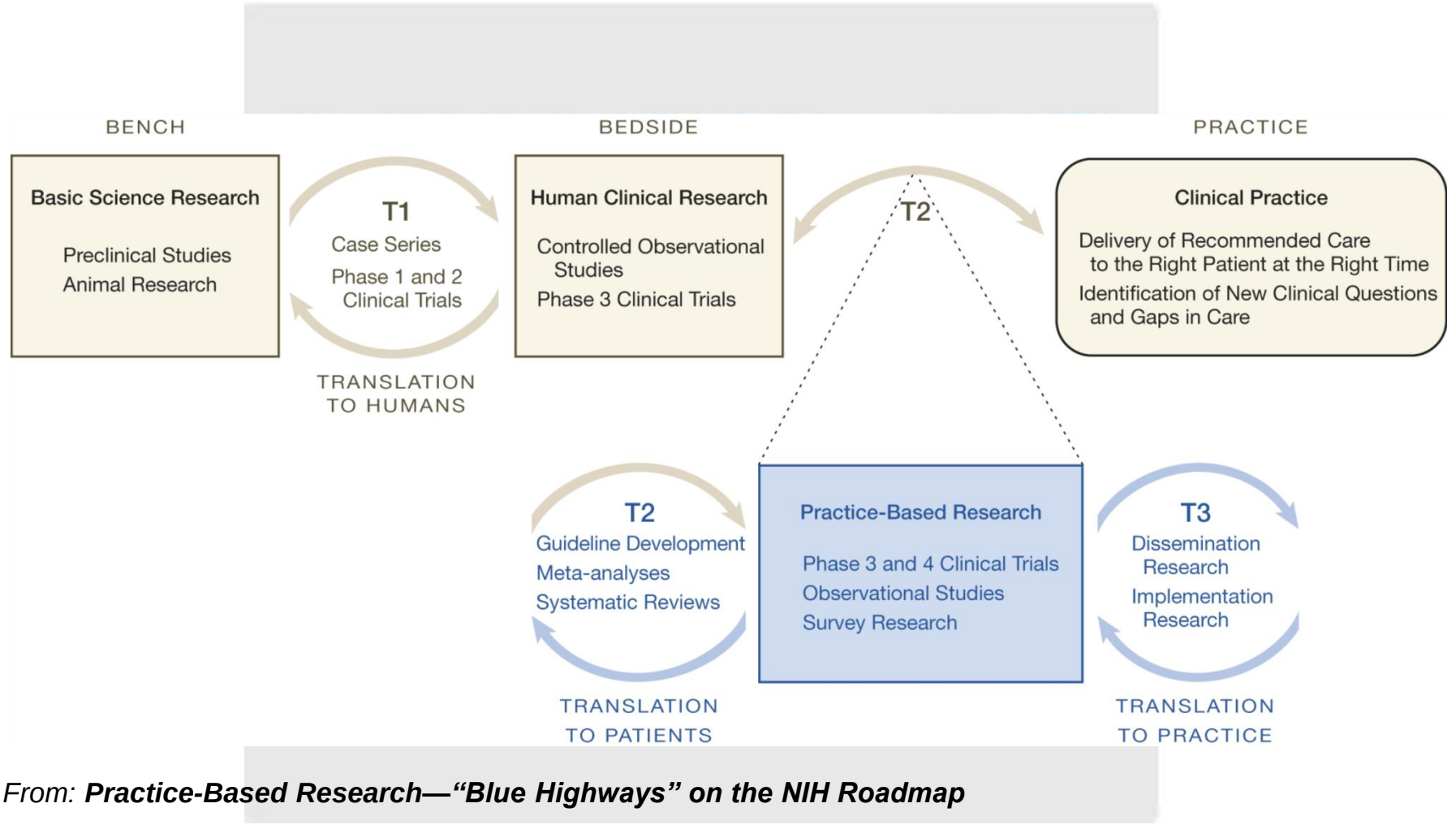
Brett, J.L., (1987). Use of nursing practice research findings. Nursing Research, 36(6), 344-349.
Coyle, L.A. & Sokop, 1990). Innovation adoption behavior among nurses. Nursing Research, 39(3), 176-180.

Translational Research: Classically Defined

"…effective translation of the new knowledge, mechanisms, and techniques generated by advances in basic science research into new approaches for prevention, diagnosis, and treatment of disease is essential for improving health"

Source: Fontanarosa PB, DeAngelis CD. Basic science and translational research in JAMA. JAMA 2002;287:1728.

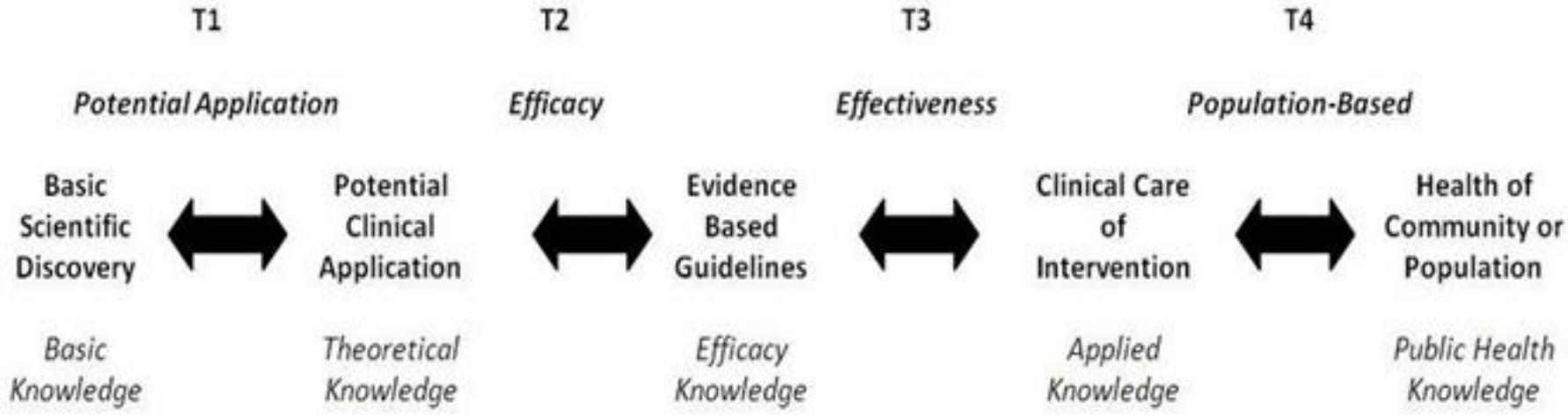
Translational Research



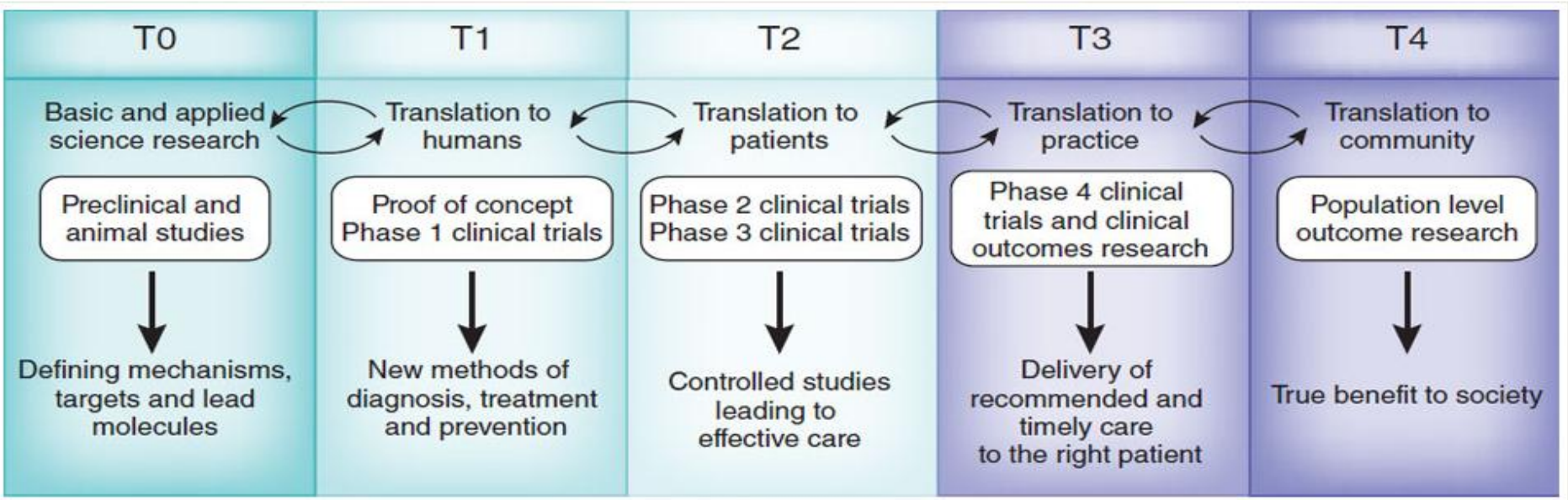
From: ***Practice-Based Research—"Blue Highways" on the NIH Roadmap***

JAMA. 2007;297(4):403-406. doi:10.1001/jama.297.4.403

NCATS defines translational research broadly to include the early steps necessary to develop new therapeutics, devices and diagnostics from



through T4.



From: Blumberg, et Al., *Nature Medicine Volume: 18, Pages: 35–41 Year published: (2012) DOI: doi:10.1038/nm.2632 Published online 06 January 2012*

Translational Research Alike in Name Only

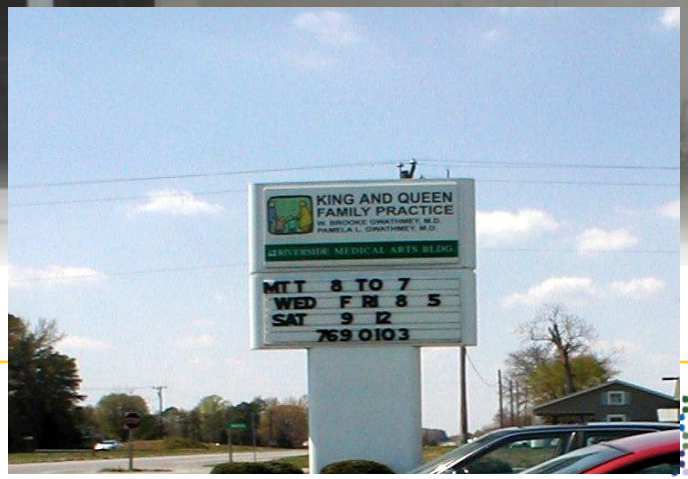
T1 and T2, T3 4, 5,6

- Goals
- Settings
- Study designs
- Investigators

The Traditional Laboratory of T1/T2

Labroatory of T2

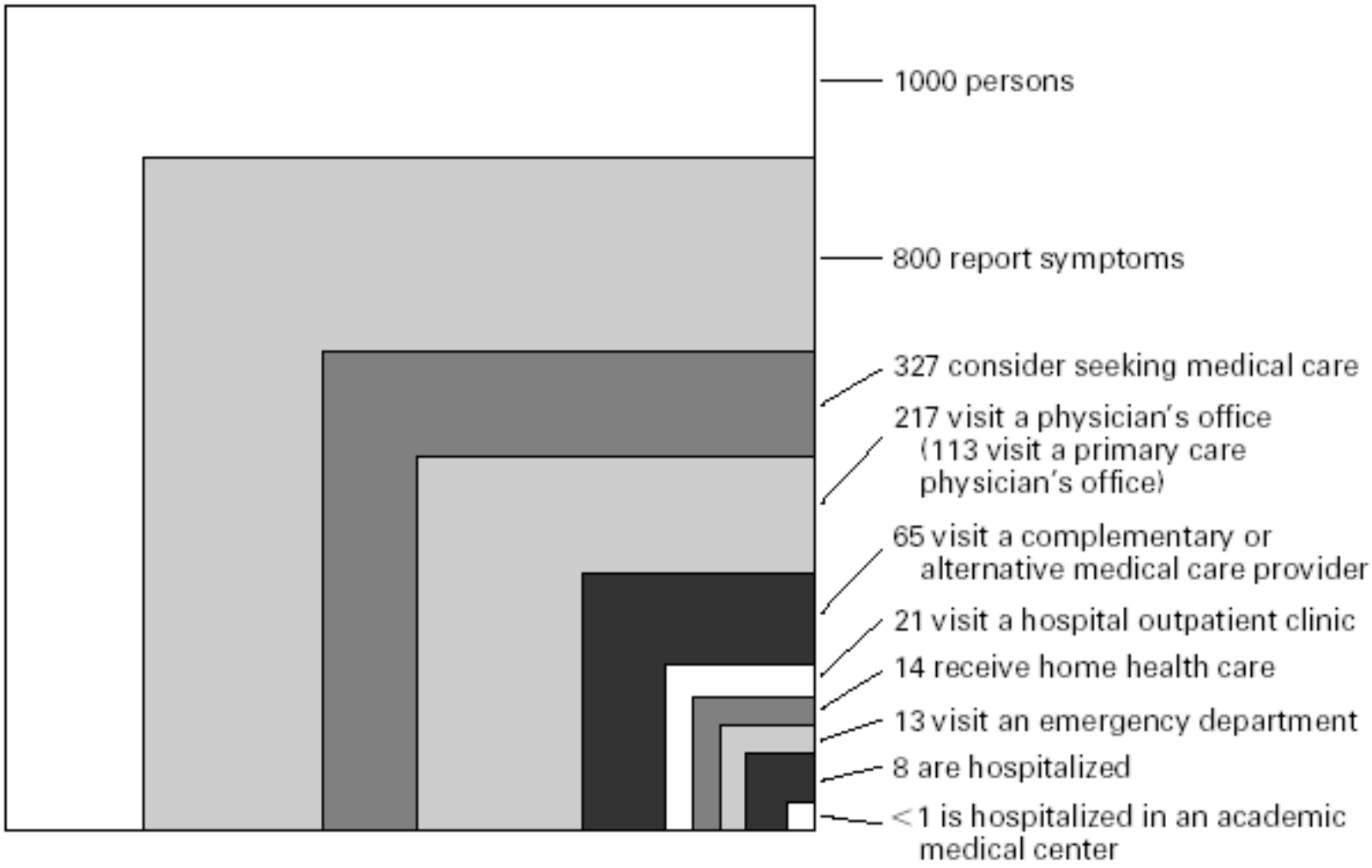
The Traditional "Laboratory" of T3/T4



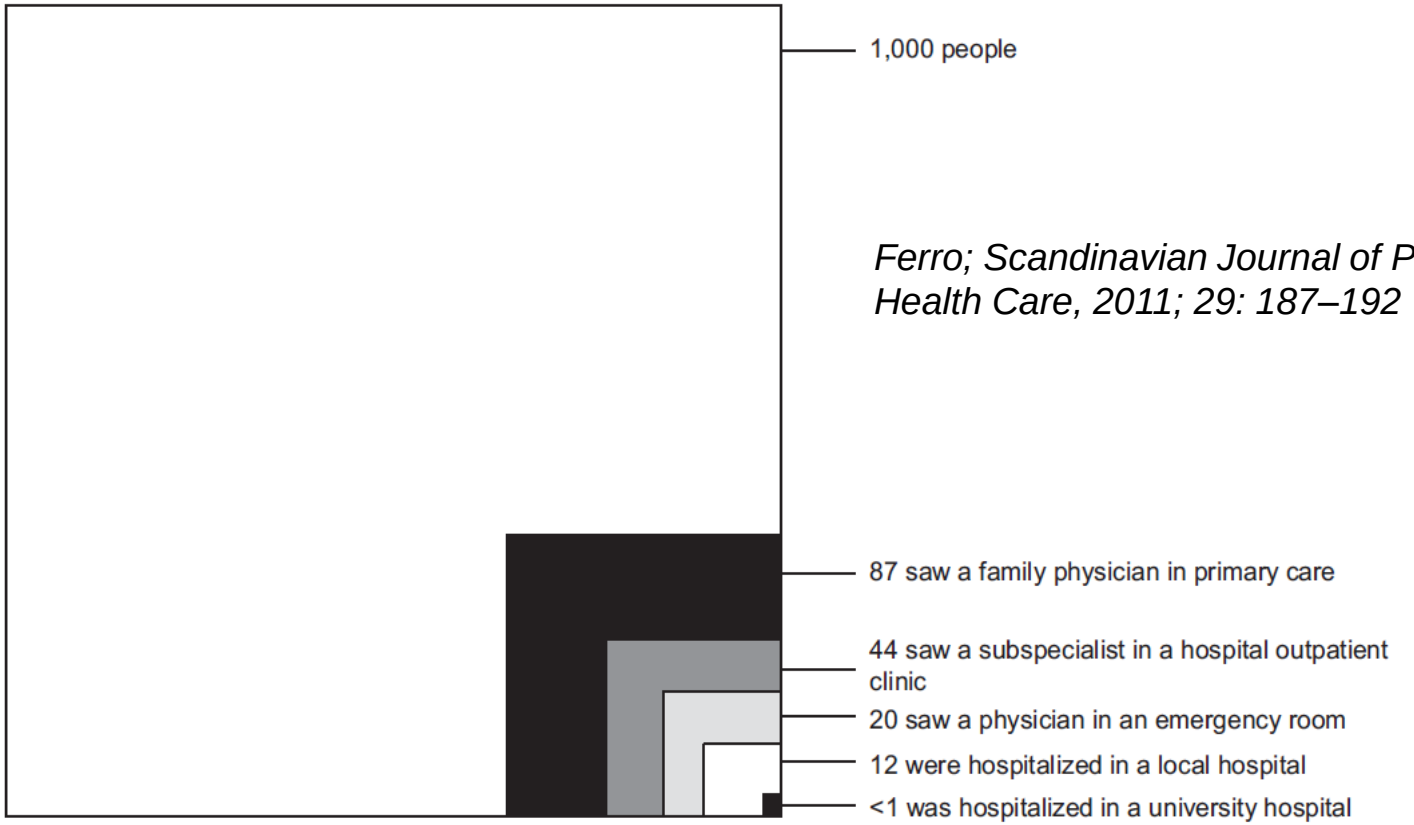
What are the Challenges?

The “Ecology” of Medical Care US

Green LA, et al. N Engl J Med 2001;344:2021-5.



The “Ecology” of Medical Care Sweden



Ferro; Scandinavian Journal of Primary Health Care, 2011; 29: 187–192

Figure 1. Number of people per 1000 inhabitants who had at least one appointment with a physician in an average month by the different health care settings.

Resources Needed for T1/T2

- Mastery of molecular biology, genetics, and other basic sciences
- Appropriately trained clinical scientists
- Strong laboratories
- Cutting-edge technology
- Supportive infrastructure within the institution

Resources Needed for T3/T4

"Implementation science": evaluating interventions in real-world settings

- Clinical epidemiology and evidence synthesis
- Communication theory
- Behavioral science
- Public policy
- Financing
- Organizational theory
- System redesign
- Informatics
- Mixed methods/qualitative research

The Dominant Challenges

- Biological and technological mysteries
- Trial recruitment
- Regulatory concerns

- Human behavior
- Infrastructure and resource constraints
- Messiness of “moving targets” and conditions that investigators cannot fully control

System Challenge

"My personal opinion is that all this "tracking" system is completely wrong and badly designed destroying the career of very good researchers with great potential to develop and discover important things in science. I am using this blog to say that the scientific community needs to re-evaluate this whole system.

– the scientific community somehow decides who stays and who doesn't. But, isn't that the same way in everything in life?; such as the way evolution works – the more adapted and fit stay and the weakest ones have to give up or "die".

Challenges: The Conventional "Afferent" Model

Community practitioners

Subject recruitment

Clinical Trials


IF YOU BUILD IT,
THEY WILL COME.

Solution?

Formulating research questions

Generalizable populations

Evaluations of effectiveness

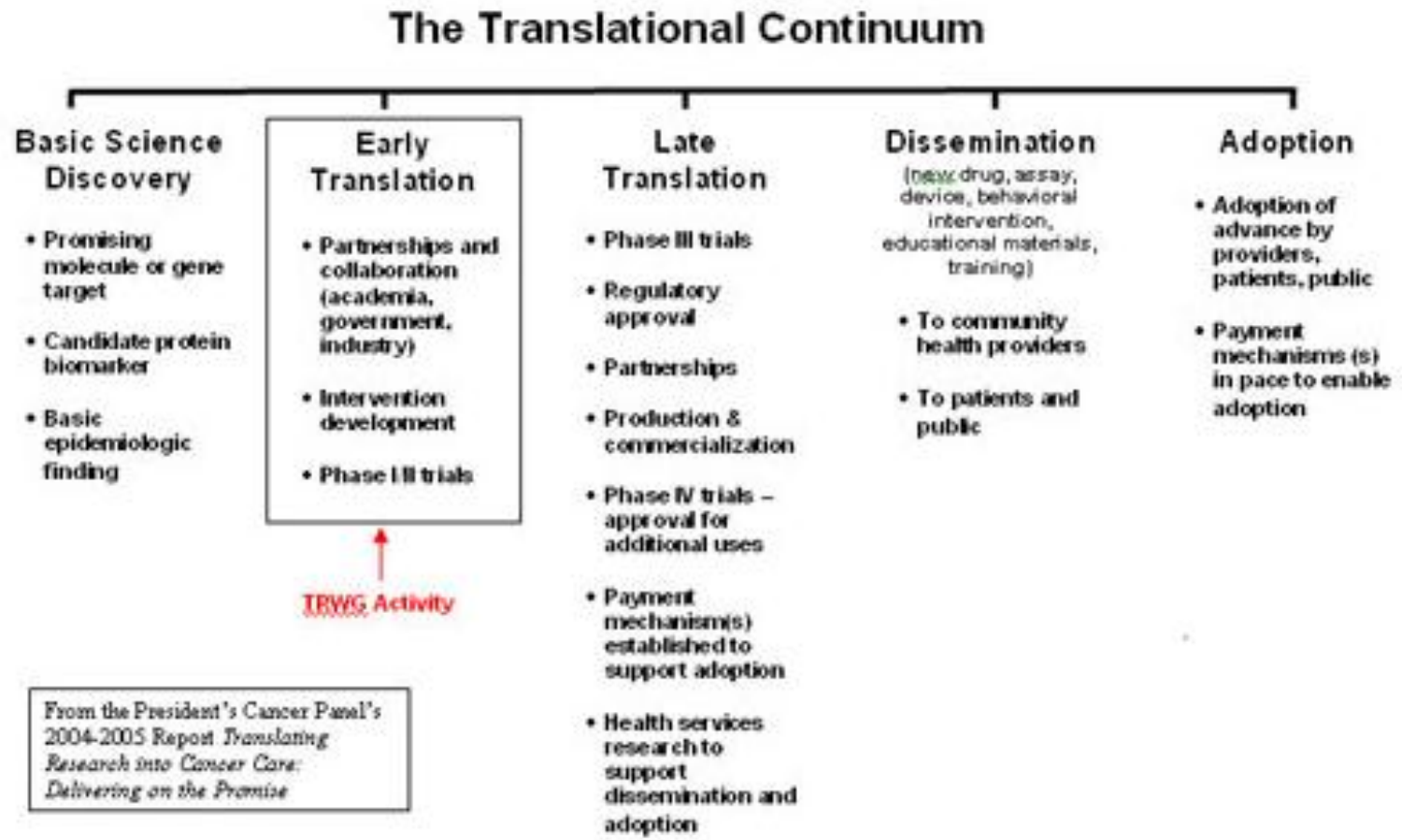
Develop Sustainability Strategies

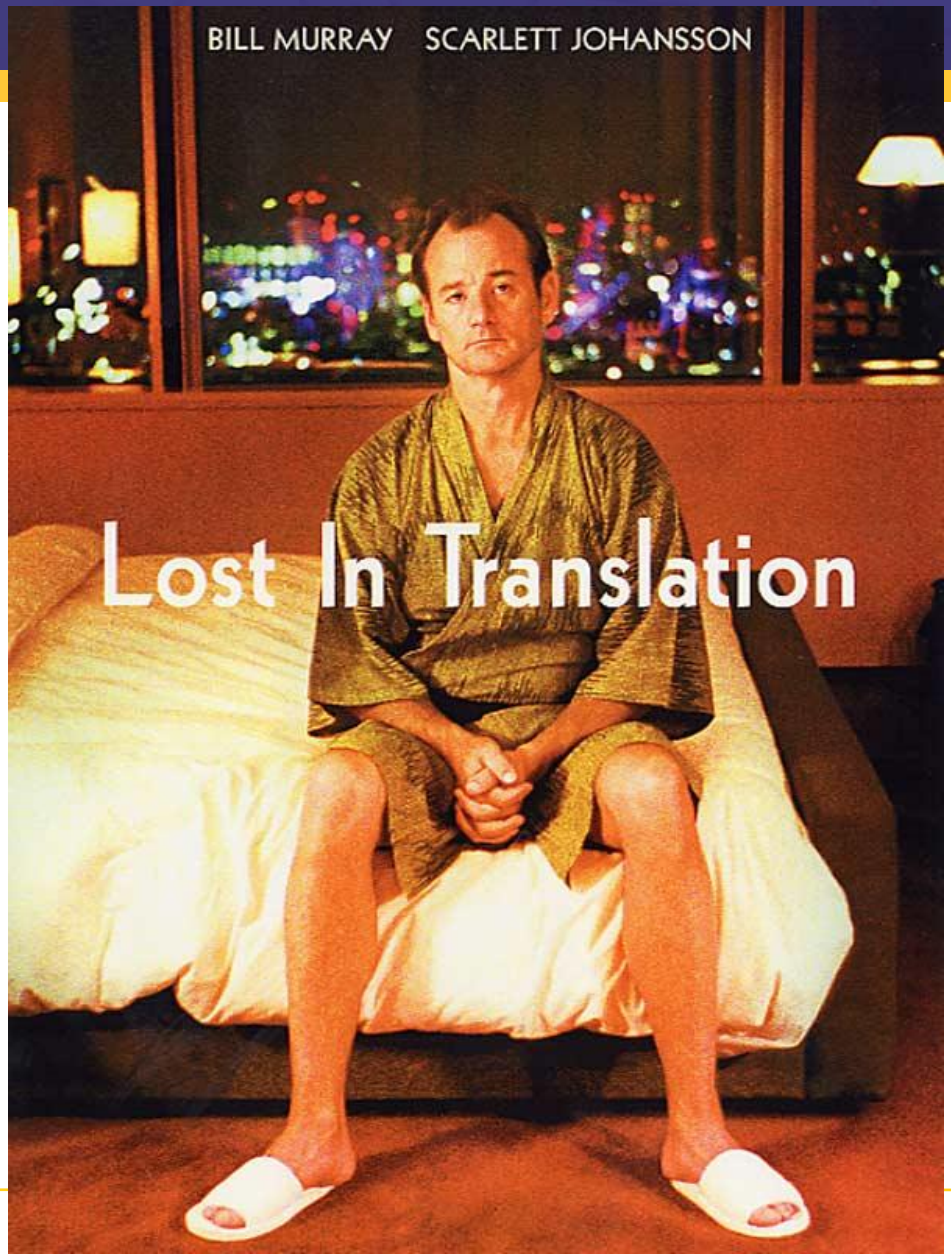
Evaluation of systems for delivering interventions

What T3/T4 Needs

- A new name? “translational research” is too vague
- Not using the same label for the T’s would reduce confusion
- Policymakers need to understand distinction between inventing treatments and getting them used

Better Labels….. Just Translation?

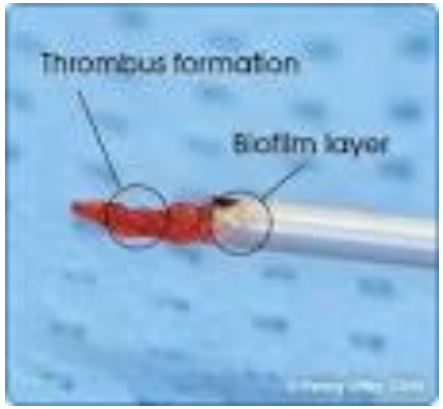



BILL MURRAY SCARLETT JOHANSSON
Lost In Translation


St. Luke
Community Hospital
MAIN ENTRANCE
EMERGENCY

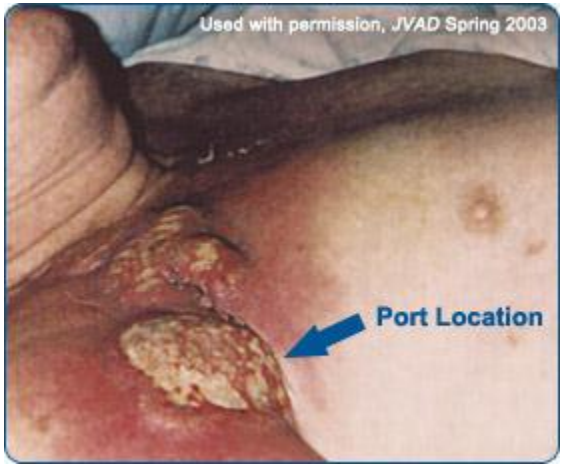
Translational Science: Research Example

Thrombotic complications of venous access devices



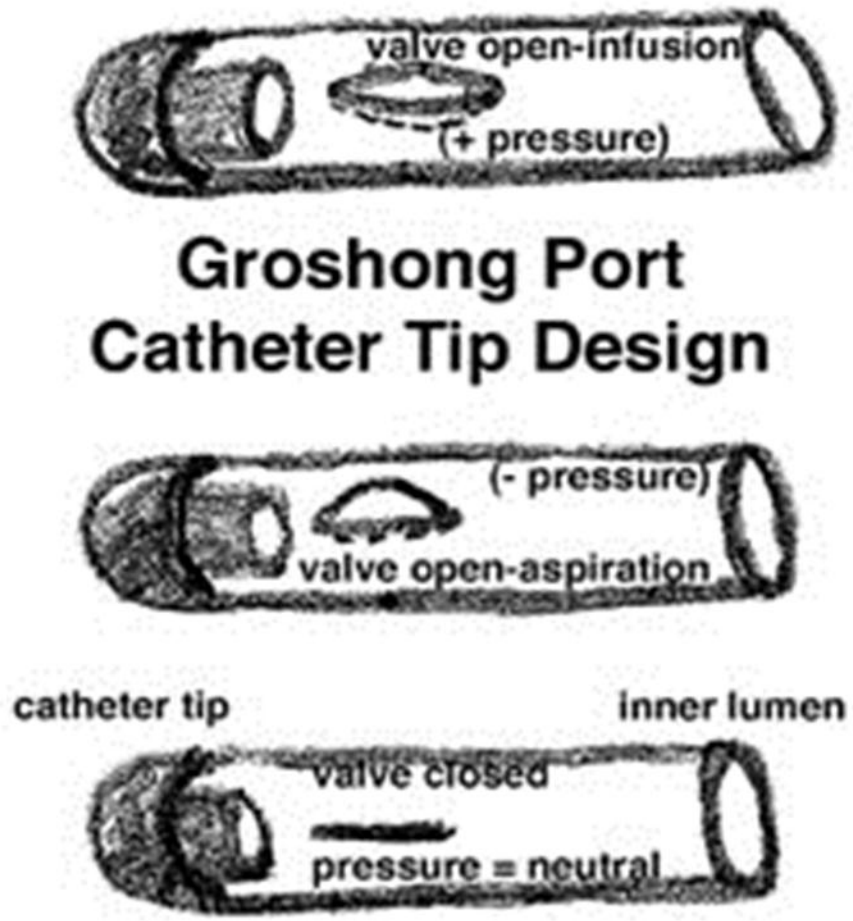
Discovery of Persistent Withdrawal Occlusion

Thrombosis of Subclavian Vein from VAD



Chemotherapy Extravasation

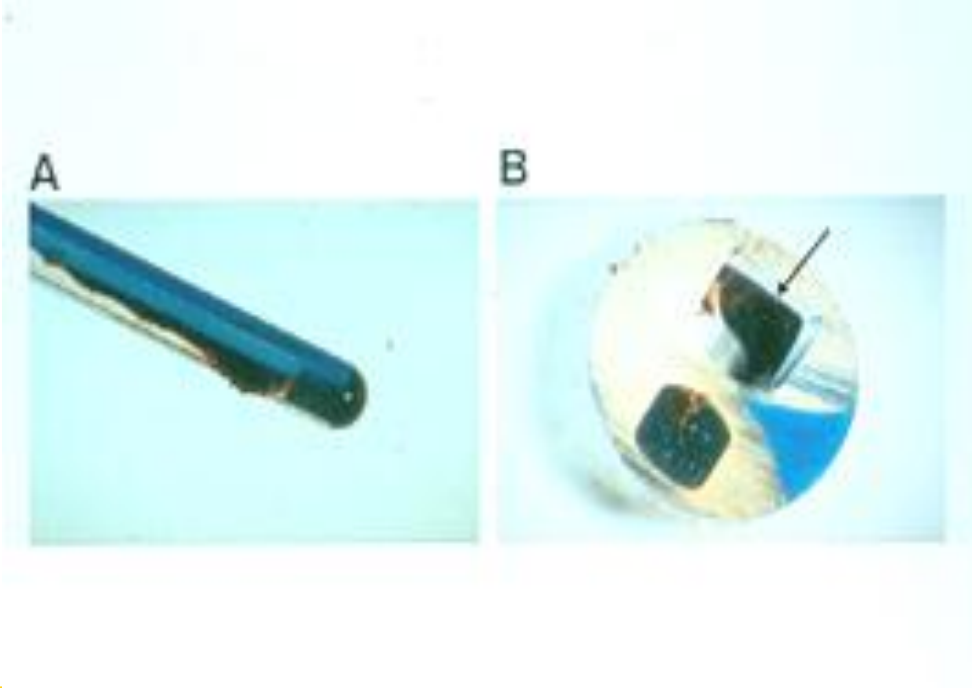
Persistent Withdrawal Occlusion



Persistent Withdrawal Occlusion

Persistent Withdrawal Occlusion

Mayo, D., Helsabeck, C., & Horne, M. (1995). Intraluminal clots in Groshong® catheters. *Journal of Venous Access Devices, 1,* 20-22.



Persistent Withdrawal Occlusion

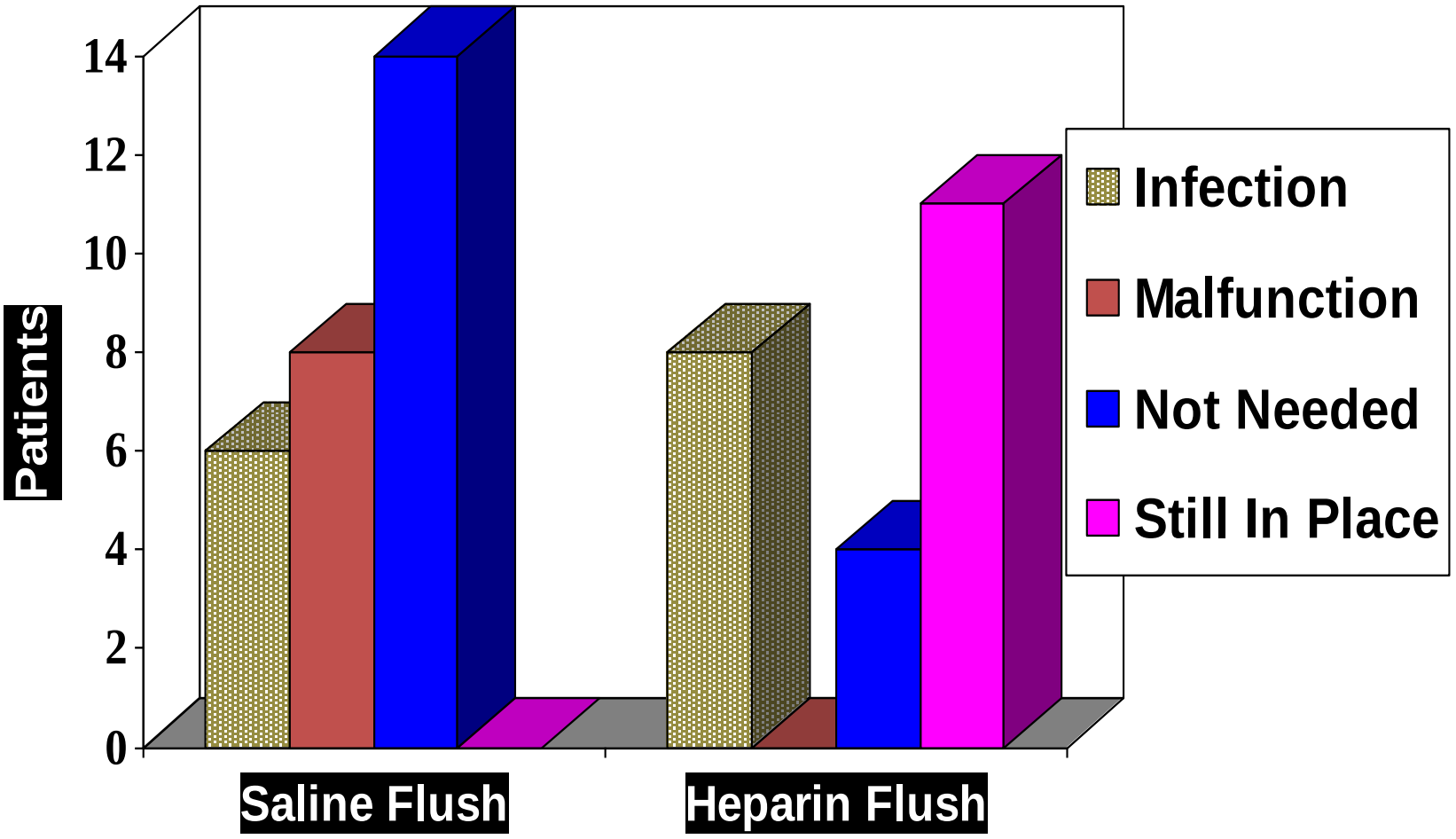
Pilot study: Quasi experimental design using a historical control group

- **All adult patients with newly inserted Groshong® catheters**
- **Population consisted of adult oncology patients**

Persistent Withdrawal Occlusion

The use of heparinized saline flush solution in Groshong® catheters will decrease the incidence of PWO when compared to Groshong® catheters flushed with normal saline alone.

Results: Persistent Withdrawal Occlusion



Results: Persistent Withdrawal Occlusion

	Saline Flush	Heparin Flush
Total Catheter Days	3,420 days	3,095 days
Vials of UK	94 vials	14 vials
Cost of UK and/or Heparin	$4,396 $1.29/day	$507 $0.33
Total Maint. Cost**	**$154.80**	**$38.40**

**Based on the Ave. Catheter Longevity of 120 days

Conclusion: Persistent Withdrawal Occlusion

The addition of heparin flush to maintain Groshong® catheters appeared to decrease the presence of intraluminal blood and clot and improves catheter function.

Translational Science: Research Example

Oncol Nurs Forum. 1996 Oct;23(9):1401-5.

The effects of heparin flush on patency of the Groshong catheter: a pilot study.

Mayo DJ[1], Horne MK 3rd, Summers BL, Pearson DC, Helsabeck CB.

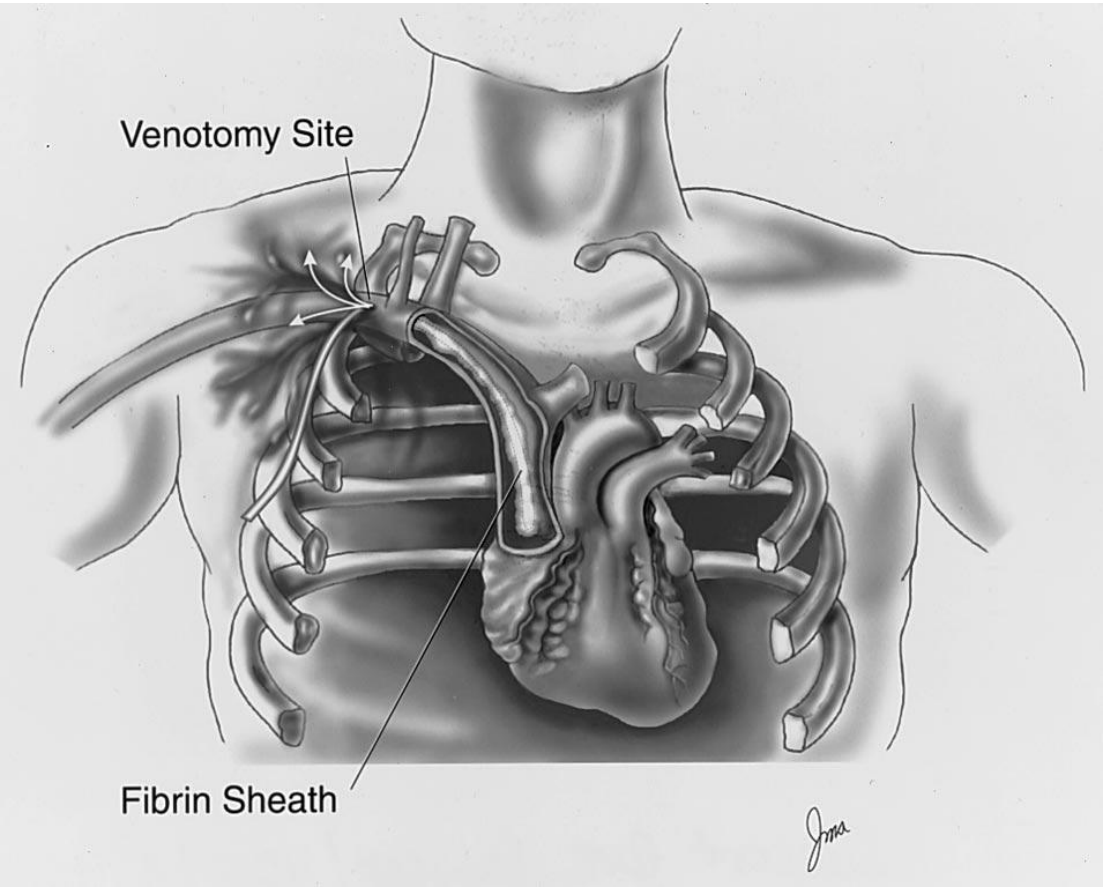
Author information

Abstract

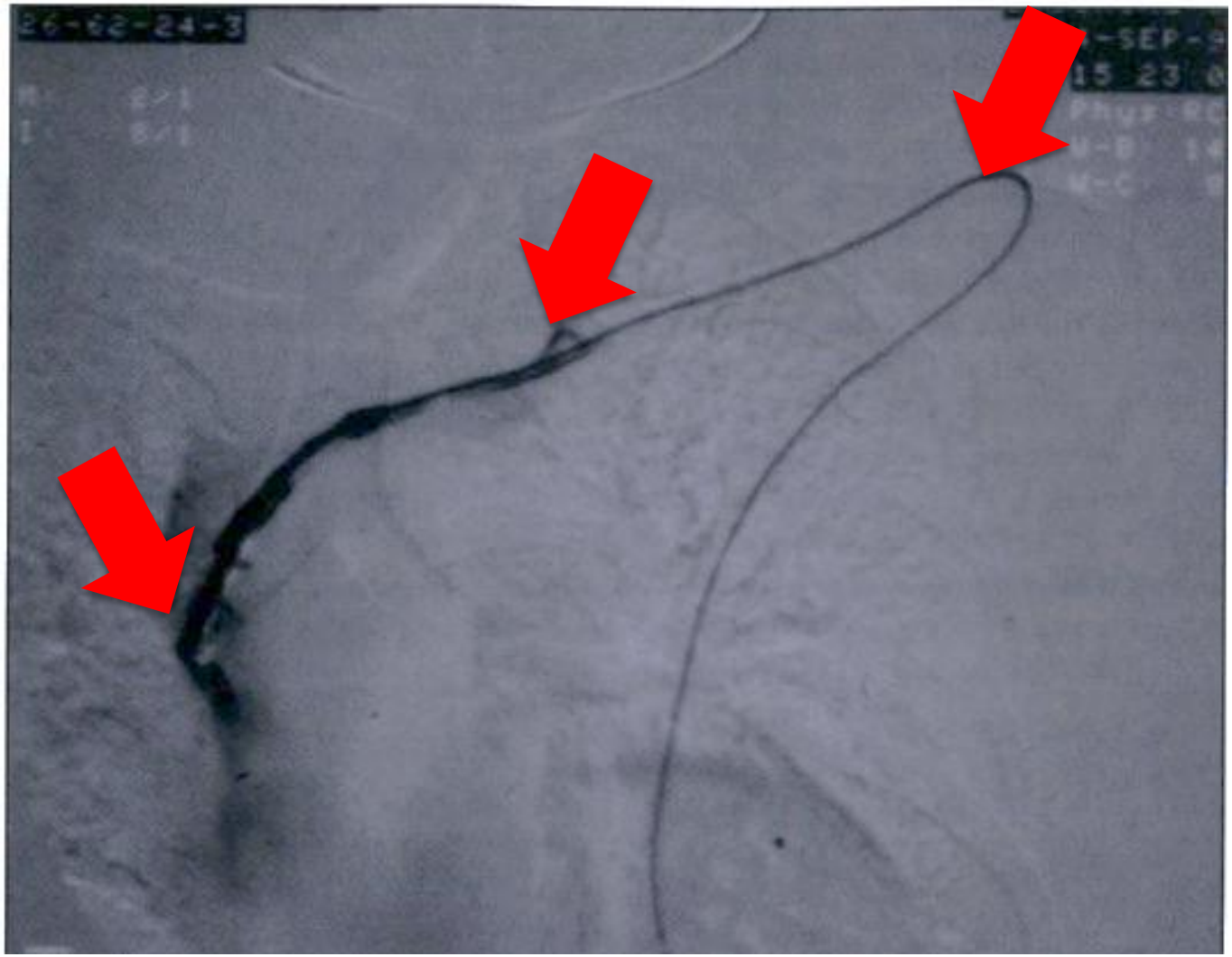
PURPOSE/OBJECTIVES: To determine whether the addition or a heparinized saline flush would decrease clot formation and persistent withdrawal occlusion (PWO) in Groshong (Bard Access Systems, Salt Lake City, UT) catheters.

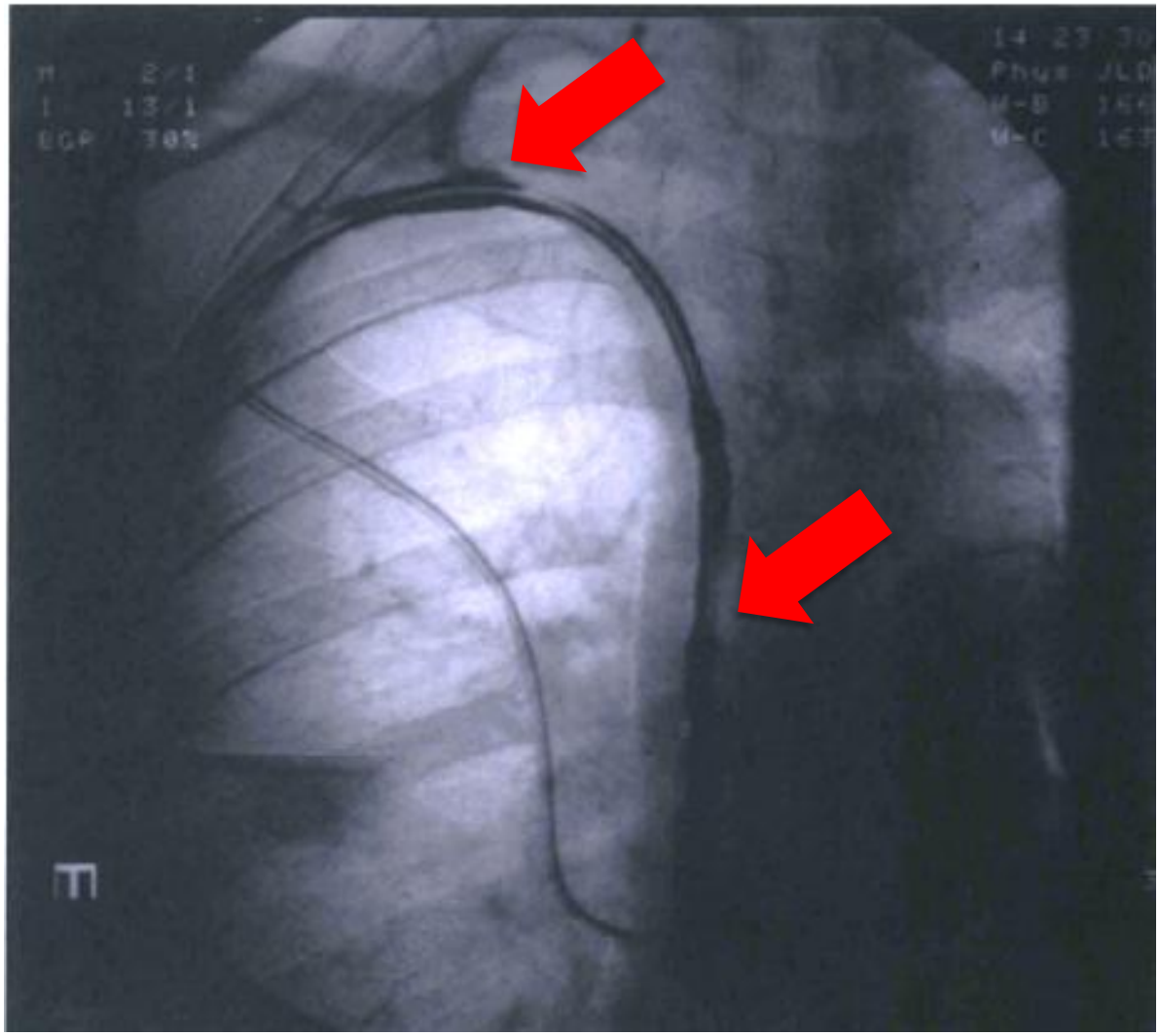
DESIGN: A prospective, nonrandomized study using a historical control group of patients with Groshong catheters that had been flushed weekly with 5 ml normal saline compared to data from patients with Groshong catheters flushed weekly with 2.5 ml heparinized saline (100 U/ml). A retrospective chart review was performed to determine the incidence of PWO. In both groups, the presence of liquid blood and adherent or nonadherent clot in explanted catheters was recorded.

Fibrin Sheath Formation



Translational Science: Research Example





Translational Science: Research Example

Background: Case report

- 56 year old woman getting treatment for breast cancer
- Catheter inserted for treatment management (Groshong)
- 3-months after insertion– PWO and treated with UK
- Sluggish blood return after UK but deemed ok to administer chemo
- Because of the PWO and suspected extravasation a cathetergram was done

Translational Science: Research Example

Translational Science: Research Example

Oncol Nurs Forum. 1995 May;22(4):675-80.

Chemotherapy extravasation: a consequence of fibrin sheath formation around venous access devices.

Mayo DJ[1], Pearson DC.

Support Care Cancer (1998) 6:51–56
© Springer-Verlag 1998

ORIGINAL ARTICLE

Donna Jo Mayo

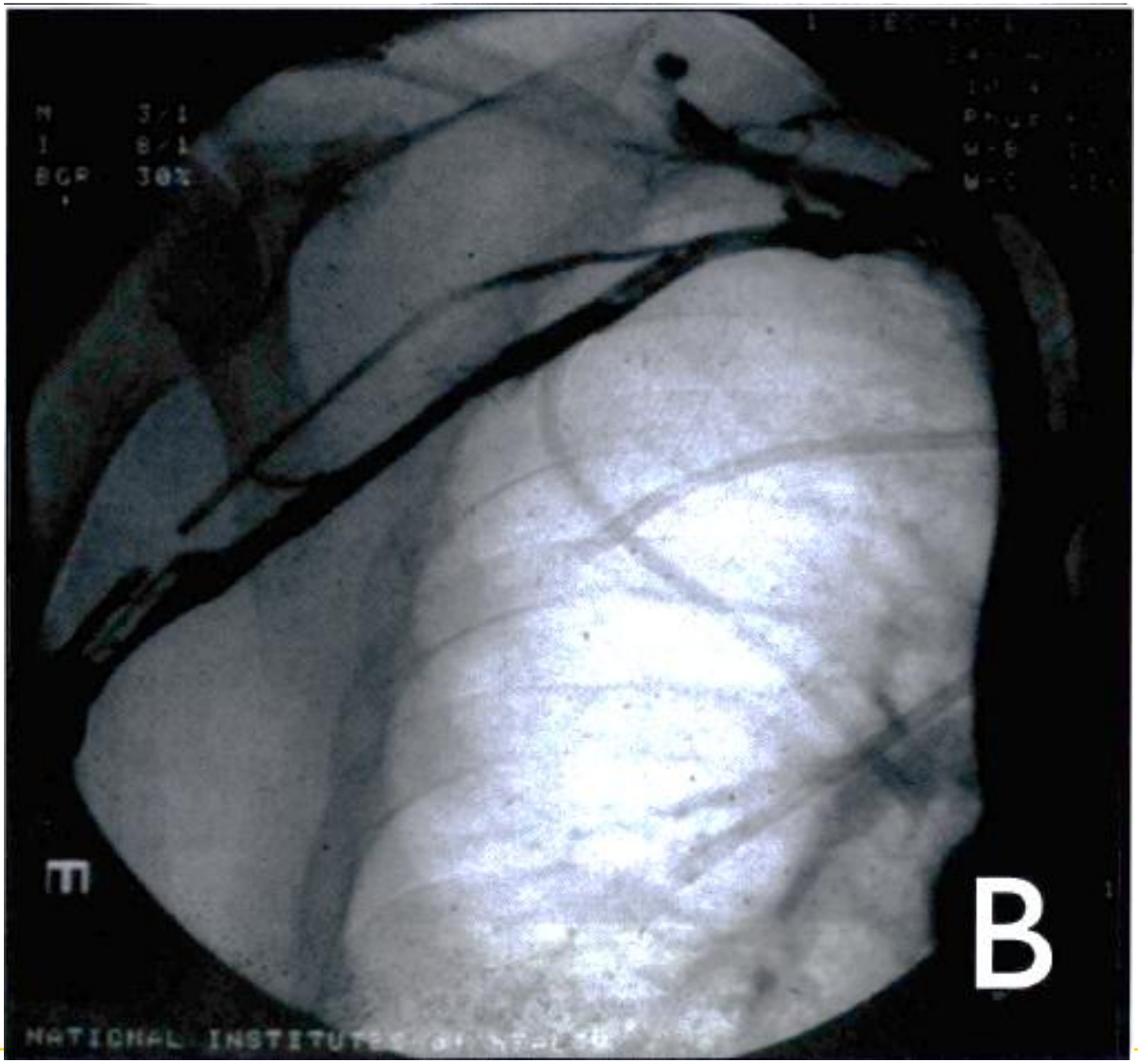
Fibrin sheath formation and chemotherapy extravasation: a case report

PMID: 7675669 [PubMed - indexed for MEDLINE]

Case Report

- Male patient with diagnosis of lymphoma
- Hickman catheter inserted via SC Vein
- Symptoms of arm swelling and pain
- Subclavian vein thrombosis diagnosed by arm venogram
- Treated with lytic therapy (t-PA)
- Vascular patency achieved in 24 hours

Translational Science: Subclavian Vein Thrombosis



Personal Experience in Translational Research

Journal of Vascular Access Devices

Volume 5, Issue 2, 2000, Pages 10–20

Current treatment options for catheter-related thrombosis

Donna Jo Mayo, RN, MA

Show more

DOI: 10.2309/108300800775897980

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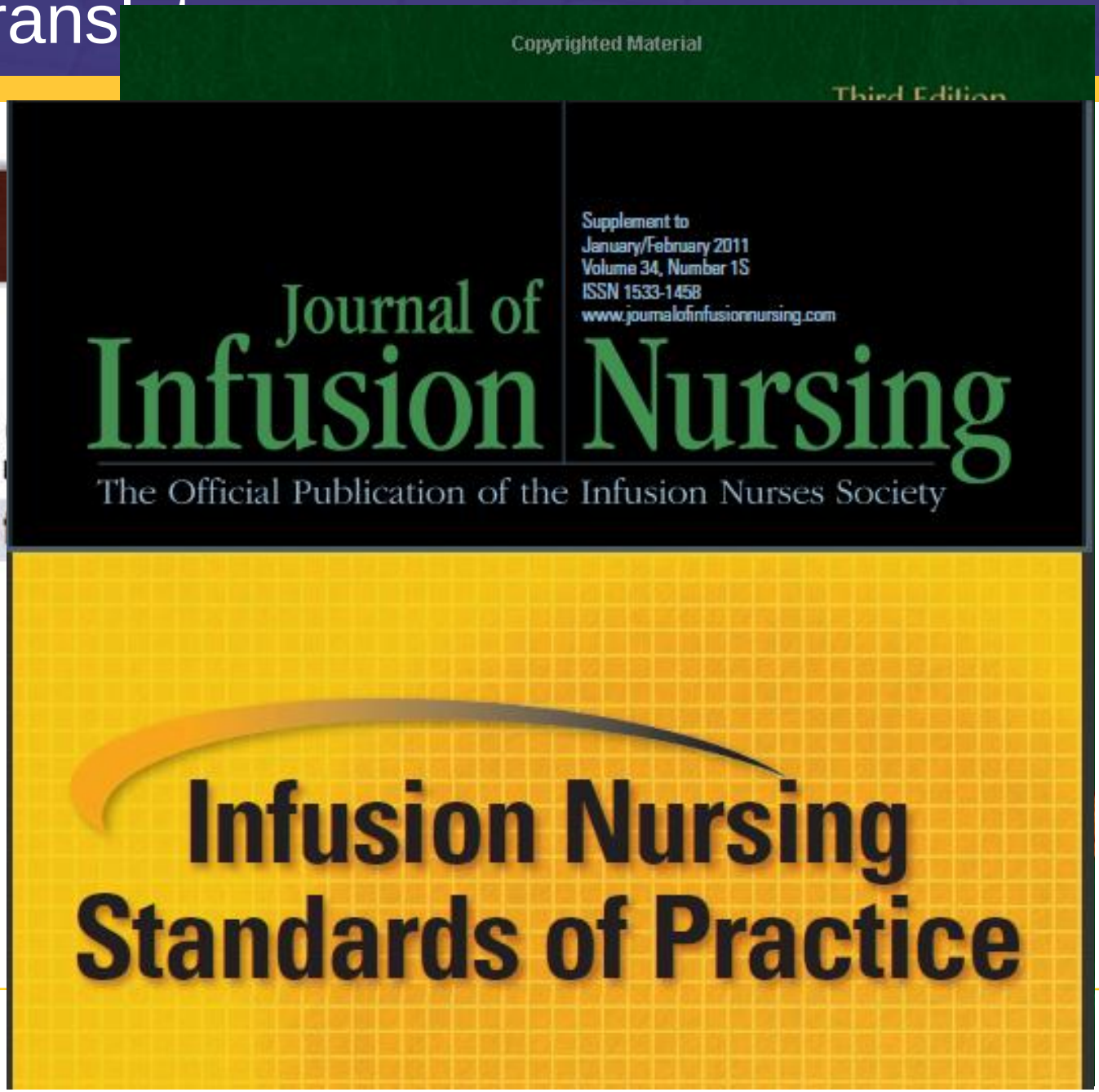
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Questions?