

How to implement research findings in daily neuro-urological practice?

Dr Reynaldo G. Gómez MD, FACS, Chief of Urology, Hospital del Trabajador Santiago, Chile, presents a lecture on how to implement research findings in daily practice.

The lecture was given for an audience of neuro-urologists but has general validity. It focuses on the main problem: the growing gap between clinical practice and the application of research findings, and then defines translational research identifying two translational blocks, T1 and T2, where T1 is the transfer of new understandings of disease mechanisms gained in the laboratory into the development of new methods for diagnosis, therapy, and prevention and T2 is the translation of results from clinical studies into everyday clinical practice and health decision making. The challenges of both T1 and T2 are discussed and an action plan to approach the problem is described.

## How to implement research findings in daily neuro-urological practice?

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- No disclosures

### The problem...

- Research speed is fast [~ 36,000 RCTs/year], but its incorporation to clinical practice is slow [... about 17y] (1)
- This result in a growing gap between clinical practice and the application of research findings
- Many patients do not receive the care recommended or receive unnecessary, inefficient or even damaging care
- It is imperative to accelerate and improve this process
- Relying on just the passive diffusion of information to keep health professionals' knowledge up to date is doomed to failure
- **Active action is required... But how??**

(1) Balas EA, Boren SA. Yearbook of Medical Informatics, 2000:65

### Translational Research

- Uptake of research findings is a complex problem requiring insights from a range of disciplines
- To promote this uptake it is necessary to identify potential barriers to implementation and to develop strategies to overcome them
- **Translational research** has arisen as a new discipline to study this complex issue

#### Editorial

**Implementation of evidence and guidelines in clinical practice: a new field of research?**  
Grol R. *International Journal for Quality in Health Care* 2000; 12:455

**Translational Research: Moving Discovery to Practice**

EA Zerhouni<sup>1</sup> *Nature* (2007) 81:126

**The Meaning of Translational Research and Why It Matters**

Steven H. Woolf, MD, MPH *JAMA* (2008) 299:211

### Translational Research

- NIH launched in 2006 the Clinical and Translational Science Award (CTSA) program to fund academic research centers with a budget of \$500 million/year
- CTSA program goal: development of multidisciplinary teams to take scientific discoveries from the laboratory and turn them into treatments
- Besides academic centers, foundations, industry, disease-related organizations, individual hospitals and health systems have also established translational research programs
- At least 2 journals (*Translational Medicine* and the *Journal of Translational Medicine*) are devoted to the topic
- European Commission's €6 billion budget for health-related research, and the United Kingdom has invested £450 million over 5 years to establish translational research centers
- The European Medical Research Councils (EMRC) at the The European Science Foundation has carried out a Forward Look on 'Implementation of Medical Research in Clinical Practice'



### What is Translational Research..?

- For many, the term refers to the "bench-to-bedside" enterprise of harnessing knowledge from basic sciences to produce new drugs, devices and treatments
- For others it refers to translating research into practice; i.e., ensuring that new knowledge actually reach the patients or populations for whom they are intended
- Two very different translational blocks have been identified:
  - T1 - the transfer of new understandings of disease mechanisms gained in the laboratory into the development of new methods for diagnosis, therapy, and prevention
  - T2 - the translation of results from clinical studies into everyday clinical practice and health decision making
- T1 and T2 are very different endeavors

Woolf SH (2008) *JAMA* 299:211

## T1

- T1 research requires:
  - Mastery of molecular biology, genetics, and basic sciences
  - Trained scientists
  - Strong laboratories with cutting-edge technology
  - Supportive institutional infrastructure
- It is the main focus of the NIH CTSA program...

## T2

- T2 occurs at the hospital but also at the community and ambulatory care level where the results of T1 reach the public
- T2 require different skills:
  - Clinical epidemiology
  - Behavioral sciences
  - Education sciences
  - Public policy
  - Financing
  - Organizational theory
  - Systems redesign
  - Informatics

## T1 ad T2 face different challenges

- T1 struggles with biological and technological mysteries, trial recruitment, and regulatory concerns
- T2 struggles with human behavior and organizational inertia, infrastructure and resource constraints
- Both T1 and T2 research are vital, but T1 overshadow T2
- Most people have T1 in mind when using the term 'translational research'
- T1 attracts more funding: for example in the US in 2002 the NIH budget included \$22 billion for basic and applied research, but only \$800 million for health services research (1)
- The NIH CTSA program advocate both T1 and T2, but the focus is on T1
- In addition, in the US T2 lies in a separate entity (the Agency for Healthcare Research and Quality) with a budget of only about \$300 million per year (2)

(1) Moses H III (2005) JAMA 294:1333

(2) Rockville, MD (2001) AHRQ pub 01-P017. <http://www.ahrq.gov/research/trip2fac.htm>

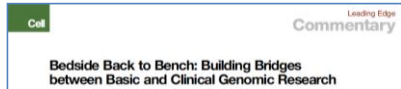
## T2 complexity and importance

- T2 go beyond the pure scope of healthcare professionals
- T2 "practitioners" also include patients, public health administrators, employers, school officials, regulators, product designers, the food industry, among others...
- T2 could save more lives than T1
- T1 occasionally yields breakthroughs that markedly improve the prognosis for a disease, but most new drugs and interventions only marginally improve overall efficacy
- Patients might benefit more—and more patients might benefit—if the health care system performed better in adequately delivering existing treatments than in producing new ones

## So... How can we do this in our practice..?

1. Collaboration on research
2. Understanding professional knowledge
3. Smart management of knowledge storage
4. Application of structured knowledge tools
5. Evidence-based Medicine and Evidence-based Practice

## 1. An example of collaboration on research...



- Genome sequencing has revolutionized the diagnosis of genetic diseases
- Close collaborations between basic scientists and clinical genomicists to link genetic variants with disease causation
- Recommendations to facilitate such collaborations:
  - Prioritizing clinically relevant genes for functional studies
  - Developing reference variant-phenotype databases
  - Adopting phenotype description standards and promoting data sharing

Manolio TA et al. (2017) Cell 169:6

## 2. Understanding the nature of Professional Knowledge

- It is a mixture of both explicit and tacit knowledge:
  - **Explicit** knowledge is external to the individual (textbooks, findings of research studies) and is often called 'evidence'
  - **Tacit** knowledge is created by the individuals through their experiences; it can be shared with others (through peer-to-peer discussions) or can be converted into explicit knowledge through publications
- Clinicians intuitively integrate explicit and tacit knowledge in their practice
- However our focus is in explicit knowledge that is "useful": research that is highly relevant to our daily practice
- This integrated "**useful knowledge**" is what really influence decision-making and produces change in practice
- It also necessary to create opportunities to reflect on practice, either as individuals or within groups, to generate and disseminate tacit knowledge
- Unfortunately these opportunities to think about and collectively discuss clinical practice are at increasing threat and there is a progressive lack of protected 'thinking time' as an integral component of daily practice

Sanders J (2016) J Health Spec 4:173

## 3. Smart management of knowledge storage

- Management of explicit knowledge through databases (Pubmed, EMBASE, Scopus...) may be frustrating
- Medical knowledge is not enough fluid:
  - Publications may be subject to bias
  - Increasing number of pay-for-publication journals
  - Access to databases may have restrictions (payment)
- Lack of systematic storage of tacit knowledge...
- Increasingly, tacit knowledge is being made explicit through social media (discussions through Whatsapp, Twitter...)

## Storage of Knowledge

### The Cochrane Collaboration

- The Cochrane Collaboration is an international, independent, not-for-profit organization of over 28,000 contributors from more than 100 countries, dedicated to making up-to-date, accurate information about the effects of healthcare readily available worldwide
- Contributors work together to produce systematic reviews of healthcare interventions, known as Cochrane Reviews
- It has generated over 5,000 Cochrane reviews and about 2,000 systematic review protocols of the highest quality
- They are contained in the Cochrane Library, together with the largest collection of controlled trial information (more than 600,000)
- Review quality is linked to two major elements: a strict conflict of interest policy and the regular updating of reviews

## 4. Use of structured knowledge tools

- Clinical Guidelines
- Structured reviews
  - ICUD Consultations
  - Cochrane Reviews

## Clinical Guidelines

- *"Systematically developed statements to assist practitioners and patient decisions about appropriate healthcare for specific circumstances"*
- Guidelines help healthcare professionals in their work, but they do not replace their knowledge and skills
- Guidelines should be produced by multiprofessional groups in a systematic, independent and transparent fashion, using appropriate quality criteria
- End-user involvement through a wide review and/or testing of the pilot version is necessary before adopting a guideline for implementation
- If guidelines are adapted from other countries or areas, they must be re-edited and reviewed or tested for applicability in the new environment
- However, *"guidelines make sense when practitioners are unclear about appropriate practice and when scientific evidence can provide an answer. They are a poor remedy in other settings"*

Højgaard L, et al. (2011) Implementation of Medical Research in Clinical Practice. [www.esf.org](http://www.esf.org)  
Wolf SH et al. (1999) Br Med J 318:527

## Factors determining the use of clinical guidelines

- *Features of the guidelines*: strength of scientific basis and feasibility of the proposed change which needs to be clear, logical and attractive
- *Features of the target group* (professionals and patients): understanding of their sensitivity, knowledge, skills, working practices and personalities
- *Features of the social context/setting*: expectations and the culture within the target network, influence of KOL
- *Features of organizational context*: financial and structural requirements of implementation (such as availability of staff and equipment), legal and regulatory issues

Grol R, Jones R (2000) Family Practice 17:S32

## 5. Evidence-based Medicine and Practice

- Evidence-based medicine (EbM) seeks to use the best scientific evidence for clinical decision-making: *"the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient"*
- Evidence-based practice (EbP) is *"the integration of the best research evidence with clinical expertise and patient values into the decision-making process..."*
  - The best evidence: clinically relevant research conducted using sound methodology
  - Clinical expertise: clinician's cumulated experience, education and skills
  - The patient brings his or her own personal and unique concerns, expectations, and values

## And ... What happens in developing countries..?

### Implementing research findings in developing countries

Garner P, Kale R, et al. BMJ. 1998; 317

- Developing countries have limited resources, so it is crucial to invest in health care that works
- Their capability to generate knowledge is limited so they mostly focus on adoption of external knowledge
- Absent of poor regulations favor the unethical promotion of drugs and unproven technology in many countries
- There is an extended time-gap to adopt cutting-edge technology and treatments, which sometimes may be beneficial
- Despite their limitations many have led the introduction of professional standards of behavior such as guidelines, essential drug programs and research summaries to ensure public policies based on good evidence

Since 1997, some developing countries began taking action to introduce research led practice

- In Palestine, the health minister promoted a national committee on clinical effectiveness
- In Thailand, the Ministry of Health and the National Health Services Research Institute set up a national quality assurance program
- In South Africa, the Medical Research Council committed support the production of systematic reviews and evidence based practice
- In Zimbabwe, researchers are working with the government looking for ways of getting research into policy and practice
- In the Philippines, the Department of Health funded evidence based guidelines for its cardiovascular disease prevention program

### In Chile:

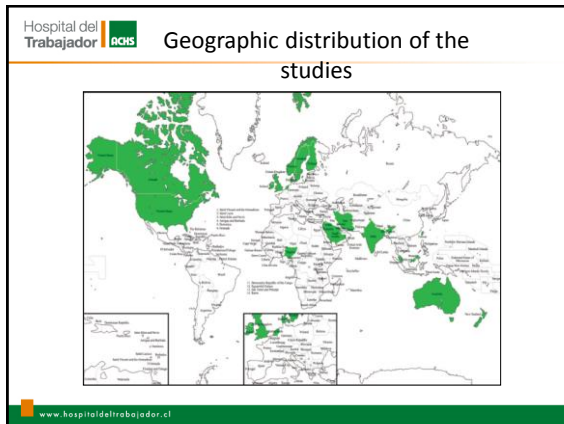
- Ministry of Health established an office to promote the implementation of research findings (1997)
- In 2016 opened the Department of Health Technology Assessment (ETESA) focus on evaluation, incorporation and update of technologies for efficient allocation of limited resources
- December 2018 created the Ministry of Science , Technology, Knowledge and Innovation to boost T1 and to promote and coordinate T2



### BMJ open Framework of policy recommendations for implementation of evidence-based practice: a systematic scoping review

- Systematic review of the literature to summarize self-reported appreciation of evidence-based practice (EBP) and organizational infrastructure solutions proposed to promote EBP
- 31 studies were included, summarizing 10,798 respondents from 17 countries in the 5 continents
- More than 20 years after its introduction, the EBP paradigm has been embraced by healthcare professionals as an important means to improve quality of patient care, but its implementation is still deficient
- Policy exerted at microlevel, middle-level and macrolevel, and supported by professional, educational and managerial role models, may further facilitate EBP

Ubbink DT, Guyatt GH, Vermeulen H. *BMJ Open* 2013;3:e001881. doi:10.1136/bmjopen-2012-001881



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## Perceived Barriers

**Doctors**

- Lack of evidence
- Conflicting evidence
- Evidence is not incorporated in clinical practice
- EBP negatively impacts medical skills and freedom

**Nurses**

- Evidence is written in foreign language
- Lack of authority to change practice
- Statistics or research is unintelligible
- Implications for practice are unclear

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## Perceived Barriers

Doctors and nurses alike

- Lack of time to read evidence or implement new ideas
- Lack of facilities or resources
- Lack of staff experienced in EBP
- Lack of training in EBP
- EBP is insufficiently supported by staff and management
- Evidence is not easily available
- Unawareness of research
- Evidence is not generalisable to own setting

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## Recommendations

• Worldwide	International Collaboration Scientific Journals
• National	Governmental enforcement Installing a National Institute
• Hosp. board	Incorporating EBP in strategic aims Allocating budget
• Managers	Recruitment of suitable personnel Identifying EBP role models

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## Recommendations

• Educators	EBP in post and undergraduate curricula
• Faculty & researchers	Monitoring effectiveness of actions taken
• Services	Medical library – online resources
• Local Workplace	Dedicated time for EBP activities Journal clubs, grand rounds
• Culture	Emphasis on EBP in day-to-day practice

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## In Conclusion...

- Efficient translation of research findings into practice is a universal problem, affecting all areas of medicine (and also nursing and midwifery...)
- Action is required at all levels of healthcare system, from consumers through to health professionals, ministries of health, and international organizations
- As leading members of the healthcare team we need to be aware and be active part of this process, that should be an integral part of our professional responsibilities

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