



**Economic Evaluation  
of  
Knowledge Translation**

**Deb Kenny, RN PhD**

**Evelyn Cornelissen, B.Sc, RD**

**13 June 2008**



Friday the 13th

**You want to  
tell me about  
Economic  
what???**



**No Thanks.  
I'm outta  
here!**



# Why weigh economic evidence?



## Paying for health



GEORGE C. HALVORSON  
GEORGE J. ISHAM, M.D.

## EPIDEMIC OF CARE

A CALL FOR SAFER, BETTER, AND MORE  
ACCOUNTABLE HEALTH CARE



## **United States**

- ❖ **Total spending was \$2.3 TRILLION in 2007, or \$7600 per person.**
- ❖ **Total health care spending represented 16% of the gross domestic product (GDP).**
- ❖ **U.S. health care spending is expected to increase at similar levels for the next decade reaching \$4.2 TRILLION in 2016, or 20% of GDP**

## **Canada**

- ❖ **Health Care spending was projected to reach \$160 billion, or 10.6% of GDP, in 2007.**

## **United Kingdom**

- ❖ **Health Care spending was projected to reach \$160 billion, or 8% of GDP.**

**Conditions for Which Medicare Will No Longer Pay More If Acquired during an Inpatient Stay.\***

<b>Condition</b>	<b>No. of Medicare Cases in Fiscal Year 2006</b>	<b>Average Medicare Payment for Admissions in Which Condition Was Present</b>
Object left in patient during surgery	764	\$61,962
Air embolism	45	\$66,007
Blood incompatibility	33	\$46,492
Catheter-associated urinary tract infection	11,780	\$40,347
<b>Pressure ulcer</b>	<b>322,946</b>	<b>\$40,381</b>
Vascular-catheter-associated infection†	Unknown	Unknown
Mediastinitis after coronary-artery bypass grafting	108	\$304,747
Fall from bed	2,591	\$24,962

\* Data are from the *Federal Register*.<sup>2</sup>

† Data are unknown because a unique code for this condition was introduced for fiscal year 2008.

# Evaluating Economic Evidence

- 1. Does the study accurately reflect a question that is an important issue in clinical practice?**
- 2. Does the analysis accurately describe the treatment pathway and account for all the medical and nonmedical services that one would expect to be incurred when the intervention is used in the course of addressing the patient's problem?**
- 3. Are the clinical endpoints meaningful? Are credible sources cited?**
- 4. Were costs and outcomes valued credibly?**
- 5. Was the analysis incremental?**
- 6. Were confidence intervals or some measure of certainty provided with the estimate of cost-effectiveness?**
- 7. Are the results discussed in the context of previous economic evaluations and the realities of clinical practice?**

(Ramsey & Sullivan, 1999)





## **QUERI Economic Analysis Guidelines**

- 1. Transparency of analysis**
- 2. Impact of the intervention on cost**
- 3. Sunk costs, supply constraints, and facility specific considerations**
- 4. Time Horizon**
- 5. Cost perspective of provider**
- 6. Effect on revenue**
- 7. Relation of intervention to community standard**
- 8. Effect on outcomes**



**Economics  
Background  
Information**

# Economics of KT

*Evelyn Cornelissen*

*RD, PhD Student*

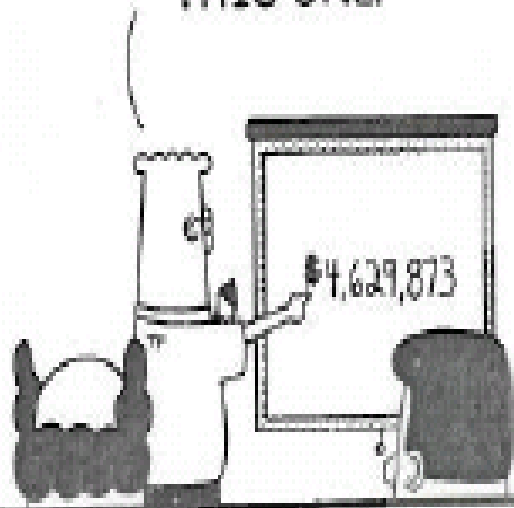
*UBC Okanagan*

*June 2008*

*[ecorneli@interchange.ubc.ca](mailto:ecorneli@interchange.ubc.ca)*

# DILBERT

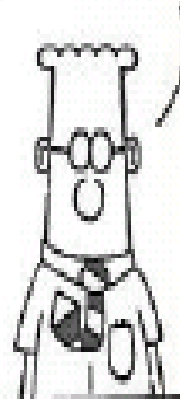
I DIDN'T HAVE ANY  
ACCURATE NUMBERS  
SO I JUST MADE UP  
THIS ONE.



scottadams@aol.com

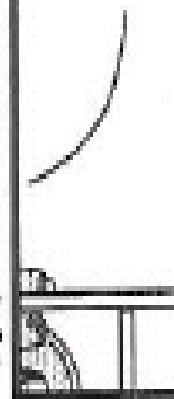
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STUDIES HAVE SHOWN  
THAT ACCURATE  
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MORE USEFUL THAN THE  
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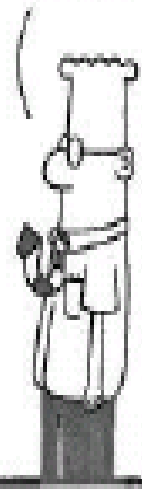


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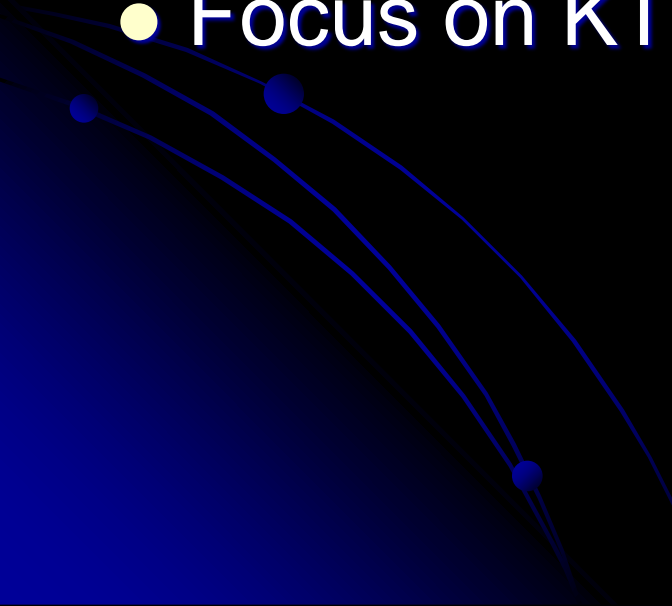
HOW  
MANY  
STUDIES  
SHOWED  
THAT?



EIGHTY-  
SEVEN.



# Objective of Session

- Review principles of economic evaluation
  - Provide context for theory – review economic evaluation of a CPG implementation study
  - Focus on KT issues and way forward
- 

# The Role of Health Economics

To provide

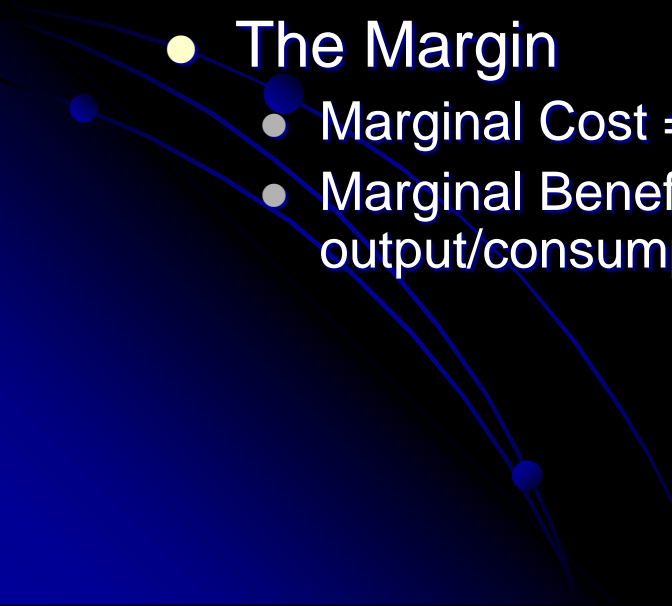
- a way of thinking
- a set of techniques (i.e. economic evaluation)

To assist decision making, usually in the healthcare sector, to promote

- efficiency
- equity

*Health economics is about maximizing social benefits subject to the constraint imposed by resource availability within the health system*

# Economic Principles

- Opportunity cost
    - every time we choose to use resources to meet one need we give up the "opportunity" to use those resources to meet some other need
    - aim of economics is to ensure that we undertake activities where benefits outweigh opportunity cost
  - The Margin
    - Marginal Cost = cost of one more unit of output/consumption
    - Marginal Benefit = benefit from one more unit of output/consumption
- 

# Allocative versus Technical efficiency

- TECHNICAL EFFICIENCY

- The objective of an intervention is taken as given. Technical efficiency is about how best to achieve that objective.

- ALLOCATIVE EFFICIENCY

- All objectives have to compete with each other for implementation. It is about whether to do something rather than how to do it. It can also be about how much to do.



## TECHNICAL QUESTIONS

- day surgery versus inpatient stay for cataracts
- local clinics versus hospital based clinics for treatment of chronic conditions

## ALLOCATIVE QUESTIONS

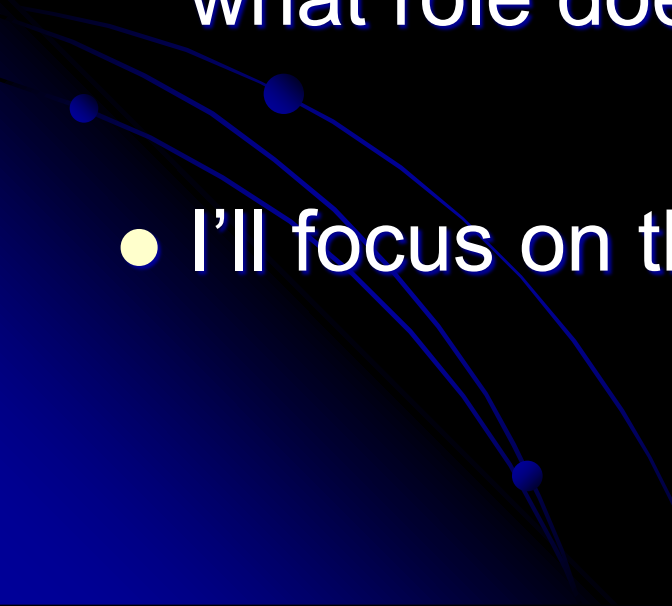
- Add acute or residential beds
- surgery for cataracts versus outpatient clinics for asthmatics

Importance of this distinction will be seen later.

# What is economic evaluation?

- Comparative analysis of alternative courses of action in terms of their costs and consequences.
- Concerned with EFFICIENCY not just effectiveness
- Important tool but rarely provides *the* answer
  - Other criteria in decision-making

# KT economic evaluation – questions:

- When assessing specific KT strategies, how can both costs and benefits be quantified?
  - When allocating healthcare resources, what role does KT play?
  - I'll focus on the first today.
- 

# Context - Economic evaluation alongside CPG Implementation Study:

## Implementation Science



Study protocol

Open Access

**Protocol for economic evaluation alongside the IMPLEMENT cluster randomised controlled trial**

Duncan Mortimer<sup>\*1,2</sup>, Simon D French<sup>3</sup>, Joanne E McKenzie<sup>3</sup>,  
Denise A O'Connor<sup>3</sup>, Sally E Green<sup>3</sup> for the IMPLEMENT study group

**Reference:** Mortimer, D. et al. (2008). Protocol for economic evaluation alongside the IMPLEMENT cluster randomized controlled trial. *Implementation Science*, 3(12).

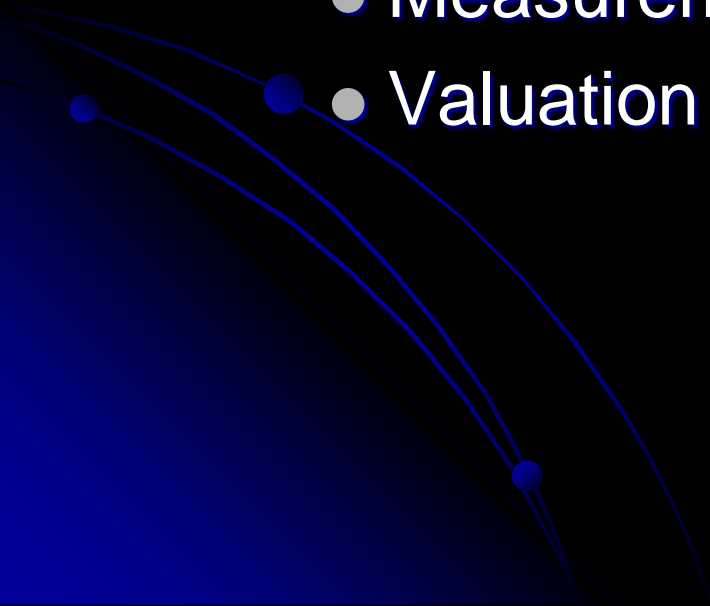
# Context - Implementation Study:

- **What:** Implementation of low back pain (LBP) CPG
- **Who:** 92 GP offices (clusters) treating adults (n=2300) presenting with acute LBP < 3 months duration
- **Why:** Evidence re cost-effectiveness of active implementation of CPGs for acute LBP is sparse. This study considers incremental benefits & costs of progressing beyond development & dissemination to implementation
- **How:** Economic analyses alongside a cluster RCT
  - Cost Effectiveness Analysis (CEA) & Cost Utility Analysis (CUA)
- **How:** Societal Perspective to quantify additional costs (savings) & health gains associated with a targeted implementation strategy as compared with access to CPG via dissemination only

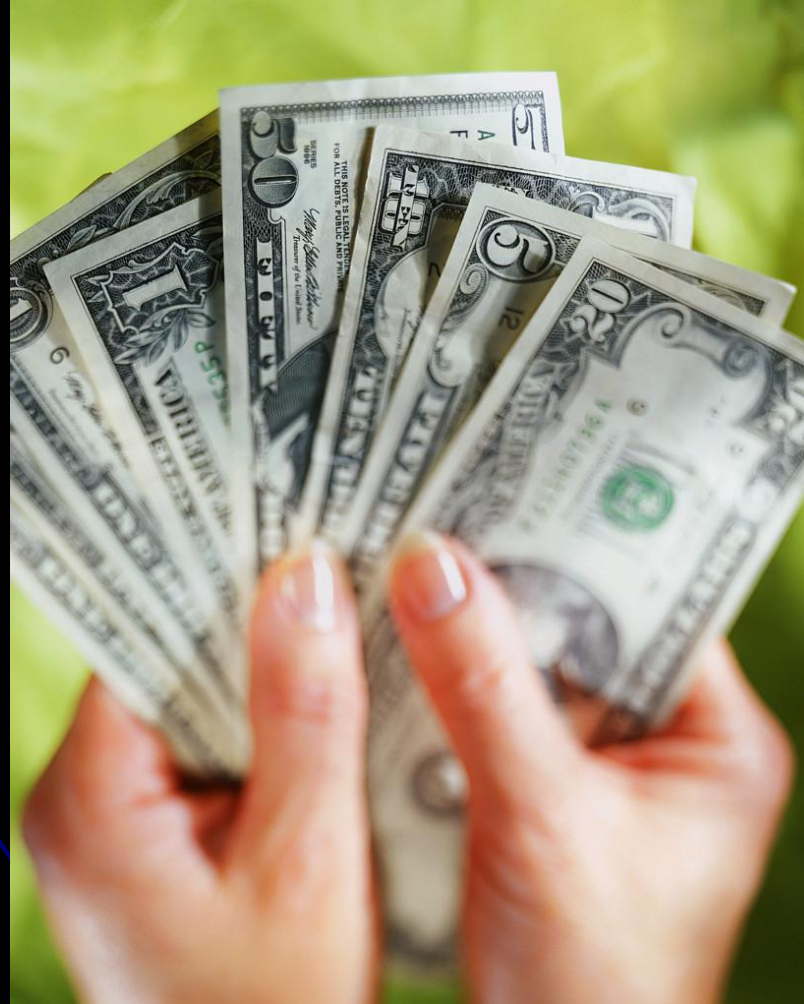
# The CPG IMPLEMENT study – cluster RCT

- Trial aim was to test the effectiveness of a theory-based implementation strategy for implementing a CPG for LBP.
- Control arm: GP offices received access to CPGs using existing dissemination strategy.
- Intervention arm: GP offices invited to participate in facilitated face-to-face workshops underpinned by behavioural theory
- Trial examined differences in:
  - Percentage of patients referred for x-ray
  - Mean level of disability for pts 3 months post-consultation
  - Incremental costs and benefits of progressing beyond development and dissemination to implementation

# Costs and Outcomes

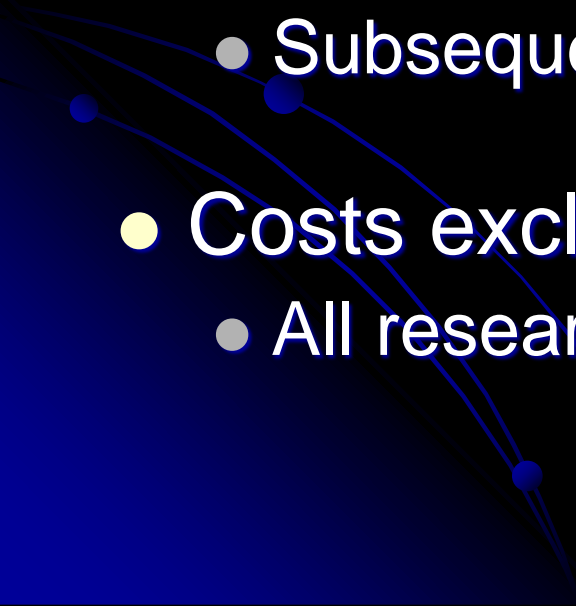
- For both costs (i.e. resource use) & outcomes/benefits (i.e. health outcomes), consider:
    - Identification
    - Measurement
    - Valuation
- 

# What cost data would you collect?





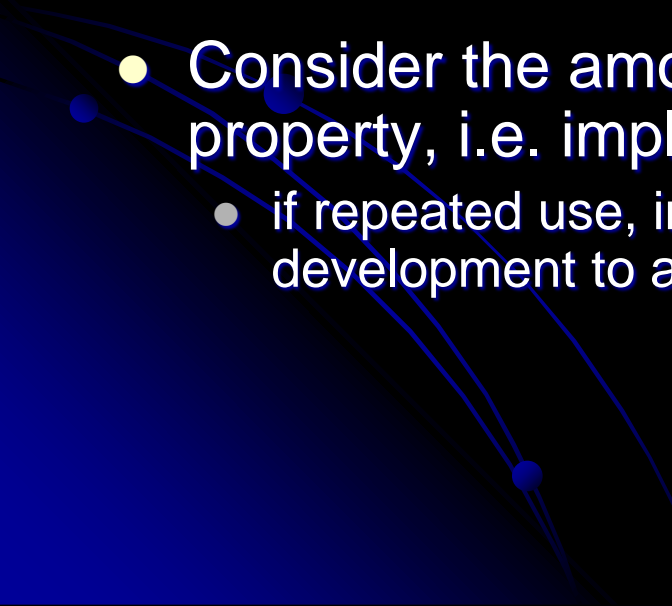
# Costs - identification

- Costs included - those associated with implementation strategy:
    - Development
    - Delivery
    - Subsequent changes in practice
    - Subsequent health effects
  - Costs excluded:
    - All research and evaluation costs
- 

# Costing considerations

- Assumption: costs associated with development/dissemination of actual CPG under existing practice are the same for both intervention and control groups, therefore excluded
- Dissemination costs for control group is specific to this group therefore included
- Time span: limited to 3 months post each patient's initial GP consult

# Costing – development of implementation strategy

- Costs associated with development:
    - Recruiting informants – assist with development
    - Time in focus groups – informants & facilitators
    - Opportunity cost – interview & meeting rooms
    - Time & equipment – focus group data analysis
    - Consultation – GP advisory committee
  - Consider the amortization of investment in intellectual property, i.e. implementation strategy
    - if repeated use, inappropriate to apportion entire cost of development to a single use
- 

# Costing – delivery of implementation strategy

- Costs associated with delivery:
  - Coordinating workshops
  - Production of materials for workshops
  - Opportunity cost – venue
  - Opportunity cost – GP travel time, attendance & post-workshop reflection
  - Labour costs – workshop prep, delivery & facilitation

# Costing – subsequent changes in practice

- Costs associated with change in practice:
  - Direct & indirect healthcare costs, i.e. x-rays, OTC or prescription analgesics, allied health or GP consults, volunteer or paid caregiver time
- Practice change expected to impact on direct & indirect costs outside the health sector, i.e. wait times, travel times for tx, productivity gains due to changes in disability, work time lost due to tx visits

# Costing – subsequent changes in practice

- Cost data collected from:
  - Enrolled practitioners
    - X-rays
  - Enrolled patients
    - Self-report – use of allied healthcare & analgesics, impact of LBP on work , time spent on tx
    - Caregiver time – estimated based on measures of LBP-related disability (vs. asking for estimates from patients)
- Using:
  - Questionnaire given to patients at each follow up
  - Questions based on health-related action items from ABS National Health Survey

# Valuation of costs (resource use)

- Unit costs for health service resources as per 'Manual of Resource Items'
- Goods/services not included in Manual, valued at market prices
- Unmarketed services (e.g. travel time, volunteer caregivers) costed using opportunity cost prices
- Productivity gains/losses:  
average ordinary wage rate X average # hrs spent on activity
  - wage rate from ABS Labour Price Index for study year
  - time spent from ABS Time Use Survey, by age group
  - Did not include replacement labour costs due to short duration of follow-up

What outcome data would you collect?

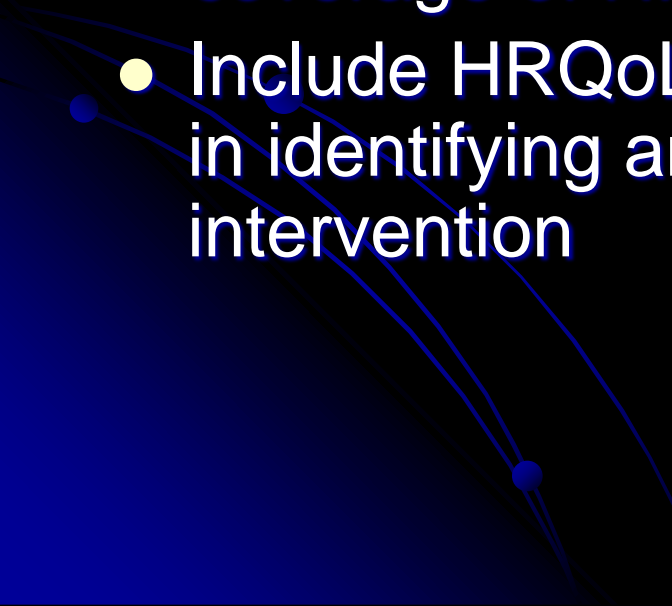




# Economic evaluation – Benefit measurement

- Benefit can be measured in different ways:
  - cases detected
  - cases treated
  - lives/life years saved
  - quality of life improvements
  - combination of quality and length of life
    - Quality adjusted life years (QALYs)
  - some other general measure of well being
    - “Willingness to pay”
- Measuring health status
  - Validated tools, e.g. EuroQoL or EQ-5D

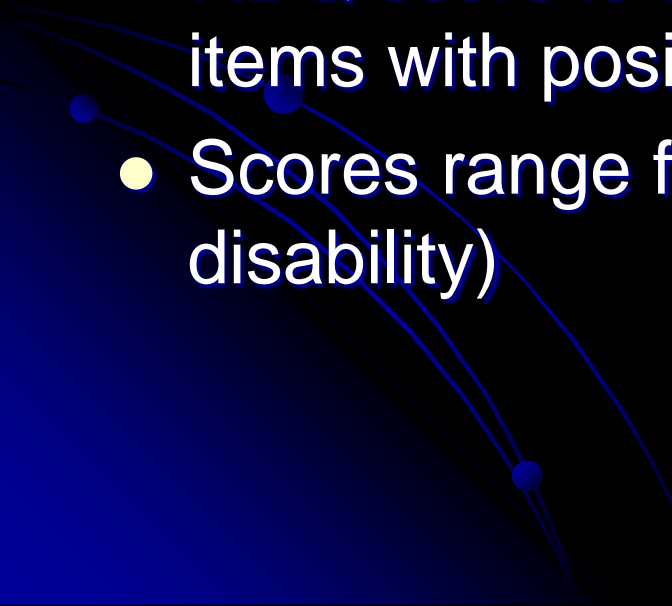
# Identification of health outcomes

- Consider: differential effects between control & intervention groups may arise re dimensions of HRQoL (health related quality of life) scores other than physical disability or pain, therefore...
  - Outcome measures used must provide broad coverage of HRQoL
  - Include HRQoL dimensions most likely relevant in identifying an effect attributable to the intervention
- 

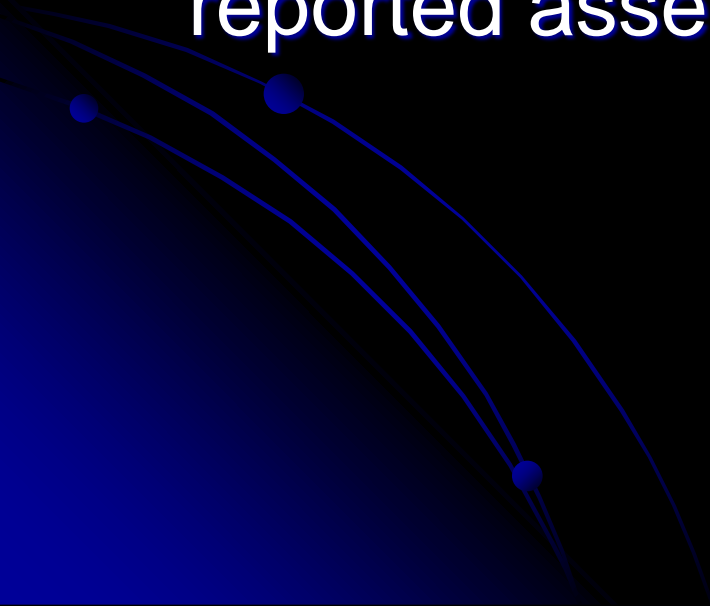
# Measurement of health outcomes

- Measures chosen to assess pt outcomes were those commonly used in trials of interventions for acute LBP & provide broad coverage of HRQoL
- Measures used:
  - Roland-Morris Disability Questionnaire (RDQ)
  - Usual Pain
  - Assessment of Quality of Life (AQoL)
- Data collected:
  - 7 days and 3 months post initial GP consult for acute LBP

# Measurement of health outcomes – RDQ

- Widely used & validated measure of LBP-specific disability
  - Measures 24 activity limitations due to back pain
  - Administered over telephone
  - RDQ score is calculated by adding up number of items with positive responses
  - Scores range from 0 (no disability) to 24 (max disability)
- 

# Measurement of health outcomes – usual pain

- 11- point scale
    - 0 = no pain, to...
    - 10 = worst pain ever
  - Acceptable reliability & validity for self-reported assessment of pain
- 

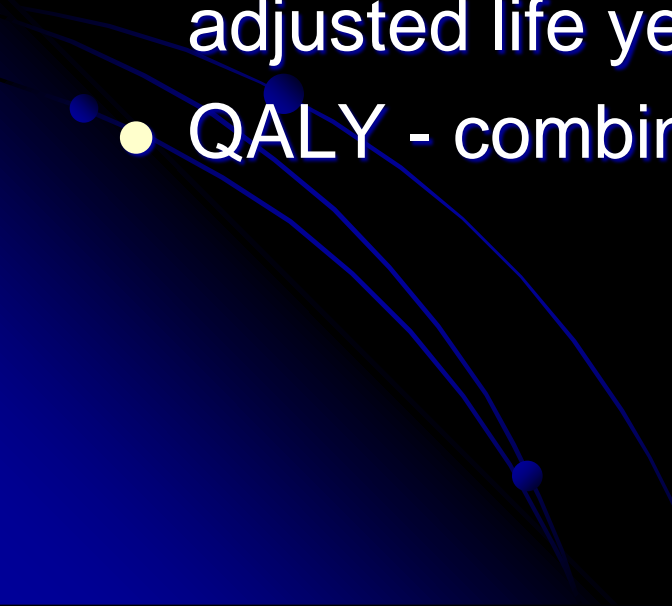
# Measurement of health outcomes - AQoL

- AQoL – 2 uses:
  - Descriptive measure of HRQoL; 5 dimensions, each reflected in 3 items:
    - Illness: prescribed meds, meds/aids, medical tx
    - Independent living: self-care, household tasks, mobility
    - Social relationships: with others, isolation, family role
    - Physical senses: seeing, hearing, communication
    - Psychological wellbeing: sleep, anxiety, depression
  - Preference-based measure of HRQoL:
    - 4/5 dimensions and 12/15 items contribute to AQoL's preference-based measure of HRQoL
    - Illness dimension excluded; could indicate underlying health condition rather than impact of the health condition on HRQoL

# Measurement of health outcomes - AQoL

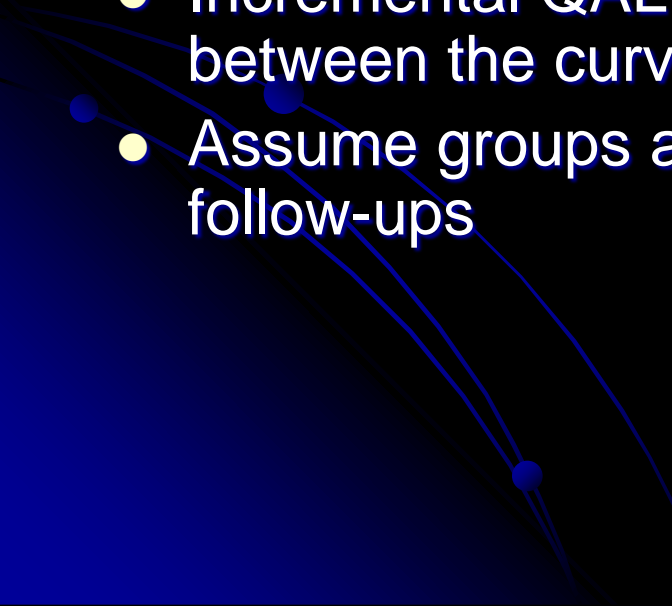
- The AQoL (preference-based measures of HRQoL) ranges from -0.04 to 1.0:
  - 1 = full health
  - 0 = death
  - neg scores = state worse than death
  - -0.04 = all-worst health state
- Administered via mail or telephone
- Validity & reliability of tool for measurement of preference-based HRQoL has been demonstrated in Australian general population

# Valuation of health outcomes

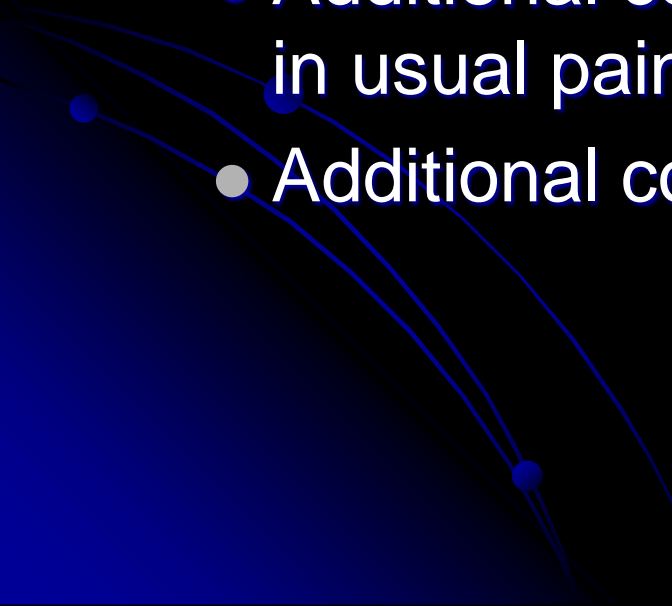
- Patient-level outcomes (RDQ, usual pain, AQoL) are expected to capture all relevant dimensions of health outcomes, however...
  - Some advantages to expressing the results of cost-effectiveness analyses in cost per quality adjusted life year (QALY) terms
  - QALY - combination of quality and length of life
- 



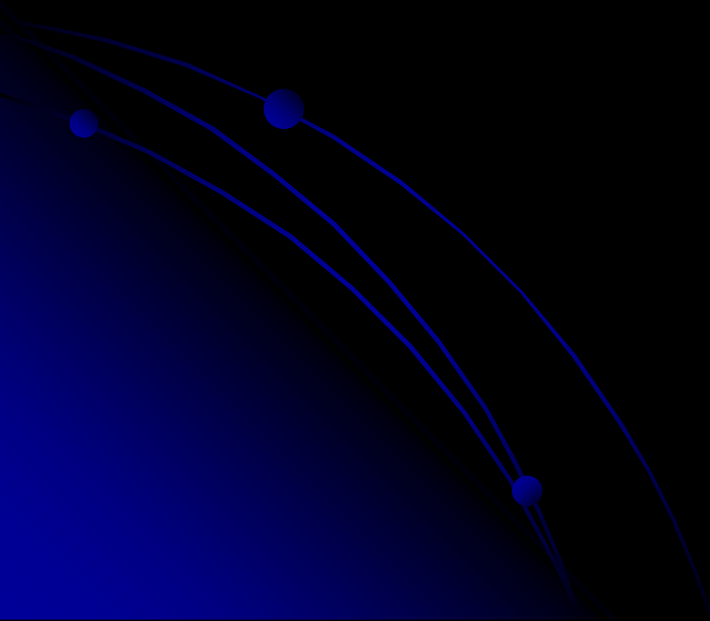
# QALYs

- To calculate effectiveness in QALY terms, between-group differences in AQoL (preference-based HRQoL weights) is combined with time over which differences persist
  - Patients in both groups assumed to track a linear path from AQoL scores at 7 days to AQoL scores at 3 months
  - Incremental QALY gain is calculated as the difference between the curves for tx & control groups
  - Assume groups are equivalent pre 7 day & post 3 month follow-ups
- 

# Incremental Analysis

- Results from the economic evaluation will be expressed as:
    - Additional costs (savings) per point difference in RDQ at 7 days & 3 months
    - Additional costs (savings) per point difference in usual pain at 7 days & 3 months
    - Additional costs (savings) per QALY gained
- 

# Back to health economics in general



**Table 10.1** Types of economic analysis

Type of analysis	Outcome measure	Conditions of use	Example
Cost-minimisation analysis	No outcome measure	Used when the effect of both interventions is known (or may be assumed) to be identical	Comparing the price of a brand name drug with that of its generic equivalent if bioequivalence has been demonstrated
Cost-effectiveness analysis	Natural units (e.g. life-years gained)	Used when the effect of the interventions can be expressed in terms of one main variable	Comparing two preventive treatments for an otherwise fatal condition
Cost-utility analysis	Utility units (e.g. quality-adjusted life years)	Used when the effect of the interventions on health status has two or more important dimensions (e.g. benefits and side effects of drugs)	Comparing the benefits of two treatments for varicose veins in terms of surgical result, cosmetic appearance and risk of serious adverse event (e.g. pulmonary embolus)
Cost-benefit analysis	Monetary units (e.g. estimated cost of loss in productivity)	Used when it is desirable to compare an intervention for this condition with an intervention for a different condition	For a purchasing authority, to decide whether to fund a heart transplantation programme or a stroke rehabilitation ward

**Reference:**  
 Greenhalgh, T.  
 (2006). *How to Read a Paper, the basics of evidence-based medicine, 3<sup>rd</sup> edition*. USA: Blackwell Publishing Ltd.

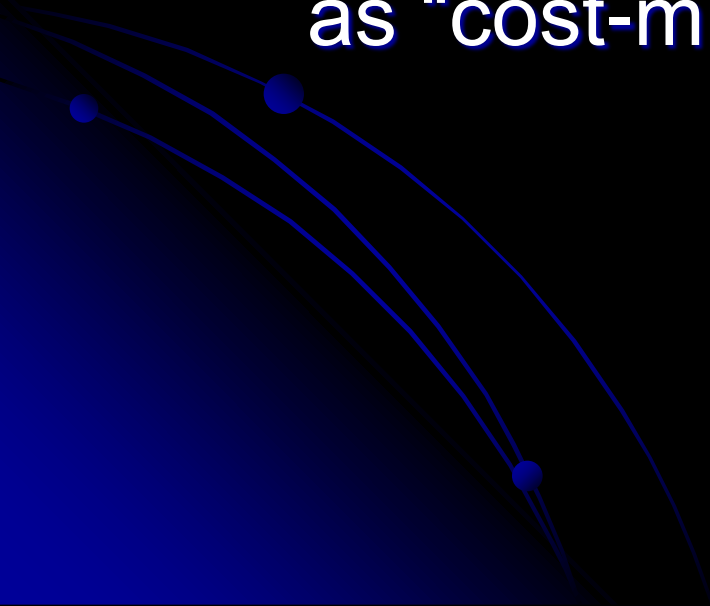
# Cost-effectiveness analysis (CEA)

“Given that it has been decided that a goal/policy will be pursued, what is the best way of achieving it?”

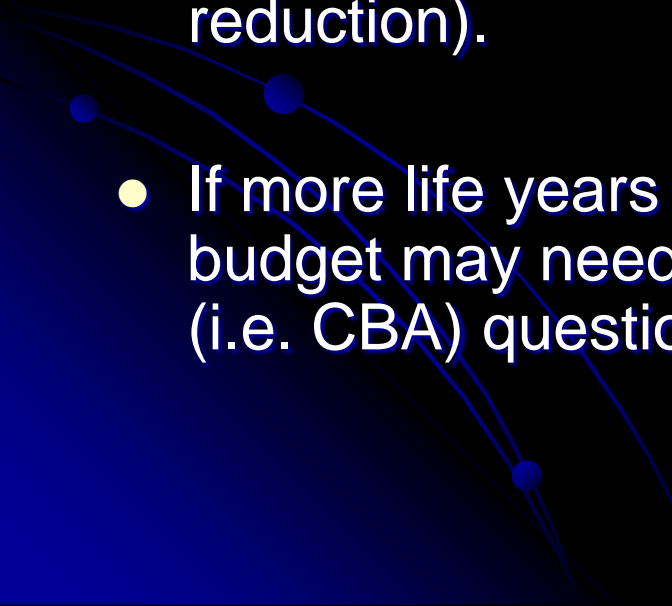
- CEA involves comparison of at least two options.
- CEA is about technical efficiency.

# CEA – 2 forms:

## 1. Compare alternatives

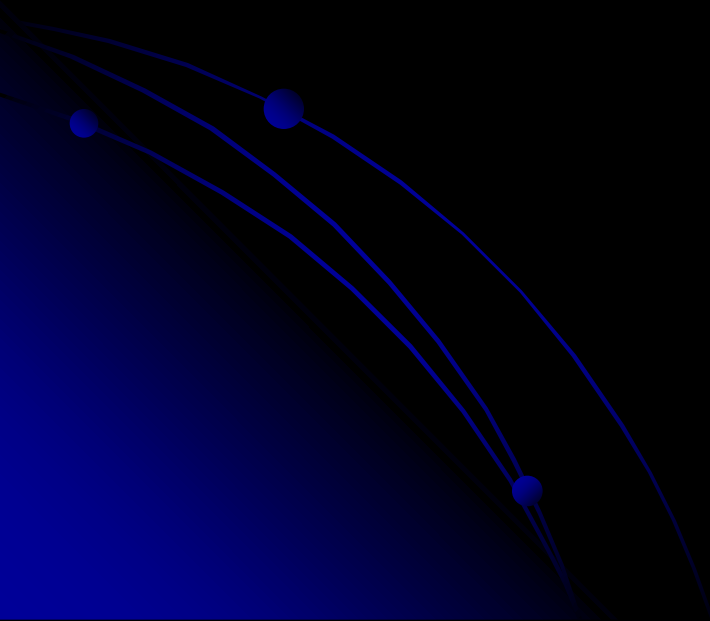
- Know (or assume) health effects to be equal
  - Analyze costs only (sometimes known as “cost-minimization”)
- 

# CEA – 2 forms:

2. Compare alternatives within a fixed budget.
    - Alternatives differ in cost and effectiveness.
    - Produce a cost-effectiveness ratio.
  - Effectiveness is singular in dimension (e.g. life years gained, disability days reduced, units of blood pressure reduction).
  - If more life years are produced at greater cost, the budget may need to be expanded. This is an allocative (i.e. CBA) question.
- 

# Limitations of CEA

- Relative, not absolute efficiency
- Cannot compare disparate alternatives
- With cost minimization, effects may not be the same for each alternative






# Cost-utility analysis

- Outcome measure is “healthy years”
- With ‘full health’ = 1 and ‘death’ = 0, states of health which are less than “full health” can be converted to “healthy years” (e.g. 2 years in state valued at 0.5 = 1 healthy year)
- Two main techniques of conversion:
  - quality adjusted life years (QALYs)
  - healthy years equivalents (HYEs)

# Cost-utility analysis

- CUA is about allocative and technical efficiency within healthcare sector
  - Broader than CEA because:
    - combines more than one attribute of “health”
    - therefore, can be applied to more disparate alternatives
  - Do not have to value benefits in monetary terms
- 

# Economic evaluation considerations

- Viewpoint of analysis
  - In LBP CPG, societal perspective
  - Consider costs and benefits from this perspective
- Alternative being compared
  - In LBP CPG, implementation vs. access to CPG via dissemination only
  - Choice of alternative designed to measure (close as possible) the opportunity cost of the intervention

Questions?



# What's out there ....



**“...the published literature on the application of economic evaluation to health and safety in healthcare has been found to be woefully inadequate in terms of methodological rigor, consistency of approach and understanding of economic evaluation methods.”**

**Niven, K. J. M. (2002). A review of the application of health economics to health and safety in healthcare. Health Policy, 61, 291-304**



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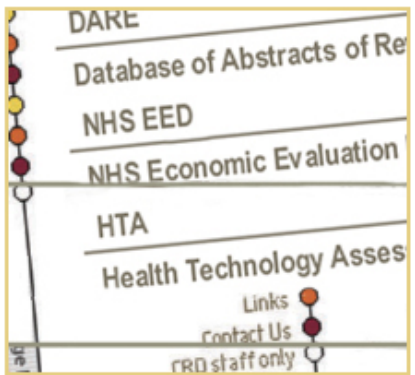
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Centre for Reviews and Dissemination databases



CRD was established in January 1994, and produces and promotes the use of research based knowledge in health and social care.



General information about the CRD databases.

DARE - (Database of Abstracts of Reviews of Effects) contains over 5000 abstracts of quality assessed and critically appraised systematic reviews.

NHS Economic Evaluation Database (NHS EED) contains over 7000 abstracts of quality assessed economic evaluations.

Both DARE and NHS EED include details of abstracts in the process of being written and these can be 'fast-tracked' on request.


 Brief record  Full record

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## NHS Economic Evaluation Database (NHS EED) - Short record display

### Rotator cuff repair: an analysis of utility scores and cost-effectiveness

Vitale M A, Vitale M G, Zivin J G, Braman J P, Bigliani L U, Flatow E L

Source	Journal of Shoulder and Elbow Surgery
Year published	2007
Volume	16(2)
Pages	181-187
Record status	This record was compiled by CRD commissioned reviewers according to a set of guidelines developed in collaboration with a group of leading health economists.
Study question	The objective of the study was to examine the cost-utility of rotator cuff repair by relating surgical costs to the increase in quality-adjusted life-years (QALYs). A societal perspective was adopted in the economic analysis.
Authors' conclusions	The cost-effectiveness of rotator cuff repair compared favourably with other common interventions in health care.
CRD commentary	Selection of comparator(s): Although no explicit justification was given for using a do-nothing approach (i.e. no cuff repair surgery) as



Rotator cuff repair: an analysis of utility scores and cost-effectiveness  
<http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?ID=22007000698>

ness:

The analysis was based on a within-group analysis, which is associated with limitations such as inclusion bias and the potential for external factors to influence the results. The study sample appears to have been representative of the study population. The authors reported very few details of the methodology used. For example, they did not report how many patients were excluded or refused to participate, nor did they report the loss to follow-up. Consequently, the internal and external validity of the study is questionable. Appropriate statistical analyses were undertaken to identify whether differences were statistically significant.

Validity of estimate of measure of benefit:

The estimation of health benefit was derived from the effectiveness study and then extrapolated over the remaining life expectancy of the patient. Since the benefits could be incurred over the lifetime of the patient, discounting was relevant and was appropriately performed. Utility values were measured using the HUI and EuroQol. The authors did not report the valuation methods used to transform responses into utilities. Furthermore, for the EuroQol, it was not clear whether the EQ-5D responses or the rating scale were used to obtain utilities.

Validity of estimate of costs:

The authors reported that the study had been conducted from a societal perspective. However, the only costs included in the analysis were those to the health care provider; other relevant health care costs, such as primary care costs, and productivity losses were not included. Although the authors reported that the impact of the intervention on productivity losses would be captured in the utility values, both UK and USA guidelines recommend their inclusion if a societal perspective is adopted. The exclusion of productivity costs would appear to have biased the results against surgical cuff repair, whereas the omission of other health care costs would have biased the results in favour of surgery.

The costs were derived from the authors' settings. Charges were at first used to proxy prices. However, these were then converted into costs using appropriate cost-to-charge ratios. Although discounting was not relevant as the costs were incurred during 1 year, the authors did discount the costs. Neither the price year nor the years over which resource use was incurred were reported.

http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?View=Full&ID=12006003706

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 Bookmarks 21 blocked Check Look for Map AutoFill Settings

Coxibs versus combination NSAID and PPI therapy for...



Brief record Full record

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## Database of Abstracts of Reviews of Effects (DARE) - Full record display

### Coxibs versus combination NSAID and PPI therapy for chronic pain: an exploration of the risks, benefits, and costs

Hur C, Chan A T, Tramontano A C, Gazelle G S

Source	Annals of Pharmacotherapy
Year published	2006
Volume	40(6)
Pages	1052-1063
CRD summary	This review compared cyclooxygenase-2 inhibitors (coxibs) with non-selective non-steroidal anti-inflammatory drugs plus a proton-pump inhibitor for patients with chronic musculoskeletal pain. The authors concluded that coxibs provide comparable pain control and produce fewer gastrointestinal complications, although the risk of cardiovascular events is unknown. The presence of several methodological flaws in the review process mean that the reliability of these conclusions is unclear.
Record status	This record is a structured abstract written by CRD reviewers. The original has met a set of quality criteria. Since September 1996 abstracts have been sent to authors for comment. Additional factual information is incorporated into the record. Noted as [A:....].
Authors' objectives	To compare the risks and benefits of cyclooxygenase-2 inhibitors (coxibs) with combined non-selective non-steroidal

of CVEs. Unpublished data suggested that the risk may be dose-related. Of the 8 trials in this outcome category, the results of one (n=1,671) (in which CVEs were used as the primary measure) suggested a statistically significantly elevated risk of CVE following parecoxib and valdecoxib compared with placebo (RR 3.7, 95% CI: 1.0, 13.5). This trend was demonstrated in another 2 trials. The first (n=2,586) compared rofecoxib with placebo and found a two-fold increase in risk (RR 1.92, 95% CI: 1.19, 3.11). The second (n=2,035) found a three-fold increase in risk (RR 3.4, 95% CI: 1.4, 7.8) when a higher dose of celecoxib was compared with placebo.

The evidence was less strong when coxibs were compared with non-selective NSAIDs. One trial (n=8,076) found a four-fold elevated risk of myocardial infarction associated with rofecoxib (0.4% versus 0.1% with naproxen) but the difference was not significant. Another trial (n=8,059) found no statistically significant increase associated with celecoxib when compared with ibuprofen or diclofenac. A larger trial (n=18,325) also found no significant increase in CVEs when lumiracoxib was compared with naproxen or ibuprofen.

Was any cost information reported?

The authors gave comparative costs for the drugs (reported in the paper), showing that most of the non-selective NSAID-PPI combinations would be less costly than coxib therapy. The exception to this was if prescription omeprazole and/or diclofenac were used as the comparators.

Authors' conclusions

In comparison with non-selective NSAIDs and PPI as combination treatment, coxibs provide comparable pain control and may produce a lower level of GI tract complications. However, the unknown risk of CVEs and higher cost of coxibs mean that this conclusion should be interpreted cautiously.

CRD commentary

The review question and inclusion criteria were clear. The database search strategy was limited but adequate. Although there was no documented search for unpublished data, there was some recognition of preliminary trial results in the review findings. The restriction to English language papers might have introduced language bias. The lack of details of the review process mean that errors and biases cannot be ruled out. In addition, the absence of a validity assessment precludes any confirmation of study reliability. The apparent considerable variation amongst the included studies was not fully explored in the context of the review findings. The authors' conclusions reflect the synthesis presented but (given the limitations above) it is unclear to what extent they are reliable.

What are the implications of the review?

Practice: The authors stated that health care providers should be aware that there are unknown risks and increased costs associated with prescribing coxibs as an equivalent pain control treatment for chronic musculoskeletal pain. Prescription should take account of individual patient characteristics.

Research: The authors stated that future research should examine the possibility of combination therapy comprising

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## Database of Abstracts of Reviews of Effects (DARE) - Full record display

**Meta-analysis: anticoagulant prophylaxis to prevent symptomatic venous thromboembolism in hospitalized medical patients**  
 Dentali F, Douketis J D, Gianni M, Lim W, Crowther M A

Source	Annals of Internal Medicine
Year published	2007
Volume	146(4)
Pages	278-288
CRD summary	This review assessed the effects of anticoagulant prophylaxis in hospitalised medical patients. The authors concluded that anticoagulant prophylaxis is effective in preventing symptomatic venous thromboembolism during anticoagulant prophylaxis in at-risk hospitalised patients. This was a well-conducted review and the authors' conclusions are likely to be reliable.
Record status	This record is a structured abstract written by CRD reviewers. The original has met a set of quality criteria. Since September 1996 abstracts have been sent to authors for comment. Additional factual information is incorporated into the record. Noted as [A:.....].
Authors' objectives	To determine the effects of anticoagulant prophylaxis in reducing clinically important outcomes in hospitalised medical patients.
Specific interventions included in the review	Studies comparing a prophylactic dose of anticoagulant (unfractionated heparin, low molecular weight heparin, or fondaparinux) with no treatment (placebo or no intervention) were eligible for inclusion. Only anticoagulant regimens that are currently recommended for the

	<p>Based on 9 studies, anticoagulant prophylaxis resulted in a statistically significant reduction in the risk of any PE: the RR was 0.43 (95% CI: 0.26, 0.71), the absolute risk reduction was 0.29%, and the NNT to prevent one symptomatic PE was 345. Based on 7 studies, anticoagulant prophylaxis resulted in a statistically significant reduction in the risk of fatal PE: the RR was 0.38 (95% CI: 0.21, 0.69), the absolute risk reduction was 0.25%, and the NNT to prevent one death due to PE was 400.</p> <p>Anticoagulant prophylaxis had no statistically significant effect on symptomatic DVT (RR 0.47, 95% CI: 0.22, 1.00), all-cause mortality (RR 0.97, 95% CI: 0.79, 1.19), or major bleeding (RR 1.32, 95% CI: 0.73, 2.37). Except for major bleeding, no heterogeneity across studies was found (I-squared 0%).</p> <p>Sensitivity analyses did not change the results of the primary analyses. The funnel plot for any PE was asymmetrical, suggesting a lack of small studies showing an association between prophylaxis and an increased risk of PE and all-cause mortality. The funnel plot for major bleeding did not suggest the presence of publication bias. There were insufficient studies to produce funnel plots for the other outcomes.</p>
Was any cost information reported?	No
Authors' conclusions	Anticoagulant prophylaxis is effective in preventing symptomatic venous thromboembolism during anticoagulant prophylaxis in at-risk hospitalised medical patients. Further research is required to assess the risk for venous thromboembolism in these patients after prophylaxis has been stopped.
CRD commentary	The authors set out a clear objective and defined clear inclusion criteria for the participants, interventions, outcomes and study design. Appropriate sources were searched without any restrictions on language or publication status, which will have reduced the risk of publication bias and missing relevant studies. However, an assessment of publication bias revealed some evidence of publication bias for one outcome. Measures were taken to reduce the risk of bias and error in the study selection, data extraction and quality assessment processes. Study quality was assessed using appropriate criteria, and adequate study details were provided. The methods used to statistically pool the studies seemed appropriate, and statistical heterogeneity was assessed. This was a well-conducted review and the authors' conclusions are likely to be reliable. In addition, the authors appropriately stated that they were unable to determine the relative efficacy of different types of anticoagulants.
What are the implications of the review?	Practice: The authors advise caution in applying the findings of this study to practice and stated that clinicians should consider anticoagulant prophylaxis within the context of absolute therapeutic benefits, potential harms and costs, as well as the potential limitations of these findings. They further stated that the use of prophylactic anticoagulation should be selective and perhaps limited to high risk patients.

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# Bottom Line

**There seems to be a literature base on the importance of economic evaluation of health care, but not necessarily linked to KT**

**Effectiveness reviews of the evidence do not always contain economic evaluation or cost data for two primary reasons:**

- 1. Cost considerations were not part of the research**
- 2. Cost considerations were weak**

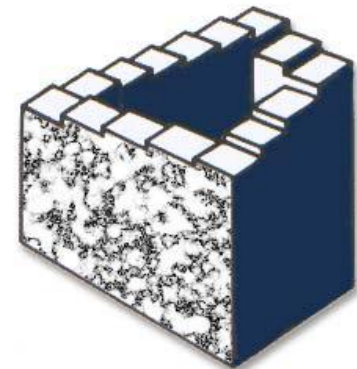


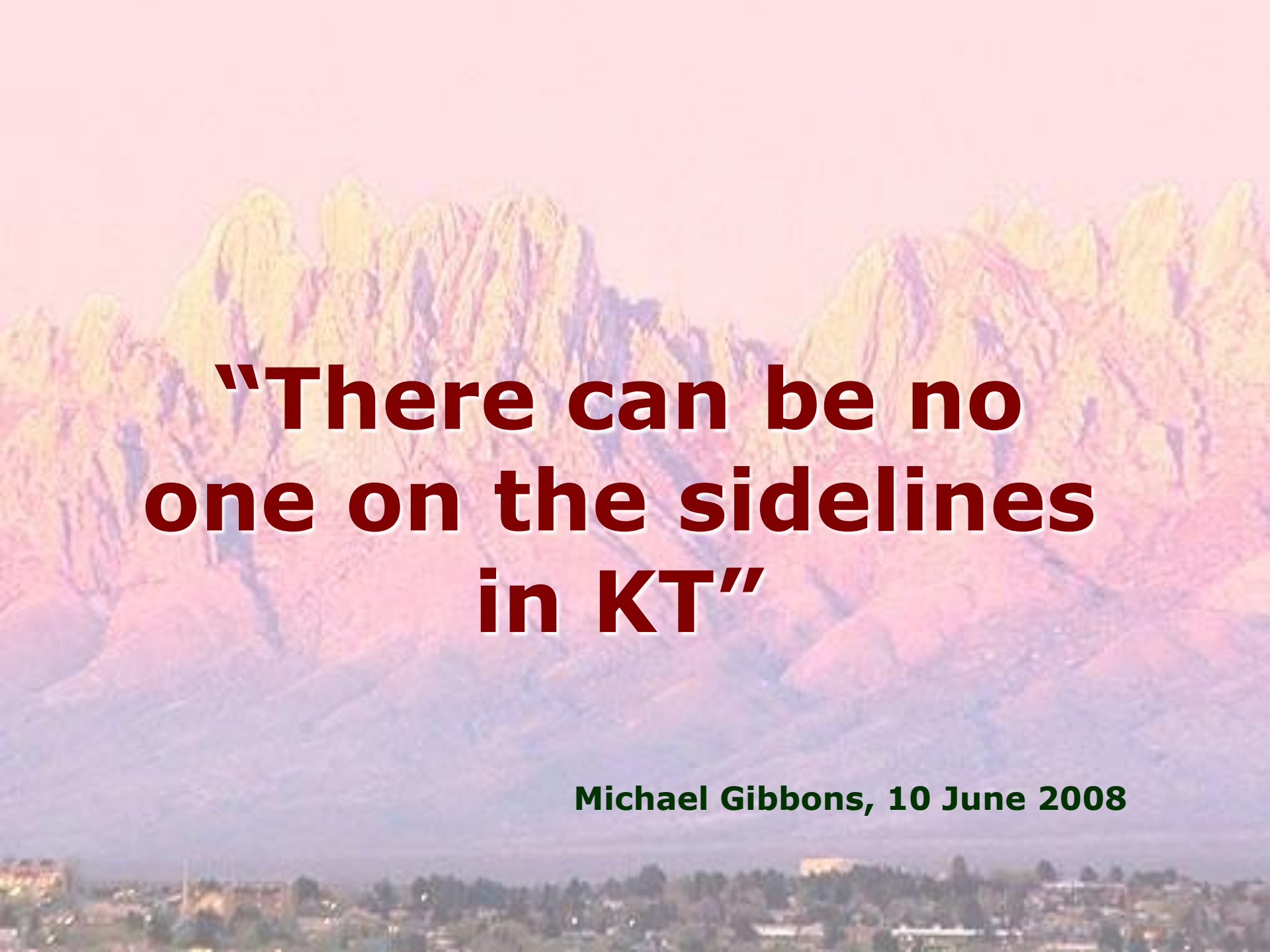
# Next Steps

**1. Develop a working group to investigate the state of economic evaluation in implementation studies**

**2. Suggested tasks for the working group:**

- ✓ **Perform a review of implementation science literature (we will have to narrow the scope of this to be doable)**
- ✓ **Write a paper outlining the results of the review (publication venue to be determined)**
- ✓ **Report progress back to group at KU09**





**“There can be no  
one on the sidelines  
in KT”**

**Michael Gibbons, 10 June 2008**

**Count me in!**



