

Lost in Translation - How Do We Prioritize So That Today's Best Science Becomes Tomorrow's Affordable Medicine?



Breakout Session Report

In just the last decade, the world has made extraordinary scientific achievements: for example, rapid technological advances accelerated the completion date of the Human Genome Project to 2003 and innovations in diagnostic imaging have significantly advanced our ability to evaluate disease from the moment of infection. However, a disconnect lies between science and clinical application, obstructing the development and testing of scientific discoveries for widespread, practical use.



Andre Wan

A 2003 study investigating the rate at which promising scientific research was translated into clinical application revealed that among discoveries made between 1979 and 1983, less than one in 10 discoveries entered clinical use within 20 years of the published discovery.* What happened to those other discoveries? What opportunities did we miss?

In recognition of the continuing challenge of translating clinical investigation findings into the practice of medicine, the 2006 Pacific Health Summit convened the "Lost in Translation" breakout session on June 22 to discuss how to ensure that today's best science becomes tomorrow's affordable medicine.

"In the United States, and indeed globally," began **Victor Dzau**, Chancellor of Health Affairs at Duke University, "these missed opportunities are indicative of fragmented health care systems that separate industry, government, insurers, clinics, and other stakeholders." This fragmentation causes serious time lags and results in huge transaction costs. In light of this dilemma, Dzau asked participants the following questions:

- How can we use incentives to commercialize new technologies and scientific methods?
- Where does local vs. global community input fit into the process?
- What are the bottlenecks and relationships between academic research, industry, and practice?
- What is the role of public-private partnership?
- How do differing developing and developed world needs affect the commercialization process?

"A large portion of money is spent on research, development, and commercialization in the United States, while a mere pittance is spent on integrating discovery into practice," **David Lawrence**, Former Chairman and Chief Executive Officer of the Kaiser Foundation Health Plan, said. Basic science and discovery represents a \$12 - 14 billion investment, while only \$200 million is devoted to improving practical applications of discovery. "Those figures need to become more balanced." By contrast, Lawrence continued, Singapore provides a positive model for translation practices.

In Singapore, the medical field has focused first on building up research capabilities before moving toward translation. Now, the country is building bridges between the clinical community and research organizations so as to involve practitioner input. Information databases and tissue repositories are being established to provide ready access to existing knowledge and reduce the duplication of efforts. Importantly, the country has also built facilities for the express purpose of facilitating contact between all stakeholders in the translation process.



David Lawrence and Gary Kaplan

That Singapore lacks a legacy of institutionalized research organizations works to its advantage in the context of translation, according to **Andre Wan**, Director of the Biomedical Research Council's Agency for Science, Technology, and Research. Without the fragmentation the United States experience, Singapore has the luxury of "a clean slate."

While appropriate resource allocation is critical for translation, effective management and operation systems in individual institutions are also key. Another positive example of translation is the Toyota Production System (TPS) as applied to health care, which has helped to streamline large-scale operations at several health institutions resulting in improved health outcomes.

* D.G. Contopoulos-Loannidis, E. Ntzani, and J.P. Ioannidis, "Translation of Highly Promising Basic Science Research Into Clinical Applications," *American Journal of Medicine* 114 (2003): 477-84.

Gary Kaplan, Chairman and CEO of Virginia Mason Medical Center, explained that implementing the Toyota system throughout Virginia Mason in Seattle has made the institution more adept at integrating new discoveries, removing waste from unnecessary organizational processes. “Every division has its own value stream, and core processes are mapped out to track inputs and their sources,” he said.

Barriers to Successful Translation:

- Fragmentation between sectors
- Enormous time lags from bench to bedside, and from bedside to general population
- Huge transaction costs
- Disproportionate amounts of resources

“Appropriate personnel assess these elements to allow tailoring to the customer,” brining discovery from the laboratory into practice, and from general practice to individualized treatment.

Despite the benefits of innovative operational and management systems, however, turning discovery into effective practice at the national and international levels remains a challenge, further compounded by drug approval processes. **Je-Ho Lee**, Director of Samsung Medical Center’s Molecular Therapy Research Center, reported that South Korean companies are forming partnerships with U.S. firms and research organizations to push parallel research projects to fruition. Lee noted that timing is very important, as is patience at every step.



Sally Davies

According to **Sally Davies**, Director of Research and Development for the United Kingdom’s Department of Health Services, “cost, context, and culture” are three big challenges to translation. And the developing world often requires different solutions than the developed world.

“When considering implementation of new medical practices in the developing world,” said **Alfred Sommer**, Professor and former Dean at the Johns Hopkins Bloomberg School of Medicine, “the touchstone should be: How much does it cost? Does it make a significant difference?” In scaling innovation for local conditions, context is critical. New technology—no matter how effective—can be useless without the appropriate infrastructure to support it.

And while integrating new discoveries is critical, we must not forget about time-honored standbys. According to **Benjamin Anderson**, Director of the Breast Health Global Initiative at the Fred Hutchinson Cancer Research Center, not everything needs to be reengineered. “Industry rules of functioning require companies to create new products to survive, but new products may be only marginally better,” he continued. Recognizing whether to invest in improvements in

products, new ways to apply old products, or new products altogether is difficult. New is not always better.

Facilitating coordination among the diverse stakeholders is essential for efficient allocation of resources, to reduce duplication, and establish a common platform for application of innovation. In addition, finding effective systems and tailoring them to local contexts helps to create an environment for more effective translation. Ultimately, concluded Victor Dzau, “we are faced with questions of how to be more forward-looking and not simply produce science for the sake of science.”

Many issues in health move discussion beyond cost and into the real of behavioral change and cultural and institutional shifts. Setting the criteria for innovation is no small task. In recognition of the many discussions that remain and the diversity of issues to cover, participants in the “Lost in Translation” breakout session proposed an ongoing project to address continuing challenges.



Ben Anderson, Sally Davies, David Lawrence, Gary Kaplan, Je-Ho Lee, Alfred Sommer, and Andre Wan

Issues to Consider:

- Turning discoveries into products
- Moving from product to delivery
- Enhancing the speed and effectiveness of uptake in the delivery system
- Enhancing discovery/product effectiveness

The Summit translation project will focus on two major problems: the loss of new discoveries throughout the translation process and the significant time required to move through that process from discovery to effective delivery. Participants will also address three broad stakeholder groups: wealthy countries, developing countries, and the partnership between the rich and poorer nations. The project will commence collaboration in the fall of 2006.

To learn more about the Pacific Health Summit, please visit www.pacifichealthsummit.org, or email ctopal@nbr.org.