Building a Career Focused on Improving Outcomes through QI and Research

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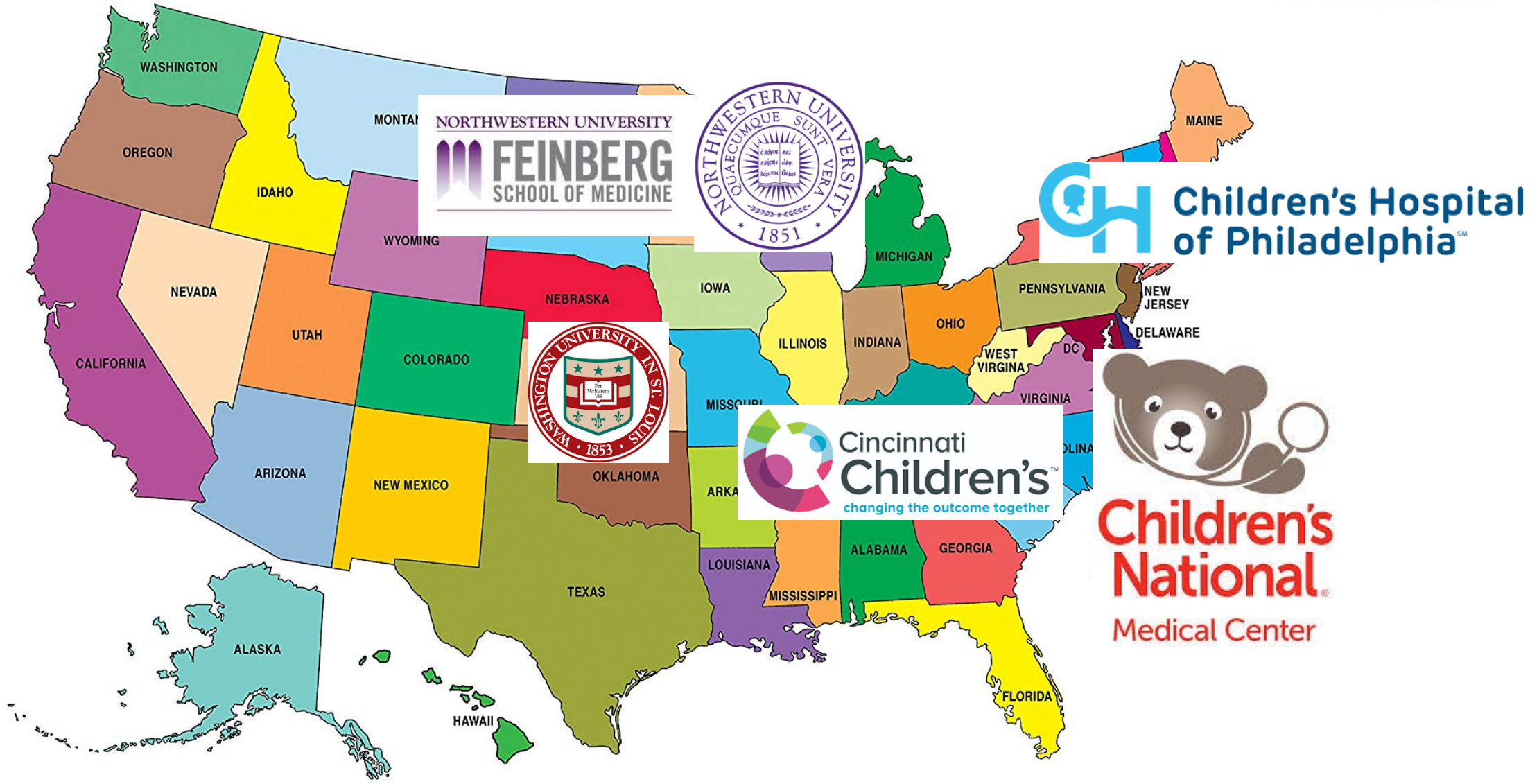
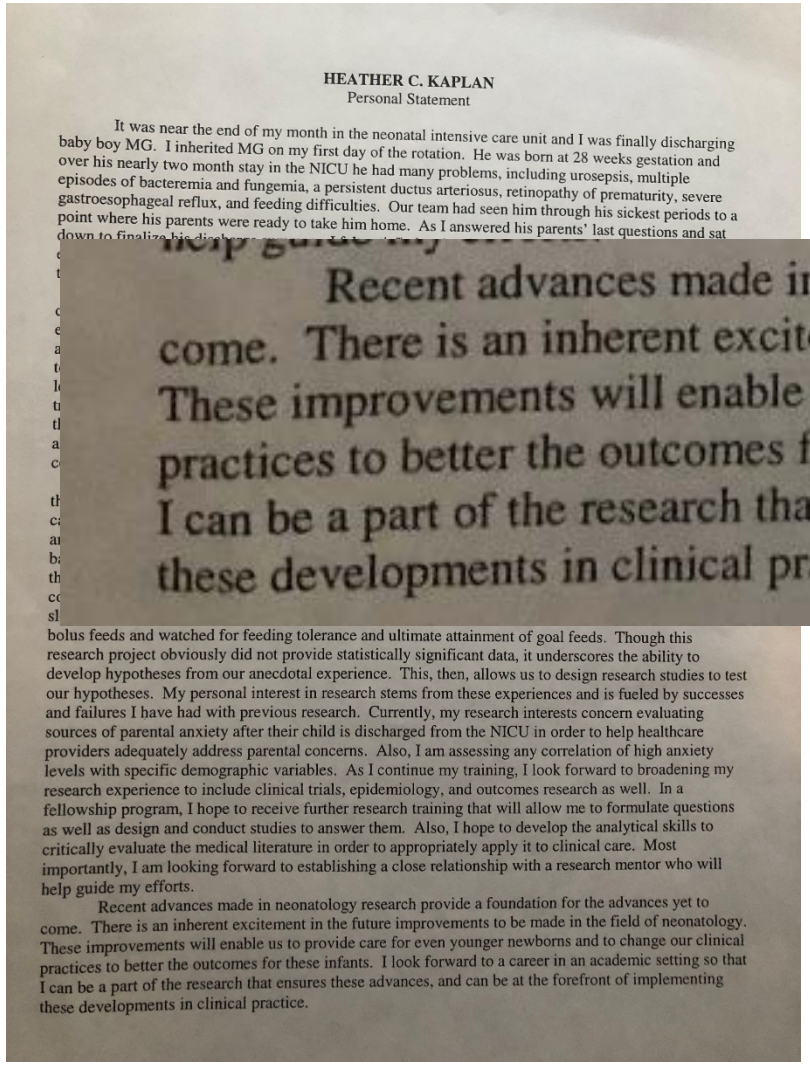
My Education and Training Path



Fellowship Application Essay (2003)



HEATHER C. KAPLAN
Personal Statement

It was near the end of my month in the neonatal intensive care unit and I was finally discharging baby boy MG. I inherited MG on my first day of the rotation. He was born at 28 weeks gestation and over his nearly two month stay in the NICU he had many problems, including urosepsis, multiple episodes of bacteremia and fungemia, a persistent ductus arteriosus, retinopathy of prematurity, severe gastroesophageal reflux, and feeding difficulties. Our team had seen him through his sickest periods to a point where his parents were ready to take him home. As I answered his parents' last questions and sat down to finalize his discharge [illegible]

bolus feeds and watched for feeding tolerance and ultimate attainment of goal feeds. Though this research project obviously did not provide statistically significant data, it underscores the ability to develop hypotheses from our anecdotal experience. This, then, allows us to design research studies to test our hypotheses. My personal interest in research stems from these experiences and is fueled by successes and failures I have had with previous research. Currently, my research interests concern evaluating sources of parental anxiety after their child is discharged from the NICU in order to help healthcare providers adequately address parental concerns. Also, I am assessing any correlation of high anxiety levels with specific demographic variables. As I continue my training, I look forward to broadening my research experience to include clinical trials, epidemiology, and outcomes research as well. In a fellowship program, I hope to receive further research training that will allow me to formulate questions as well as design and conduct studies to answer them. Also, I hope to develop the analytical skills to critically evaluate the medical literature in order to appropriately apply it to clinical care. Most importantly, I am looking forward to establishing a close relationship with a research mentor who will help guide my efforts.

Recent advances made in neonatology research provide a foundation for the advances yet to come. There is an inherent excitement in the future improvements to be made in the field of neonatology. These improvements will enable us to provide care for even younger newborns and to change our clinical practices to better the outcomes for these infants. I look forward to a career in an academic setting so that I can be a part of the research that ensures these advances, and can be at the forefront of implementing these developments in clinical practice.

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Fellowship Training

- Byproduct of moving around for education and training…exposure to variation!
- Natural question arises—why do these variations in outcomes and care practices exist across hospitals?

Kaplan *et al. BMC Health Services Research* 2011, **11**:22
http://www.biomedcentral.com/1472-6963/11/22

BMC Health Services Research

RESEARCH ARTICLE Open Access

Assessment of surfactant use in preterm infants as a marker of neonatal intensive care unit quality

Heather C Kaplan[1,3,4*], Scott A Lorch[2,3,4], Jennifer Pinto-Martin[4,5], Mary Putt[4], Jeffrey H Silber[2,4,6]

Abstract

Background: Proposed neonatal quality measures have included structural measures such as average daily census, and outcome measures such as mortality and rates of complications of prematurity. However, process measures have remained largely unexamined. The objective of this research was to examine variation in surfactant use as a possible process measure of neonatal quality.

Methods: We obtained data on infants 30 to 34 weeks gestation admitted with respiratory distress syndrome (RDS) within 48 hours of birth to 16 hospitals participating in the Pediatric Health Information Systems database from 2001-2006. Models were developed to describe hospital variation in surfactant use and identify patient and hospital predictors of use. Another cohort of all infants admitted within 24 hours of birth was used to obtain adjusted neonatal intensive care unit (NICU) mortality rates. To assess the construct validity of surfactant use as a quality metric, adjusted hospital rates of mortality and surfactant use were compared using Kendall's tau.

Results: Of 3,633 infants, 46% received surfactant. For individual hospitals, the adjusted odds of surfactant use varied from 2.2 times greater to 5.9 times less than the hospital with the median adjusted odds of surfactant use. Increased annual admissions of extremely low birth weight infants to the NICU were associated with greater surfactant use (OR 1.80, 95% CI 1.02-3.19). The correlation between adjusted hospital rates of surfactant use and in-hospital mortality was 0.37 (Kendall's tau $p = 0.051$).

Conclusions: Though results were encouraging, efforts to examine surfactant use in infants with RDS as a process measure reflecting quality of care revealed significant challenges. Difficulties related to adequate measurement including defining RDS using administrative data, accounting for care received prior to transfer, and adjusting for severity of illness will need to be addressed to improve the utility of this measure.

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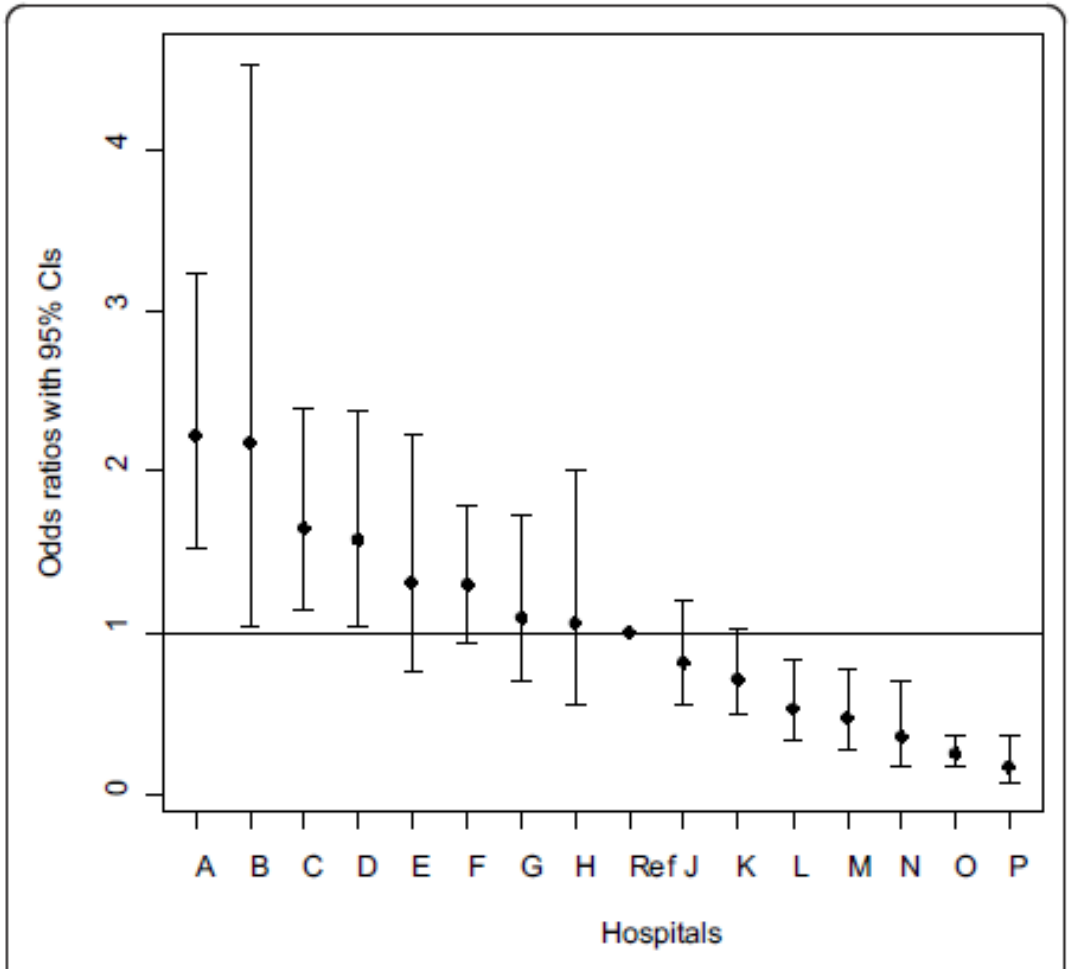
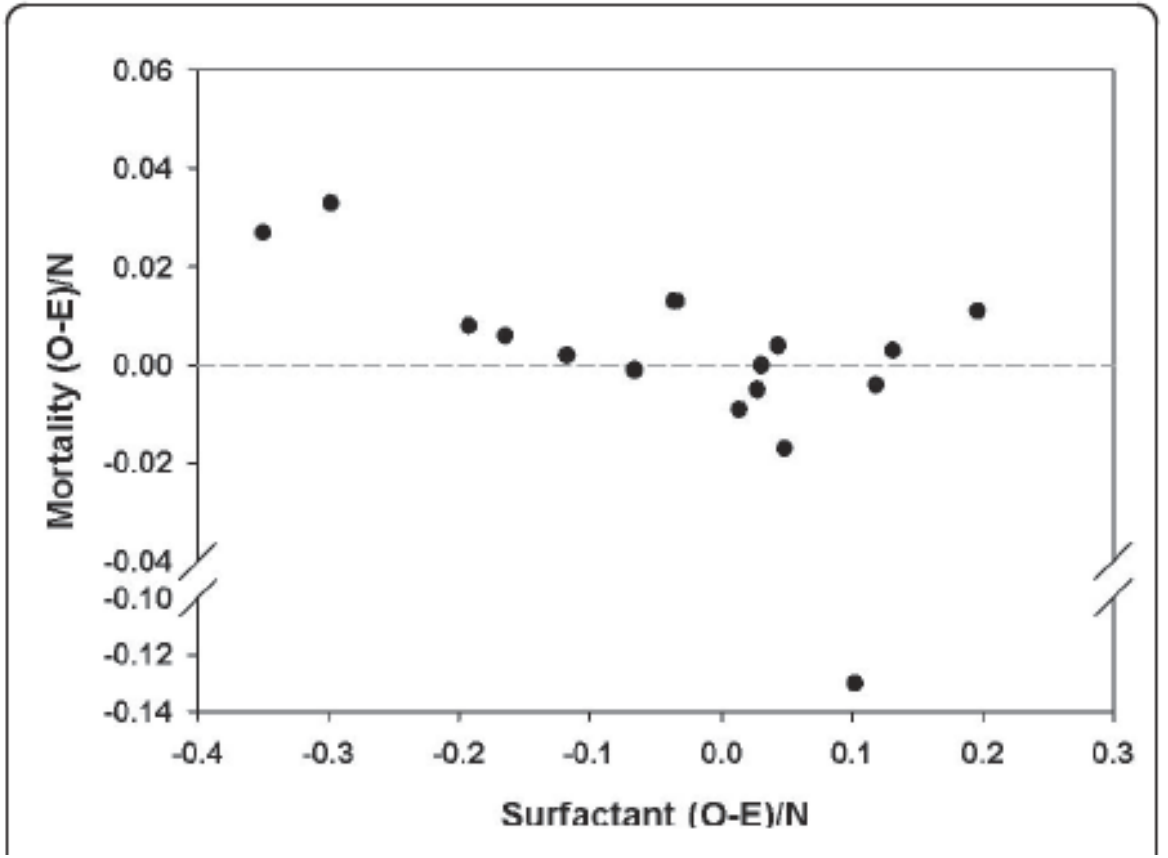
Kaplan HC. *BMC HSR.* 2011





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Faculty Interview Trail (CCHMC)

"You could spend your entire career describing variation, but how will that make a difference for any baby?"

-Uma Kotagal, MBBS, MSc

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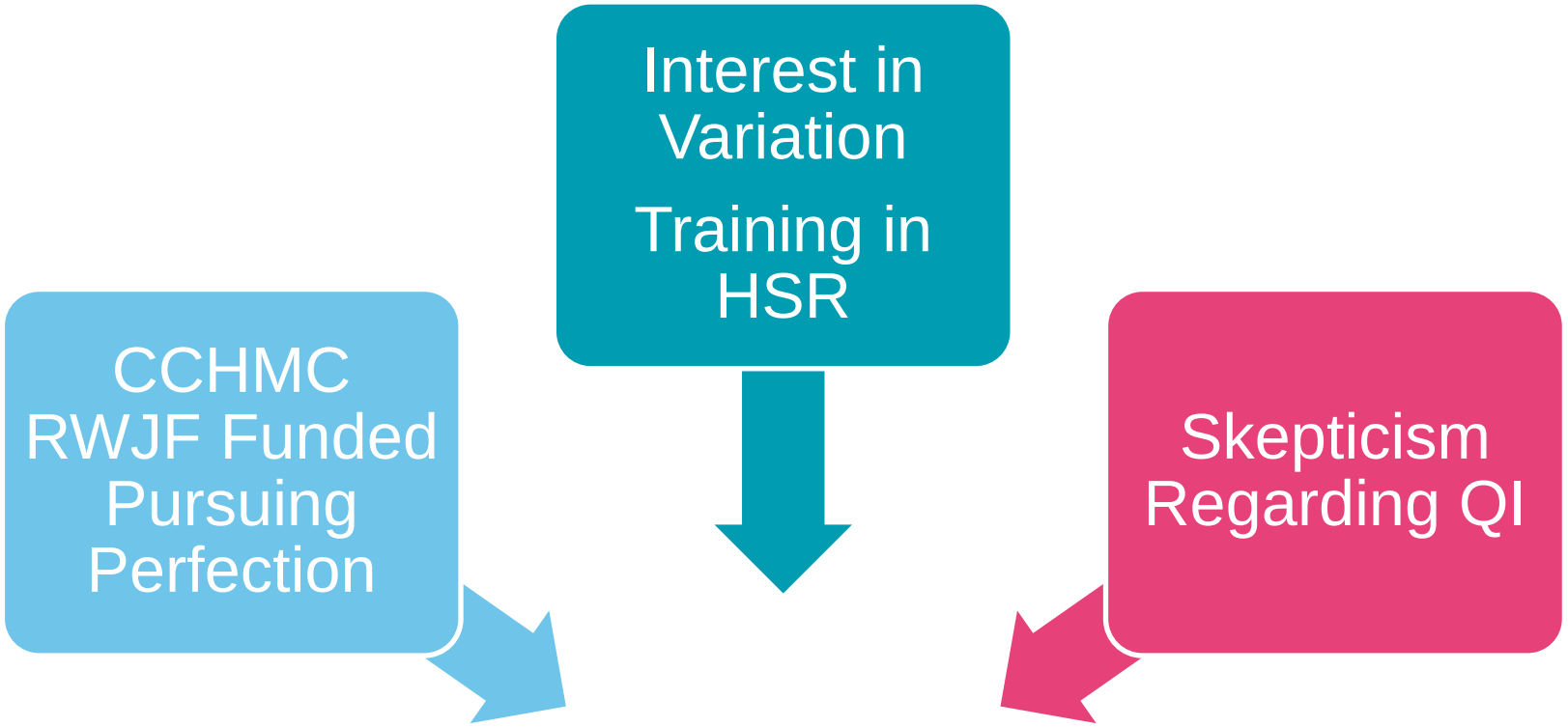
Serendipity



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Quality collaboratives

Optimizing quality collaboratives

Sheila Leatherman

While the evidence base for the effectiveness of quality collaboratives is emerging, valuable knowledge can be gained from experts in order to design and optimize implementation of collaboratives.

A METHOD GAINING ACCEPTANCE

"Quality collaborative" is the term used to describe a technique which is increasingly being used in a number of countries and is perceived by participants as a valuable method of sharing experience, accessing expertise, and providing an environment which supports quality improvement endeavours. Although the name is rather generic, the form and functions of quality collaboratives are constantly being refined through real world learning. Regrettably, the published evidence base is not as replete as one would hope when such a resource intensive intervention is enjoying popularity. Anecdotal reporting and insights of experts are therefore important for designing and implementing collaboratives to optimize their effectiveness.

OLD AND NEW CHALLENGES

In this issue of *QSHC* Øvretveit and colleagues[1] present their recommendations as 10 challenges for organizing and implementing collaboratives to maximize import. Many of the problems noted are shared by other quality improvement interventions—in fact, they are endemic to the basic challenges of management. Although seemingly self-evident, we are appropriately reminded that change management is inherently dependent upon clarity of intent, shared goals, explicit definition of resource requirements, and stability of purpose.

A number of the challenges might be most constructively understood as indictments of the state of the art of quality measurement and management, as well as admonitions for realizing the value of collaboratives. Three stand out: (1) data analysis, (2) accountability for achieving results, and (3) sustaining effort. Each of these critical functions requires both will and skill. Firstly, collaboratives face the same difficulties as do many other quality interventions—namely, that validated data are not readily accessible nor are the requisite analytical skills available in every institutional setting where a collaborative is working. Secondly, ongoing measurement is imperative but is often sacrificed to other pressing duties. Collaboratives need to be held accountable, as do all quality improvement interventions, for the precious resources expended both in money and in human effort. For example, a collaborative focused on cancer care in the UK is reported to involve 10 000 individuals and £5 million of expenditure. A regular account of progress against explicitly agreed objectives should be required. Finally, sustainability requires a diligent effort to institutionalize the change intervention and a commitment to monitoring progress. These three functions are rudimentary to quality management of any sort.

Less generic are the considerations peculiar to effecting change in health services. The challenges noted here may, in fact, represent uniquely valuable contributions which are by-products of implementing quality collaboratives. For example, collaboratives rely on clinical teams and, in many cases, physicians are in key roles. When effectively implemented, the clinician must assume the role of institutional change agent, which is different from the agent of the patient. These new "systems thinking skills" for clinicians are likely to have other secondary benefits. Another strength of collaboratives is the relatively efficient use of experts to facilitate and guide multiple institutional teams to internalize best practice and translate the opportunity to their own setting. This access to expertise may not have been available to individual institutions.

MOVING FORWARD FOR SYSTEMIC IMPROVEMENT

Over the past two decades there has beer an ebb and flow of quality improvemen methodologies in health care, but few o these methods have been linked to published evidence base of effectiveness Enthusiasm has taken the place o evidence, and we have placed faith i "magical fixes" that fail to meet ou expectations, such as the excessive reli ance on medical audit or, more recently the hopes that publicly released perform ance data will have a dramatic impact o system performance.[2] It is therefor important to heed the experts' ow acknowledgement of the deficient em pirical evidence base for quality collabo ratives.

We also know, however, that there is clear logic of and need for simultane ously using a number of levers fo change to systemically improve healt care.[3] Such a strategy would selectivel use collaboratives as one of many ap proaches alongside such interventions a payment reform, regulation, incentives and performance monitoring to effec constructive change. The relativ strength of quality collaboratives await further definitive research but, in th meantime, we can benefit from listenin to the experts who are gaining valuabl knowledge in how to design and imple ment quality collaboratives most effec tively.

Qual Saf Health Care 2002;11:307

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REFERENCES

1 **Øvretveit J**, Bate P, Cleary P, *et al*. Quality collaboratives: lessons from research. *Qual Saf Health Care* 2002;11:345–51.
2 **Marshall M**, Shekelle P, Leatherman S, *et al*. What do we expect to gain from the public release of performance data? A review of the evidence. *JAMA* 2000;283:1866–74.
3 **Leatherman S**. *Applying performance indicators to improve health systems performance. Measuring up: improving health systems performance in OECD countries*. Paris: OECD, 2002.

MOVING FORWARD FOR SYSTEMIC IMPROVEMENT

Over the past two decades there has been an ebb and flow of quality improvement methodologies in health care, but few of these methods have been linked to a published evidence base of effectiveness. Enthusiasm has taken the place of evidence, and we have placed faith in "magical fixes" that fail to meet our expectations, such as the excessive reliance on medical audit or, more recently, the hopes that publicly released performance data will have a dramatic impact on system performance.[2] It is therefore important to heed the experts' own acknowledgement of the deficient empirical evidence base for quality collaboratives.

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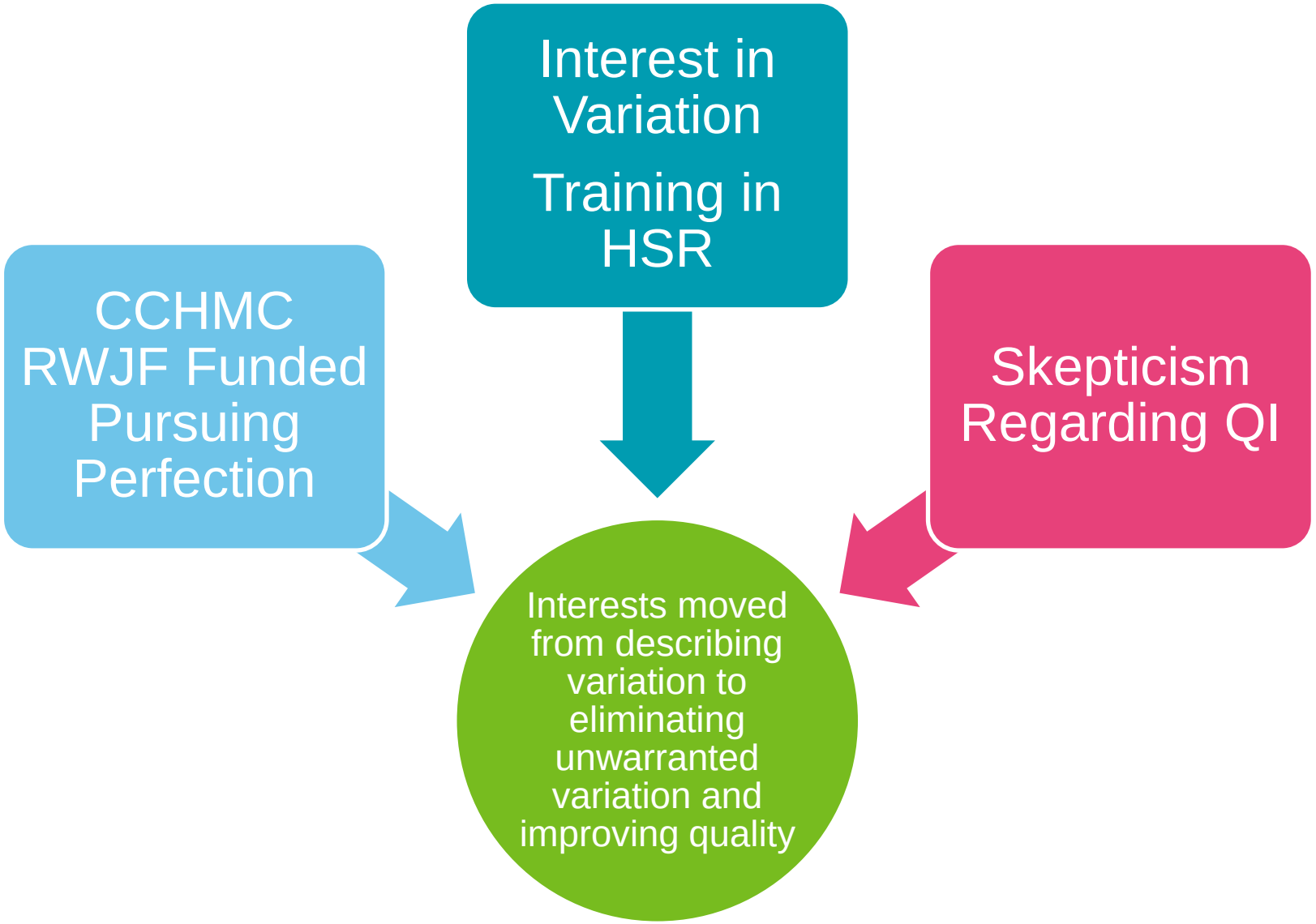
Leatherman S. *Quality Safety and Healthcare.* 2002

Serendipity



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Solving Quality Problems

- There are serious problems with the quality of healthcare
- There is substantial evidence of overuse, underuse, and misuse of care
- Safe, effective, patient-centered, timely, equitable and efficient care will not happen automatically

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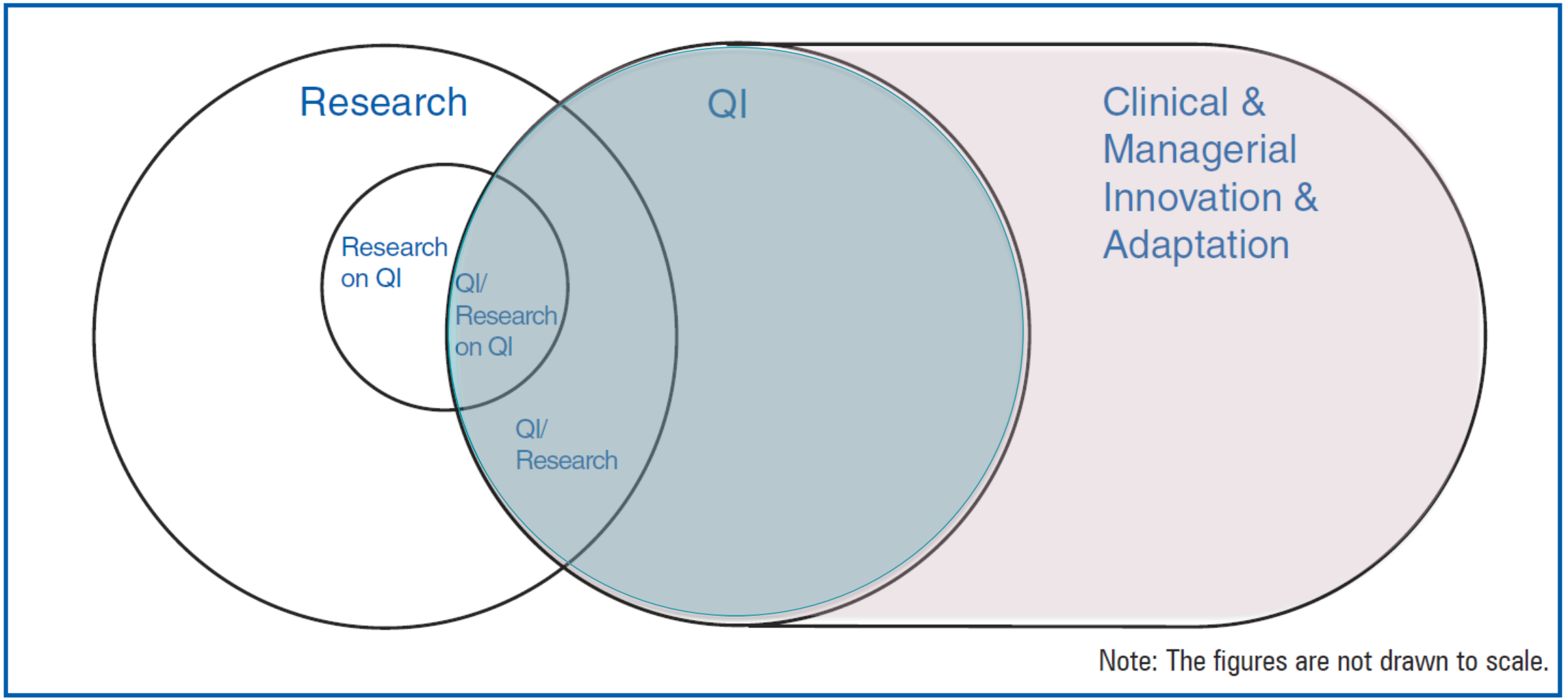

Hastings Center Report. The Ethics of Using QI Methods to Improve Health Care Quality and Safety, 2006

Quality Improvement

- Good clinical care combined with systematic, experiential learning
- Rely on theory and evidence (practical experience & research) to identify changes that may be beneficial
- Meant to incorporate features of local context
- Iterative with rapid feedback of results
- Yields information about what works and the way change occurs
- Activities designed to bring about immediate improvements in care

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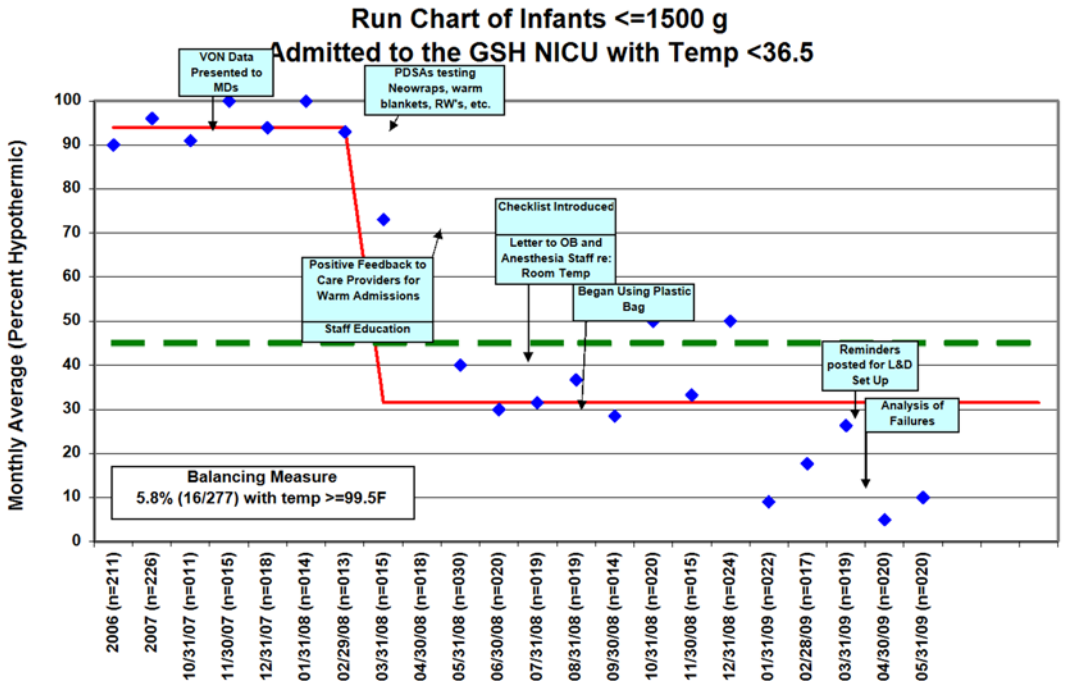
My First QI Project (2007)

Hypothermia: A Practical Approach to a *Chilling* Problem

Heather Kaplan, MD, MSCE

May 9, 2008



Quality Improvement Intervention

- QI methods
  - Multi-disciplinary QI Team
  - Ongoing data collection & feedback
  - FOCUS-PDCA methods
  - "Bundle" of interventions
- Reliability principles
  - Staff Education
  - Checklist use
  - Real time feedback
  - Analysis of Failures

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Journal of Perinatology (2018) 38:742–750
https://doi.org/10.1038/s41372-018-0104-0

QUALITY IMPROVEMENT ARTICLE

A quality improvement initiative to reduce necrotizing enterocolitis across hospital systems

Amy T. Nathan[1,2] · Laura Ward[1,2] · Kurt Schibler[1,2] · Laurel Moyer[1,2,3] · Andrew South[1,2,4] · Heather C. Kaplan[1,2]

Received: 4 October 2017 / Revised: 27 February 2018 / Accepted: 28 February 2018 / Published online: 20 April 2018

Abstract

Objective Necrotizing enterocolitis (NEC) is a devastating intestinal disease in premature infants. Local rates of NEC were unacceptably high. We hypothesized that utilizing quality improvement methodology to standardize care and apply evidence-based practices would reduce our rate of NEC.

Study design A multidisciplinary team used the model for improvement to prioritize interventions. Three neonatal intensive care units (NICUs) developed a standardized feeding protocol for very low birth weight (VLBW) infants, and employed strategies to increase the use of human milk, maximize intestinal perfusion, and promote a healthy microbiome.

Results The primary outcome measure, NEC in VLBW infants, decreased from 0.17 cases/100 VLBW patient days to 0.029, an 83% reduction, while the compliance with a standardized feeding protocol improved.

Conclusion Through reliable implementation of evidence-based practices, this project reduced the regional rate of NEC by 83%. A key outcome and primary driver of success was standardization across multiple NICUs, resulting in consistent application of best practices and reduction in variation.

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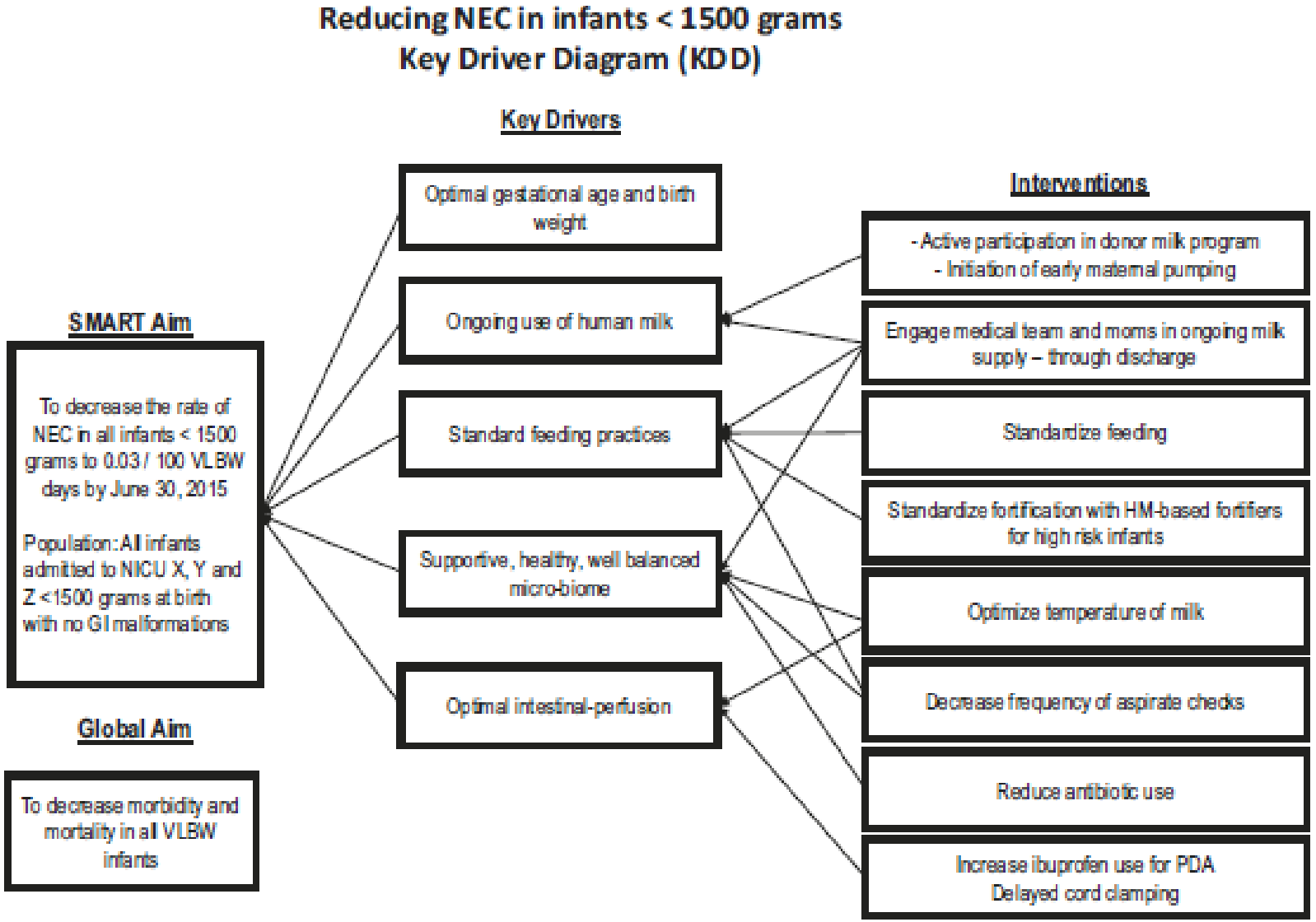
Nathan AT, et al. *J of Perinatology.* 2018

Theory and Evidence to Identify Interventions



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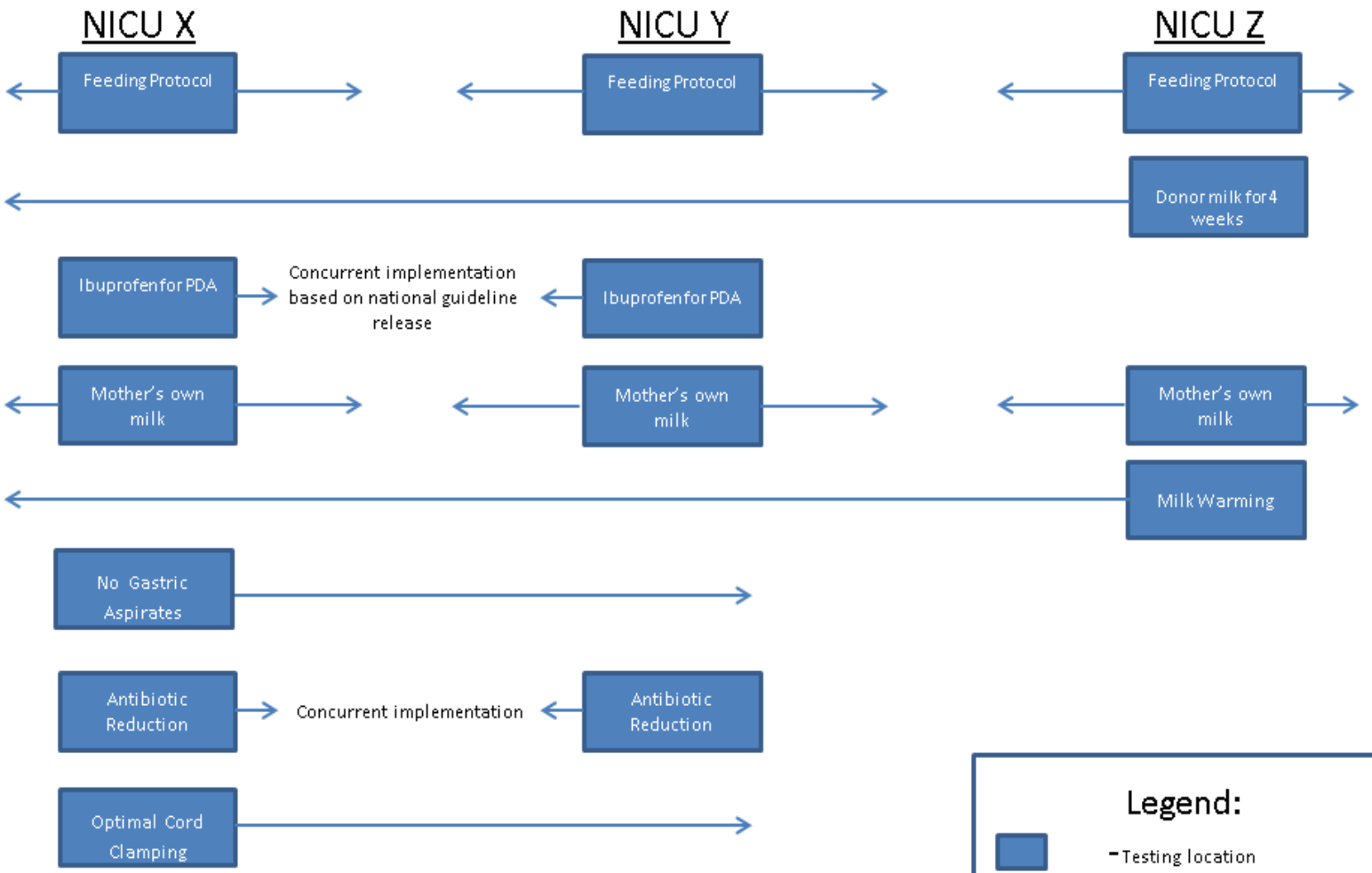
Flow diagram of improvement efforts across 3 NICUs



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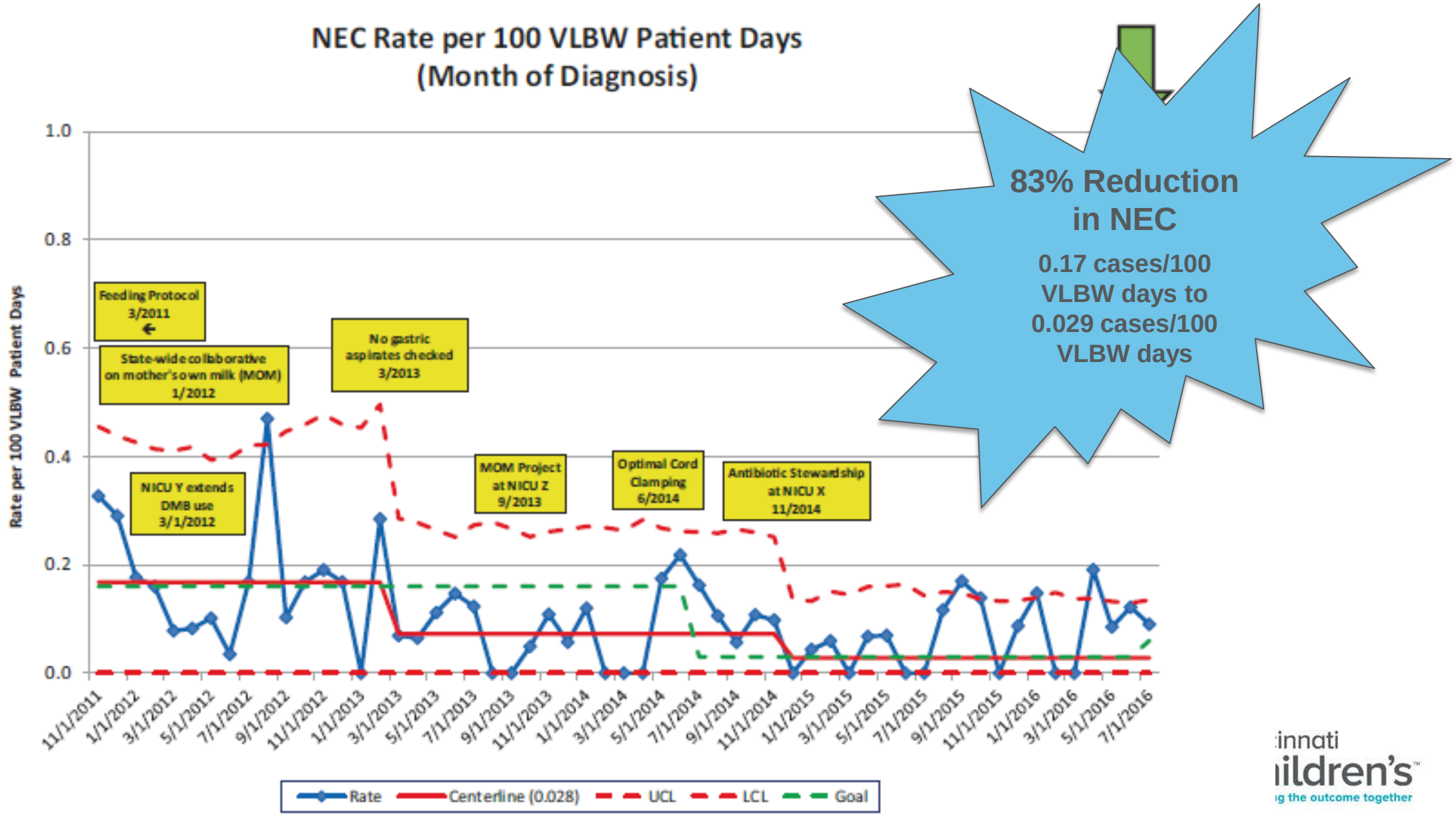

Perinatal Institute (PI) QI Program

- Goal: Achieve improved quality and outcomes across the PI care sites
- Approach:
  - Build QI capability in all units
  - Facilitate partnership between physicians, nurses, and allied health care team members
  - Use national benchmarking (VON) and local data to drive improvement
  - Prioritize QI projects to assure alignment with hospital and PI goals
  - Share learning and collaborate across hospitals
  - Build deep culture of quality improvement

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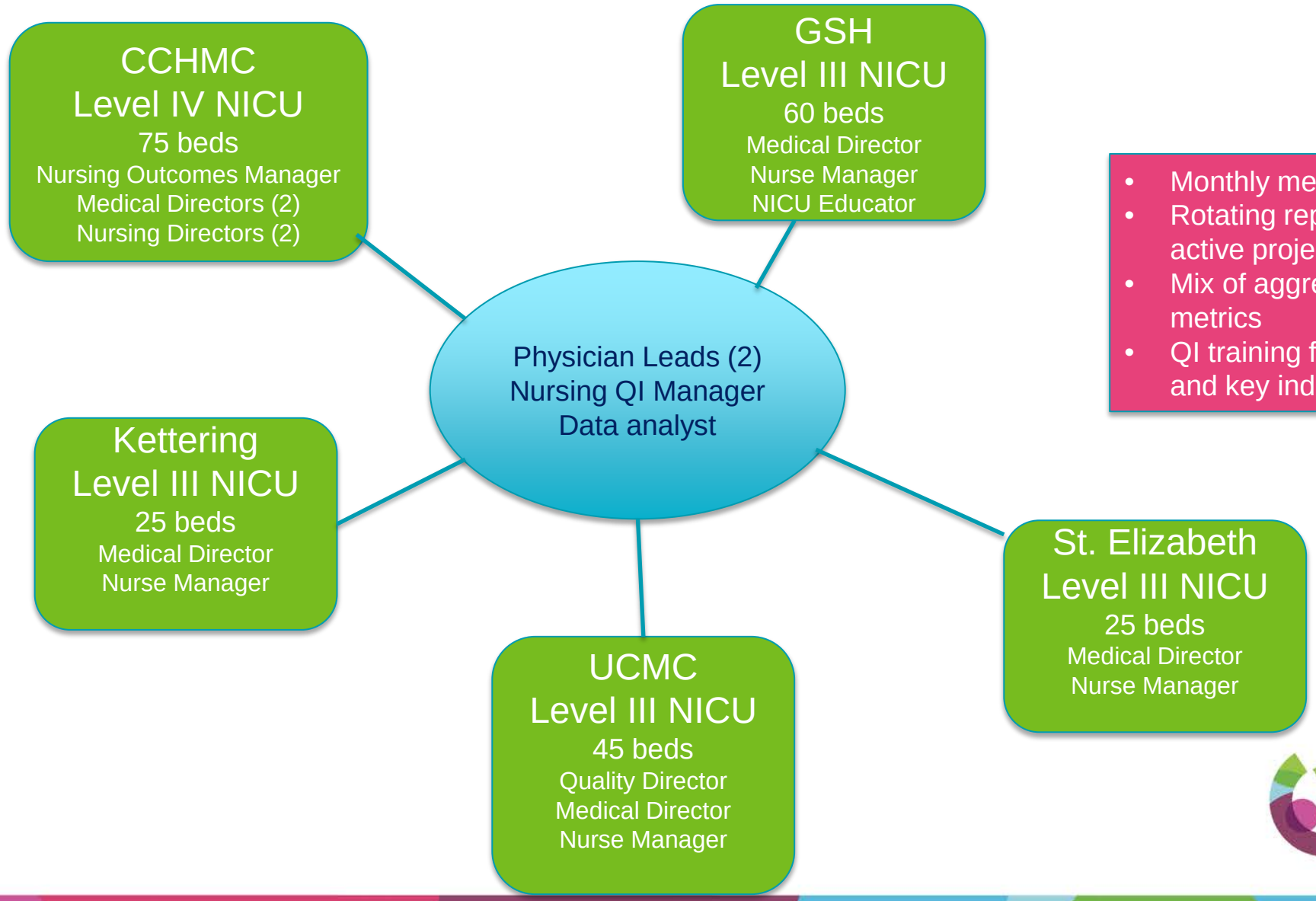
PI QI Structure



- Monthly meetings
- Rotating reports from each unit on active projects
- Mix of aggregate and unit-specific metrics
- QI training for collaborative projects and key individuals

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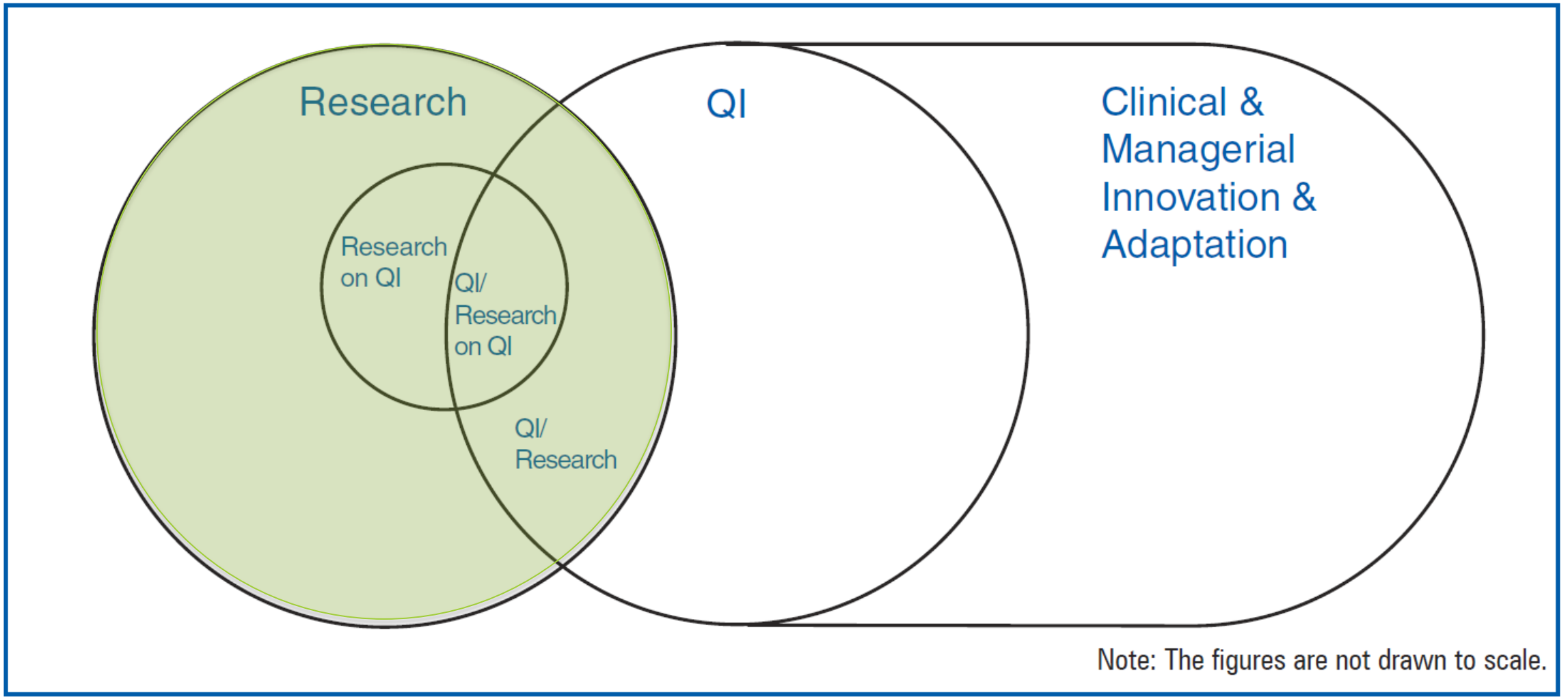
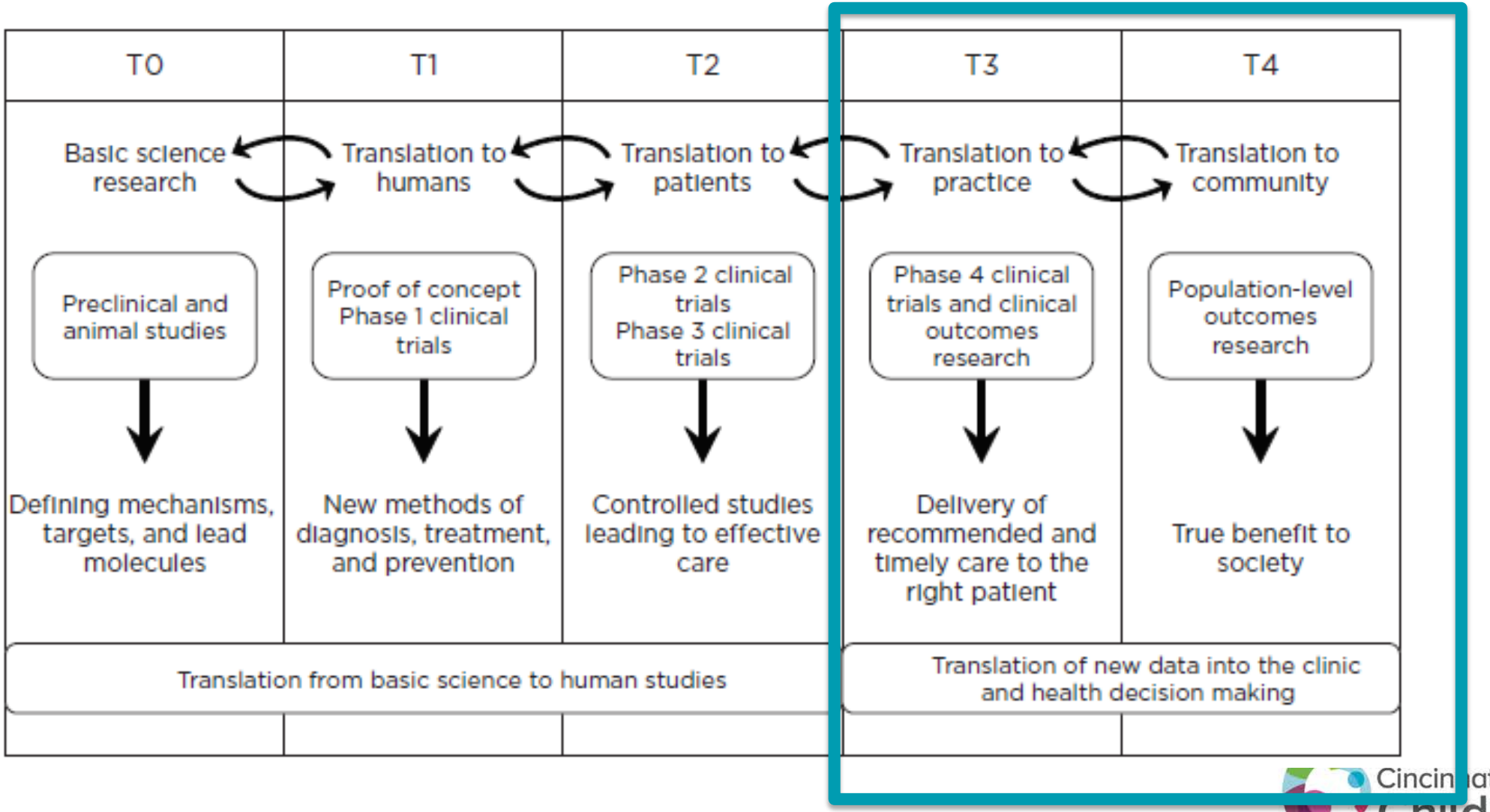


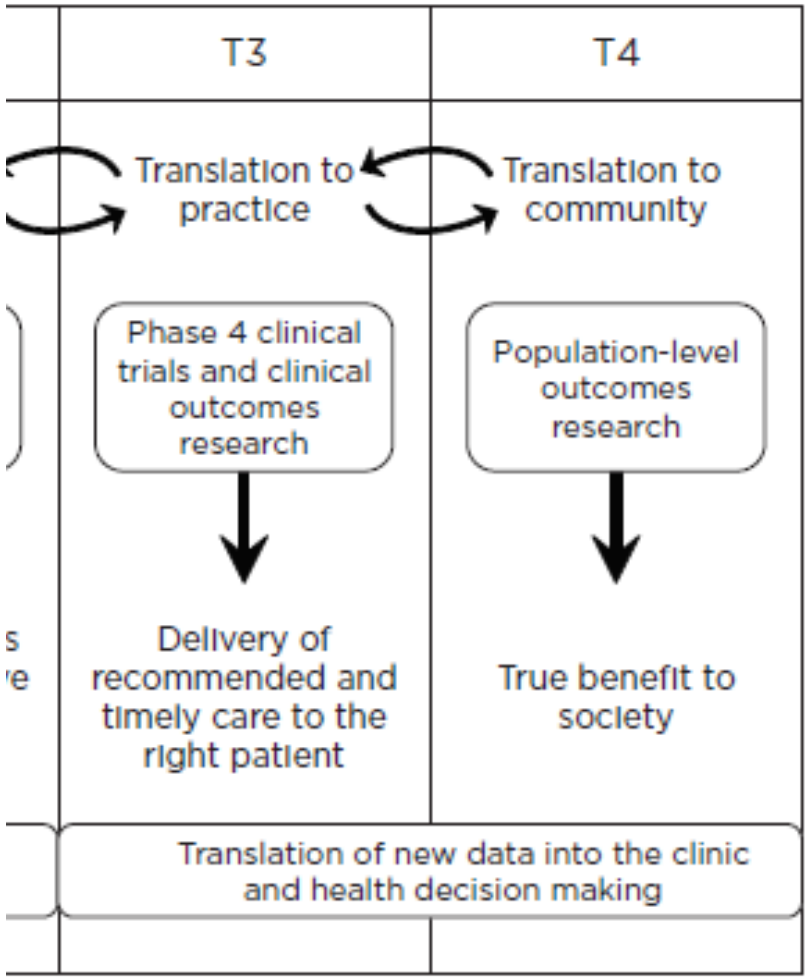
Hastings Center Report. The Ethics of Using QI Methods to Improve Health Care Quality and Safety, 2006

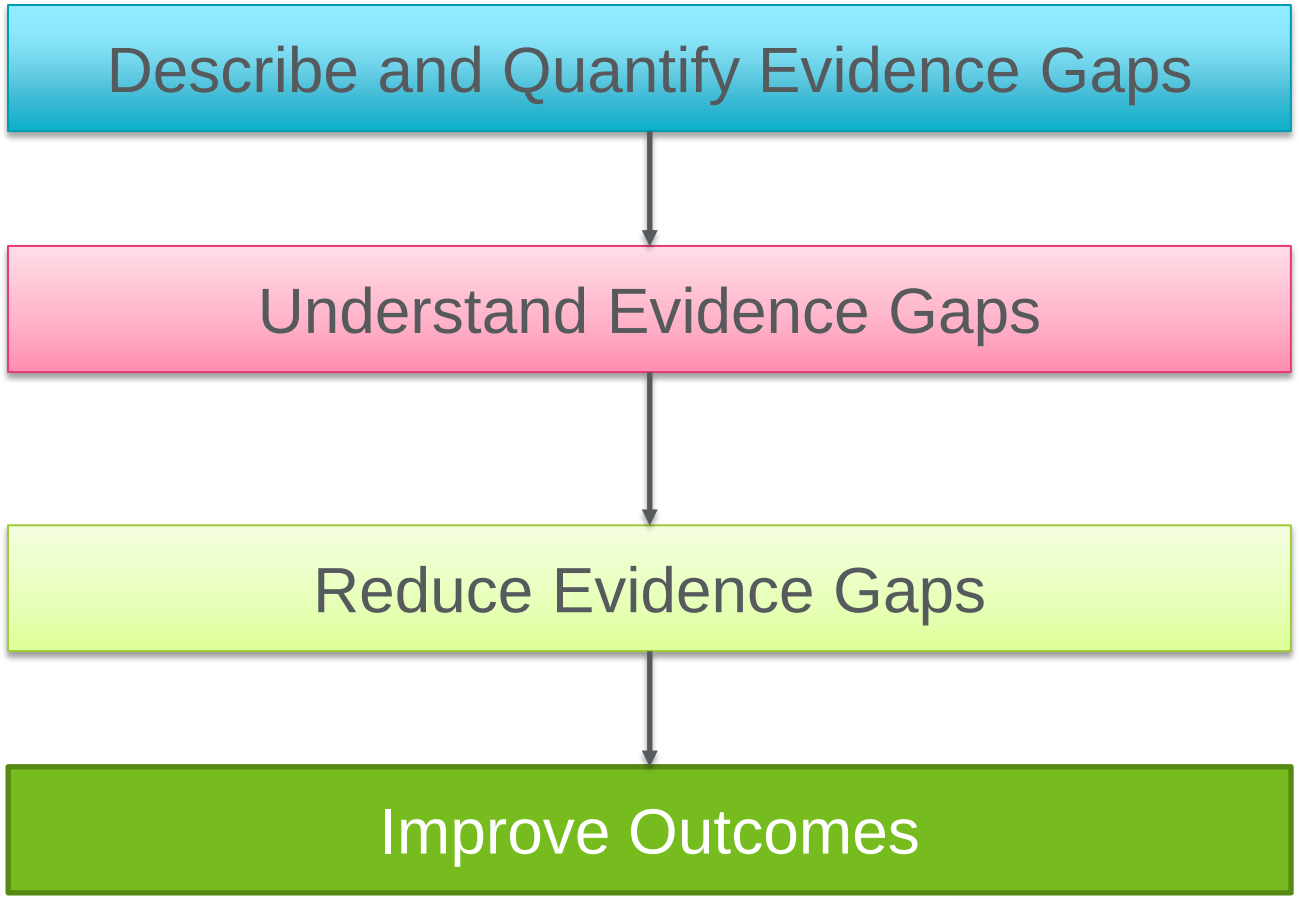
Phases of Research



IOM. The CTSA Program at NIH: Opportunities for Advancing Clinical and Translational Research, 2013
Figure adapted from Blumberg et al, *Nature Medicine*, 2012

T3 and T4 Research





IOM. The CTSA Program at NIH: Opportunities for Advancing Clinical and Translational Research, 2013
Figure adapted from Blumberg et al, *Nature Medicine*, 2012

Understanding Variation in Vitamin A Supplementation Among NICUs

AUTHORS: Heather C. Kaplan, MD, MSCE,[a,b,c] Meredith E. Tabangin, MPH,[d] Diana McClendon, MPH, MSW,[b] Jareen Meinzen-Derr, PhD,[d] Peter A. Margolis, MD, PhD,[b,c] and Edward F. Donovan, MD[b,e]

Divisions of [a]Neonatology, [b]Health Policy and Clinical Effectiveness, and [d]Biostatistics and Epidemiology, [c]Center for Health Care Quality, and [e]Child Policy Research Center, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio

Kaplan HC, et al. *Pediatrics.* 2010

Variation in Vitamin A between (and within) hospitals?

T2
Research

The New England Journal of Medicine

VITAMIN A SUPPLEMENTATION FOR EXTREMELY-LOW-BIRTH-WEIGHT INFANTS

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BARBARA J. STOLL, M.D., JAMES A. LEMONS, M.D., DAVID K. STEVENSON, M.D.,
CHARLES R. BAUER, M.D., SHELDON B. KORONES, M.D., AND AVROY A. FANAROFF, M.B., B.CH.,
FOR THE NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT NEONATAL RESEARCH NETWORK*

ABSTRACT

Background Vitamin A supplementation may reduce the risk of chronic lung disease and sepsis in extremely-low-birth-weight infants. The results of our pilot study suggested that a dose of 5000 IU administered intramuscularly three times per week for four weeks was more effective than the lower doses given in past trials.

Methods We performed a multicenter, blinded, randomized trial to assess the effectiveness and safety of this regimen as compared with sham treatment in 807 infants in need of respiratory support 24 hours after birth. The mean birth weight was 770 g in the vitamin A group and 769 g in the control group, and the respective gestational ages were 26.8 and 26.7 weeks.

Results By 36 weeks' postmenstrual age, 59 of the 405 infants (15 percent) in the vitamin A group and 55 of the 402 infants (14 percent) in the control group had died. The primary outcome — death or chronic lung disease at 36 weeks' postmenstrual age — occurred in significantly fewer infants in the vitamin A group than in the control group (55 percent vs. 62 percent; relative risk, 0.89; 95 percent confidence interval, 0.80 to 0.99). Overall, 1 additional infant survived without chronic lung disease for every 14 to 15 infants who received vitamin A supplements. The proportions of infants in the vitamin A group and the control group who had signs of potential vitamin A toxicity were similar. The proportion of infants with serum retinol values below 20 μg per deciliter (0.70 μmol per liter) was lower in the vitamin A group than in the control group (25 percent vs. 54 percent, P<0.001).

Conclusions Intramuscular administration of 5000 IU of vitamin A three times per week for four weeks reduced biochemical evidence of vitamin A deficiency and slightly decreased the risk of chronic lung disease in extremely-low-birth-weight infants. (N Engl J Med 1999;340:1962-8.)

INFANTS with extremely low birth weights (≤1000 g) have low plasma and tissue concentrations of vitamin A,[1-3] and vitamin A deficiency may predispose these infants to chronic lung disease.[4] A meta-analysis[5] of clinical trials of vitamin A supplementation for preterm infants[6-9] revealed a 17 percent increase in the rate of survival without chronic lung disease, which approached statistical significance. The current relevance of these trials is limited by changes in the vitamin A concentration in infant formulas and by the use of antenatal glucocorticoid and postnatal surfactant therapy. Moreover, in a pilot study[5] we found that many infants given the dose of vitamin A administered in these trials had low serum retinol concentrations.[5,7,10]

We conducted a multicenter, randomized trial to determine the effectiveness and safety of a higher dose of vitamin A than used in previous trials in extremely-low-birth-weight infants. We hypothesized that vitamin A supplementation would increase the rate of survival without chronic lung disease and, on the basis of prior studies,[6,9,11,12] reduce the risk of hospital-acquired sepsis.

METHODS

Study Subjects and Design

We studied 807 infants with birth weights ranging from 401 to 1000 g who received mechanical ventilation or supplemental oxygen at 24 hours of age in one of the participating centers (see the Appendix) between January 1996 and July 1997. To reduce the likelihood of early death that was unrelated to vitamin A status and to facilitate enrollment, we enrolled infants 24 to 96 hours after birth. We excluded infants with major congenital anomalies, those with congenital nonbacterial infection, those thought to have a terminal illness (as indicated by a pH below 6.80 or by the presence of hypoxia with bradycardia for more than two hours), and those who were to receive vitamin A in a parenteral fat emulsion or in doses exceeding recommendations for multivitamin preparations. The study was approved by the institutional review board at each center, and informed consent was obtained for each infant.

The infants were stratified according to center and birth weight (401 to 750 g or 751 to 1000 g) and assigned to the vitamin A or control group by a hospital pharmacist using a randomization list

From the University of Texas Southwestern Medical Center, Dallas (J.E.T., K.A.K.); the National Institute of Child Health and Human Development, Bethesda, Md. (L.L.W.); Women and Infant's Hospital, Providence, R.I. (W.O.); George Washington University Biostatistics Center, Rockville, Md. (L.M.); Yale University, New Haven, Conn. (R.A.E.); Emory University, Atlanta (B.J.S.); Indiana University, Indianapolis (J.A.L.); Stanford University, Stanford, Calif. (D.K.S.); University of Miami, Miami (C.R.B.); University of Tennessee, Memphis (S.B.K.); and Case Western Reserve University, Cleveland (A.A.F.). Address reprint requests to Dr. Tyson at UT Houston, 6431 Fannin, Suite 3.228, Houston, TX 77030.

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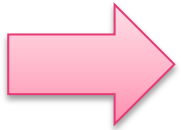
*Other members of the National Institute of Child Health and Human Development Neonatal Research Network are listed in the Appendix.



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T3
Research

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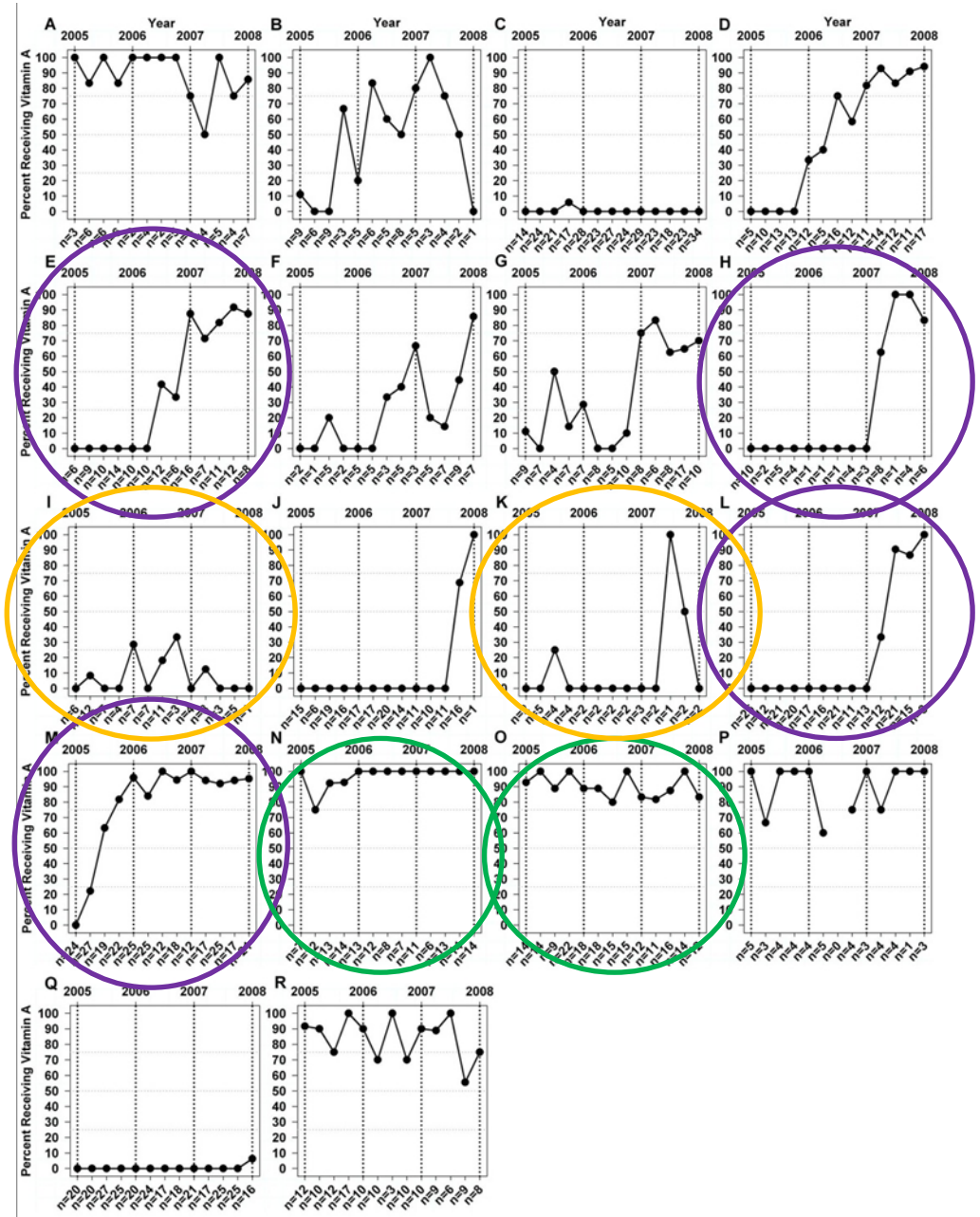

- 24% of infants received Vitamin A
- 60% of hospitals used Vitamin A in at least one patient
- Use increased over time
- Time to adoption varied
- Patterns of use varied:
  - Consistent Use
  - Sporadic Use

Kaplan, et al. *Pediatrics.* 2010

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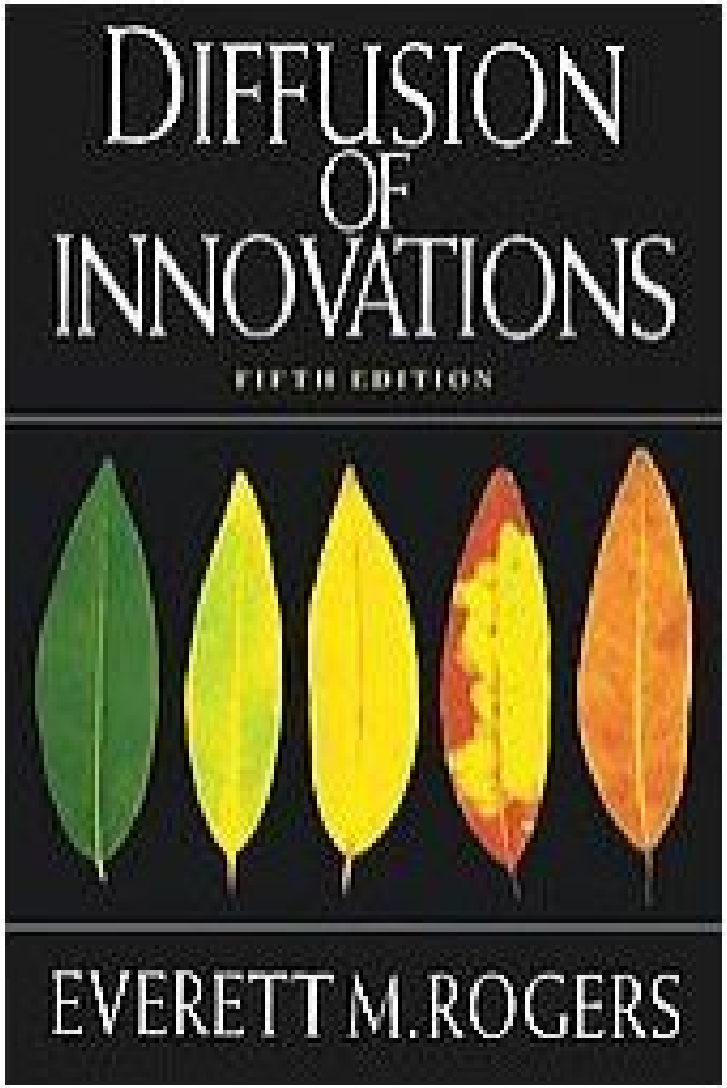

- Perceived efficacy: higher among centers using Vitamin A compared to centers not using Vitamin A (83% vs. 33%, p=0.03).
- Complexity: NICUs using Vitamin A were more likely to believe implementing Vitamin A was not difficult compared to non-users (75% vs. 22%, p=0.02)
- Perceived Relative Advantage: no significant difference (33% vs. 0%, p=0.07)
  "We estimated that Vitamin A may decrease our rate by a maximum…of 4 to 21%. Implementing other potentially better practices with more rigor will have more effect."
- Trialability: no significant difference (33% vs. 11%, p=0.26)
  "A phone survey showed the major concern of initiating Vitamin A after the Tyson study was side effects of injections. Therefore, we performed a QI study after initiating Vitamin A …to monitor complications of injections. There were none noted and no concerns from our nursing staff."

Kaplan HC, et al. *Pediatrics.* 2010

Conclusions

- Use of Vitamin A is increasing over time (in 2010)
- Adoption has been slow, variation remains
- Source of much of this variation relates to provider attitudes and system characteristics
- Understanding factors related to variation will allow for the design of optimal interventions to increase the efficiency and effectiveness with which evidence is implemented

Kaplan HC, et al. *Pediatrics.* 2010

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Clinical Practice and Quality

Statewide Quality Improvement Initiative to Reduce Early Elective Deliveries and Improve Birth Registry Accuracy

Heather C. Kaplan, MD, MSCE, Eileen King, PhD, Beth E. White, MSN, Susan E. Ford, MSN, Sandra Fuller, MEd, Michael A. Krew, MD, MS, Michael P. Marcotte, MD, Jay D. Iams, MD, Jennifer L. Bailit, MD, MPH, Jo M. Bouchard, MPH, Kelly Friar, MHA, and Carole M. Lannon, MD, MPH

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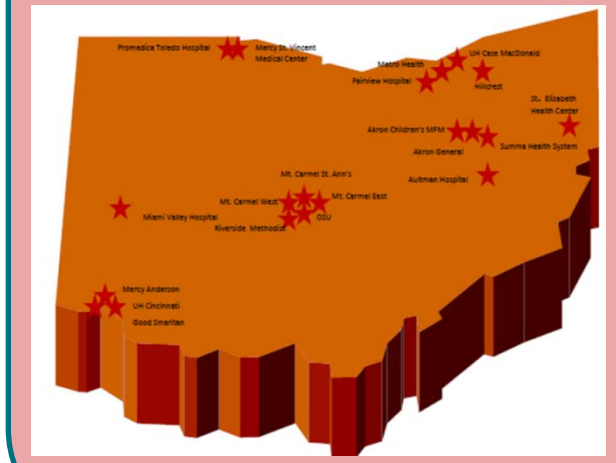
Kaplan HC, et al. *Obstetrics & Gynecology,* 2018

Ohio Perinatal Quality Collaborative (OPQC) 39 Week Project

20 Charter Hospitals
49% of Ohio Births
2008-2010
IHI BTS™ Methods
Chart /Birth Registry Data
Reduced EED from 25% to <5%
Birth Registry: 13 % to 7%



15 Pilot Sites
17% of Ohio Births
2012-2013
Adapted IHI BTS™ + Site Visits
Birth Registry Data ONLY
Focus on Accuracy & Clinical Processes
Reduced EED from 15% to <5% (Birth Registry Data)

72 Remaining Sites
32% of Ohio Births
2013-2014
Birth Registry Data ONLY
Focus on Accuracy & Clinical Processes
Short Timeline (14-months)
NO Site Visits

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Study Design

Stepped Wedge Design:

	2012			2013												2014								
	J	F	… D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Wave 1	B	B	… B	B	I	I	I	I	I	I	I	I	S	S	S	S	S	S	S	S	S	S	S	S
Wave 2	B	B	… B	B	B	B	B	I	I	I	I	I	I	I	I	S	S	S	S	S	S	S	S	S
Wave 3	B	B	… B	B	B	B	B	B	B	B	I	I	I	I	I	I	I	I	S	S	S	S	S	S

B= Baseline, I= Intervention, S= Sustain

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Reduction in EED Across Waves

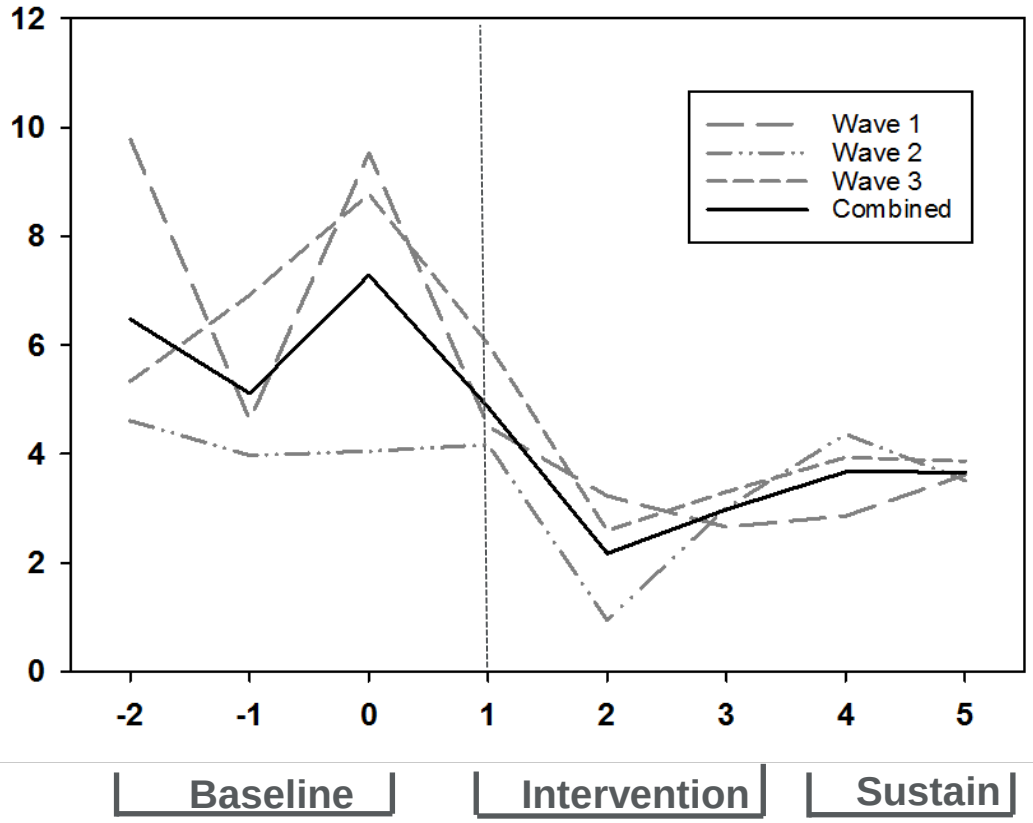

Table 3. Comparison of Rates of Early Elective Deliveries Across Phases

	Baseline vs Implementation			Implementation vs Sustain	
Group	Baseline*	Implementation*	*P*	Sustain*	*P*
Combined (n=70)	6.2 (5.1–7.5)	3.2 (2.4–4.1)	<.001	3.6 (2.7–4.7)	.44
Wave 1 (n=24)	7.8 (5.7–10.2)	3.3 (2.1–5.2)	<.001	3.2 (1.7–5.1)	.81
Wave 2 (n=22)	4.2 (2.6–6.2)	2.5 (1.3–4.1)	.04	3.9 (2.2–6.1)	.12
Wave 3 (n=24)	6.8 (4.8–9.1)	3.7 (2.3–5.4)	.002	3.8 (2.2–5.8)	.89

Data are estimates of the median % (95% CI) unless otherwise specified.
* Analysis done with arcsine square root transformation; values have been back-transformed.

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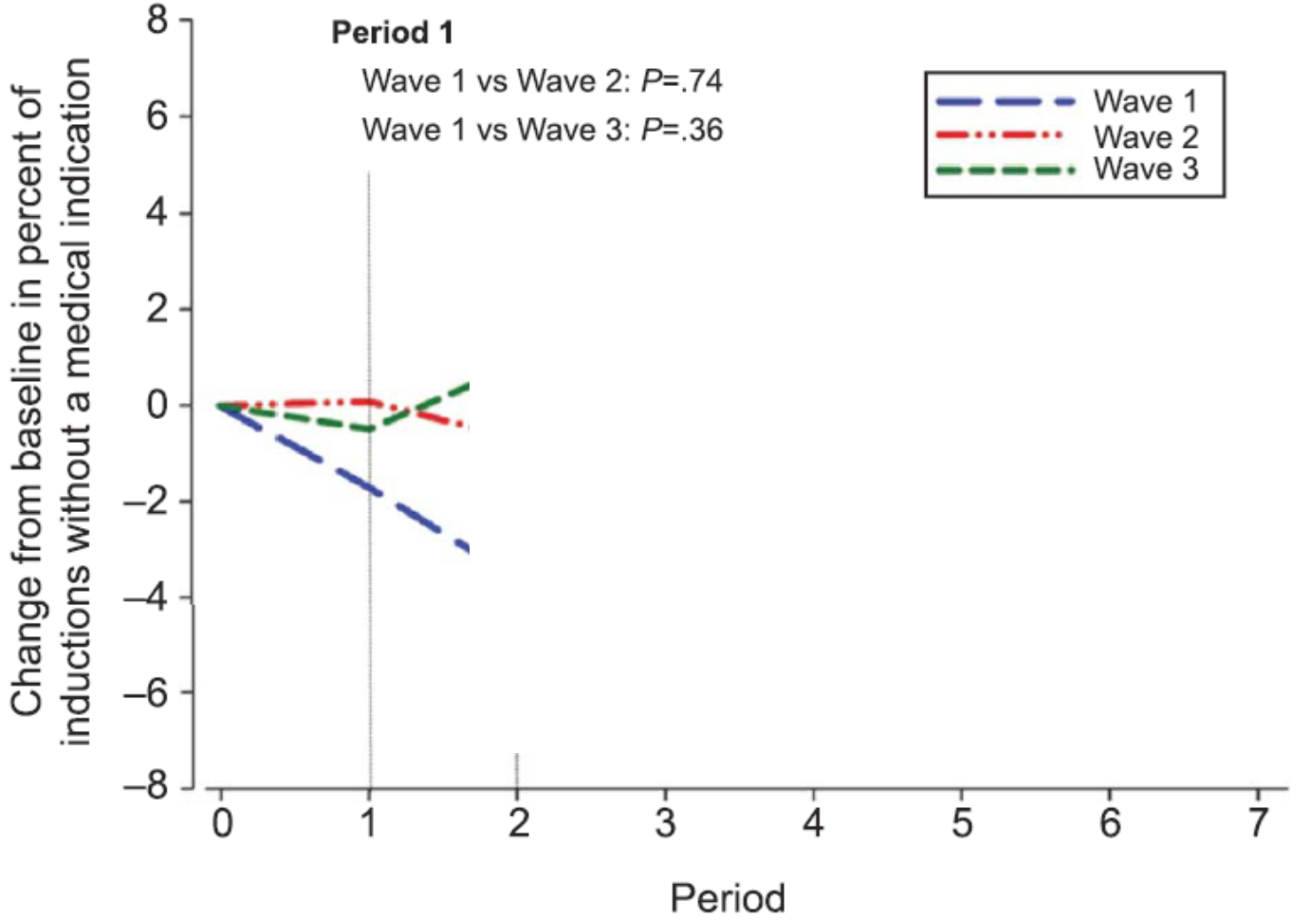
Comparison Across Waves



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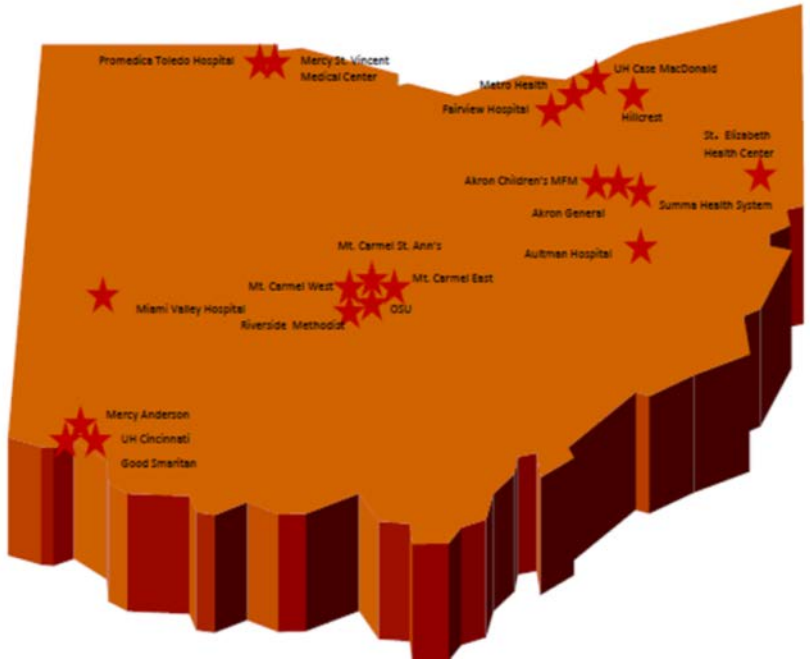

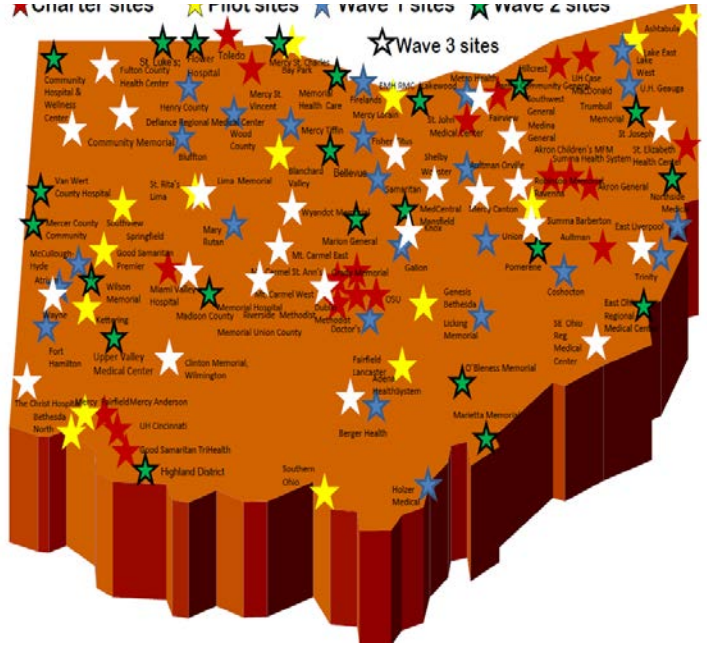

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Take Home Points…

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Lessons learned in my career (so far)…

- Take advantage of training opportunities
- Build your reputation by executing and by sharing your work
- Network with those who have similar career paths
- Keep an open mind with respect to the methods and approaches that can be used to improve care delivery and outcomes (research *and* QI)

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Questions and Discussion

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Questions for the Group

1. How have you demonstrated productivity in the QI/patient safety (either for academic promotion or gaining leadership opportunities/added responsibility)?
2. How have you fit QI into your career path?
3. There are many ways to build knowledge and skill in QI. What resources or programs have you used? What have been the pros and cons of each?

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