

## A New Global Heart Series

The National Heart, Lung, and Blood Institute (NHLBI) is one of 27 institutes and centers that make up the U.S. National Institutes of Health (NIH), the largest source of funding for biomedical research in the world. The mission of the NHLBI is to provide global leadership for a research, training, and education program to promote the prevention and treatment of heart, lung, and blood diseases and enhance the health of all individuals so that they can live longer and more fulfilling lives [1]. In particular, the NHLBI stimulates fundamental discoveries in basic, clinical, and population science research; enables the translation of scientific discoveries into clinical and public health practice; fosters training and mentoring of emerging scientists and clinicians; and communicates research advances to the public [1]. Beginning with this issue of *Global Heart*, the NHLBI will use the gWATCH section of the journal to share and communicate current perspectives on its activities, initiatives, and research advances with the global cardiovascular health community. In this issue, the institute's perspectives on its new collaborative partnership model for developing clinical cardiovascular practice guidelines and its current emphasis on implementation science and translation research are presented.

### COLLABORATIVE MODEL FOR PRACTICE GUIDELINES DEVELOPMENT

On June 19, 2013, coincident with a public meeting of the NHLBI Advisory Council (NHLBAC), the NHLBI announced a new 2-step collaborative partnership model for the development of current and future clinical cardiovascular practice guidelines [2], in alignment with recent recommendations from the Institute of Medicine [3,4]. In the first step of this model, the NHLBI refocuses its agenda on facilitating the generation of rigorous systematic evidentiary reviews in support of the highest quality clinical practice guidelines worthy of the public trust. Results of these rigorous reviews will be made available free as a global public resource. In the second step of this model, the NHLBI will collaborate with organizations that are on the frontlines of direct patient care to prepare and issue the related clinical practice guidelines informed by the rigorous evidentiary reviews. To implement this model, the NHLBI is partnering with stakeholder or professional organizations including primary care and cardiovascular specialty organizations, other federal agencies, and international associations to ensure the

completion and dissemination of these guidelines to reach health care providers on the front lines of preventive care and the general public [5]. In future issues of the journal, the NHLBI will share concrete plans for future systematic evidentiary reviews; the process for internal evaluation and continuous improvement; strategies to facilitate sustained adoption and implementation of guidelines; and the identification of evidence gaps to inform and guide research investments in order to maximize public health impact.

### IMPLEMENTATION SCIENCE AND THE TRANSLATION OF RESEARCH DISCOVERIES INTO PRACTICE

The NHLBI has been the global leader in heart, lung, and blood research advances and has funded major basic and clinical research as well as landmark epidemiological investigations that have led to effective diagnostic, preventive, and therapeutic interventions in the last half-century [1,6]. It is well-recognized, however, that much of these research advances is often "lost in translation" [7] and that the fraction of discovery science that reaches patients in clinical practices and real world settings remains very low. For example, Westfall et al. [8] commented that it takes an average of 17 years for only 14% of new scientific discoveries to enter day-to-day clinical practice, and that Americans receive, on average, only half of recommended preventive, acute, and long-term quality health care. In fact, Naderi et al. showed more recently that nearly one-third of patients with a history of myocardial infarction and about one-half without do not adhere to effective evidence-based treatments [9].

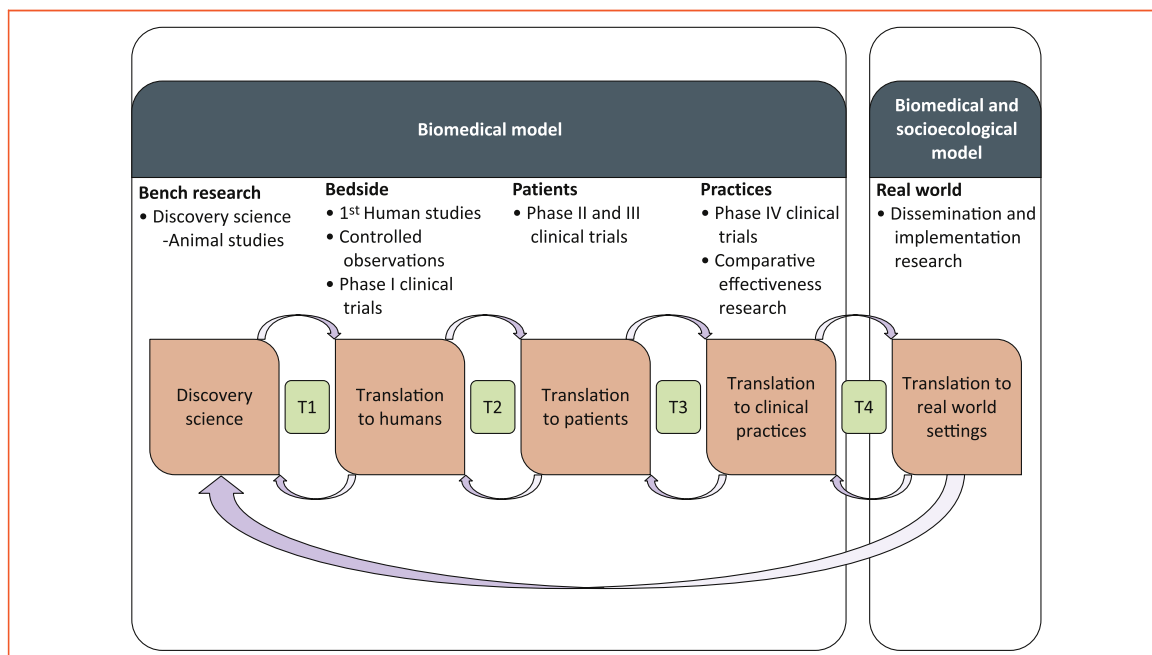
Recognizing the enormity of the research translation gap, the NHLBI held a series of internal leadership retreats in May and June earlier this year that led to a commitment of renewed emphasis on T4 translation research, including dissemination and implementation research (Fig. 1) as one approach to maximize the clinical and public health impact of its research discoveries. In this conceptualization, implementation research is interpreted to include rigorous hypotheses testing and formal exploration of the processes and factors that influence the successful and sustained adoption and integration of evidence-based interventions within specific settings such as schools, work sites, communities, and other public health settings in order to improve population health [10,11].

The perspectives expressed in this article do not necessarily represent the views of the National Institutes of Health, Department of Health and Human Services, or any other government entity.

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**FIGURE 1. The 4 steps (T1, T2, T3, and T4) involved in the translation of fundamental discovery science into clinical and public health impact in real-world settings.** T1, the first translational step—bench to bedside or animal studies to humans; T2, the second translational step—translating science discovery to patients with specific diseases; T3, the third translational step—translating clinical insights to service delivery in clinical practices; T4, the fourth translational step—translating effective interventions to real-world settings. Based on and informed by the models of Khoury et al. *Genet Med* 2007;9:665–74, and the Harvard Catalyst; The Harvard Clinical and Translational Science Center, available at: <http://catalyst.harvard.edu/pathfinder/>. Accessed August 28, 2013.

The diseases and risk factors addressed by NHLBI are among the major contributors to global mortality and disability. Thus, renewed emphasis on T4 translation research in this arena can go a long way to maximize the population impact of related biomedical research advances made so far. In future issues of this journal, the NHLBI will share information on funding opportunities to accelerate T4 translation research in heart, lung, and blood diseases and their risk factors.

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#### REFERENCES

1. National Heart, Lung, and Blood Institute. NHLBI Strategic Plan. National Institutes of Health. Available at: <http://www.nhlbi.nih.gov/about/strategicplan/index.htm>; 2007. Accessed August 28, 2013.
2. Gibbons GH, Shurin SB, Mensah GA, Lauer MS. Refocusing the agenda on cardiovascular guidelines: an announcement from the National Heart, Lung, and Blood Institute. *Circulation* 2013 Jun 19 [Epub ahead of print].
3. Institute of Medicine. Finding what works in health care: standards for reviews. National Academy of Sciences. Available at: <http://www.iom.edu/Reports/2011/Finding-What-Works-in-Health-Care-Standards-for-Systematic-Reviews.aspx>; 2011. Accessed August 28, 2013.
4. Institute of Medicine. Clinical practice guidelines we can trust. National Academy of Sciences. Available at: <http://www.iom.edu/Reports/2011/Clinical-Practice-Guidelines-We-Can-Trust.aspx>; 2011. Accessed August 28, 2013.
5. Gibbons GH, Harold JG, Jessup M, Robertson RM, Oetgen W. Next steps in developing clinical practice guidelines for prevention. *Circulation* 2013 Aug 8 [Epub ahead of print].
6. Nabel EG, Lauer MS. The cardiovascular programs of the National Heart, Lung, and Blood Institute: from vision to action to impact. *J Am Coll Cardiol* 2009;53:1082–3.
7. Lenfant C. Shattuck lecture—clinical research to clinical practice—lost in translation? *N Engl J Med* 2003;349:868–74.
8. Westfall JM, Mold J, Fagnan L. Practice-based research—“Blue Highways” on the NIH roadmap. *JAMA* 2007;297:403–6.
9. Naderi SH, Bestwick JP, Wald DS. Adherence to drugs that prevent cardiovascular disease: meta-analysis on 376,162 patients. *Am J Med* 2012;125:882–7.
10. Lobb R, Colditz GA. Implementation science and its application to population health. *Annu Rev Public Health* 2013;34:235–51.
11. Rabin BA, Brownson RC, Haire-Joshu D, Kreuter MW, Weaver NL. A glossary for dissemination and implementation research in health. *J Public Health Manag Pract*. 2008;14:117–23.