

A Gap Too Wide:

The Need To Transfer Evidence Into Practice

Narrowing the gap between evidence and practice requires physician behavioral change, as well as public education and acceptance.

By Walter W. Rosser, MD, CCFP, FCFP, MRCGP(UK)

In the early part of the 21st century, the knowledge of how to improve the delivery of medical care for the benefit of patients is rapidly increasing. The actual rate of transfer of this knowledge to benefit people in the community, however, has not kept pace.

In this article, examples illustrating the width of this gap were chosen based on: their potential to significantly improve health; prevalence; evidence of the potential to improve longevity

and/or quality of life; and the width of the gap between what evidence suggests would be the best practice and what is the current practice.

The Gap In Anti-infective Use For Five Common Infections

Upper Respiratory Tract Infections

A recent survey of Medicaid patients in the state of Kentucky found 60% of ambulatory patients presenting with upper respiratory tract infections (URTIs) received antibiotics.¹ A systematic review of 1,699 children suffering from defined URTI, randomized to antibiotic or placebo therapy, found no benefit from antibiotic treatment.² Those receiving antibiotics had more gastrointestinal disturbance, suggesting the use of antibiotics for URTIs in most children cannot be justified. The gap between knowledge and practice, however, remains wide.

Dr. Rosser is professor, family medicine, department of family medicine, Queen's University, Kingston, Ontario. His areas of medical interest include guideline assessment and dissemination of evidence-based information.

Implementing Medical Research

Pharyngitis

Canadian studies have found 45% of those presenting to family doctors complaining of a sore throat, who have no cough, fever, tonsillar exudates or anterior cervical lymph nodes, have less than a 7% chance of having streptococcal pharyngitis and are unlikely to benefit from antibiotics.³ Forty-five per cent of people complaining of a sore throat in the absence of cough have one or two of the following symptoms:

- Fever; a temperature above 38.5 C;
- Tender anterior cervical lymph nodes; or
- Tonsillar exudates.

These individuals have a 25% to 33% chance of having group A beta-hemolytic streptococcal infection of the throat. A throat swab, using a rapid strep test for group A beta-hemolytic streptococcus, should be used to determine the need for antibiotics.⁴ Only 10% of people complaining of a sore throat in the absence of cough, who have all three of the aforementioned symptoms — indicating a greater than 60% chance of streptococcus infection — should be given penicillin. Extensive use of this simple strategy has the potential to reduce current antibiotic usage for pharyngitis by 75%.⁵

Otitis Media

There is accumulating international evidence that a watchful-waiting approach to managing otitis media carries minimal risk of adverse outcomes. Although the first trial using the watchful-waiting approach in the treatment of otitis media was reported in Holland in 1981 (adopted as best practice by Dutch family physicians in the late 1980s), other physicians did not follow. A more recent meta-analysis found 15% to 25% of children, who do not have spontaneous resolution of otitis media within 72 hours, suffer less than one extra day of pain. Watchful waiting should not exceed 24 hours in children under the

age of two, but may extend to 72 hours in those who are older.⁶

The gap between solid evidence and practice remains wide, as 98% of children with a painful or red ear presenting to their physician in North America receive a 10-day course of antibiotics. In the United Kingdom, they receive anti-infectives for five days.⁷ By adopting and accepting a watchful-waiting strategy, the Dutch have reduced the use of antibiotics for otitis media by up to 75%.⁸⁻¹⁰

In spite of the evidence, recently published guidelines from the American and Canadian pediatric societies continue to recommend five days of antibiotics for all children presenting with symptoms of otitis media.¹⁰ A practical way of reducing the amount of antibiotics used has been adopted by British and North American general practitioners. The technique involves providing the parents with information about watchful-waiting, as well as a five-day prescription for antibiotics. The key is to suggest they wait 48 hours to 72 hours before filling the prescription. This allows time for the watchful-waiting approach to be tried.

Acute Bronchitis

Acute bronchitis usually occurs in smokers who are otherwise healthy and have no chronic lung disease. Although studies have found that between 65% and 80% of adults presenting with acute bronchitis are given antibiotics, approximately 80% of these episodes have a viral or mixed viral bacterial etiology.¹¹ A meta-analysis has found insignificant differences in outcomes between those treated and those not treated with antibiotics in acute bronchitis in the absence of comorbidity.^{12,13}

Acute Sinusitis

One randomized, controlled trial (RCT) found the time required to recover from acute sinusitis (an average of 14 days) is similar in people who are given a three- or 10-day course of antibiotics.¹⁴ There are conflicting results between studies using decongestants alone and decongestants with or without antibiotics.^{15,16} The treatment of uncomplicated acute sinusitis, using oral or topical decongestants with three days of antibiotics, is justified while we await clear evidence that antibiotics offer little benefit. A watchful-waiting strategy similar to that described for otitis media may be the most appropriate way to manage acute sinusitis.

Narrowing the Gap

To narrow the wide gap between evidence and practice for the five common infections requires not only physician-behavioral change, but public education and acceptance. Availability of clear guidelines and a physician-led community education program to reduce the use of antibiotics for common infections have resulted in a reduction in antibiotic prescribing.^{17,18} Creating the required magnitude of change presents a great challenge to continuing medical educators since their programs will need to extend beyond the lecture hall and into the community.

The Gap Between Evidence and Practice In Cancer Prevention

There is a growing body of evidence that cancer-revention strategies that detect precancers or early lesions can be treated effectively, thereby improving life expectancy. As new knowledge is forthcoming, the gap between evidence and practice widens.



By adopting and accepting a watchful-waiting strategy, the Dutch have reduced the use of antibiotics for otitis media by up to 75%.

Papanicolaou Test

Although no (RCT) has ever been, or will ever be, carried out to provide level-one evidence of the life-saving effects of cervical Papanicolaou (Pap) smear screening, evidence of declining mortality rates from cervical cancer in large populations that have a high percentage of women receiving regular screening provides proof of reduced mortality. Most of the debate about cervical-cancer prevention is focused on

Implementing Medical Research

Table 1

Reduction In The Incidence Of Invasive Cancer Of The Cervix

Interval between screening	Reduction in incidence
10 years	64.1%
5 years	83.6%
3 years	90.8%
2 years	92.5%
1 year	93.5%

Oncolink: Screening for cervical cancer. The draft update of this chapter was prepared for the U.S. Preventive Services Task Force by Steven H. Wolfe.

the frequency of testing in low-risk women. The futility of this debate is illustrated in Table 1, where there is a clinically insignificant reduction in the incidence of invasive cervical cancer between annual and triennial screening.

A more important debate should focus on the substantially reduced mortality from cervical cancer, which would occur if every woman received a Pap smear, even at five-year intervals. In most developed countries, less than 60% of women ever receive a Pap smear; in under-developed countries, the situation is likely to be much worse.

Reminding patients in family practices about the importance of this test provides one approach to increasing the number of women receiving the test. However, more creative strategies involving public education and a reduction in barriers to getting Pap smears are needed.¹⁹

Prostate Cancer

Whether all men over the age of 50 should undergo annual screening for prostate cancer is the subject of an increasingly heated debate.

Rectal examination as a screening procedure lacks sensitivity and specificity, and the transrectal ultrasound is not considered to be a practical screening test.²⁰

Prostate-specific antigen (PSA) has been widely advocated, but creates 40% to 90% false-positive rates. When positive, PSA requires men to undergo rectal biopsy as well.²¹ An estimated 85% of all men with prostate cancer have a slow-growing, minimally invasive type of cancer that does not affect quality of life or life expectancy. The effectiveness of treatment on the 15% of men who have more aggressive prostate cancer remains unclear. Proceeding with full

treatment has the potential to do more harm than good.²²

The Canadian Task Force on the Periodic Health Examination recommends that men undergoing PSA tests sign a consent form, stating they understand the PSA has the potential of causing more harm than good. This debate will only be silenced when both screening and diagnostic tests improve sufficiently to separate aggressive from noninvasive tumors, and when new treatments reduce the serious side effects of radical prostatectomy.

Discussion

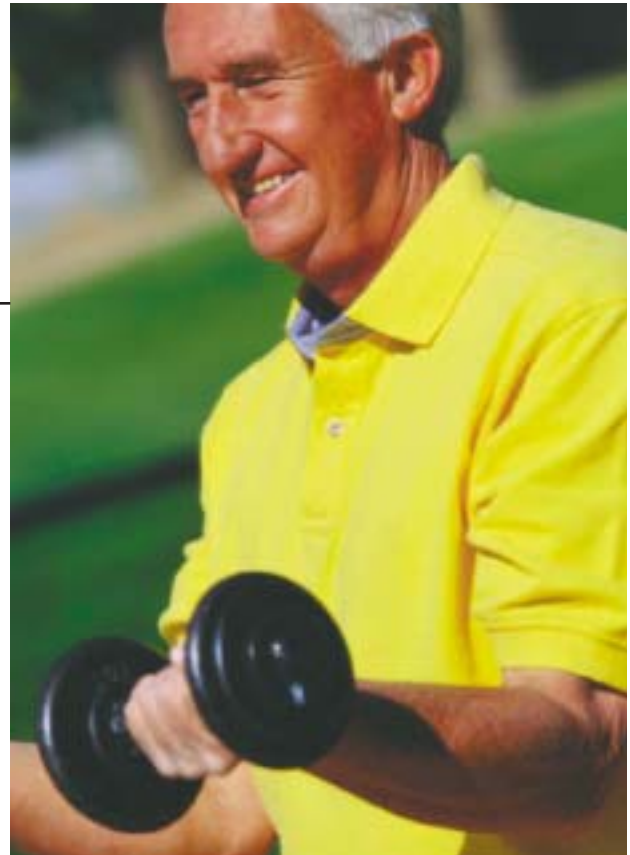
Seven common problems have been discussed where the gap between evidence from research and what is happening in practice is too wide. There are many other examples of a wide gap between evidence and practice, and new knowledge is continually creating more examples. Lives are lost every day because this gap exists. A review of the methods of continuing medical educators and the power to change physician and

Implementing Medical Research

Whether all men over the age of 50 should undergo annual screening for prostate cancer is the subject of an increasingly heated debate.

population behavior identifies a few effective strategies.²³ The need to educate the public about the gap and the need for their support in moving toward a more evidence-based style of practice is required. In Ontario, the collaboration between the Ministry of Health and the Ontario Medical Association in choosing the best guidelines available and then promote their use through physicians is a small step toward addressing these problems (see www.gacguidelines.ca).


If the world's population is to benefit fully from new knowledge that is constantly forthcoming, then more resources need to be devoted to narrowing current knowledge gaps. Research involving behavior change, and communications and marketing expertise is needed to better understand what is necessary to effectively accelerate the narrowing of the gap. Failure to address these issues will produce a widening of the knowledge gap between what we know we can improve (*i.e.*, duration and quality of life) and what is accessible to the population.



ADVAIR™
salmeterol xinafoate / fluticasone propionate

Asthma Control.

Now available in **DISKUS™** and **MDI**.



[†]**ADVAIR™** is indicated for the maintenance treatment of asthma in patients, where the use of a combination product is appropriate. This may include patients on effective maintenance doses of long-acting β_2 -agonists and inhaled corticosteroids or patients who are symptomatic on current inhaled corticosteroid therapy. [†]**ADVAIR™** should not be used to treat acute asthmatic symptoms.¹

[†]**ADVAIR™** DISKUS[®] contains lactose and is contraindicated in patients with IgE mediated allergic reactions to lactose or milk.




In adolescents and adults, the most common side effects are throat irritation (2%), hoarseness/dysphonia (2%), headache (2%), and candidiasis (2%) which can be reduced by rinsing and gargling with water after inhalation; and palpitations ($\leq 1\%$). In children aged 4 to 11, the only adverse event with an incidence of $>2\%$ was candidiasis.

HPA-axis function and hematological status should be assessed periodically. Height should also be regularly monitored in children and adolescents receiving prolonged treatment with inhaled corticosteroids.

[†]**ADVAIR™** is available in 2 dosage forms, [†]**ADVAIR™** DISKUS[®], for patients 4 years and older and [†]**ADVAIR™** Inhalation Aerosol for patients 12 years and older.

Reference: 1. Product Monograph of **ADVAIR™**, GlaxoSmithKline Inc., December 2001

[†]**ADVAIR™** used under license by GlaxoSmithKline Inc. DISKUS[®] is a registered trademark, used under license by GlaxoSmithKline Inc.[®] The appearance, namely the color, shape, and size of the DISKUS[®] inhalation device, is used under license by GlaxoSmithKline Inc.

 **GlaxoSmithKline**  

Implementing Medical Research

References

1. Mainous AG, Hueston WJ: The cost of antibiotics in treating upper respiratory tract infections in a Medicaid population. *Arch Fam Med* 1998; 7(1):45-9.
2. Fahey T, Stocks N, Thomas T: Systematic review of the treatment of upper respiratory tract infection. *Arch Dis Child*; 79(3):225-30.
3. McIsaac WJ, Goel V, Slaughter PM, et al: Reconsidering sore throats, part 2: Alternative approaches and practical office tools. *Can Fam Physician* 1997; 3:495-500.
4. Pittetti RD, Drenning JD, Wald R: Evaluation of a new rapid antigen detection kit for group A beta haemolytic streptococcal pharyngitis. *Paediat Emerg Care* 1998; 14(6):396-8.
5. McIsaac WJ, Goel V, Slaughter PM, et al: Sore throat or strep throat? Is an antibiotic required? *Can Med Assoc J* 1998; 158(1):75-83.
6. Delmar C, Glaz P, Hayem M: Are antibiotics indicated in the initial treatment for children with acute otitis media? A meta analysis. *BMJ* 1997; 314:1526-30.
7. Culpepper L: International Otitis Media Study: An ASPN Project. Personal communication 2000.
8. Von Buchen FL, Dunk JHM, van't Hof MA: Therapy of acute otitis media: Myringotomy, antibiotics or neither? A double-blind study in children. *Lancet* 1981; 2:883-7.
9. Froom S, Culpepper L, Greb P, et al: Diagnosis and antibiotic treatment of acute otitis media. A report from international primary care network. *BMJ* 1990; 300:582-6.
10. Kozyrskyj AI, Hildes-Ripstein GE, Longstaffe SEA, et al: Treatment of acute otitis media with a shortened course of antibiotics: A meta analysis. *JAMA* 1998; 279(21):1736-42.
11. Gonzales R, Steiner JF, Sande MA: Antibiotic prescribing for adults with colds, URI and bronchitis by ambulatory care physicians. *JAMA* 1997; 278:901-4.
12. Smucny JJ, Becker LA, Glazier R, et al: Are antibiotics an effective treatment for acute bronchitis? A meta analysis. *J Fam Pract* 1998; 47(6):453-60.
13. Bent S, Saint S: Antibiotics in acute bronchitis. *Am J Med* 1999; 6:62-7.
14. Williams JW, Helleman DR, Samsa GP, et al: Randomized controlled trial of 3 versus 10 days of trimethoprim/sulfamethoxazole for acute maxillary sinusitis. *JAMA* 1995; 273:1015-21.
15. Lindbaek M, Jopdahl P, Johnson UL: Randomized double blind placebo controlled trial of Penicillin V and Amoxicillin in the treatment of acute sinusitis. *Infection in Adults*. *BMJ* 1996; 313:325-9.
16. Van Buchem FL, Knotierus JA, Schrijnemaekers VJJ, et al: Primary care based randomized placebo controlled trial of antibiotic treatment in acute maxillary sinusitis. *Lancet* 1997; 349:683-7.
17. Stewart J, Pilla J, Dunn L: Pilot study for appropriate anti-infective community therapy. Effect of a guideline-based strategy to optimize use of antibiotics. *Can Fam Physician* 2000; 46(4):851-9.
18. Ontario anti-infective review panel: *Anti-infective Guidelines For Community-Acquired Infections*. Second Edition. Queen's University Press, Toronto, 1997.
19. Pirkis JE, Jolley D, Dunt DR: Recruitment of women for Pap tests: A meta analysis. *Br J Gen Pract* 1998; 48(434):1603-7.
20. Rosser WW, Shafir S: *Evidence-based Family Medicine*. BC Decker, Hamilton, 1998, p. 143.
21. Mettlin C, Lee F, Drago J, et al. The American Cancer Society national prostate cancer detection project: Findings of the detection of early prostate cancer in 2,425 men. *Cancer* 1991; 67:2949-58.
22. The Canadian Task Force on the Periodic Health Examination: *The Canadian guide to clinical preventive health care*. Minister of Supply and Services, 1994.
23. Oxman AD, Thomson MA, Davis DA, et al: No magic bullets: A systematic review of 102 trials of interventions to improve professional practice. *Can Med Assoc J* 1995; 153(10):1423-31.