USING EVIDENCE TO GUIDE CLINICAL PRACTICE

Christopher Patterson
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Using evidence: objectives

• Explain how a diagnosis is made
• Understand the hierarchy of evidence
• Demonstrate where evidence has really changed treatment
• Describe evidence-based practice and the value of clinical practice guidelines
Situation 1: 78 year old lady

- Patient: “Doctor I have a pain in my knee”
- Doctor: “How long have you had this?; did you injure it?; does it swell?; what time of day is it worse?; is it stiff in the morning?; do other joints bother you?; have you ever had this before etc.
- Patient answers truthfully
- Doctor examines knee
Situation 1

- Physician concludes interview, orders X-Ray of knees
- Writes prescription for NSAID (a COX-2 inhibitor)
- Advises return in 2 weeks
Situation 2: 78 year old lady

- Patient: “Doctor I have a pain in my knee”
- Doctor: “How long have you had this?; did you injure it?; does it swell?; what time of day is it worse?; is it stiff in the morning?; do other joints bother you?; have you ever had this before etc.
- Patient answers truthfully
- Doctor examines knee
Situation 2

• Physician excuses self
• Performs medline literature search on
  (1) non pharmacological treatments for osteoarthritis of knee
  (2) clinical trials comparing paracetamol (acetaminophen) with NSAIDs for osteoarthritis
• Physician returns to patient
Situation 2

• Physician discusses results of literature search
• Patient and physician agree on therapeutic target (pain will no longer interfere with walking)
• Patient will use walking stick, topical analgesic, and oral paracetamol if necessary
• Patient will return in 2 weeks to report progress
• Physician enquires if patient satisfied with visit
Evidence-based Medicine

• “The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients”

• Archie Cochrane (1972)

• Gordon Guyatt (1992) JAMA 1992;268:2420
How do we make a diagnosis?
How we make a diagnosis

- Pattern recognition (I have seen this before…)
- Hypothetico deductive strategy (could this be..)
- Exhaustive inquiry (I have no idea: I will start from the beginning..)
How we make a diagnosis: time course (after Norman GR et al)
Pattern Recognition

• How long did it take you to identify this building?

• *Note that:*

• *it was dark*

• *only a portion of the building was shown*
How we make a diagnosis

• The experienced physician: I recognize this OR could this be A,B or C? If not, it is probably D,E, or F…
How we make a diagnosis

• The experienced physician: I recognize this OR could this be A,B or C? If not, it is probably D,E, or F…

• The lay person: I recognize this OR could this be a, b, or c?
How we make a diagnosis

• The experienced physician: I recognize this OR could this be A,B or C? If not, it is probably D,E, or F…
• The lay person: I recognize this OR could this be a, b, or c?
• The traditional medical graduate: I will take a history, perform an examination then I shall know what it is.
Investigations: making better use of tests (history, examination or laboratory)
How we make a diagnosis: using Bayes theorem

- Diagnostic likelihood depends upon:
  - Pre test probability (prevalence)
  - Characteristics of the “test” especially likelihood ratios (LR)
  - Pretest odds x LR = post test odds or diagnostic probability
  - A “good” test has a large LR if positive and a small LR if negative
How we make a diagnosis

• 80 year old community dwelling person (prevalence of dementia 12%; odds 1:8)
• If his Mini Mental State Examination score is 20 (LR 8.2)
• Diagnostic probability of dementia is moderately higher (1:8 x 8.2 = 8.2:8 ~1:1 about 50%)
• But if MMSE score is 26 (LR 0.06-0.1)
• Diagnostic probability of dementia is very low (1:8 x 0.1 = 0.1:8 or less than 2%)
Now, back to the lady with the sore knee!
Evidence-based Medicine

- What is the clinical decision to be made?
Evidence-based Medicine

- What is the clinical decision to be made?
- What is the evidence?
Evidence-based Medicine

• What is the clinical decision to be made?
• What is the evidence?
• What values influence the decision?
Evidence-based Medicine

• What is the clinical decision to be made?

*What is the most effective and least harmful treatment to reduce pain and minimize disability in this person’s osteoarthritic knee?*
Evidence-based Medicine

• What is the clinical decision to be made?
• What is the evidence?

Options include non pharmacological treatments (e.g. use of heat/cold; walking stick/cane; rest/exercise) medications (e.g. analgesics, NSAIDs, intraarticular injections) surgery.

Search medline using RCT and these terms AND/OR osteoarthritis treatment guidelines
Evidence-based Medicine

• What is the clinical decision to be made?
• What is the evidence?
• What values influence the decision?

*She may prefer to avoid NSAIDs or other oral medications, but may accept topical agents. Much too early to consider surgery.*
What do we mean by evidence for a treatment?
Evidence: a hierarchy

• Testimonials
Evidence: a hierarchy

- Testimonials
- Historical examples
Evidence: a hierarchy

- Testimonials
- Historical examples
- Expert opinion
Evidence: a hierarchy

- Testimonials
- Historical examples
- Expert opinion
- Case series
Evidence: a hierarchy

- Testimonials
- Historical examples
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- Case series
- Uncontrolled comparisons (e.g. case controls)
Evidence: a hierarchy

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- Uncontrolled comparisons (e.g., case controls)
- Controlled trials without randomization
Evidence: a hierarchy

- Testimonials
- Historical examples
- Expert opinion
- Case series
- Uncontrolled comparisons (e.g. case controls)
- Controlled trials without randomization
- Randomized controlled trials (RCTs)
The Randomized Controlled Trial

- Population defined: hypothesis stated
- Divided into active treatment and placebo groups by random allocation
- Participants unaware of allocation (blinding)
- Treating physicians unaware (double blinding)
- Participants remain in assigned groups
- All participants accounted for at end
Evidence: a hierarchy

- Testimonials
- Historical examples
- Expert opinion
- Case series
- Uncontrolled comparisons (e.g. case controls)
- Controlled trials without randomization
- Randomized controlled trials (RCTs)
- Systematic reviews of RCTs
Evidence: a hierarchy

- Testimonials
- Historical examples
- Expert opinion
- Case series
- Uncontrolled comparisons (e.g. case controls)
- Controlled trials without randomization
- Randomized controlled trials (RCTs)
- Systematic reviews of RCTs
- Meta analysis of systematic reviews
Problems with Expert Opinion

• Influenced by experience
Problems with Expert Opinion

• Influenced by experience
• Event rates may be low
Problems with Expert Opinion

- Influenced by experience
- Event rates may be low
- Textbooks outdate quickly
Problems with Expert Opinion

• Influenced by experience
• Event rates may be low
• Textbooks outdate quickly
• It’s hard to change
Time lag between evidence and expert opinion (Antman, JAMA. 1992)
Problems with uncontrolled trials

- 45 topics searched: 240 RCTs, 168 non-randomized studies retrieved
- When compared with RCTs
- *Summary odds ratios showed good agreement* ($r=0.75$, $p=<.001$) BUT
- *Between study heterogeneity* 41% vs 23%
- *Larger treatment effects* 28 vs 11 $p=.009$

Ioannides J et al. JAMA 2001; 286: 821
Comparison of Non-RCT & RCT

Ioannidis et al JAMA 2001; 286: 821
Problems with uncontrolled trials

- 49 Highly Cited Clinical Trials
- When compared with RCTs
- 5/6 non RCTs subsequently contradicted
- 9/39 RCTs subsequently contradicted*
- * $p=.008$
- These RCTs tended to be smaller

Ioannides J JAMA 2005; 294: 218
Where *non* RCTs misled us (seriously)

- Nurses Health Study: *prospective cohort* showed association between estrogen hormone replacement therapy (HRT) and 44% relative risk of coronary artery disease (ie much lower)
Where *non* RCTs misled us (seriously)

- Nurses Health Study: *prospective cohort* showed association between estrogen hormone replacement therapy (HRT) and 44% relative risk of coronary artery disease (ie much lower)
  
  **BUT**

- Heart and Estrogen/progestin Replacement Study another *large RCT* showed *increase* of 30-40% RR of stroke, 47% RR of dementia

- Women’s Health Initiative (WHI) a *large RCT* showed 29% *increased* RR of coronary disease
Change in prescriptions for HRT after publication of HERS study
(Hersh et al JAMA;291:47)
Where evidence has really changed treatment recently

- Postmenopausal hormone replacement therapy (Estrogen HRT)
- Extracranial-intracranial (EC-IC) bypass surgery
- Treatment of Alzheimer’s Disease
- Management of Diabetes
- Treatment of heart failure
Where evidence should have changed treatment

• New (and expensive) vs old (and cheap) antihypertensive medications (ALLHAT)
Where evidence should have changed treatment

- New (and expensive) vs old (and cheap) antihypertensive medications (ALLHAT)
- Treatment for heart failure in nursing homes (25% receive appropriate doses of ACEI)
Where evidence should have changed treatment

• New (and expensive) vs old (and cheap) antihypertensive medications (ALLHAT)
• Treatment for heart failure in nursing homes (25% receive appropriate doses of ACEI)
• Treatment of osteoporosis (only 20% older women treated adequately, very few men)
Where evidence should have changed treatment

- New (and expensive) vs old (and cheap) antihypertensive medications (ALLHAT)
- Treatment for heart failure in nursing homes (25% receive appropriate doses of ACEI)
- Treatment of osteoporosis (only 20% older women treated adequately, very few men)
- ASA, anticoagulants for atrial fibrillation (still less than 50% in most surveys)
- Beta blockers after AMI (same as for ASA)
Time lag between expert opinion and implementation (Antman, JAMA. 1992)
Is there a simple answer to converting evidence into practice?

• No simple answers!
• Physicians enjoy their autonomy, resent external pressures
• What about Clinical Practice Guidelines?
Clinical Practice Guidelines

“Systematically developed statements designed to assist the decision making of practitioners and patients about appropriate health care for specific clinical circumstances”

Audet & Greenfield  Ann Intern Med 1990;113:709
Clinical Practice Guidelines

- Better care, based on evidence
- Reduce variations in practice
- Set a standard by which to judge physician treatment (lawyers like them…)
Clinical Practice Guidelines

• Better care, based on evidence
• Reduce variations in practice
• Set a standard by which to judge physician treatment (lawyers like them…)

BUT

• Resource intensive
• Need updating
Thoughts about Clinical Practice Guidelines (CPGs) for Dementia

- Questionnaire sent to a random sample of 2362 Canadian Family Physicians in 1999
- 44% response rate after a single reminder
- 45% of respondents admitted difficulty assessing patients with dementia
- 55% of respondents admitted difficulty managing patients with dementia
- 90% reported that CPGs would be very useful in their practices

Canadian Consensus Conference on Dementia

In cases of suspected dementia:

- Interview spouse or caregiver
- Physical, neurological examination
- Cognitive testing
- Basic blood tests (CBC, TSH, Calcium, blood sugar etc.)
- Referral to Alzheimer’s society
- Etc, etc

Patterson C, Gauthier S et al CMAJ 1999;160:12 Suppl 1-14
RCT of revealing or concealing MMSE scores to Family Physicians

- Cohort study of 926 patients in 4 family practices in Ontario Canada (1 city, 3 rural)
- Extensive screening including MMSE
- Those scoring less than 24 (5.4%) were randomized to:
  (a) *reveal* result to FMD  or  
  (b) *conceal* result from FMD
RCT of revealing or concealing MMSE scores to Family Physicians

- Advice on follow up given with MMSE results
- Charts reviewed 12 months later for 10 procedures recommended in Canadian Consensus Conference on Dementia (1999)
- Examples of procedures: collateral history, physical, neurological & cognitive examination, referrals (Alzheimer Society, specialists) laboratory tests etc.
RCT of revealing or concealing MMSE scores to Family Physicians

• Results: *No difference* in procedures performed between patients where results were revealed or concealed

Patterson C, Wheatley LS (1999)
RCT of revealing or concealing MMSE scores to Family Physicians

• Results: No difference in procedures performed between patients where results were revealed or concealed

Why?

• MMSE unsolicited; not believed important; diagnosis already known; treatment believed difficult or ineffective

Patterson C, Wheatley LS (1999)
Why don’t physicians follow clinical practice guidelines?
Why don’t physicians follow clinical practice guidelines?

- Too many guidelines
- Conflicting recommendations
- Not enough time
- Concern about loss of autonomy
- Fear of decreased satisfaction with practice
- Suspicious when issued by governments or insurance agencies
Why don’t physicians follow clinical practice guidelines?

*They are more likely to be followed if:*

- they agree with them
- they are endorsed by respected colleagues (local opinion leaders)
- they are endorsed by major professional organizations
- they are user-friendly

(after Hayward R CMAJ 1997;156:1715)
How do physicians change behaviour?
Diffusing best practices

• Perceptions of the innovation

Berwick D JAMA 2003; 289:1969
Diffusing best practices

• Perceptions of the innovation
• Characteristics of the people who adopt, or reject the innovation

Berwick D JAMA 2003; 289:1969
Diffusing best practices

• Perceptions of the innovation
• Characteristics of the people who adopt, or reject the innovation
• Contextural factors

Berwick D JAMA 2003; 289:1969
Diffusing best practices

Perceptions of the innovation:
- Perceived benefit
- Compatible: beliefs, values, needs
- Complexity
- Local adaptation
- “Trialability”
- “Observability”
- Account for 49-87% of the spread
OTTAWA ANKLE RULES
for Ankle Injury Radiography

A) Posterior edge or tip of lateral malleolus
C) Base of 5th Metatarsal

MALLEOLAR ZONE

LATERAL VIEW

MIDFOOT ZONE

MEDIAL VIEW

B) Posterior edge or tip of medial malleolus
D) Navicular

6 cm

a) An ankle x-ray series is only required if there is any pain in malleolar zone and any of these findings:
1. bone tenderness at A
   OR
2. bone tenderness at B
   OR
3. inability to bear weight both immediately and in the emergency department

b) A foot x-ray series is only required if there is any pain in midfoot zone and any of these findings:
1. bone tenderness at C
   OR
2. bone tenderness at D
   OR
3. inability to bear weight both immediately and in the emergency department

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Diffusing best practices

Perceptions of the innovation
Characteristics of the people who adopt, or reject the innovation
Characteristics of People: the pace of change

Figure 2. Adopter Categorization on the Basis of Innovativeness

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Diffusing best practices

Perceptions of the innovation
Characteristics of the people who adopt, or reject the innovation

• Innovators
• Early adopters (opinion leaders)
• Early majority
• Tipping point (15-20%)
• Late majority (watching for proof)
• Laggards (still watching....)

Rogers E Diffusion of Innovations, 1995
Techniques that change physician performance

- Didactic Continuing Medical Education (CME) does not change performance

Mazmanian P, Davis D  JAMA; 288(9): 1057
Techniques that change physician performance

- *Didactic Continuing Medical Education (CME) does not change performance*
- Needs defined by learners

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Techniques that change physician performance

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- Interaction (e.g. case discussions, role play, hands on, academic detailing, audit/feedback)

Mazmanian P, Davis D  JAMA; 288(9): 1057
Techniques that change physician performance

- Didactic Continuing Medical Education (CME) does not change performance
- Needs defined by learners
- Interaction (e.g. case discussions, role play, hands on, academic detailing, audit/feedback)
- Sequenced, multifaceted (e.g. work learn work, opinion leaders, follow up)

Mazmanian P, Davis D  JAMA; 288(9): 1057
Diffusing best practices

Perceptions of the innovation
Characteristics of the people who adopt, or reject the innovation
Contextural factors
• Environment
• Management
• Social milieu
Effect of HOPE trial on ramipril prescribing in Ontario
(Tu et al CMAJ 2003;168:553)
Why was the effect of HOPE so dramatic in changing behaviour?

- Prestige of investigator, based in Ontario
- Widespread dissemination of results
- Broad eligibility of patients
- Results clinically (as well as statistically significant)
- Single daily dose, well tolerated, familiar drug class
- Skilful marketing by pharmaceutical company
Did we meet our objectives?

- Outlined diagnostic process
- Described the hierarchy of evidence
- Defined Evidence based Medicine (EBM)
- Examples of where good evidence has improved treatment
- Described Clinical Practice Guidelines
- Outlined challenges to EBM
- Looked at physician behaviour
CONCLUSIONS

• Evidence based practice is here to stay!
• Knowing how we diagnose (and do it better, faster) is important
• Evidence must be relevant, and immediately accessible
• Diffusion of best practices is helped by the right people in the right environment
Useful Evidence-based medicine resources

• TheCochraneLibrary.com
• Ahrq.gov (Agency for Healthcare Research and Quality USA)
• Ctfphc.org (Canadian Task Force on Preventive Health Care) Great links!
What do these numbers mean?

- 101
- 96
- 8.2
- 340,000
- 5.6
- 5.6
- 140
- 3.8
- 96
- 27
What do these numbers mean?

• 101
• 96
• 8.2
• 340,000

• 5.6
• 94

• 140
• 3.8
• 96
• 27
Now it is obvious!

- 101 g/L
- 96 fL
- 8.2
- 340,000
- 5.6 mmol/L
- 94 umol/L
- 140 mmol/L
- 3.8 “
- 96 “
- 27 “
Table 4. Odds ratios for mortality

<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>INTERVENTION n/N</th>
<th>CONTROL n/N</th>
<th>ODDS RATIO 95% CONFIDENCE INTERVAL</th>
<th>WEIGHT %</th>
<th>ODDS RATIO (95% CONFIDENCE LIMITS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tellbach and Moore, 1979</td>
<td>24/170</td>
<td>42/169</td>
<td>3.2 (0.46, 1.26)</td>
<td>5.6</td>
<td>0.69 (0.47, 1.02)</td>
</tr>
<tr>
<td>Hendriksen et al, 1984</td>
<td>56/200</td>
<td>75/200</td>
<td>8.2 (0.52, 0.98)</td>
<td>18.3</td>
<td>0.91 (0.74, 1.11)</td>
</tr>
<tr>
<td>Verhe et al, 1984</td>
<td>81/577</td>
<td>105/571</td>
<td>201 (0.77)</td>
<td>10.3</td>
<td>1.36 (0.84, 1.09)</td>
</tr>
<tr>
<td>Sorensen and Strene, 1988</td>
<td>342/777</td>
<td>231/777</td>
<td>5.1 (0.22, 1.25)</td>
<td>3.2</td>
<td>0.70 (0.49, 1.00)</td>
</tr>
<tr>
<td>Cooper and Domopoulos, 1990</td>
<td>66/272</td>
<td>54/267</td>
<td>23/165</td>
<td>2.2</td>
<td>0.70 (0.49, 1.00)</td>
</tr>
<tr>
<td>McEwen et al, 1992</td>
<td>16/151</td>
<td>22/145</td>
<td>5.4 (0.83, 1.82)</td>
<td>1.9</td>
<td>0.62 (0.37, 1.71)</td>
</tr>
<tr>
<td>Clarke et al, 1992</td>
<td>70/261</td>
<td>60/262</td>
<td>1.5 (0.37, 1.71)</td>
<td>1.5</td>
<td>0.70 (0.49, 1.00)</td>
</tr>
<tr>
<td>Hall et al, 1992</td>
<td>14/181</td>
<td>18/136</td>
<td>6.5 (0.37, 1.71)</td>
<td>4.3</td>
<td>0.60 (0.38, 1.25)</td>
</tr>
<tr>
<td>Pathe et al, 1992</td>
<td>67/269</td>
<td>86/256</td>
<td>5.1 (0.22, 1.25)</td>
<td>3.2</td>
<td>0.70 (0.49, 1.00)</td>
</tr>
<tr>
<td>Wasson et al, 1992</td>
<td>10/249</td>
<td>10/248</td>
<td>6.5 (0.25, 1.19)</td>
<td>1.5</td>
<td>0.60 (0.38, 1.25)</td>
</tr>
<tr>
<td>Van Boezen et al, 1993</td>
<td>42/292</td>
<td>50/288</td>
<td>4.3 (0.25, 1.19)</td>
<td>1.5</td>
<td>0.60 (0.38, 1.25)</td>
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<tr>
<td>Wagner et al, 1994</td>
<td>17/638</td>
<td>23/687</td>
<td>27.9 (0.72, 0.97)</td>
<td>4.3</td>
<td>0.60 (0.38, 1.25)</td>
</tr>
<tr>
<td>Burton et al, 1997</td>
<td>286/3165</td>
<td>454/2090</td>
<td>0.84 (0.25, 1.20)</td>
<td>1.0</td>
<td>0.46 (0.18, 1.20)</td>
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<tr>
<td>Hay et al, 1998</td>
<td>5/289</td>
<td>22/410</td>
<td>8.2 (0.80, 4.54)</td>
<td>2.5</td>
<td>0.67 (0.22, 1.40)</td>
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<td>Lennox et al, 1998</td>
<td>1/101</td>
<td>2/100</td>
<td>0.5 (0.04, 1.59)</td>
<td>1.5</td>
<td>0.46 (0.18, 1.20)</td>
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<tr>
<td>Bully et al, 2000</td>
<td>7/22</td>
<td>3/69</td>
<td>1.6 (0.22, 1.40)</td>
<td>1.6</td>
<td>0.70 (0.49, 1.00)</td>
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<td>Holbert et al, 2001</td>
<td>12/250</td>
<td>18/253</td>
<td>8.2 (0.80, 4.54)</td>
<td>2.5</td>
<td>0.67 (0.22, 1.40)</td>
</tr>
<tr>
<td>Mardown et al, 2001</td>
<td>1/50</td>
<td>5/50</td>
<td>1.6 (0.22, 1.40)</td>
<td>1.6</td>
<td>0.70 (0.49, 1.00)</td>
</tr>
<tr>
<td>Schneider et al, 2001</td>
<td>48/530</td>
<td>42/431</td>
<td>4.8 (0.57, 1.18)</td>
<td>4.8</td>
<td>0.77 (0.51, 1.00)</td>
</tr>
</tbody>
</table>

Pooled random effects estimate
Heterogeneity chi-square 19.03 (df=18) P=0.39

n/N = number dying/number studied.
<table>
<thead>
<tr>
<th>Length of Follow Up (mo)</th>
<th>Number of Studies</th>
<th>Total Sample Size</th>
<th>Heterogeneity P Value</th>
<th>Summary Odds Ratio (95% Confidence Limits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2</td>
<td>1123</td>
<td>.99</td>
<td>1.00 (0.57, 1.77)</td>
</tr>
<tr>
<td>12</td>
<td>11</td>
<td>5714</td>
<td>.80</td>
<td>0.80 (0.66, 0.98)</td>
</tr>
<tr>
<td>24</td>
<td>11</td>
<td>13,426</td>
<td>.87</td>
<td>0.78 (0.70, 0.87)</td>
</tr>
<tr>
<td>36</td>
<td>7</td>
<td>4680</td>
<td>.20</td>
<td>0.90 (0.75, 1.06)</td>
</tr>
<tr>
<td>48</td>
<td>2</td>
<td>5749</td>
<td>.15</td>
<td>0.90 (0.76, 1.04)</td>
</tr>
</tbody>
</table>
### Table 5. Odds ratios for living in the community

<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>INTERVENTION n/N*</th>
<th>CONTROL n/N*</th>
<th>ODDS RATIO (95% CONFIDENCE INTERVAL)</th>
<th>WEIGHT %</th>
<th>ODDS RATIO (95% CONFIDENCE LIMITS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hendrickson et al, 1984**</td>
<td>213/300</td>
<td>206/300</td>
<td></td>
<td>13.6</td>
<td>1.12 (0.79, 1.54)</td>
</tr>
<tr>
<td>Yetter et al, 1984*</td>
<td>471/577</td>
<td>443/571</td>
<td></td>
<td>17.8</td>
<td>1.28 (0.96, 1.71)</td>
</tr>
<tr>
<td>Sorensen and Sorensen, 1988*</td>
<td>289/777</td>
<td>271/777</td>
<td></td>
<td>26.4</td>
<td>1.11 (0.90, 1.36)</td>
</tr>
<tr>
<td>Clark et al, 1992*</td>
<td>190/261</td>
<td>169/262</td>
<td></td>
<td>11.8</td>
<td>1.03 (0.80, 1.32)</td>
</tr>
<tr>
<td>Hall et al, 1992*</td>
<td>61/81</td>
<td>51/86</td>
<td></td>
<td>4.7</td>
<td>2.07 (1.07, 3.99)</td>
</tr>
<tr>
<td>Putty et al, 1992*</td>
<td>290/346</td>
<td>244/356</td>
<td></td>
<td>14.5</td>
<td>1.68 (1.20, 2.35)</td>
</tr>
<tr>
<td>Van Rossum et al, 1993**</td>
<td>231/292</td>
<td>223/288</td>
<td></td>
<td>11.3</td>
<td>1.10 (0.74, 1.64)</td>
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<tr>
<td>Pooled random effects estimate</td>
<td>1745/2657</td>
<td>1607/2640</td>
<td></td>
<td></td>
<td>1.23 (1.06, 1.43)</td>
</tr>
</tbody>
</table>

Heterogeneity chi-square 8.23 (df = 6) P = .22

* n/N = number living in the community/number studied.
Effect of HOPE trial on ramipril prescribing in Ontario

(Tu et al CMAJ 2003;168:553)
Diagnosis: expert vs. novice

- Inexperienced medical students vs. seasoned clinicians
- History alone
- History plus photograph
- Explaining features in photograph

Brooks, LeBlanc, Norman 2000