

# To Do or Not To Do: determining effectiveness and appropriateness of surgery

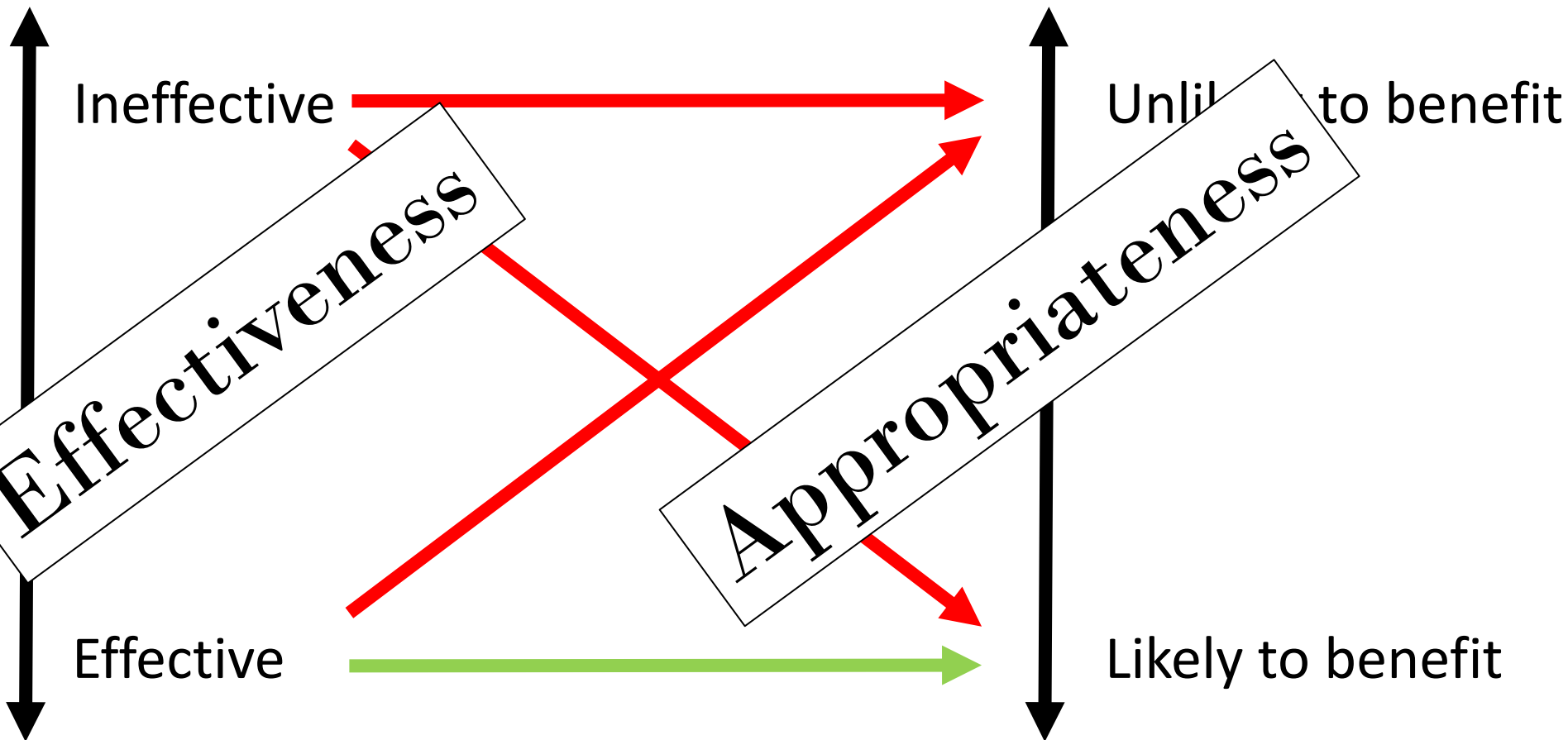
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# Interventions

# Patients



# Ideal

1. Reduce / eliminate **ineffective** procedures
2. Evaluate procedures with **unknown effectiveness**
3. Apply **effective** procedures efficiently & appropriately

# 1. Reducing **ineffective** procedures

# Knee arthroscopy, aged >50, SWSLHD

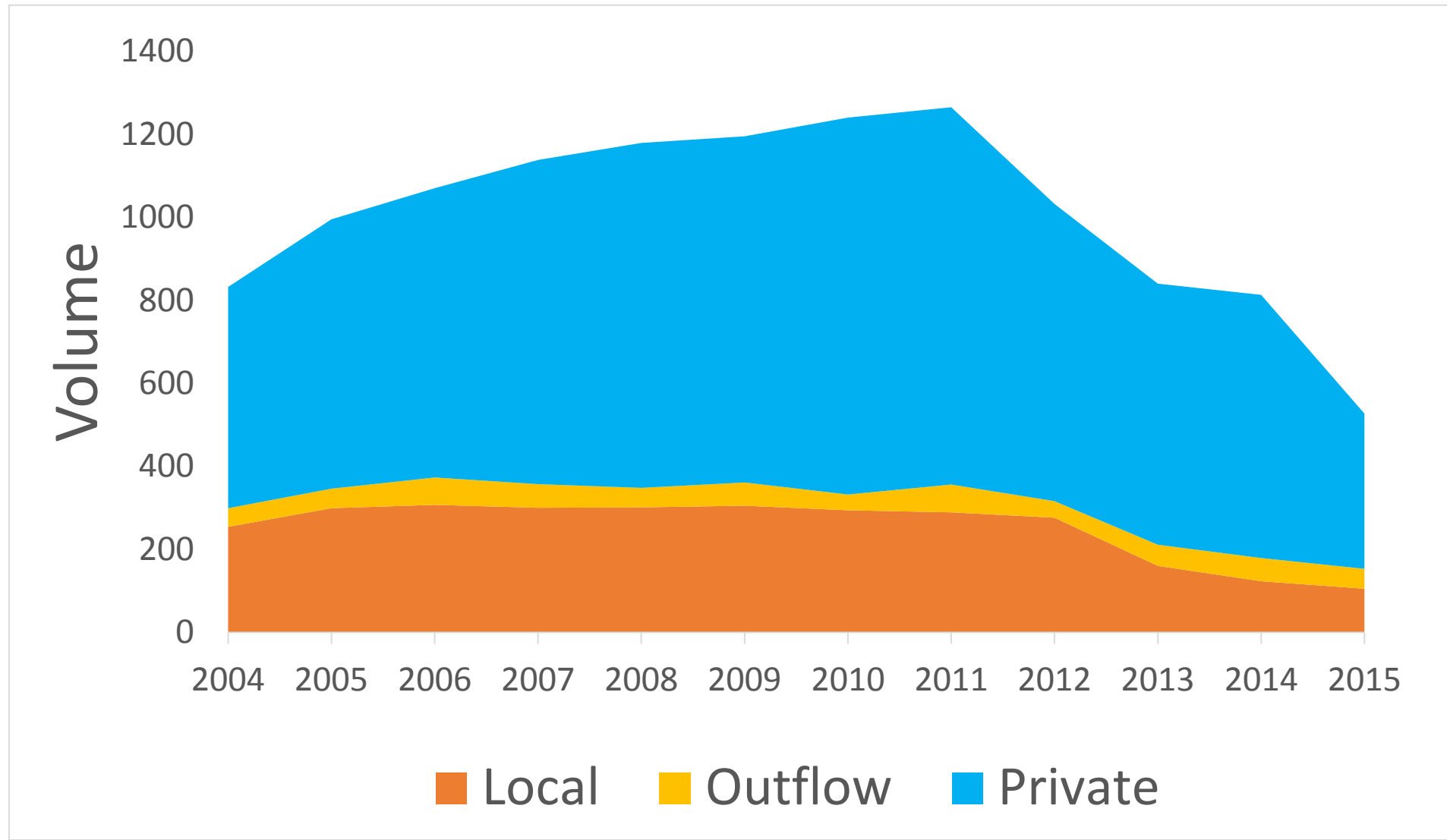
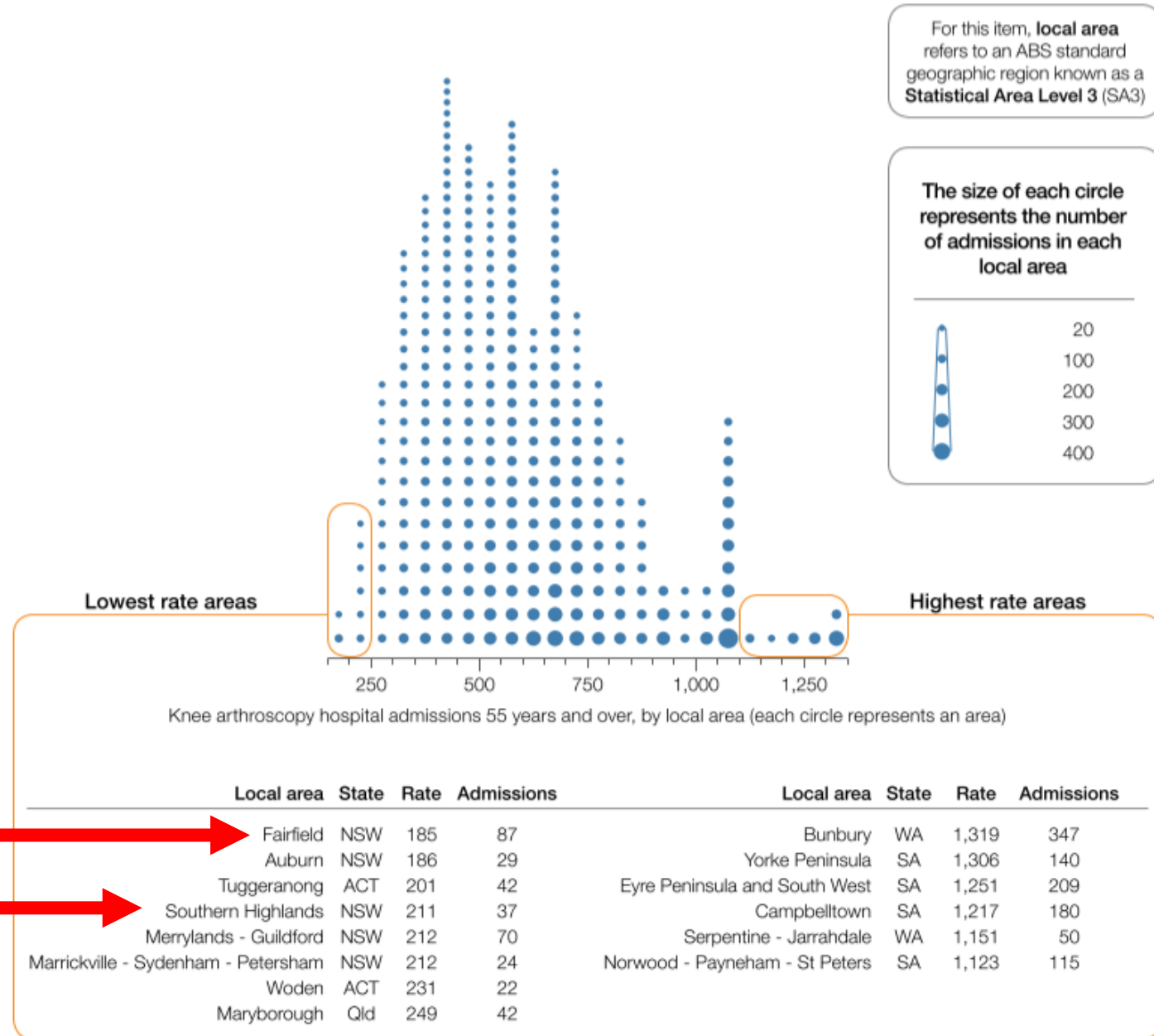


Figure 29: Number of knee arthroscopy admissions to hospital per 100,000 people aged 55 years and over, age standardised, by local area, 2012–13



# How did it work?

- Scientific justification
- Clinician led change

## Guest editorial

# Routine knee arthroscopic surgery for the painful knee in middle-aged and old patients—time to abandon ship

### Editorials

## Arthroscopy to treat osteoarthritis of the knee?

Rachelle Buchbinder and Ian A Harris

Med J Aust 2012; 197 (7): 364-365.

doi: 10.5694/mja12.11201

### Practice Pointer

## Management of degenerative meniscal tears and the role of surgery

BMJ 2015 ; 350 doi: <https://doi.org/10.1136/bmj.h2212> (Published 04 June 2015)

## Guest Editorial

# Arthroscopy for degenerative knee—a difficult habit to break?



Siemieniuk, Harris et al, BMJ 11 May 2017

## **Arthroscopic surgery for degenerative knee arthritis and meniscal tears**

- “... strong recommendation against the use of arthroscopy in nearly all patients with degenerative knee disease ... further research is unlikely to alter this recommendation”
- Healthcare administrators and funders may use the number of arthroscopies performed in patients with degenerative knee disease as an indicator of quality care.

## Population



People with degenerative knee disease

Including people with or without:

Radiographic evidence of osteoarthritis <sup>i</sup>

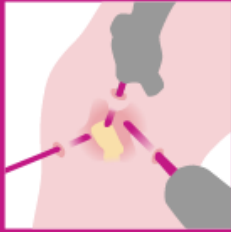
Mild to severe osteoarthritis

Mechanical symptoms <sup>i</sup>

Acute onset knee pain <sup>i</sup>

Meniscal tears <sup>i</sup>

## Choice of intervention



### Arthroscopic surgery

Arthroscopic surgery with or without partial meniscectomy or debridement

or



### Conservative management

Any conservative management strategy (exercise therapy, injections, drugs)

## Recommendations

Favours arthroscopic surgery

Favours conservative management

Applies to



All

Strong

Weak

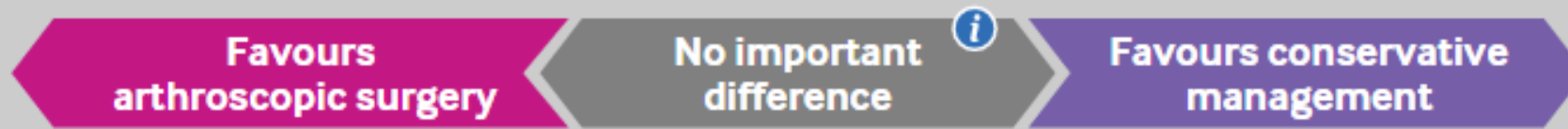
Weak <sup>i</sup>

Strong <sup>i</sup>

Click for details 

We recommend against arthroscopic knee surgery in patients with degenerative knee disease

## Comparison of benefits and harms



### Long term benefits (1–2 years)

Mean score (0–100, high better)

### Evidence quality

Outcome	Arthroscopic surgery	Comparison	Conservative management	Evidence quality	More
Pain	21.9	No important difference	18.8	★★★★ High	More ▼
Function	13.3	No important difference	10.1	★★★★ Moderate	More ▼

### Short term benefits (<3 months)

Mean score (0–100, high better)

Outcome	Arthroscopic surgery	Comparison	Conservative management	Evidence quality	More
Pain	20.4	5.38 higher	15.0	★★★★ High	More ▼
Function	14.2	4.94 higher	9.3	★★★★ Moderate	More ▼

### Short term harms (<3 months)

Events per 1000 people

Outcome	Arthroscopic surgery	Comparison	Conservative management	Evidence quality	More
Venous thromboembolism	5	5 fewer	0	★★★★ Low	More ▼
Infection	2	2 fewer	0	★★★★ Low	More ▼

## Key practical issues

### Arthroscopic surgery

Performed by a surgeon, in an operating theatre

Recovery typically between 2 to 6 weeks

At least 1–2 weeks off work, depending on speed of recovery and physical demands of job

### Conservative management

May be performed in hospital or the community

No recovery time

Time off work may be required for appointments, such as physiotherapy and injections

## Preferences and values

The panel believes that almost everyone would prefer to avoid the pain and inconvenience of the recovery period after arthroscopy, since it offers only a small chance of a small benefit.

## Resourcing

Arthroscopy is not cost-effective from a societal perspective.

# The Urgent Need for Evidence in Arthroscopic Meniscal Surgery

## A Systematic Review of the Evidence for Operative Management of Meniscal Tears

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AJSM 2016: “No difference was found between arthroscopic meniscal debridement compared with nonoperative management”

“further evidence is required to determine which patient groups have good outcomes from each intervention ... more research is urgently needed to support ... meniscal surgery”

# Lubowitz, Arthroscopy, 2014 (editorial)

“patients who may not be of entirely sound mind are selected as research subjects [in placebo-controlled surgical studies], and research performed on such individuals would not be generalizable to mentally healthy patients”

# How do surgeons change practice?

Health Systems and Policy Research  
ISSN 2254-9137

**2016**

Vol. 3 No. 1:6

**Evidence and the Drivers of Variation  
in Orthopaedic Surgical Work: A Mixed  
Methods Systematic Review**

**Grove A<sup>1</sup>, Johnson R<sup>2</sup>,  
Clarke A<sup>2</sup> and Currie G<sup>3</sup>**

# Keys to practice change

- Evidence, preferably locally produced
- Initiation by key players
- Local decisions
- Acceptance by colleagues

- Gradual, person, 'line-of-sight' change

**CLINICIAN INVOLVEMENT**



# How else can we reduce **ineffective** procedures?

- Financial and regulatory (state and federal, insurers)
- Education (public, professional)

Overuse  
When Less

JAMA

ices



Choosing Wisely

Allison Lipitz-Snyderman



Foundation

Series

Evidence for overuse of medical services around the world

Shannon Brownlee  
Glasziou, FRACGP  
Deborah Korenstein

THE LANCET

MD, Prof Paul  
Chalmers, BSc,

# 1. Reducing **ineffective** procedures - summary

- High quality evidence

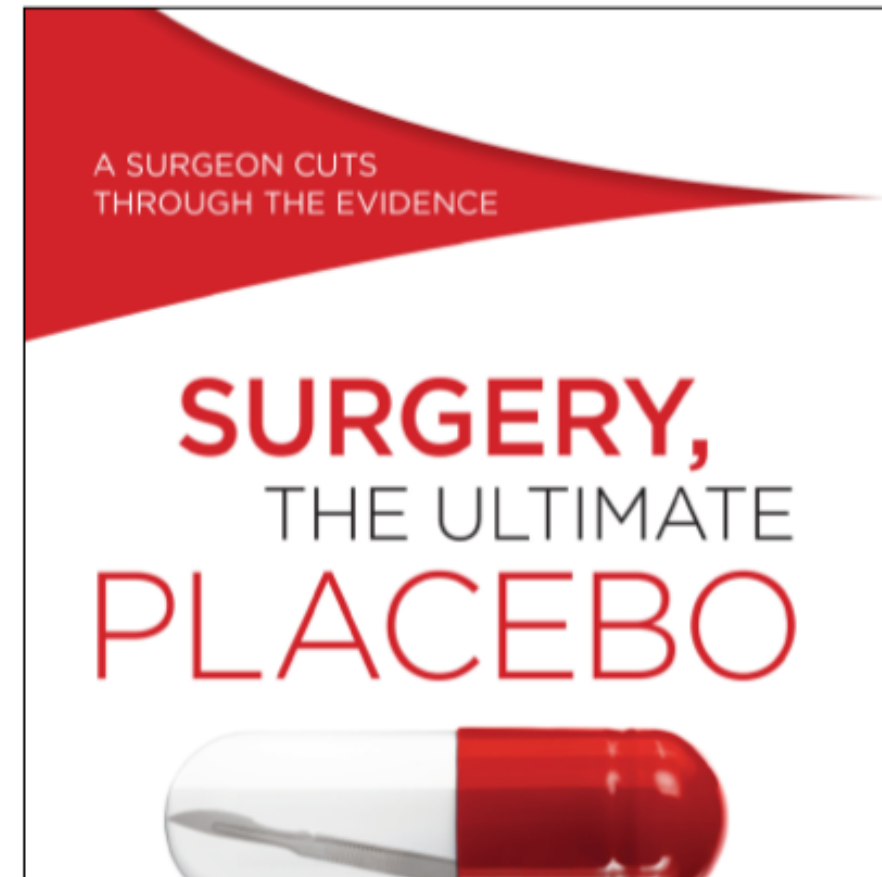
a scientific process

- Practice change

a social process

## 2. Evaluating procedures of **unknown effectiveness**

# Understanding biases and evidence



Narrative review

Countering cognitive biases in minimising low value care

Ian A Scott<sup>1,2</sup>, Jason Soon<sup>3</sup>, Adam G Elshaug<sup>4</sup>, Robyn Lindner<sup>5</sup>

# Empirical evidence of overestimation of benefit


[Review](#) | Less Is More

March 2017

## **Clinicians' Expectations of the Benefits and Harms of Treatments, Screening, and Tests**

A Systematic Review

## Discordance Between Patient and Surgeon Satisfaction After Total Joint Arthroplasty

[Ian A. Harris](#), MMed(Clin Epi), PhD, FRACS(Ortho) , [Anita M. Harris](#), MBBS, LLB, [Justine M. Naylor](#), BAppSc(Phty), PhD, [Sam Adie](#), MBBS, MSpMed, MMed(Clin Epi), [Rajat Mittal](#), MBBS, MS, [Alan T. Dao](#), MBBS

# CONSORT Compliance in Surgical Randomized Trials

## *Are We There Yet? A Systematic Review*

*Sam Adie, BSc(Med), MBBS, MSpMed, MPH, Ian A. Harris, MBBS, MMed(Clin Epi), PhD, FRACS, Justine M. Naylor, BAppSc, PhD, and Rajat Mittal, BSc(Med), MBBS, MS, MMed(Clin Epi)*

# Quality of Conduct and Reporting of Meta-analyses of Surgical Interventions

*Sam Adie, PhD, MBBS, MSpMed, MPH, BSc (Med),\*† David Ma, MBBS, BSc (Med),\*  
Ian A. Harris, PhD, MBBS, MMed (Clin Epi), FRACS,\*† Justine M. Naylor, PhD, BAppSc,\*†  
and Jonathan C. Craig, PhD, MBChB, DCH, MM‡§*

# The unpredictability paradox: review of empirical comparisons of randomised and non-randomised clinical trials

Regina Kunz, Andrew D Oxman

## Systematic Review of the Empirical Evidence of Study Publication Bias and Outcome Reporting Bias

Kerry Dwan<sup>1\*</sup>, Douglas G. Altman<sup>2</sup>, Juan A. Arnaiz<sup>3</sup>, Jill Bloom<sup>4</sup>, An-Wen Chan<sup>5</sup>, Eugenia Cronin<sup>6</sup>, Evelyne Decullier<sup>7</sup>, Philippa J. Easterbrook<sup>8</sup>, Erik Von Elm<sup>9,10</sup>, Carrol Gamble<sup>1</sup>, Davina Gherzi<sup>11</sup>, John P. A. Ioannidis<sup>12,13</sup>, John Simes<sup>14</sup>, Paula R. Williamson<sup>1</sup>

Empirical evidence of bias in treatment effect estimates in controlled trials with different interventions and outcomes: meta-epidemiological study



# Introducing new technologies

 Perspectives

## Double standards in clinical practice ethics

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# What Is the Benefit of Introducing New Hip and Knee Prostheses?

# IDEAL collaborative

	1 Idea	2a Development	2b Exploration	3 Assessment	4 Long-term study
Purpose	Proof of concept	Development	Learning	Assessment	Surveillance
Number and types of patients	Single digit; highly selected	Few; selected	Many; may expand to mixed; broadening indication	Many; expanded indications (well defined)	All eligible
Number and types of surgeons	Very few; innovators	Few; innovators and some early adopters	Many; innovators, early adopters, early majority	Many; early majority	All eligible
Output	Description	Description	Measurement; comparison	Comparison; complete information for non-RCT participants	Description; audit, regional variation; quality assurance; risk adjustment
Intervention	Evolving; procedure inception	Evolving; procedure development	Evolving; procedure refinement; community learning	Stable	Stable
Method	Structured case reports	Prospective development studies	Research database; explanatory or feasibility RCT (efficacy trial); disease based (diagnostic)	RCT with or without additions/modifications; alternative designs	Registry; routine database (eg, SCOAP, STS, NSQIP); rare-case reports
Outcomes	Proof of concept; technical achievement; disasters; dramatic successes	Mainly safety; technical and procedural success	Safety; clinical outcomes (specific and graded); short-term outcomes; patient-centred (reported) outcomes; feasibility outcomes	Clinical outcomes (specific and graded); middle-term and long-term outcomes; patient-centred (reported) outcomes; cost-effectiveness	Rare events; long-term outcomes; quality assurance

# How much of surgery is effective?

OPEN ACCESS Freely available online



## Randomised Trial Support for Orthopaedic Surgical Procedures

Hyeung C. Lim<sup>1\*</sup>, Sam Adie<sup>1,2</sup>, Justine M. Naylor<sup>1,2,3</sup>, Ian A. Harris<sup>1,2,3</sup>

# Determining effectiveness

- What surgery historically relies on
  - Biologically plausible mechanism
  - Laboratory evidence
  - Observational studies
- What should be used to determine effectiveness
  - The method with the least error

Evaluating effectiveness – too hard?

## Registry-Based Pragmatic Trials in Heart Failure: Current Experience and Future Directions

Lars H. Lund<sup>1,2</sup> • Jonas Oldgren<sup>3</sup> • Stefan James<sup>3</sup>

VIEWPOINT

### The Platform Trial

An Efficient Strategy for Evaluating  
Multiple Treatments

What's the alternative?

## 2. Evaluating procedures of **unknown effectiveness**

- Without high quality evidence, effectiveness is uncertain
- Generate quality evidence, *with or prior to* introduction

### 3. Allocating **effective** procedures efficiently

Improving value of effective procedure

Improving quality, safety and cost

# How to improve **value** for joint replacement

- Improve outcomes
  - Revision surgery
  - Patient readmission
  - Patient reported outcomes
- Reduce costs
  - Length of stay
  - Bed days
  - Rehab

**Appropriateness?**



# Appropriateness in joint replacement

- Hip replacement satisfaction: 95%
- Knee replacement satisfaction: 80%

# Improving effectiveness and appropriateness in surgery

1. Reduce / eliminate **ineffective** procedures
2. Evaluate procedures with **unknown effectiveness**
3. Apply **effective** procedures efficiently & appropriately