Associate Professor Ian Scott
Director
Department of Internal Medicine and Clinical Epidemiology, Princess Alexandra Hospital, Brisbane

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

(Plenary)
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

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Value of modern healthcare

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


- Cancer: 585k
- Medical error: 251k
- Heart disease: 611k
- COPD: 149k
- Suicide: 41k
- Motor vehicles: 34k
- Firearms: 34k

Based on our estimate, medical error is the 3rd most common cause of death in the US.

Makary & Daniel
BMJ 2016

Data source:
http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf
Value of modern healthcare

?30% waste = $46 billion a year
Drivers of healthcare costs

- 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

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.
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

- 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

- *Before CT pulmonary angiography*
  - Incidence (any diagnosis): 0.5, 0.64
  - Incidence (primary diagnosis): 3.3, 0.05
  - Mortality: -1.9, 0.01

- *After CT pulmonary angiography*
  - Incidence (any diagnosis): 7.1, <0.001
  - Incidence (primary diagnosis): 7.2, <0.001
  - Mortality: -0.5, 0.02

Graph showing the rate of PTE detection from 1993 to 2006, with a vertical line indicating the year CT pulmonary angiography was introduced. The case fatality rates for any diagnosis and primary diagnosis are also presented.
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

Percent

75

Ten-year risk
of hip fracture

Osteopenic definition

60

Proposed definition

45

Current definition

30

15

0

50–54
55–59
60–64
65–69
70–74
75–79
80–84
85+

Age group (years)

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

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

New diagnostic test challenging existing disease definition
(Biomarkers, High resolution imaging, Genetic markers)

Detect new abnormalities

Responsibility of DTA researchers:
To come up with improved methods to evaluate the true benefits of new tests and reduce overdiagnosis

More true disease cases detected
Clinical relevant consequences
Better treatment decisions
Clinical benefit

More (mild) abnormalities detected
No clinical relevant consequences
Incorrect treatment decisions
More harm

Test leading to clinical benefit

Test leading to overdiagnosis
Counter strategies

Assess utility of new tests
Counter strategies

Assess utility of new tests

Discordant results

Traditional performance xistics
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

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

<table>
<thead>
<tr>
<th>Vignette</th>
<th>Patients (n = 203)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
</tr>
<tr>
<td>Headache: patient A has a headache and is worried about brain cancer, asks PCP for CT scan</td>
<td></td>
</tr>
<tr>
<td>Part 1: PCP does not recommend or order a CT</td>
<td>72 (36.2)</td>
</tr>
<tr>
<td>Part 2: PCP explains potential harms of CT radiation exposure</td>
<td>103 (51.2)</td>
</tr>
<tr>
<td>Part 3: patient A seeks a second opinion from a different doctor who orders a CT scan</td>
<td>60 (30.0)</td>
</tr>
<tr>
<td>Upper respiratory infection: patient B has a runny nose, headaches, no fever and asks PCP for antibiotics</td>
<td></td>
</tr>
<tr>
<td>Part 1: PCP does not prescribe antibiotics</td>
<td>132 (65.7)</td>
</tr>
<tr>
<td>Part 2: PCP explains American Academy of Family Physician guidelines, which do not recommend antibiotics for sinus infections</td>
<td>161 (80.5)</td>
</tr>
</tbody>
</table>

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

Scenario One
Mira does have screening.
- Cancer diagnosis and treatment
  - Her cancer is found.
  - She is diagnosed and has treatment.

Mira lives to age 85, and then dies of heart disease.

Scenario Two
Mira does not have screening.
- No cancer diagnosis, no treatment
  - Her cancer is never found.
  - Never affects her health.

Mira also lives to age 85, and then dies of heart disease.

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 and just stay the same. Without screening, they would never be noticed or cause any trouble. Preventing these cancers through screening is called over-detection (or over-diagnosis).

Even after further check-up and examination, we 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, radiation, hormone therapy, and chemotherapy. There are many important side effects to these treatments which are described on pages 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.

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

Hersch et al Lancet 2015
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
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

Main sites include the anterior-posterior spine and femoral neck; non-main sites include the lateral lumbar spine, Ward triangle of the hip, and the radius. Error bars indicate 95% CI.

Fenton et al JAMA Intern Med 2016
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  
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

Sussman et al JAMA Intern Med 2015
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, ant-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)

- Advance care planning (ACP) systematically applied to patients with advanced chronic diseases associated with similar outcomes

  - 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**

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