



Associate Professor Ian Scott

Director

Department of Internal Medicine and Clinical
Epidemiology, Princess Alexandra Hospital,
Brisbane

Friday, August 12, 2016

(Plenary)

14:20 - 14:40 Minimising Overdiagnosis and Overtreatment - What We
Can Do About It

Waste Not Want Not

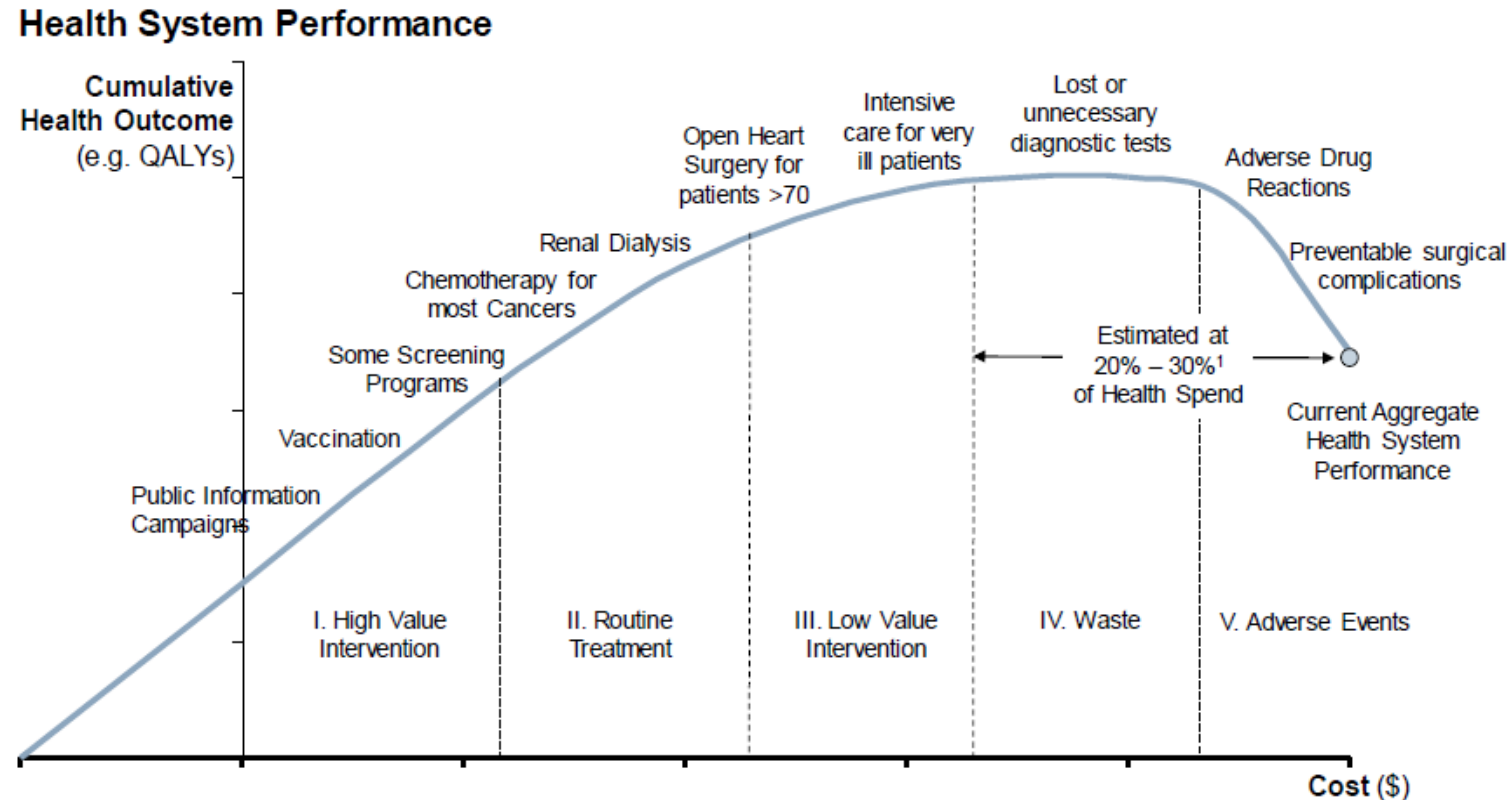
Minimising Overdiagnosis and Overtreatment

What We Can Do About It

Ian Scott

Director of Internal Medicine and Clinical Epidemiology,
Princess Alexandra Hospital
Associate Professor of Medicine,
University of Queensland, Brisbane
Adjunct Associate Professor of Medicine,
Monash University, Melbourne

Value of modern healthcare

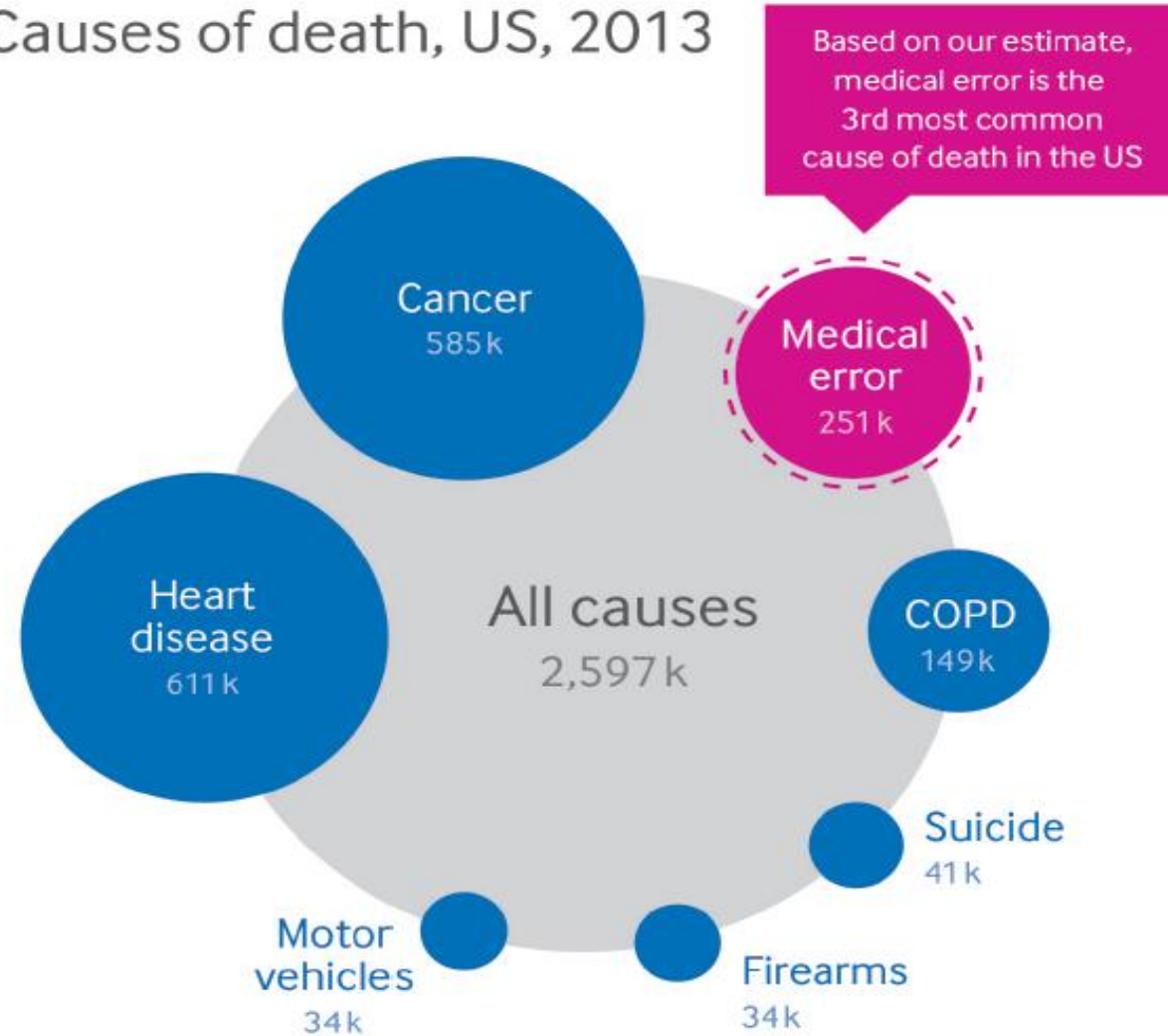


1. Institute of Medicine 2012

Unnecessary services represent about 10% of all U.S. health care spending — nearly \$300 billion a year

Value of modern healthcare

Causes of death, US, 2013



Makary & Daniel
BMJ 2016

Data source:
http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf

Value of modern healthcare

Figure 2: Benefit growth -1983-84 to 2014-15 (\$ billion)

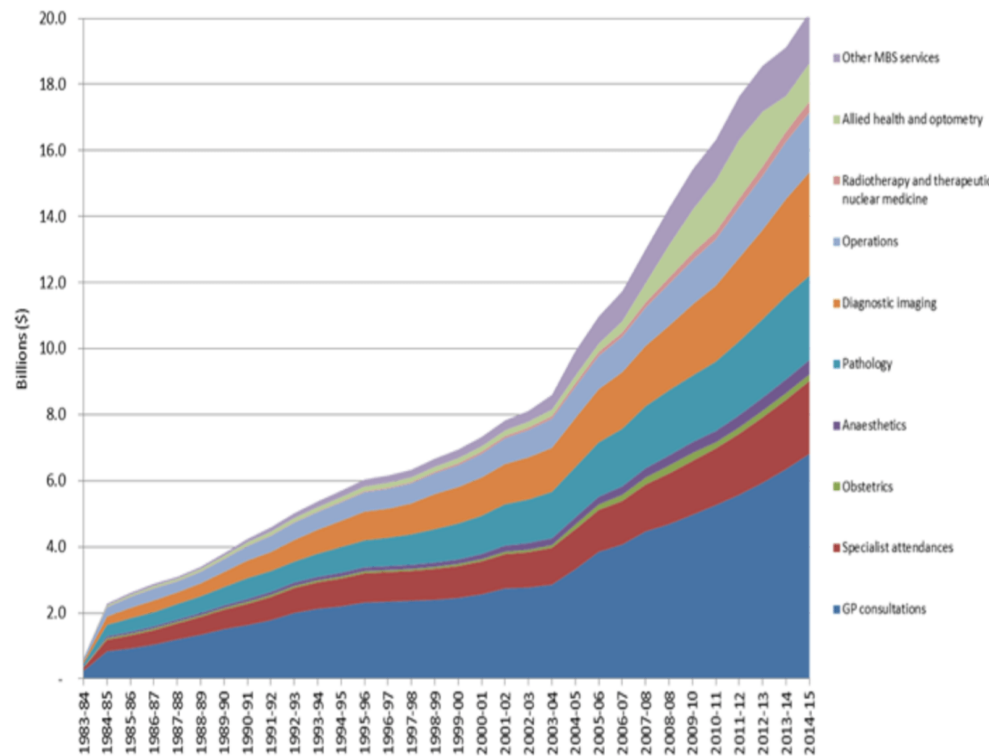
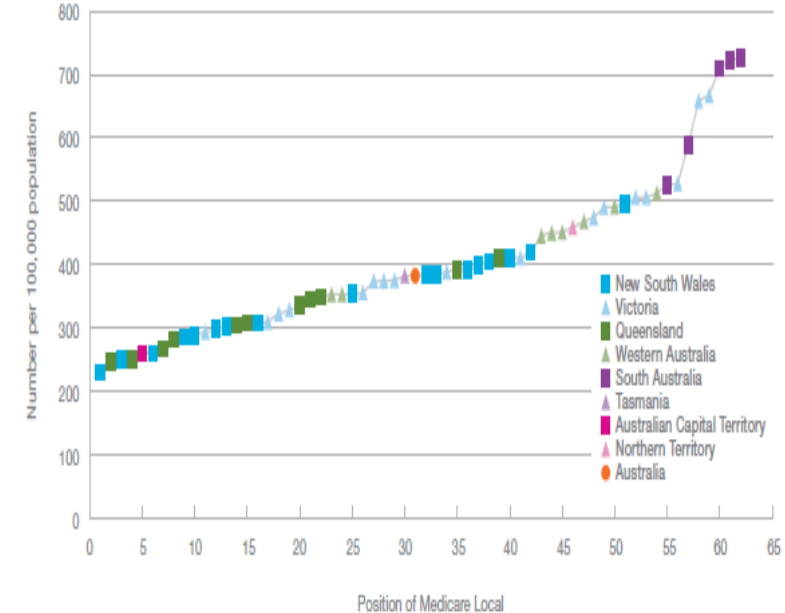


Figure 2: Separations for knee arthroscopy by Medicare Local, age and sex standardised number per 100,000 population

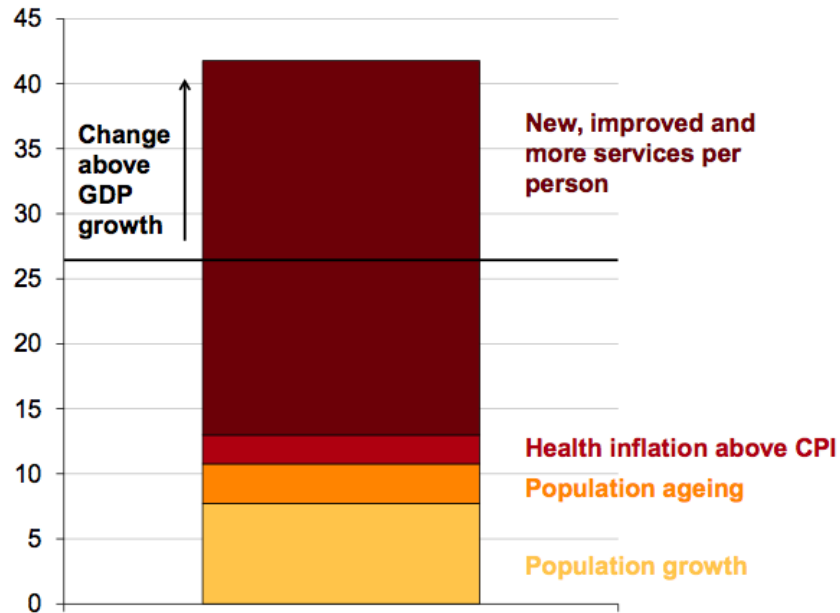


Australian Commission on Safety and Quality in Health Care (ACSQHC).
Medical Practice Variation: Background Paper. Sydney: ACSQHC, 2013.

?30% waste = \$46 billion a year

Drivers of healthcare costs

Figure 9: Change in Australian governments' health expenditure
\$ bn, 2002-03 to 2012-13



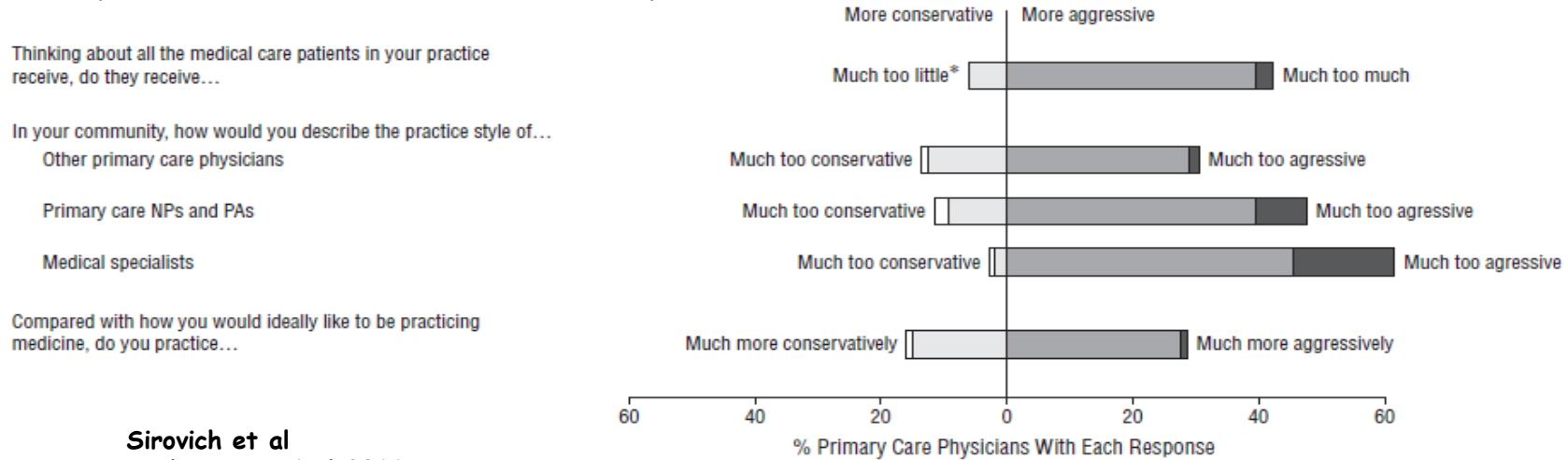
Note: 'Population growth' models the effect of the increase in population size with no change in the age structure or average per capita health expenditure. 'Population ageing' uses age-specific per capita health expenditure data (based on AIHW figures) to model the effect of changes in the population structure. 'Health inflation above CPI' uses appropriate AIHW health price indices to model inflation in each category of expenditure. 'New, improved and more services per person' is the amount of expenditure that cannot be explained by these three factors.

Source: Grattan analysis of AIHW (2012); AIHW (2012); ABS (2013a) Cat. no. 6401.0 Tables 1 and 2; ABS (2013c) Cat. no. 3101.0 Table 59.

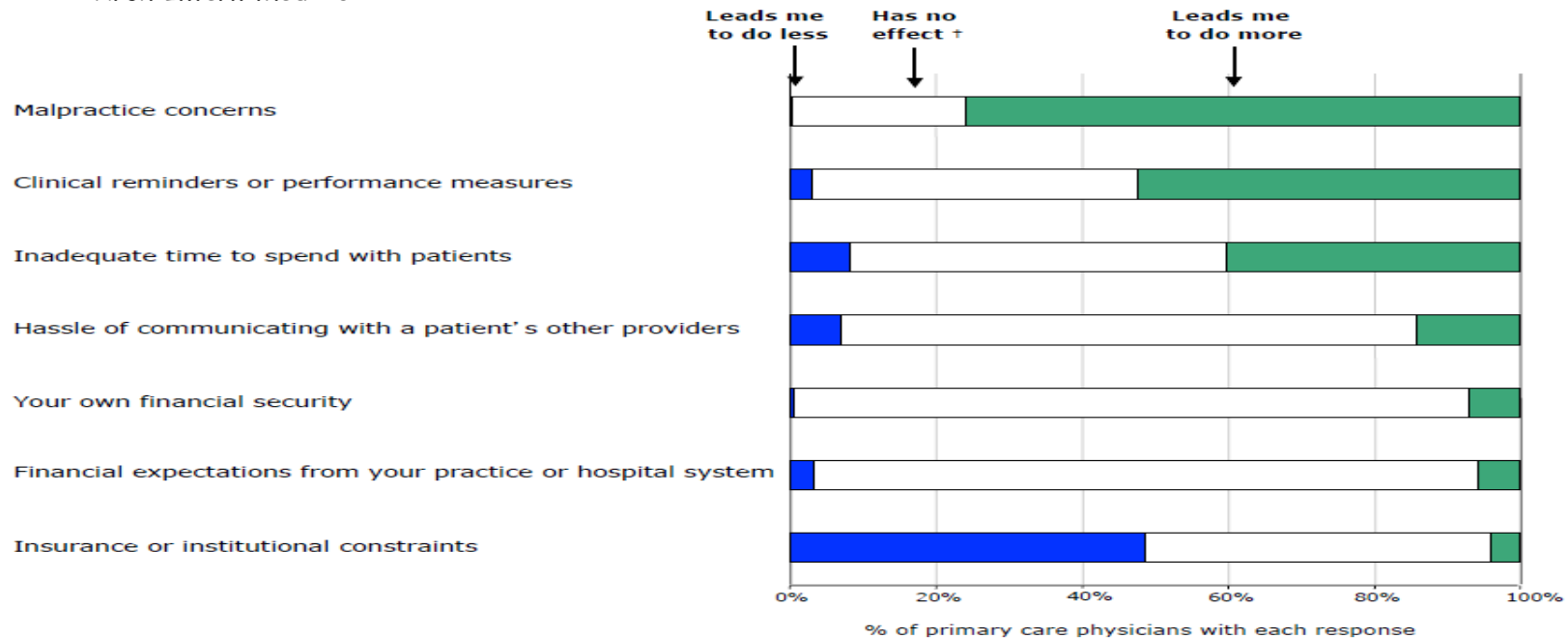
- NOT
 - Population growth
 - 'Ageing population'
 - Cost inflation
 - Falling dollar
- At least 60% of growth in spending is greater use of healthcare technologies
 - Care of proven outcome value
 - Overdiagnosis and overtreatment

Perspectives of US primary care doctors

Survey of 627 doctors: 70% response rate



Sirovich et al
Arch Intern Med 2011



Overdiagnosis

- Being diagnosed with a condition one does have but which, if not identified, would not have caused any harms during one's lifetime
- Incorrect diagnosis of a condition one does not have
 - overdiagnosis until misdiagnosis is defined
 - Stacey et al BMJ 2015
- Prevalence

• Asthma	30%
• Mild hypertension	60%
• Lung cancer	25%
• CKD	20%
• Gestational diabetes	20%
• Breast cancer	42%
• PTE	25%

 - Moynihan et al BMJ 2012

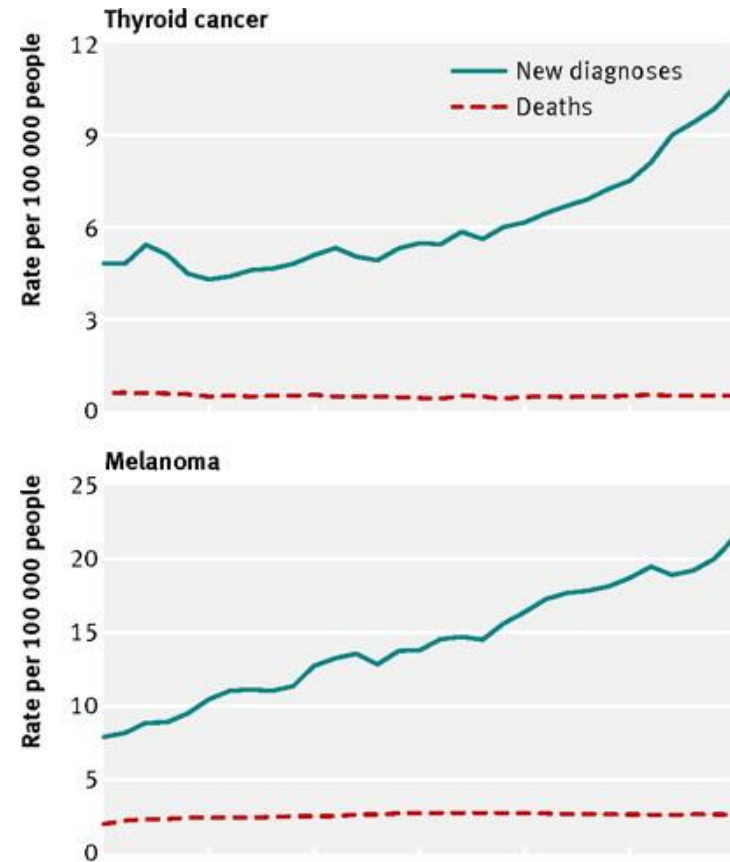
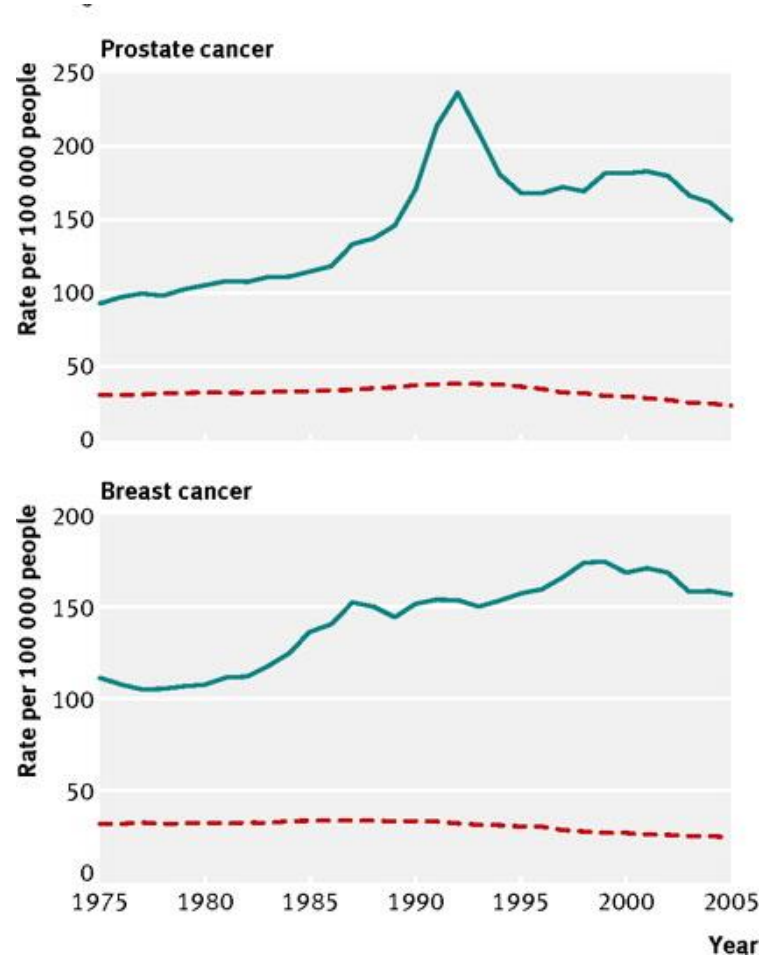
Drivers

- More sensitive diagnostic technological capable of detecting ever smaller “abnormalities”
 - hs-Tn assays, MRI, PET/MRI, cardiac MRI, CTCA, biomarkers, genomics, proteomics
- Expanded disease definitions (often from conflicted guideline panels)
 - Gestational diabetes, dementia, hypertension, osteoporosis, CKD
 - Moynihan et al. *PLoS Med* 2013;10:e1001500.
- Reduced diagnostic confidence of physicians in time-pressured situations resorting to excessive test ordering for patient safety and for reducing liability risk
- Quality incentives that penalise underdiagnosis but not overdiagnosis
 - Intolerance of error and culture of blame
- Health system incentives favouring more tests and treatments
- Commercial and professional vested interests
- Medicalisation of normal variants
 - pseudodiseases (also called disease mongering), such as low testosterone and restless leg syndrome
- Cultural beliefs that more is better; faith in early detection unmodified by its risks

Examples

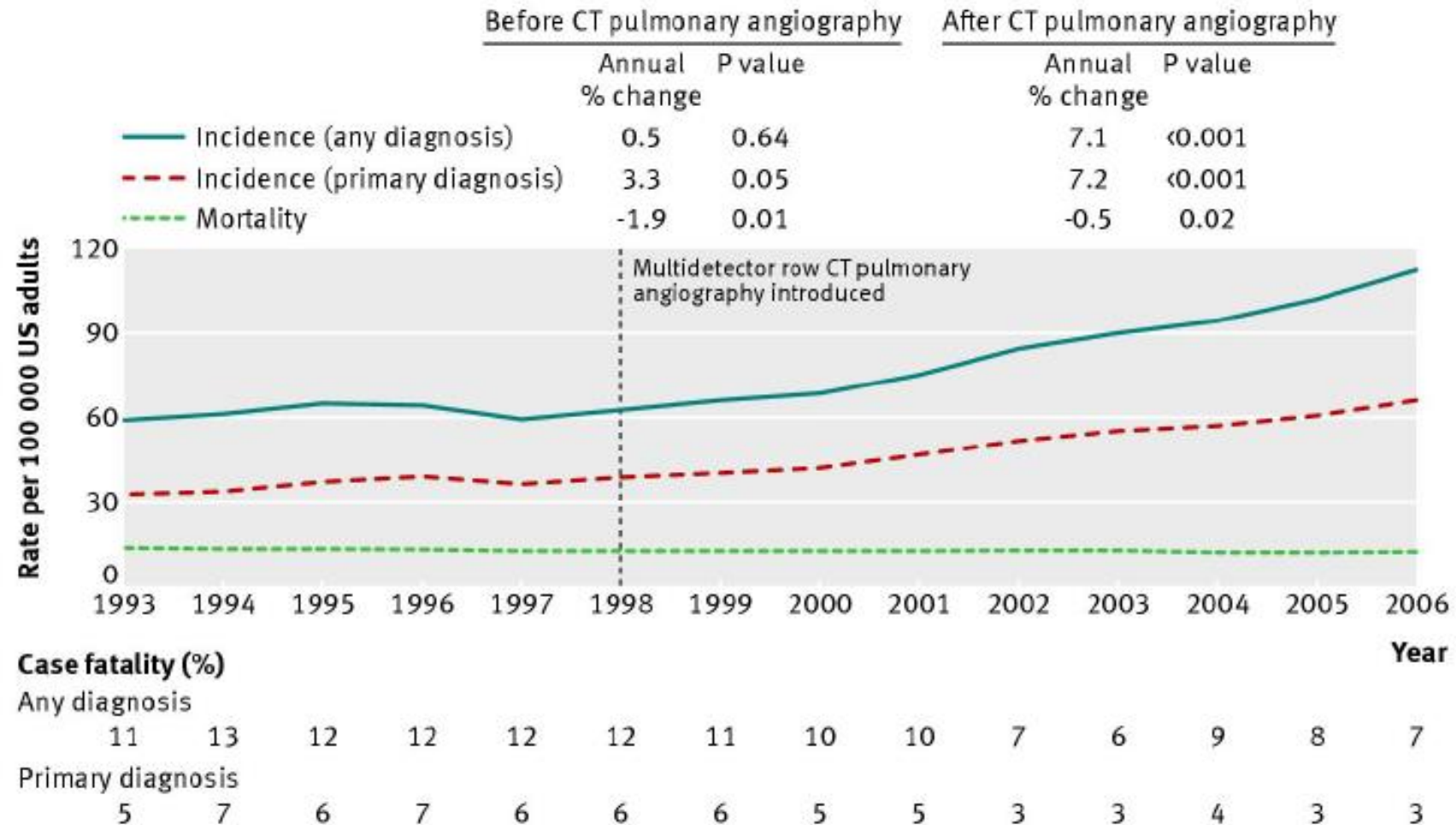
- Screening for asymptomatic carotid stenosis
- Screening pelvic exams in asymptomatic women
- CT/MRI scans for uncomplicated delirium or syncope
- Xrays/CT/MRI scans for uncomplicated lower back pain
- Ultrasound or IVP for uncomplicated pyelonephritis
- BNP in clinically evident congestive heart failure
- Screening for thyroid or prostate cancer in absence of risk factors
- Pre-operative cardiac testing for low risk, non-cardiac procedures

Increased rates of cancer detection



AIHW 2010

Increased rates of PTE detection



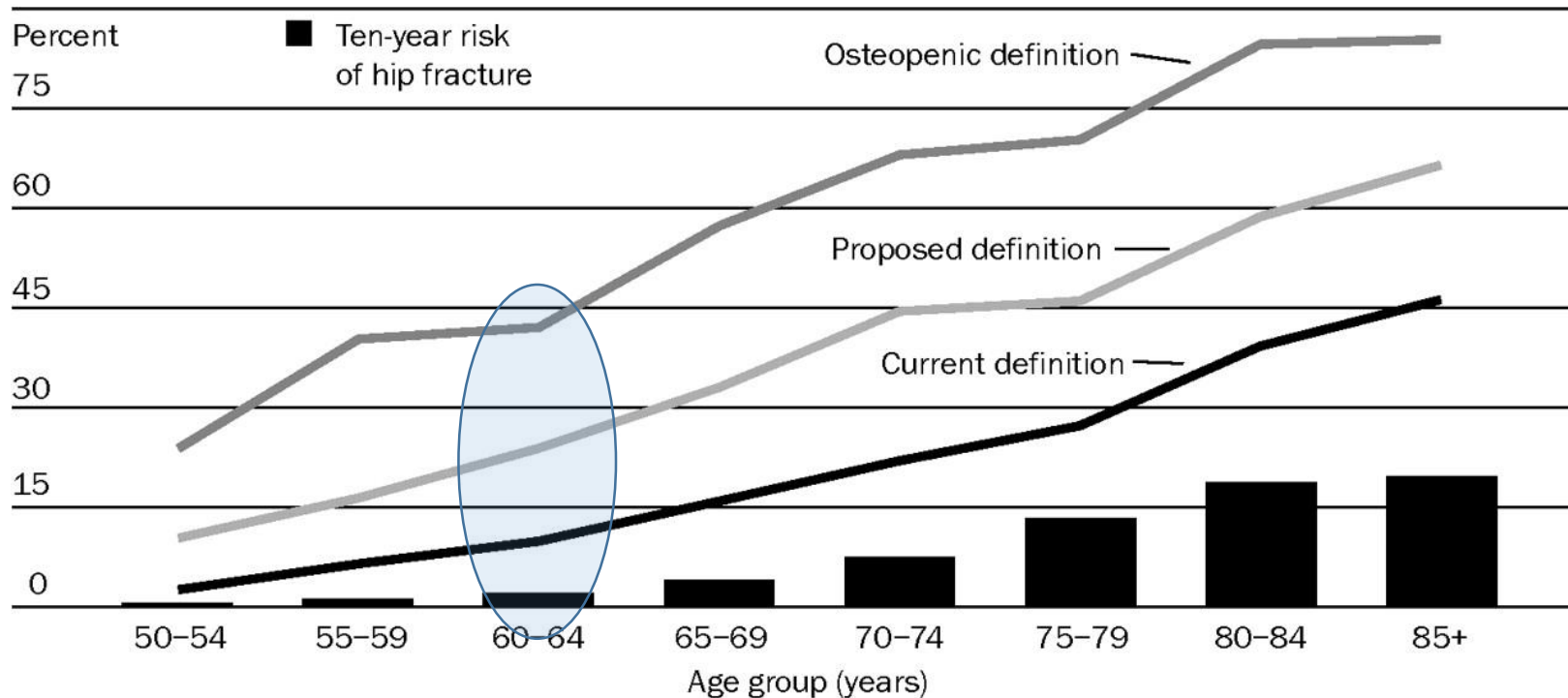
Changing disease definitions

- New criteria for diagnosing gestational diabetes (GDM) by *International Association of Diabetes in Pregnancy Study Group (IADPSG)*
 - increase GDM diagnoses from **6% (WHO)** to **18% (IADPSG)**
 - **Cost** extra \$US2.5 billion/year
 - Based on risk of adverse outcome
 - **NO evidence treatment of new cases improve outcomes**

Changing disease definitions

EXHIBIT 3

Comparison Of Prevalence Of Osteoporosis At Different Disease Definitions, With Ten-Year Risk Of Hip Fracture, For Women Age Fifty And Older, United States, 2000



SOURCE: Authors' analysis of data from the National Health and Nutrition Examination Survey (NHANES III), 1988-94; the 2000 National Inpatient Sample (NIS); and the 2000 U.S. census.

NOTE: For explanation of disease definitions, see text.

Brooke Herndon et al. Health Aff 2007

Consequences

- Psychological and behavioural effects of disease labelling
- Physical harms and side effects of unnecessary tests or treatment
- Quality of life affected by unnecessary treatment
- Hassles of unnecessary tests and treatments
- Increased financial costs to individuals
- Wasted resources and opportunity costs to the health system
- Overmedicalisation of society

Counter strategies

Raise awareness



Conference partners

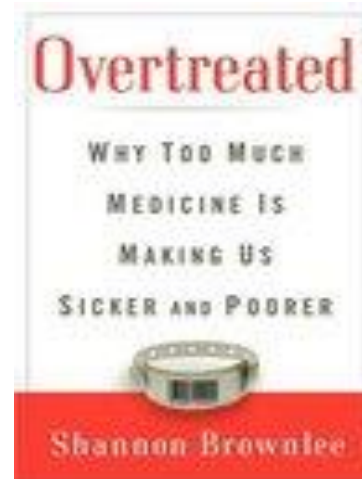
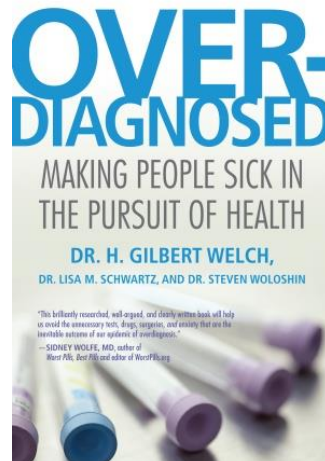
2013 Dartmouth
2014 Oxford
2015 Washington
2016 Barcelona

Home About Readings Conference Blog Contact



LESS IS MORE
- = + MEDICINE

HOME THE IDEA TOOLS BLOG [FRANÇAIS] ABOUT



**Choosing Wisely
Australia**

An initiative of NPS MedicineWise

Launch in April 2015
Now 18 colleges

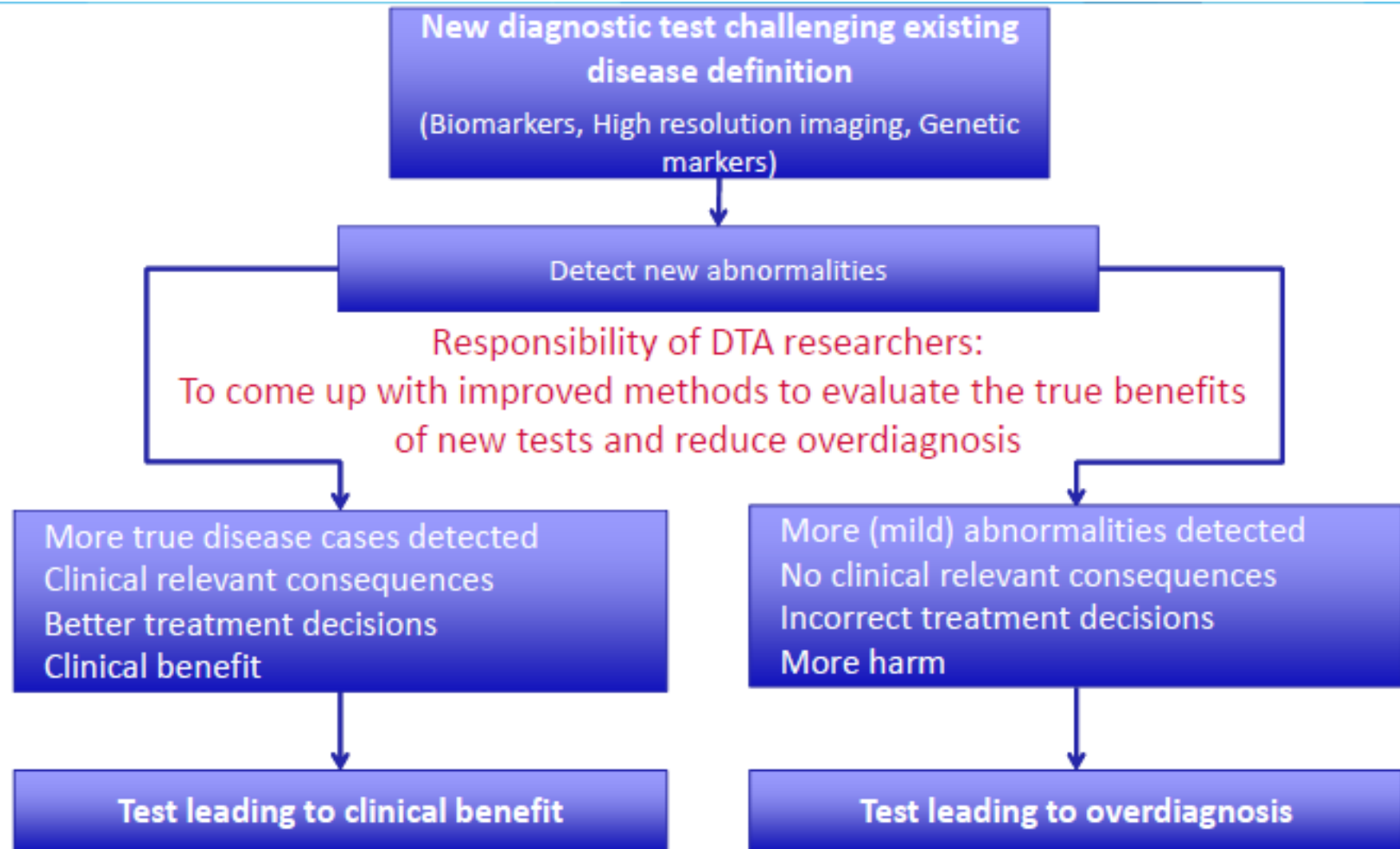
Counter strategies

Question validity of new disease definitions

- Insist on validation of any new disease definition and its natural history before expanding indications for listed tests and treatments
 - Events or outcomes important to patients
 - Identify predictors for such outcomes
 - Evidence that intervention favourably alters natural history

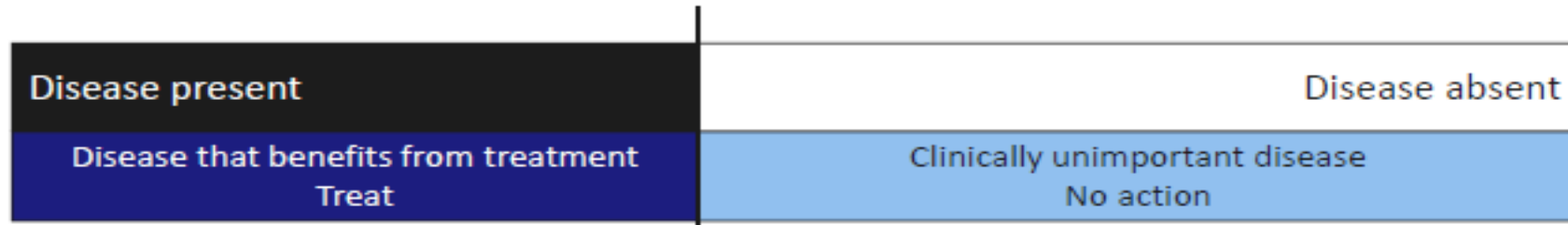
Counter strategies

Assess utility of new tests



Counter strategies

Assess utility of new tests

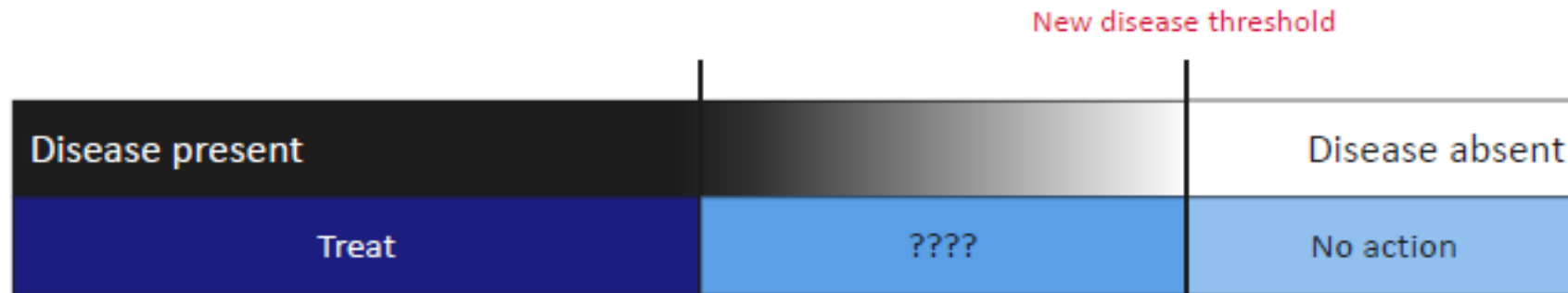


Disease threshold



Newly detected abnormalities

Disease threshold



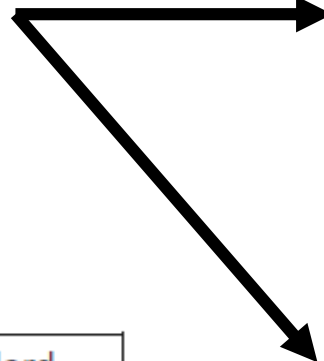
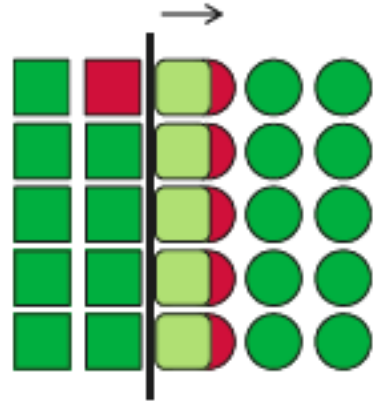
New disease threshold

Disease threshold

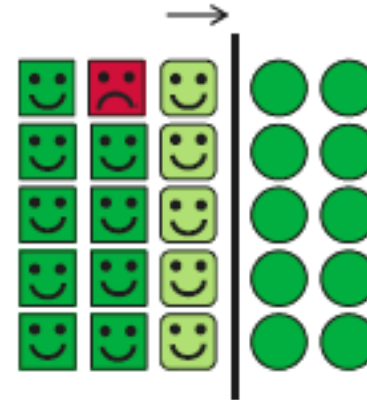
Counter strategies

Assess utility of new tests

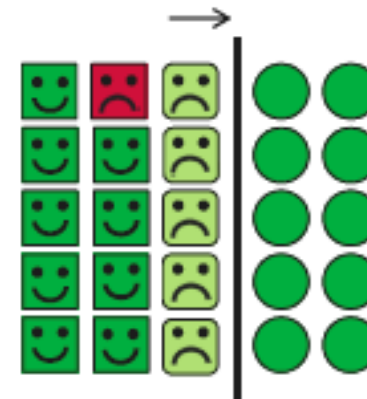
Disease threshold →



Disease threshold →



Disease threshold →



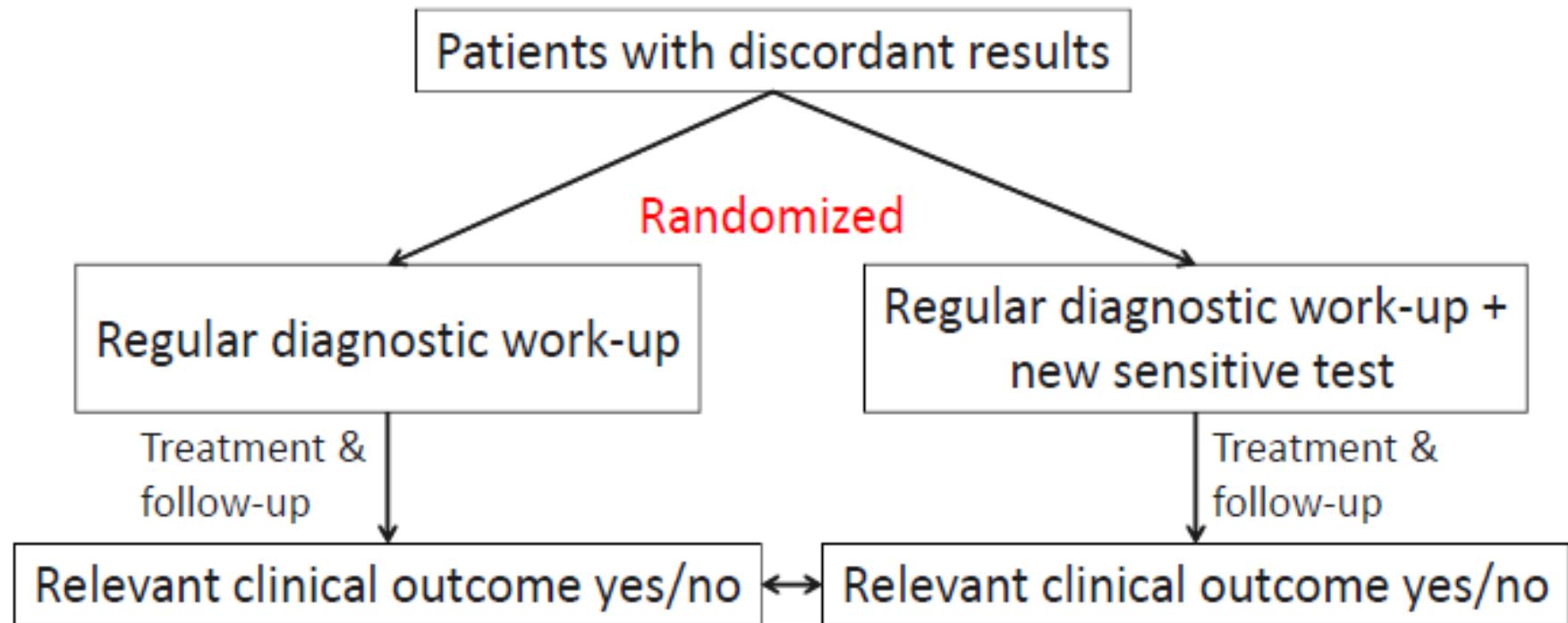
	Current Reference Standard	
	Disease present	Disease absent
New test positive	True Positive	False Positive
New test negative	False Negative	True Negative

Discordant results

Traditional performance statistics
Sn, Sp, PV and LR do not help

Counter strategies

Assess utility of new tests



Counter strategies

Shared decision-making

- Survey of 500 randomly selected Australians
 - 44% response rate
- Only 10% reported ever being told about overdiagnosis by a doctor
- 18% of men who reported having prostate cancer screening, and 10% of women who reported having mammography said they were told about overdiagnosis.
- 93% agreed that along with screening benefits, people should be informed about overdiagnosis
- In regards to panels setting disease definitions, 78% felt ties to pharmaceutical companies inappropriate

- Moynihan et al PLoS One 2015

Counter strategies

Shared decision-making

- Patients overestimate benefits and underestimate harms of screening tests, treatments
 - Hoffman & Del Mar JAMA Intern Med 2015
- Informing patients using decision aids, personalised estimates of benefit and harm often dampens enthusiasm
 - Stacey et al Cochrane Database Syst Rev 2014
- Majority of law suits, even in cases of missed diagnosis, relate to poor communication and interpersonal failures
 - Vincent et al Lancet 1994

Vignette	Patients (n = 203) ^b		
	No. (%)	95%	CI
Headache: patient A has a headache and is worried about brain cancer, asks PCP for CT scan			
Part 1: PCP does not recommend or order a CT	72 (36.2)	29.5-43.3	
Part 2: PCP explains potential harms of CT radiation exposure	103 (51.2)	44.1-58.3	
Part 3: patient A seeks a second opinion from a different doctor who orders a CT scan	60 (30.0)	23.6-36.7	
Upper respiratory infection: patient B has a runny nose, headaches, no fever and asks PCP for antibiotics			
Part 1: PCP does not prescribe antibiotics	132 (65.7)	58.7-72.2	
Part 2: PCP explains American Academy of Family Physician guidelines, which do not recommend antibiotics for sinus infections	161 (80.5)	74.3-85.8	

Patients who rated care as very good to excellent

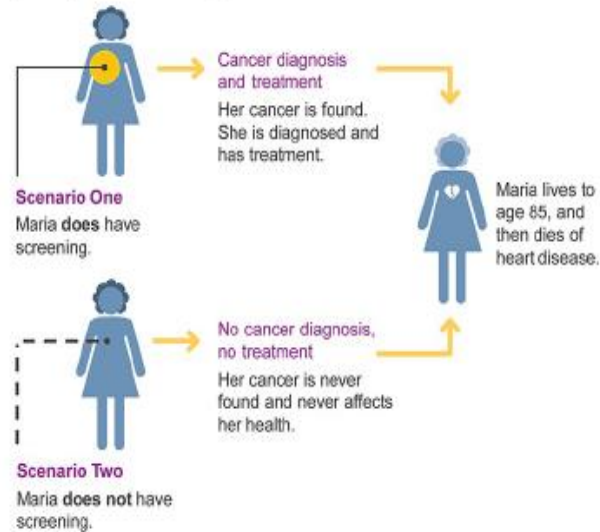
Warner et al
JAMA Intern Med
2016

Counter strategies

Shared decision-making

Over-detection: an example

Imagine a woman called Maria who develops a small, slow-growing breast cancer in her 50s or 60s. The picture below shows two possible scenarios that could happen to Maria: Scenario 1 (top) is with screening, and Scenario 2 (bottom) is without screening.



Maria's life span is the same, whether or not she has screening. So if she has screening, she experiences over-detection (a diagnosis and treatment she does not need).

Putting it together

For women in Australia who have breast screening over 20 years:

4 out of 1000 women avoid dying from breast cancer, and 19 out of 1000 women experience over-detection.

So that means **more women experience over-detection than avoid dying from breast cancer.**

2. Screening leads to finding some breast cancers that are not harmful (over-detection)*

The cancers found by screening are treated to try and prevent problems later. But some cancers found by screening would never cause problems anyway. Cancers like this may grow very slowly or just stay the same. Without screening, they would never be noticed or cause any trouble. **Finding these cancers through screening is called over-detection (or over-diagnosis).**

Even after further checks and examination, doctors cannot be sure which cancers will be harmless. Therefore, treatment is recommended. So, across all the women who have screening, some end up having treatment they do not need.

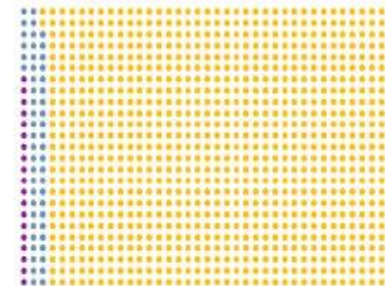
Breast cancer treatments include surgery, radiotherapy, hormone therapy, and chemotherapy. There are important side effects to these treatments which are described on page 8.

Over-detection over 20 years of screening

Out of 1000 women who have breast screening for 20 years, 73 women are diagnosed with breast cancer.

Of these,

- 19 women experience over-detection: they are diagnosed and treated for a cancer that would not have caused any trouble and
- 54 women are diagnosed with breast cancer that is not over-detection.



- extra woman diagnosed with breast cancer due to over-detection
- woman diagnosed with breast cancer that is not over-detection
- woman not diagnosed with breast cancer

As this information is new, there is an example of over-detection on the next page.

Counter strategies

Repudiate disease mongering



Do you hate someone
else's appearance?

Is it making you miserable? Ruining a relationship?
You may have Body Dysmorphic Disorder by proxy.
Contact us to learn about research and therapy options.

  (617)643-6204
mghocd.org/bddbp

*Consent is being used for illustrative purposes only and any person depicted in the content is a model.

Overtreatment

- Treatment that is unwarranted because of:
 - Overdiagnosis
 - Misdiagnosis
 - Evidence of harm or no benefit
 - Unfavourable risk–benefit trade-offs
 - within the context of a patient's illness severity, age, co-morbidities, physical and mental function, life expectancy, care goals and personal preferences
 - Disproportionate cost

Drivers

- Newer treatments with putative better toxicity profiles and patient acceptability
- Expanded indications ('indication creep')
 - Changing disease definitions
 - Extrapolation of trial results to excluded or non-studied populations
- Commercial and professional vested interests
- Quality and legal incentives that penalise under-treatment but not overtreatment
 - Intolerance of error and culture of blame
- Health system incentives favouring more treatments
- Cultural beliefs that more is better; faith in early or more aggressive treatment
- Preference for quick technical fix rather than more challenging lifestyle change

Overtreatment

Harmful or ineffective interventions

- Between 30% and 50% of trials which test established practices show little or no benefit in contradiction to prevailing assumptions
 - Prasad et al. Arch Intern Med 2011
- Such discredited practices tend to persist
 - sustained sometimes by vested interests
 - more often by strongly held professional beliefs and biases
 - Scott & Elshaug Intern Med J 2013
- More than 150 high-volume MBS items are ineffective or of unproven value
 - Elshaug et al. Med J Aust 2012
 - Only 3% of MBS items subject to formal evaluation

Overtreatment

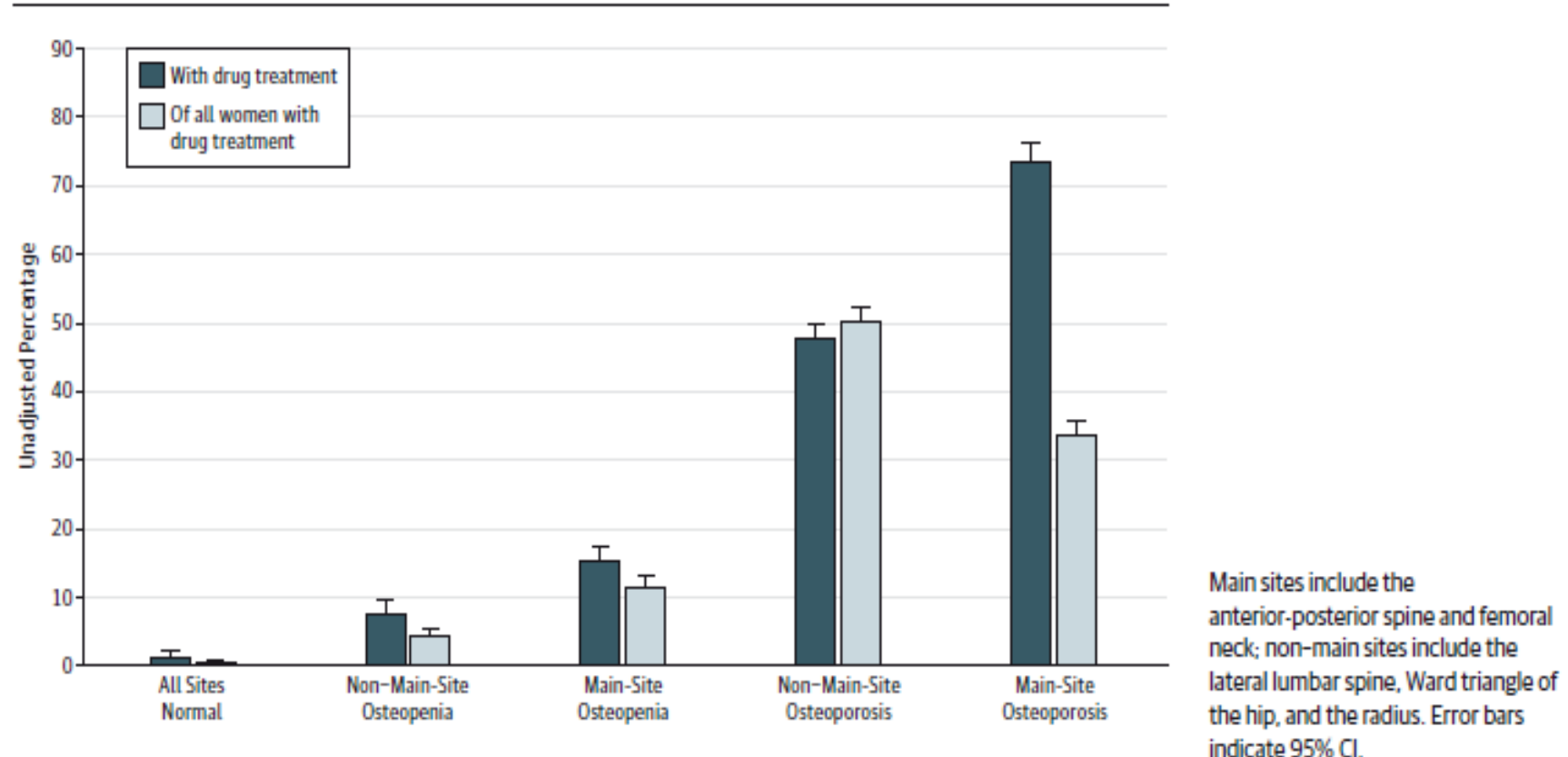
Harmful or ineffective interventions

- Antibiotics for viral infections or uncomplicated otitis media
- Vertebroplasty in acute osteoporotic fractures
- PCI in stable, non-critical CAD
- Early dialysis in ESRF
- Tight glucose control and monitoring in type 2 diabetes (not on insulin)
- Long term PPIs in uncomplicated upper GI disease
- Statins in asymptomatic, low risk patients
 - <10% 5-year CV risk
- Prolonged (7-14 days) antibiotics in paediatric UTIs (vs 5-7 days)
- Prolonged (14 days) oral steroids for exacerbations COPD (vs 5 days)
- Prolonged (7-14 days) antibiotics in CAP (vs 5 days)

Overtreatment

Risk-treatment mismatch

Figure. Unadjusted Percentage of Women Receiving New Drug Prescriptions and Percentage of All Women Treated by Dual-Energy X-ray Absorptiometry Screening



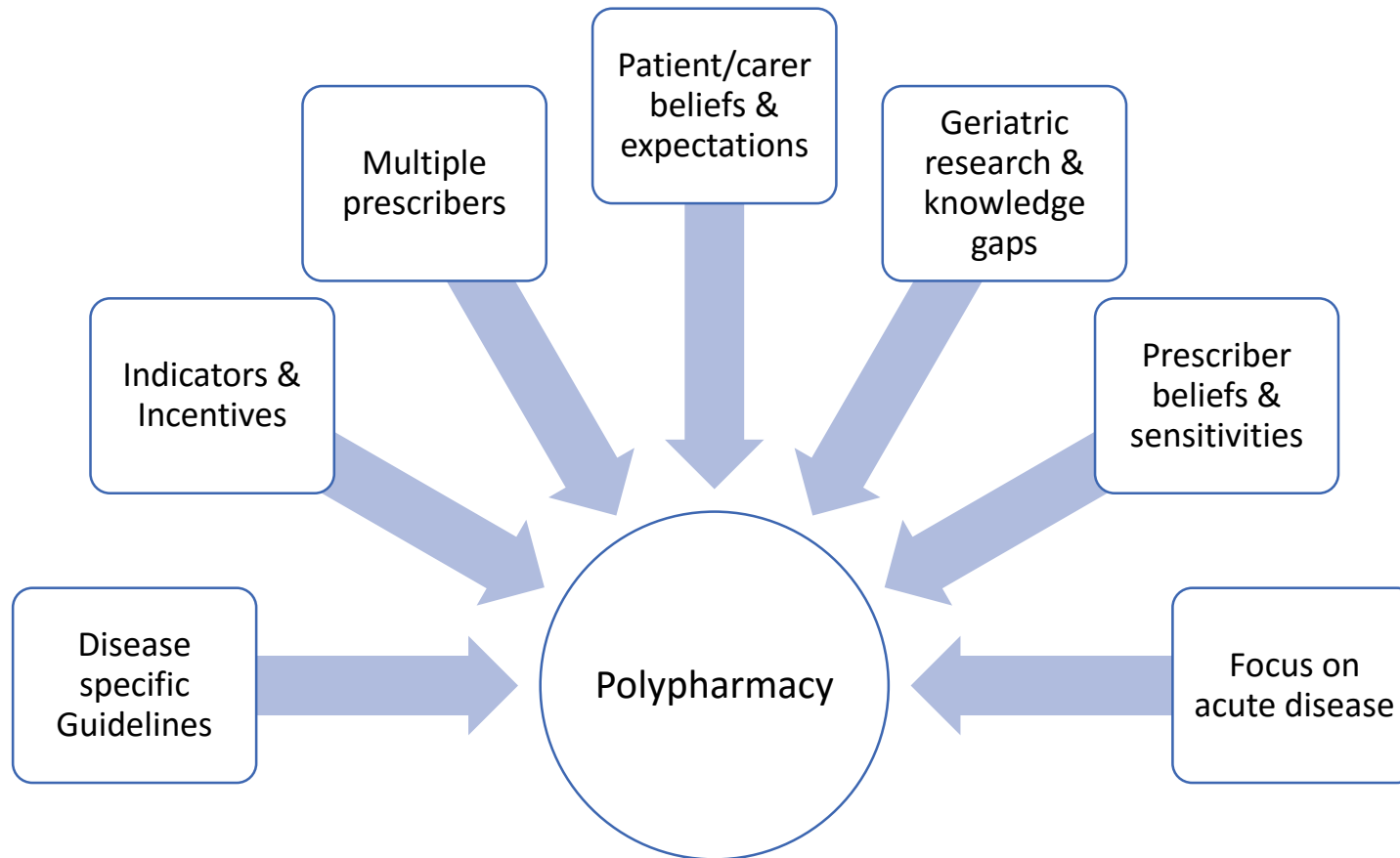
Overtreatment

Inappropriate polypharmacy

More than 5 regularly prescribed medications increases risk of adverse drug reactions in older patients

- delirium, cognitive impairment, falls, disability

1 of 5 medications are inappropriate Scott et al Med J Aust 2015



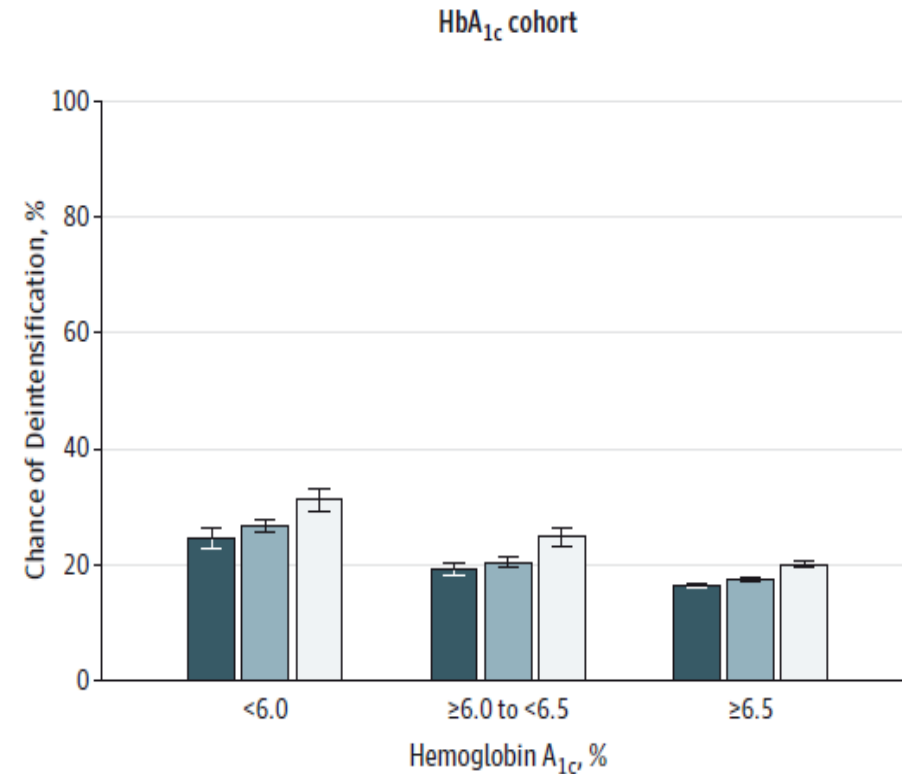
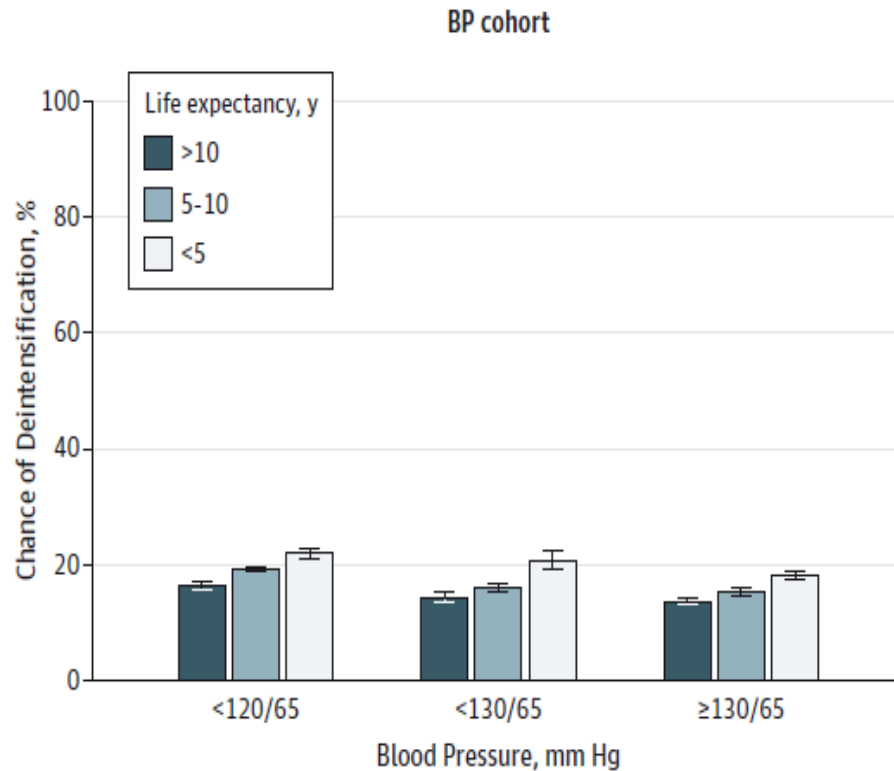
Overtreatment

Overly aggressive care

211 667 patients >70 years with diabetes mellitus

Receiving active treatment (defined as BP-lowering medications other than ACE-I/ARBs or glucose-lowering medications other than metformin)

Discontinuation or dosage decrease within 6 months after index measurement



Overtreatment

Overly aggressive care

38 studies of non-beneficial interventions (NBIs) in patients at end of life (within 6 mo of death)

- 33–38% of patients received NBIs
- 30% received active measures
 - dialysis, radiotherapy, chemotherapy, transfusions and life support treatment
- 38% received antibiotics, cardiovascular, digestive and endocrine treatments in terminal phases
- 33–50% received non-beneficial tests in terminal phases
- 10% underwent non-beneficial ICU admission in terminal phases

Counter strategies

Confirm correct indications

- Verify diagnosis
 - Misdiagnosis
 - Overdiagnosis (overdetection, misclassification)
- Check for contra-indications, interactions (drug-drug and drug-disease)
- Check for past toxicity or non-adherence
- Check for treatment intensity, burden and complexity
- Consider non-pharmacological alternatives and prn vs regular
- Determine appropriate treatment targets, timelines and stopping rules

Counter strategies

Avoid ineffective or harmful treatments

- Access reputable guidance
 - Choosing Wisely websites
 - NICE 'Do Not Do' recommendations
 - NPS RADAR
- Defer using newly introduced treatments for 2 years
 - Unless compelling evidence of clinically important outcome benefits
- Beware clinically unimportant or questionable benefits in health status
 - Scott Int J Clin Pract 2014

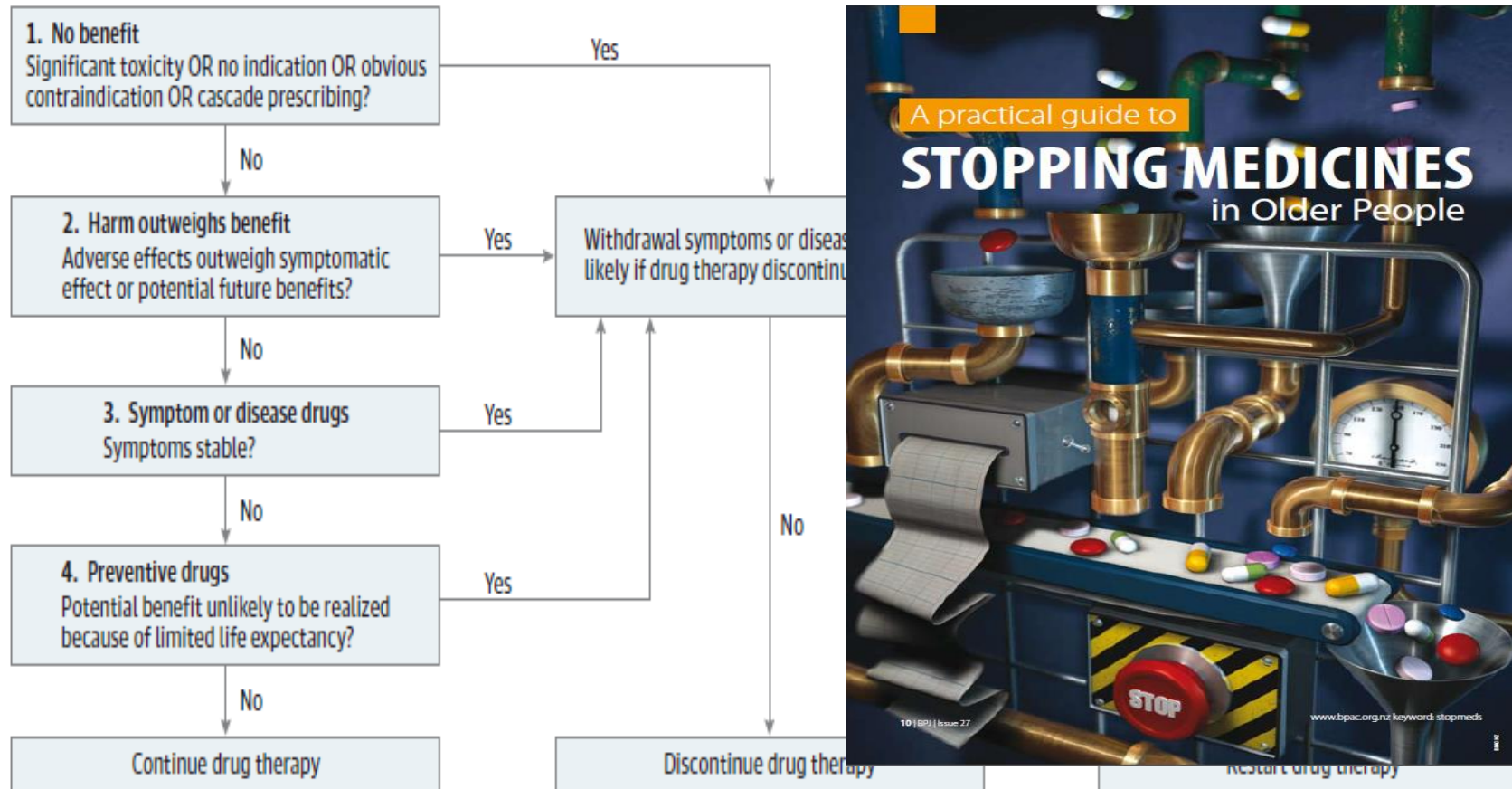
Counter strategies

Target care according to absolute risk

- Use disease-specific prediction scores that estimate absolute disease risk
 - CVD Alliance risk predictor, CHADsVasc score
- Use treatment-specific prediction scores that estimate absolute treatment harm
 - HAS-BLED score
- Use point of care decision aids that provide ARR estimates for different interventions
 - Pictograms with minimum standardised fact sheet for common clinical scenarios
 - Stacey et al Cochrane Database Syst Rev 2014

Counter strategies

Deprescribe unnecessary medications



Target PPIs, antipsychotics, antidepressants, anti-dementia drugs, anti-anginals, anti-hypertensives

Scott et al JAMA Intern Med 2015

Counter strategies

Adopt conservative end of life care

- More conservative/palliative approach prolongs survival, improves symptoms, avoid invasive care, lower costs (by up to a third)
 - Temel et al N Engl J Med 2010; Zhang et al. Arch Intern Med 2009
- Advance care planning (ACP) systematically applied to patients with advanced chronic diseases associated with similar outcomes
 - Wright et al JAMA 2008; Bischoff et al J Am Geriatr Soc 2013; Nicholas et al JAMA 2011; Ache et al J Am Geriatr Soc 2014; Scott et al Med J Aust 2015
- Consider ACP in patients where your answer to 'surprise' question is 'no'
 - Knowing all I know about this patient, would I be surprised if he/she were to die within the next 12 months
- Access resources that can assist with end of life care
 - Decision Assist
- Consider early referral to a palliative care service

Choosing Wisely recommendations

RACGP

- 1 Don't use proton pump inhibitors (PPIs) long term in patients with uncomplicated disease without regular attempts at reducing dose or ceasing.
- 2 Don't commence therapy for hypertension or hyperlipidaemia without first assessing the absolute risk of a cardiovascular event.
- 3 Don't advocate routine self-monitoring of blood glucose for people with type 2 diabetes who are on oral medication only.
- 4 Don't screen asymptomatic, low-risk patients (<10% absolute 5-year CV risk) using ECG, stress test, coronary artery calcium score, or carotid artery ultrasound.
- 5 Avoid prescribing benzodiazepines to patients with a history of substance misuse (including alcohol) or multiple psychoactive drug use.
- 6 Don't order colonoscopy as a screening test for bowel cancer in people at average or slightly above average risk. Use faecal occult blood screening instead
- 7 Don't order chest x-rays in patients with uncomplicated acute bronchitis
- 8 Don't routinely do a pelvic examination with a Pap smear
- 9 Don't treat otitis media (middle ear infection) with antibiotics, in non-Indigenous children aged 2-12 years, where reassessment is a reasonable option
- 10 Don't test thyroid function as population screening for asymptomatic patients

Closing comments

"The delivery of good medical care is to do as much nothing as possible"

- *Samuel Shem, The House of God*

"The irony is that the system has become so ineffective and dangerous that avoiding medical treatment (excluding perhaps emergency care) has become one of if not the best healthcare strategy you can implement to protect your health and well-being."

- *Anonymous patient*