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Cathy C. Sarli

Kristi L. Holmes

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# A New Role for the Library: Measuring Research Productivity and Impact

# Washington University in St. Louis SCHOOL OF MEDICINE

# Cathy C. Sarli, MLIS, AHIP and Kristi L. Holmes, PhD

Translational Research Support Division, Bernard Becker Medical Library, Washington University in St. Louis School of Medicine, St. Louis, MO; Washington University Institute of Clinical and Translational Sciences

The Becker Medical Library Model for Assessment of Research Impact <sup>1,2</sup> provides indicators of evidence of impact based on resulting diffusion of research outputs and activities, resources for locating evidence of impact, and also includes strategies that can be utilized by biomedical scientists to enhance their research impact.

The recent emphasis in demonstrating translational outcomes of research findings into clinical practice and community benefit has spurred a need for new methods beyond traditional citation metrics to document the impact of research. There are a number of resources available to track diffusion of research impact in order to provide a meaningful assessment of policy, practice and health outcomes. Libraries can play a role in helping biomedical researchers quantify the resulting synthesis of biomedical research findings that are not discernable via traditional citation analysis.

# General Examples of Research Impact

## Advancement of Knowledge represents research outputs and/or activities that contribute to the scholarly record.

How was the research output used? How was awareness of research output demonstrated?

- License agreement granted for use of intellectual property generated by the research study
- Clinical data generated in support of marketing a medical device
- Consensus Development Conference
- Curriculum guidelines
- Cited references

## Clinical Implementation is the adoption of research outputs and/or activities in clinical applications.

How was translation of research outputs into clinical applications demonstrated?

- Creation of Current Procedural Terminology (CPT) codes
- Medical device is registered with FDA and used in delivery of healthcare
- Research study cited in private insurance benefit plan in support of coverage
- Healthcare providers report that research outputs from a research study has affected the way they manage patients

## **Community Benefit** is the enhancement of community health outcomes as a result of research outputs.

How was community health enhanced as a result of research output?

- A blood test for detection of damage to the heart muscle leads to early treatment for myocardial infarctions, a leading cause of death worldwide.
- · A critically appraised economic evaluation reports that research outputs from a research study demonstrates an effective injury intervention strategy in reducing head injuries: "wearing a bicycle helmet reduced the risk of incurring a head injury following an accident by 70%."
- The Ocular Hypertension Treatment Study (OHTS) demonstrated that medical treatment of people with intraocular pressure (IOP) of > or =24 mm Hg reduces the risk of the development of primary open-angle glaucoma (POAG) by 60%.

## Legislation and Policy Enactment represents codification of research outputs into public law, guidelines, standards or policy.

How did research outputs influence or result in enactment of public law, guidelines, standards or policy?

- Smoke-free Air Acts
- Automated External Defibrillators (AED) Acts
- ANSI Standards
- AIA Guidelines for Design and Construction of Health Care Facilities
- Testimony given by a research investigator before a governing body supports creation of a bill and/or regulation

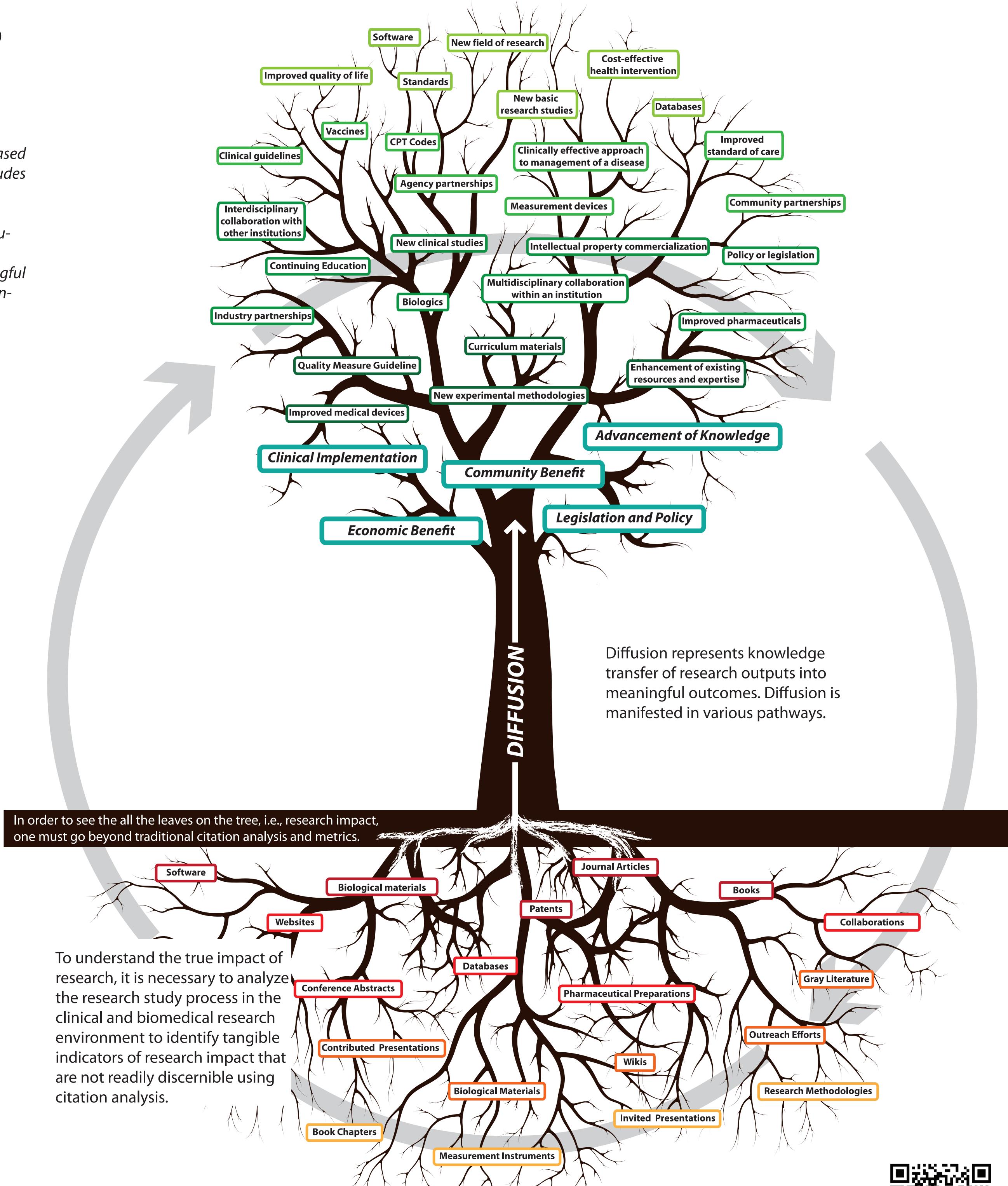
citation analysis.

## **Economic Benefit** represents economic outcomes as a result of research outputs and/or activities.

## How did research outputs result in economic outcomes?

- Discovery of lithium treatment for manic-depressive disorders saved the US over \$145 billion in hospital costs.
- Cochlear implants in profoundly or completely deaf children not only improve their quality of life but are also expected to save society about \$53,000 over the individual child's lifetime, including both direct and indirect costs.
- 1 Sarli CC, Dubinsky EK, and Holmes KL. 2010. Beyond citation analysis: A model for assessment of research impact. J Med Libr Assoc. January; 98(1): 17-23. http://www.pubmedcentral.nih.gov/2801963
- 2 Becker Medical Library Model for Assessment of Research Impact http://becker.wustl.edu/impact/assessment/index.html
- 3 Wells R, Whitworth A. 2007. Assessing outcomes of health and medical research: do we measure what counts or count what we can measure? Australia and New Zealand Health Policy, 4:14. http://www.anzhealthpolicy.com/content/4/1/14

# PATHWAYS TO RESEARCH IMPACT



**RESEARCH PROCESS & OUTPUTS** 

# Research Impact: The Ocular Hypertension Treatment Study http://ohts.wustl.edu/

Hutcheson, Kelly A. Application of new ophthalmic technology in the pediatric patient: Pediatrics and strabismus. Current Opinion in Ophthalmology, September 2007;18(5):384–391 "In adult patients, measurement of the central corneal thickness (CCT) has become standard of care for patients with known or suspected glaucoma. In the Ocular Hypertension

Treatment Study, the CCT was found to be a strong predictor for the development of glaucoma, with patients having co those with thicker corneas...it has become the standard of care to perform pachymetry measurements on all children with

Thimons, J. James. Pachymetry: The New Standard of Care In Glaucoma. Optometric Management. May 2006.

"Since the publication of the Ocular Hypertension Treatment Study (OHTS), central corneal thickness as a significant risk management. Pachymetry is a remarkable tool and has rapidly become a mainstay of clinical practice in the area of glau large degree, been answered by the clinical community. The American Academy of Ophthalmology deemed CCT an inte Association incorporated CCT into its recommendations for Preferred Practice Patterns. Medicare issued a unique reimb history of ophthalmic science."

#### **Quality Measure Guideline**

The National Committee for Quality Assurance (NCQA), Health Plan Employer Data and Information Set (HEDIS) HEDIS Glaucoma Screening in Older Adults (GSO) Measure (first year optional Senior measure), 2005.

HEDIS Glaucoma Screening in Older Adults (GSO) Measure (required Senior measure), 2006-2009.

U.S. Preventive Services Task Force Evidence Synthesis

Primary Care Screening for Ocular Hypertension and Primary Open-Angle Glaucoma: Evidence Synthesis, 2005.

Based on USPSTF rating criteria, the quality of the OHTS study was rated "good." The OHTS study provides. . . "good evidence that treatment for ocular hypertension and early POAG is

Ohba N, Nakao K, Isashiki Y, Ohba A. The 100 most frequently cited articles in ophthalmology journals. *Arch Ophthalmol*. 2007 Jul;125(7):952-60.

Included as one of the top 100 most frequently cited articles is: Kass MA, Heuer DK, Higginbotham EJ; et al. The Ocular Hypertension Treatment Study: a randomized trial determines that topical ocular hypotensive medication delays or prevents the onset of primary open angle glaucoma.

Principles and Guidelines for the Curriculum for Education of the Ophthalmic Speciali Guidelines and Standards for Education of an Ophthalmologist: A Curricular Outline Appendix: Glaucoma: Ocular Hypertension Treatment Study

#### Royal College of Ophthalmologists Guidelines for the Management of Open Angle Glaucoma and Ocular Hypertension

**New Research Studies** 

R-01 Short Wavelength Automated Perimetry

R-01 Confocal Scanning Laser Ophthalmoscopy

Pachymetry Ancillary Study

R-21 EGPS/OHTS Confocal Scanning Laser Ophthalmoscopy Collaboration Ocular Hypertension Treatment Study (OHTS): Ancillary Genetic Testing

R-21 European Glaucoma Prevention Study (EGPS)/OHTS Collaborative Analysis

### **Clinical/Practice Guidelines**

American Academy of Ophthalmology

Primary Open-Angle Glaucoma Suspect Preferred Practice Pattern™ Guideline, 2005. American Optometric Association

Care of the Patient with Open Angle Glaucoma: Reference Guide for Clinicians, 2002. International Council of Ophthalmology/International Fed. of Ophthalmological Societies Primary Open-Angle Glaucoma (Initial Evaluation), 2007.

Primary Open-Angle Glaucoma Suspect (Initial and Follow-up Evaluation), 2007. Royal College of Ophthalmologists

Guidelines for the Management of Open Angle Glaucoma and Ocular Hypertension, 2004.

**Devers Risk Calculator** 

Glaucoma Risk Calculator—The Scoring Tool for Assessing Risk

Pfizer Hand-Held Glaucoma Five Year Estimator Risk Calculator Glaucoma Five Year Estimator Risk Calculator

Primary Open-Angle Glaucoma (Follow-up Evaluation), 2007.

## **American Medical Association Current Procedural Terminology (CPT) Codes**

CPT Code Category III for pachymetry established in 2002.

CPT Code Category I for pachymetry established in 2004.

"Corneal pachymetry (the measurement of corneal thickness) is an essential tool for glaucoma d the cornea. . . The determination of an accurate IOP improves the diagnosis, screening and mana

CPT Assistant: Authoritative Coding Information. The American Medical Association, July 2004.

# "It is no longer enough to measure what we can – we need to measure what matters."

-- Wells & Whitworth

Ocular Hypertension

Treatment Study



## **Change in Delivery of Healthcare Services**

Murphy, John. National Panel: OHTS affects when optometrists treat glaucoma. Review of Optometry, July 15, 2003;140(7).

"Three out of four panelists say that the Ocular Hypertension Treatment Study (OHTS) has affected the way they manage glaucoma patients."

"We now routinely perform ultrasound pachymetry on all glaucoma suspects and ocular hypertensives."

"Three in 10 optometrists now perform baseline pachymetry on new glaucoma patients. Many say they have since ordered (or are about to order) a pachymeter." "I treat patients with a family history and thinner corneas earlier than I would have before." "Five years ago, only about one-third of optometrists typically treated glaucoma patients themselves. Now, two-thirds of optometrists say they treat glaucoma patients largely on their

Management of ocular hypertension: a cost-effectiveness approach from the Ocular Hypertension Treatment Study. Kymes S, et al. Am J Ophthal 2006 Jun;141(6):997-1008. "The Ocular Hypertension Treatment Study (OHTS) demonstrated that medical treatment of people with intraocular pressure (IOP) of > or =24 mm Hg reduces the risk of the development of primary open-angle glaucoma (POAG) by 60%. Although the treatment of individual patients is largely dependent on their attitude toward the risk of disease progression and blindness, the treatment of those patients with IOP of > or =24 mm Hg and a > or =2% annual risk of the development of glaucoma is likely to be cost-effective."

## **Private and Public Healthcare Benefit Plans**

Many private and public insurance benefit plans allow for pachymetry for measurement of corneal thickness, with variations in coverage.

Example: Cigna: "The OHTS established corneal thickness as a risk factor for glaucoma."

## **Consensus Development Conferences**

Canadian Perspectives in Glaucoma Management: Setting Target Intraocular Pressure Range Can J Ophthalmol. 2003 Apr;38(3):189-97. "Recent evidence supports the concept of aggressively lowering IOP to help prevent glaucoma related blindness." OHTS is referred to as one of the "gold standard" prospective

randomized clinical trials that support this concept."

## **Continuing Education Materials**

10th Annual Glaucoma Report: High Tech Glaucoma Devices Hasten Diagnosis, 2004. "Perhaps the most important point: The Ocular Hypertension Treatment Study (OHTS) identified corneal thickness not just as a variable that affects Goldmann IOP readings but as an independent risk factor for developing glaucoma. Specifically, OHTS uncovered a linear relationship between IOP and corneal thickness in patients with "thicker" corneas.

13th Annual Glaucoma Report: Calculate the Risk Factors For Glaucoma, 2007. .. the Ocular Hypertension Treatment Study (OHTS) and other studies published during the last decade have fundamentally changed how we diagnose and manage glaucoma, and have helped us to identify such risks. In past years, we diagnosed open-angle glaucoma based on elevated intraocular pressure (IOP), visible optic nerve damage and correlated visual