WHY DID I DO THAT?

Malvinder S. Parmar

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Medical Director, *Internal Medicine,*
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Northern Ontario School of Medicine

@wittykidney

CADTH 2017: 25 April 2017 Breakfast Symposium

Northern Ontario School of Medicine

Northern Ontario School of Medicine

École de médecine du Nord de l'Ontario

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Conflict of Interest Declaration: Nothing to Disclose

Presenter: ***Malvinder S. PARMAR***

Title of Presentation: ***Why did I do that?***

I have no financial or personal relationships to disclose

DISCLAIMER

Cartoons used in this presentation are for humorous purposes and are not to offend any group, race, sex or size.

Please Read Carefully

OBJECTIVES:

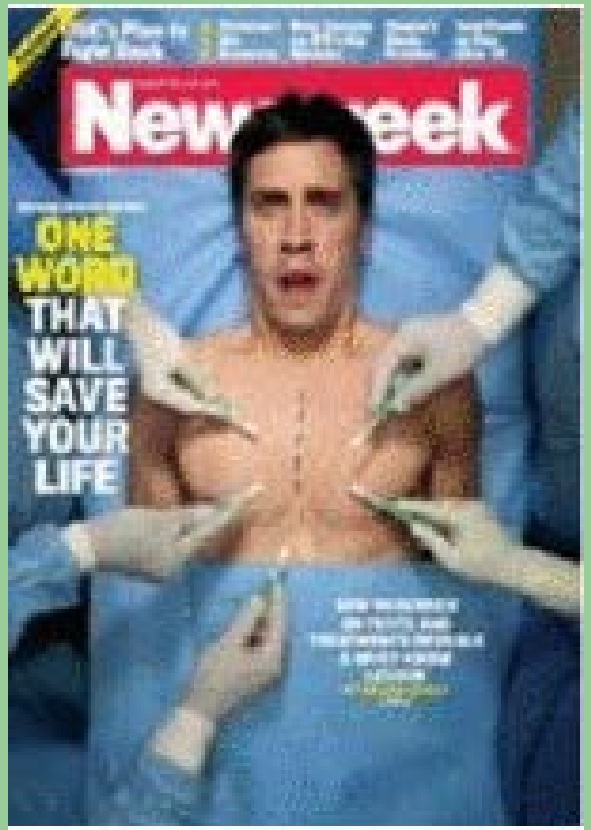
At the end of this session, the attendees will be able to:

From polyformacy to formacology

Davina Allen

Allen D. *BMJ Qual Saf* 2017;**0**:1–3. doi:10.1136/bmjqs-2017-006677

WHAT IS THE PROBLEM?



Unnecessary care in Canada tops 1 million tests and treatments a year

1st national picture emerges of unnecessary scans in hospitals, heavy prescribing to kids for insomnia

By Amina Zafar, CBC News Posted: Apr 06, 2017 8:00 AM ET | Last Updated: Apr 07, 2017 12:05 AM ET

FIFTH ESTATE | Billions wasted on drug spending in Canada, research shows

Hidden camera investigation reveals questionable drug company marketing practices

By Timothy Sawa and Lisa Ellenwood, CBC News Posted: Jan 12, 2017 5:00 AM ET | Last Updated: Jan 12, 2017 12:19 PM ET

Employer-funded private insurance plans in Canada wasted more than $3 billion per year between 2011 and 2015 by covering unnecessary dispensing fees and expensive drugs that have cheaper options, research conducted for the fifth estate shows. (CBC)

What is the Problem?

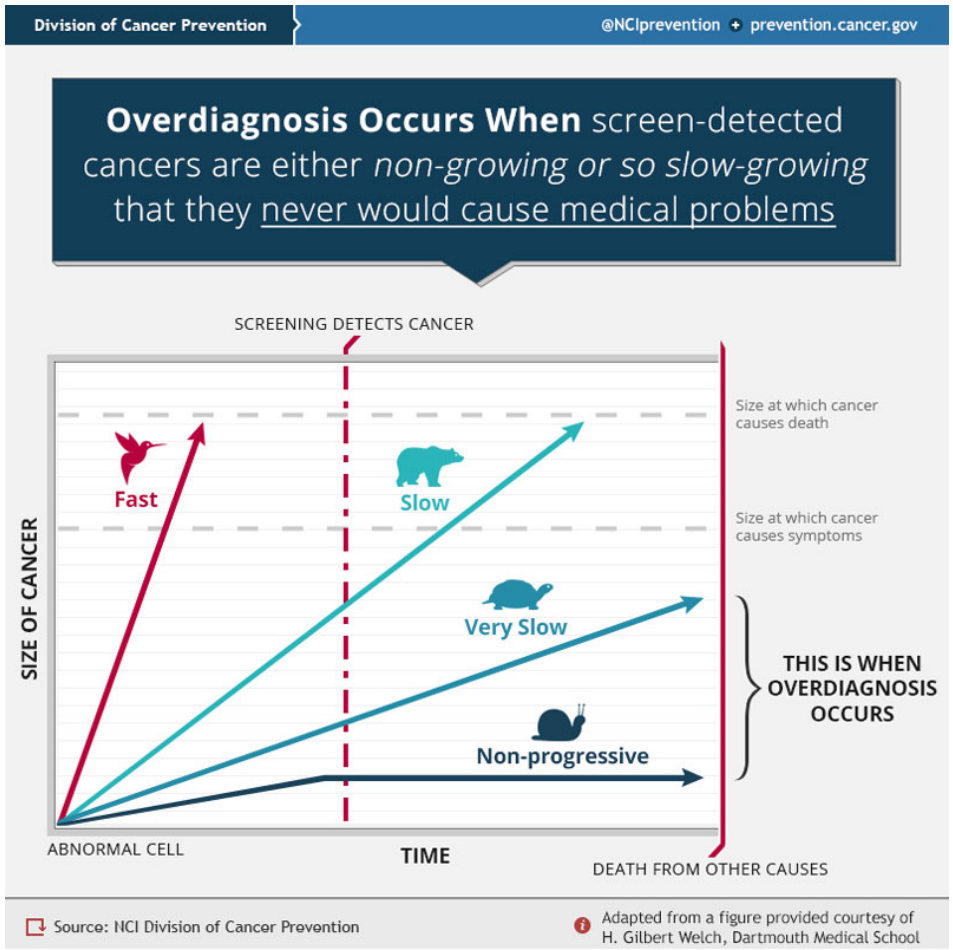
- **Medicaliz(s)ation**
  - *Ageing issues*
  - *Broadening definitions*
  - *Expanding indications*
- **Over-Investigations**
  - *Screening*
  - *Rule-out Medicine*
  - *Over-sensitive tests,*
    - *often used inappropriately*
    - *Sensitivity trumps specificity*

OVER-INVESTIGATIONS

"We've found a mass. The good news is we have weapons of mass destruction."

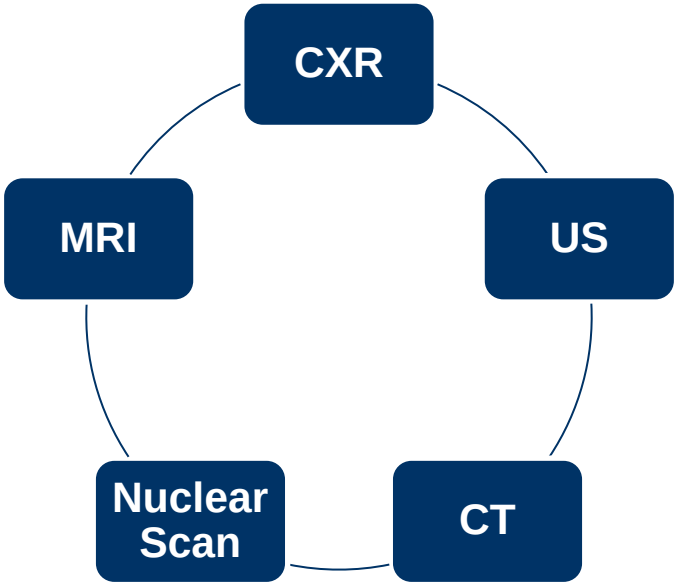
OVERDIAGNOSIS

NCI Division of Cancer Prevention; H. Gilbert Welch, Dartmouth Medical School



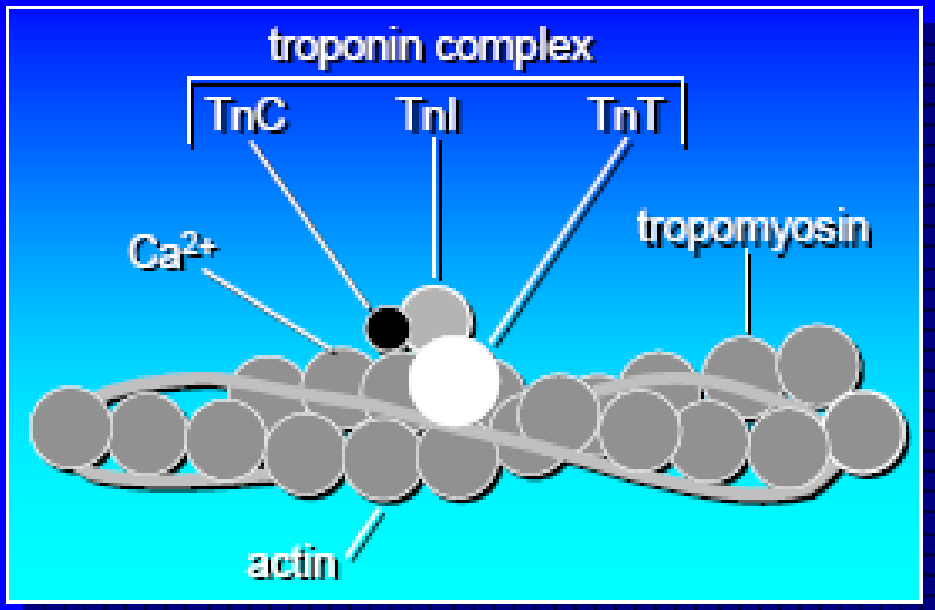
Few common tests, examples

- Troponin
- D-Dimer
- Ferritin
- eGFR
- Imaging studies



Troponin Characteristics

- **Troponin C (18 kd)**
- Calcium-binding subunit
- No cardiac specificity
- **Troponin I (26.5 kd)**
- Actomyosin-ATP-inhibiting subunit
- Cardiac-specific form
- **Troponin T (39 kd)**
- Anchors troponin complex to theTropomyosin strand



The troponin complex consists of three different proteins (TnC, TnI, and TnT) that regulate the calcium-mediated contractile process of striated muscle.

Troponin

- Troponin C – same in all muscles
- Troponin I & T – have cardiac specific isoforms
- Levels rise 3-6 hours after injury
- Insensitive within 6 hours of symptoms
- **Negative troponin >8 hours after symptom onset – effectively rules out MI**
- Peaks ~ 20 hours
- May remain elevated for 7-14 days
- Helpful in making a diagnosis of symptoms within past 3-7 days
- Not helpful in making a diagnosis of infarct extension or re-infarction.

Troponin

Troponin T [cTnT]

- For ACS:
  - Sensitivity:
    71 - 100%
  - Specificity:
    31 - 86%
- Advantages:
  - Highly sensitive for detecting ischemia
  - Helps stratify risk later [Prognostic value]
- Disadvantages:
  - Less specific than cTnI
  - Increased in CKD

Troponin I [cTnI]

- For ACS:
  - Sensitivity:
    43 - 94%
  - Specificity:
    48 - 100%
- Advantages:
  - More specific than cTnT
  - Helps stratify risk later [Prognostic value]

Non-ACS causes of Troponinemia

- Cardiac
  - **CHF** Myocarditis, pericarditis, procedures, arrhythmias, cardioversion, cardiac contusion, CABG
- Pulmonary
  - **PE**, pneumonia
- Neurologic
  - Stroke, SAH
- Renal
  - **Renal failure**
- Misc
  - HIV, thermal injury, cirrhosis, hypothyroidism, sepsis
  - Pregnancy
  - Strenuous exercise

Abstract

Full text links

ELSEVIER FULL-TEXT ARTICLE

Am J Cardiol. 2012 Aug 15;110(4):594-8. doi: 10.1016/j.amjcard.2012.03.052. Epub 2012 May 10.

Cardiac troponins in young marathon runners.

Traiperm N[1], Gatterer H, Wille M, Burtscher M.

Author information

Abstract

Cardiac **troponin** increases are common in adult **marathon** finishers. However, data on **troponin** values for young **marathon runners** are scarce. Forty young **runners** (20 healthy male and 20 female) 13 to 17 years old participated in this study. Blood samples were taken before, immediately after, and 24 hours after the race for determination of cardiac **troponin** T (cTnT) and **troponin** I (cTnI). Thirty-seven **runners** completed the race with a mean finishing time of 4 hours 53 minutes. No participant developed an adverse medical event during or after the race. In 30 of 37 participants, levels of cTnT and/or cTnI exceeded upper reference limits of 0.01 and 0.1 ng/ml immediately after the race, and in 3 participants these levels were even higher than the reference range for acute myocardial infarction (>0.1 and >0.5 ng/ml for cTnT and cTnI, respectively). Twenty-four hours after the race no participant had **troponin** levels exceeding the upper reference limits. Average increases of **troponin** levels did not differ between sexes. In conclusion, this is the first study to show that cardiac **troponin** levels increase to a similar extent in male and female adolescent **marathon runners** as observed in adults. Rapid recovery of **troponin** levels after a race is indicative of a physiologic rather than a pathologic response.

PMID: 22579084 [PubMed - indexed for MEDLINE]

Troponin - summary

- Both cTnT and cTnI – are **specific markers of myocardial injury**, *but*
- Elevated Troponin is **not always a marker of ischemic injury**
  - may be due to cardiac injury associated with chronic structural heart disease rather than acute ischemia
- Clinical challenge is **differentiating ischemic from non-ischemic myocardial injury**
- There are many conditions where Troponin levels can increase, but data exist for CHF, PE and renal failure.
- Elevated troponin levels **portend a worse prognosis**

Date	Time	Result	Units	Reference	Comments
4/1/16	07:10	0.34 *H Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
3/1/16	20:05	0.64 *H Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
3/1/16	11:40	0.83 *H Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
3/1/16	01:55	0.04	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
9/12/15	06:15	0.04 Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
8/12/15	21:02	0.03	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
8/12/15	11:40	0.03	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
20/11/15	21:35	0.17 *H Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
20/11/15	13:45	0.31 *H Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
20/11/15	06:15	0.22 *H Δ	ug/L	<0.04	Results Repeated and Ve Interpretation: < 0.04 probability of cardiac i
19/11/15	22:47	0.02	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
21/10/15	15:40	0.03 Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
21/10/15	06:20	0.05 *H Δ	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
21/10/15	00:25	0.04	ug/L	<0.04	Interpretation: < 0.04 probability of cardiac i >= 0.10 ug/L High risk
17/7/15	13:30	< 0.03	ug/L	0-0.06	----------Reference Range---------- Nor 0.00 - 0.06.....
19/6/15	12:10	< 0.03	ug/L	0-0.06	----------Reference Range---------- Nor 0.00 - 0.06.....
17/5/15	08:02	< 0.03	ug/L	0-0.06	----------Reference Range---------- Nor 0.00 - 0.06.....
16/5/15	22:22	< 0.03	ug/L	0-0.06	----------Reference Range---------- Nor 0.00 - 0.06.....
15/4/14	16:10	0.83 *H Δ	ug/L	<0.04	Interpretation: < 0.04 ug probability of cardiac injur >= 0.10 ug/L High risk for
15/4/14	06:28	1.00 *H Δ	ug/L	<0.04	Previous results reviewed. Interpretation: < 0.04 ug probability of cardiac injur

- Coronary angiogram (2000 and 2006) – Occluded RCA – no interval change
- P. MIBI (2006, 2016) – LVEF 58%, inferolateral ischemia, no interval change from 2006

Patients are often told that they had a "small heart attack" and some of the patients may have had these so many times that they outlive their cats, as "cats have nine-lives."

Is clopidogrel (Plavix) required in this patient?

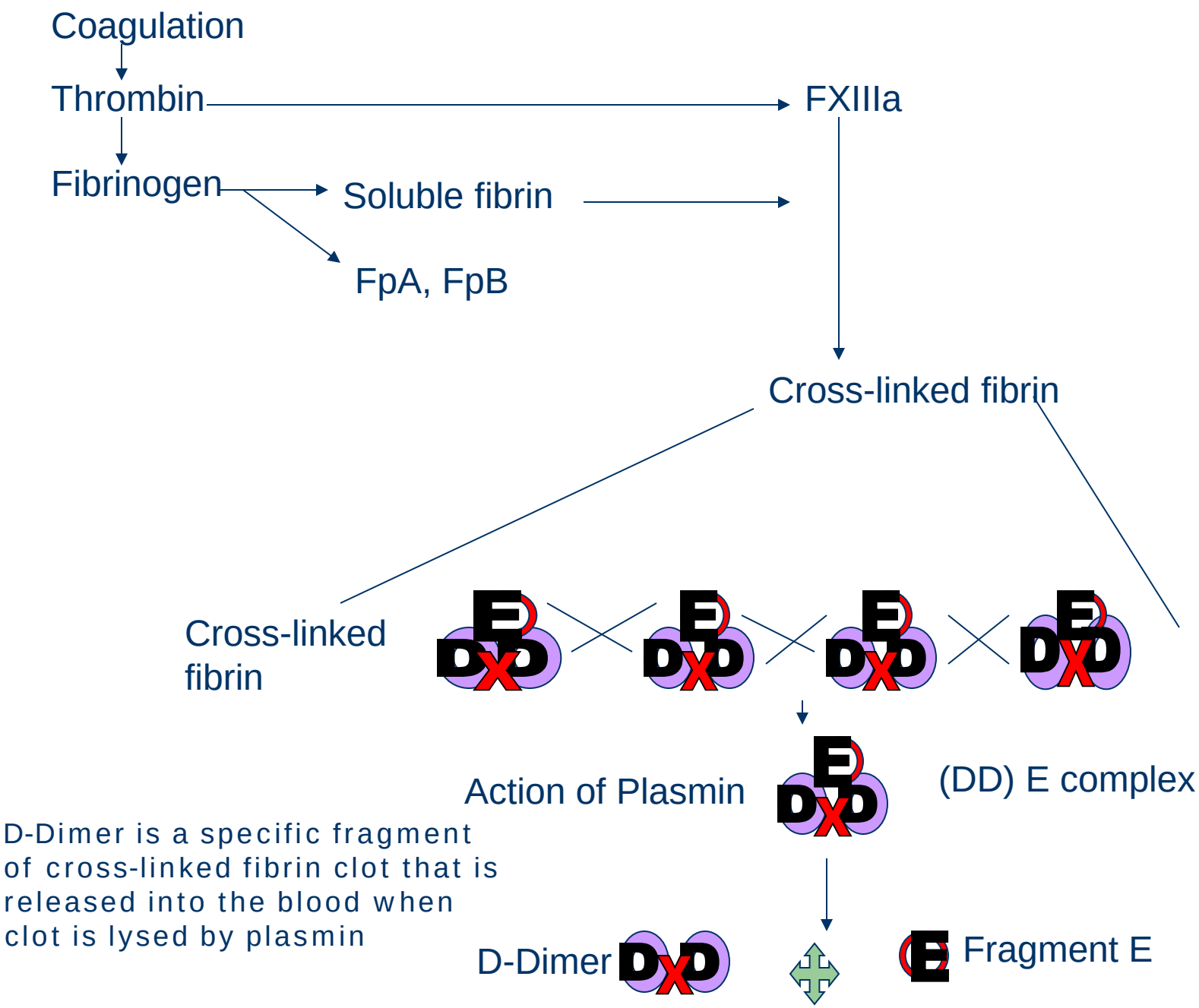
D-Dimer

- For thrombosis:
  - Sensitivity – 93%
  - Specificity – **25%**
- Negative Predictive Value –99.5% [if low probability]
- **ELISA is more sensitive** [than rapid latex agglutination test]

What is D-Dimer?

Thrombosis

Fibrinolysis



D-Dimer is a specific fragment of cross-linked fibrin clot that is released into the blood when clot is lysed by plasmin

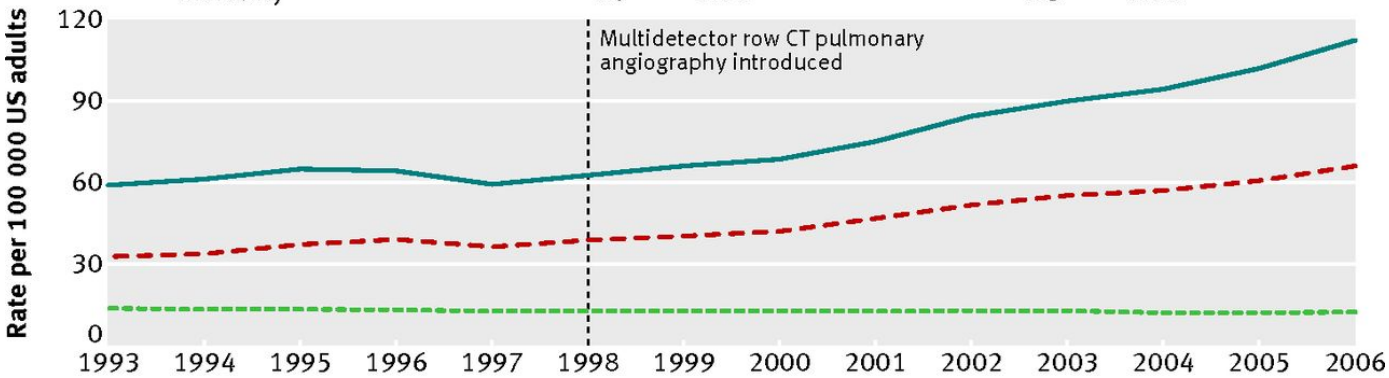
Elevated D-Dimer

- Thrombo-embolic disorders
  - DVT/PE
  - MI
- Infection/Sepsis
- DIC
- Malignancy
- Trauma
- Systemic disease – inflammation
- Anticoagulation
- After surgery
- Pregnancy

Pulmonary embolism

Wiener, R. et al: Archives of Internal Medicine 2011;171(9):831-7

	Before CT pulmonary angiography		After CT pulmonary angiography	
	Annual % change	P value	Annual % change	P value
Incidence (any diagnosis)	0.5	0.64	7.1	<0.001
Incidence (primary diagnosis)	3.3	0.05	7.2	<0.001
Mortality	-1.9	0.01	-0.5	0.02

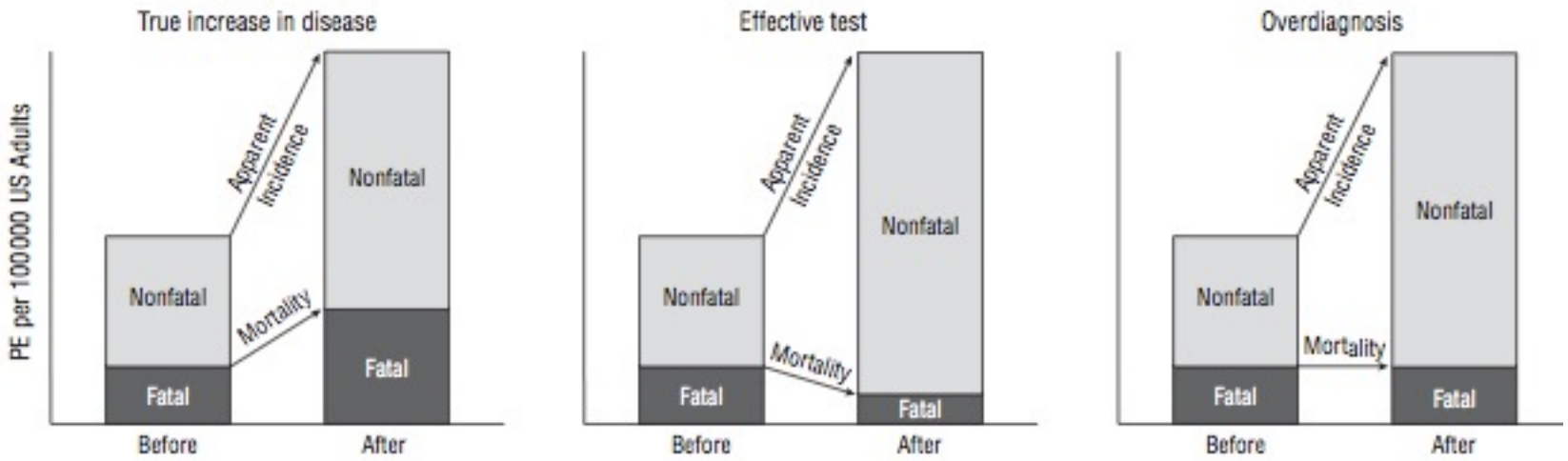


Case fatality (%)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Any diagnosis	11	13	12	12	12	12	11	10	10	7	6	9	8	7
Primary diagnosis	5	7	6	7	6	6	6	5	5	3	3	4	3	3

Pulmonary Embolism in US

Wiener, R. et al: Archives of Internal Medicine 2011;171(9):831-7



Increase in risk factors results in more pulmonary emboli, with no change in disease severity.

More sensitive test detects more pulmonary emboli, and new cases benefit from treatment → fewer deaths.

More sensitive test detects more pulmonary emboli, and new cases do not benefit from treatment (mild disease).

Mr. Ferritinemia

- 45-year old man with history of generalized aches and pains [Fibromyalgia x 5 years] and fatigue, had ‘vague’ abdominal pain.
- Noted to have **elevation of ALP and GGT** [200-250] with **normal AST, ALT**
- **Ferritin of 1030**
- Abdominal ultrasound – Liver 18.6 cm, spleen 13.5 am
- CT abdomen – Liver 18.8 cm, spleen 13 cm
- Diagnosis – Hemochromatosis?

What to do next?

- **Liver biopsy [**already done**]**: preserved hepatic architecture, minimal inflammation, no portal or parenchymal fibrosis, increased iron deposition – could be early hemochromatosis
- **Hfe genetic testing** – heterozygous for Cys282Tyr mutation
- Do you agree with the diagnosis?

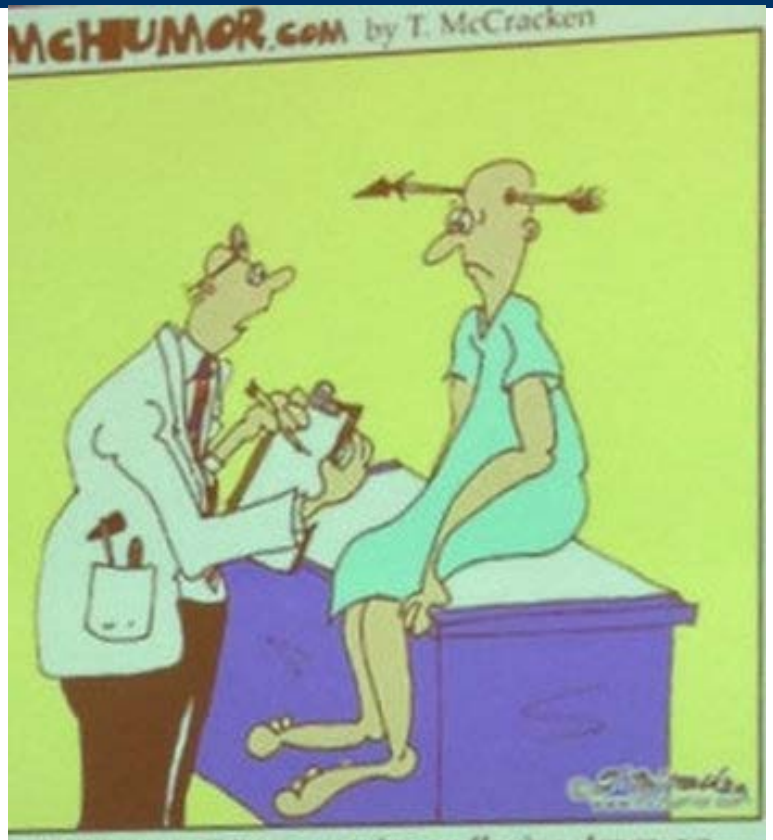
Missing Links

- When **Ferritin 1030, CRP 86, T-sat 0.19**
- Saw geneticist – told him ‘not sure’, not c/w hemochromatosis – but, didn’t agree with my impression of being ‘reactive’
- 3-months later,
  - **Ferritin 121, ESR 2, CRP <3, T-sat 0.21**
- Elevated ferritin - not always hemochromatosis, often reactive
- The episode of vague abdominal pain was diverticulitis that resolved with time and as the inflammation resolved, CRP and ferritin normalized.

Picture is worth … $$$!

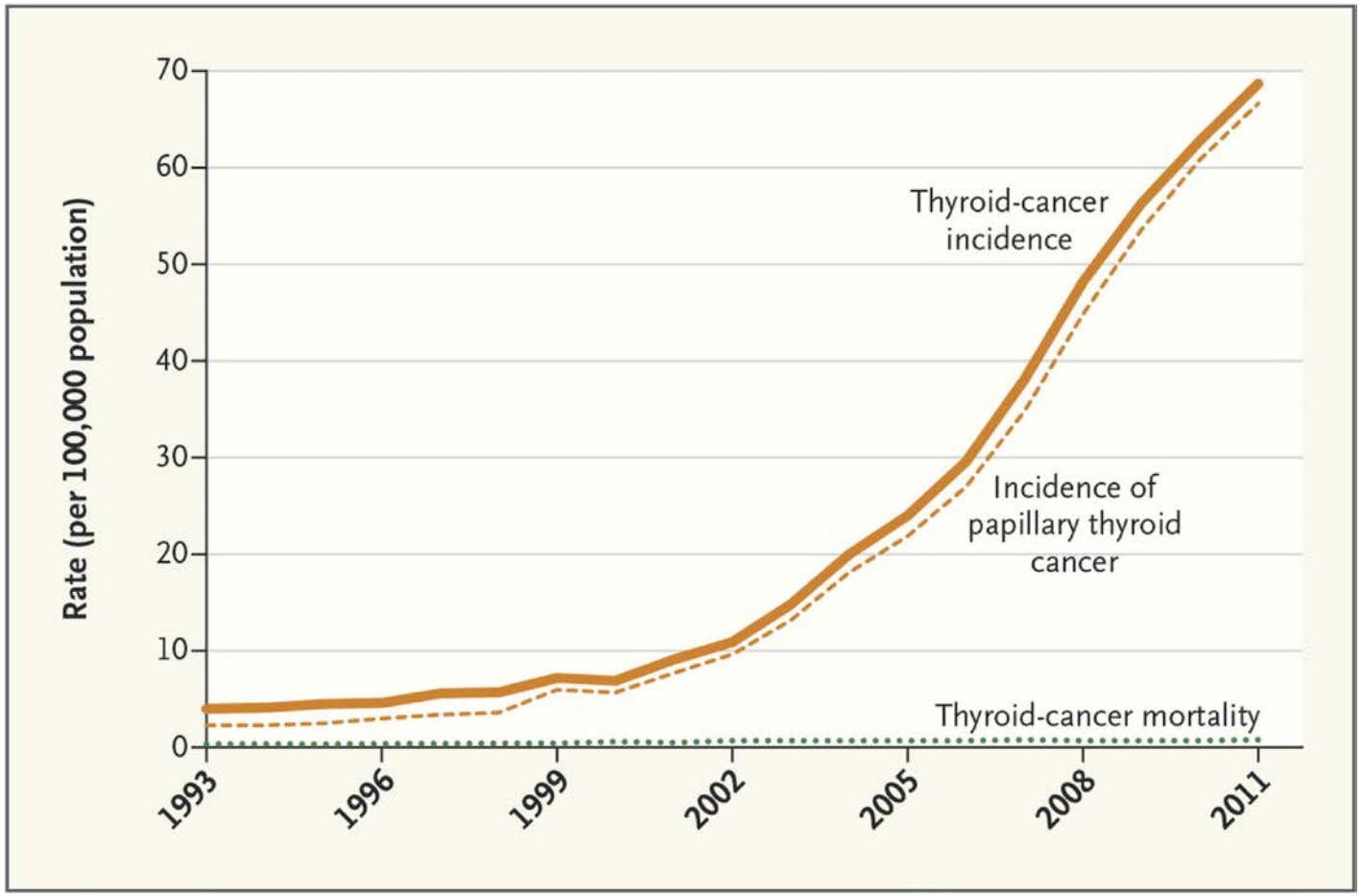
"Well, as we thought, it's something gross."

Playing it safe!
Making sure!



"Off hand, I'd say you're suffering from an arrow through your head, but just to play it safe, I'm ordering a bunch of tests."

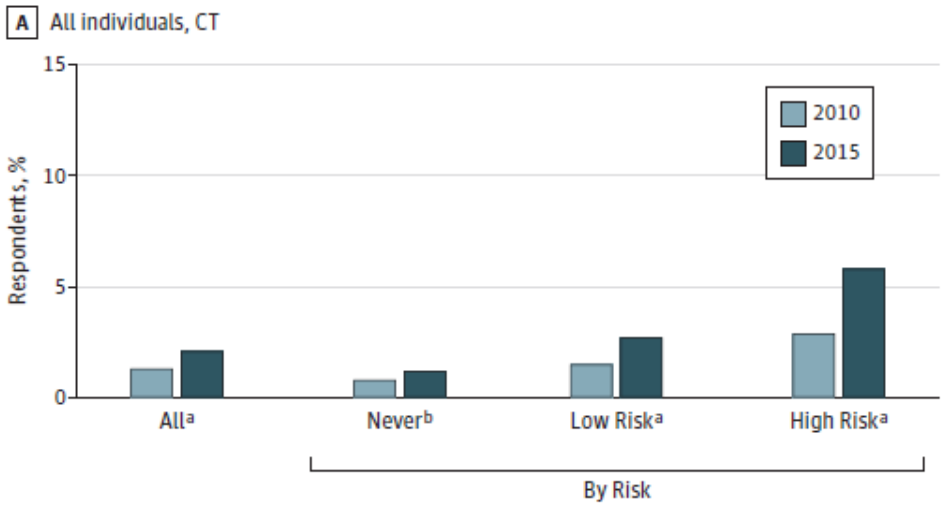
Thyroid cancer



Lung cancer screening

Huo J. et al JAMA Internal Medicine March 2017;3(177):440

Figure 1. Weighted Analysis of the Rate of Lung Cancer Screening in the National Health Interview Survey by Screening Technology and Risk for Lung Cancer



No. at risk	All[a]	Never[b]	Low Risk[a]	High Risk[a]
2010				
Unweighted	213/11 534	71/8479	80/4845	55/1693
Weighted	809 978/63 901 565	269 854/34 497 088	305 951/20 019 179	213 080/7 315 650
2015				
Unweighted	456/20 657	143/11 570	186/6517	109/1830
Weighted	1 431 524/68 904 243	464 221/39 656 754	572 895/21 198 030	329 321/5 725 940

Lung cancer screening

Redberg RF, O'Malley PG. JAMA Internal Medicine March 2017;3(177):311

EDITORIAL

Important Questions About Lung Cancer Screening Programs When Incidental Findings Exceed Lung Cancer Nodules by 40 to 1

Rita F. Redberg, MD, MSc; Patrick G. O'Malley, MD, MPH

Chasing MIRANDaS

- Chasing **M**ultiple **I**ncidental **R**adiological **A**bnormalities of **N**o or **D**oubtful clinical **S**ignificance

Type 1 error (significance level)

- **Probability of finding an effect that isn't real (false positive), is 1 in 20 (p=0.05)**
  - If you do 20 tests/investigations, chance of finding a false positive test is $1-(0.95)^{20} = 0.64$ [**64%**]
  - If you do 50 tests/investigations, the chance of finding a false positive test is $1-(0.95)^{50} = 0.92$ [**92%**]

“If you torture some(one)thing long-enough, it will confess to something!”

Probability of a false +ve test = 1 - $(0.95)^n$

& cost to the system

Malvinder Parmar
@wittykidney

Follow

Replying to @ethanjweiss @JJheart_doc d 3 others

The misuse of a test is exponentially proportional to its non-invasiveness.

RETWEET 1 LIKE 1

4:37 AM - 18 Apr 2017

1 1

Why do we do what we do?

We do things, because

1 March 2004

Malvinder S. Parmar,
Medical Director,
Internal Medicine
Timmins & District Hospital, Timmins, Ontario, Canada

We [doctors] do things, because other doctors do so and we don't want to be different, so we do so;

Send response to journal:
Re: We do things, because

Competing interests: None declared


Hiphuggers'
Tingly thighs

Why do we do what we do?

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Re: We do things, because

, or because we were taught so[by teachers, fellows and residents]; or because we were forced [by teachers, administrators, regulators, guideline developers] to do so, and think that we must do so;

Competing interests: None declared

Application of Evidence/Guidelines/Protocols without using “common-sense” is like driving with a professional license without thinking.

DATA == EVIDENCE

THE MILBANK QUARTERLY
A MULTIDISCIPLINARY JOURNAL OF POPULATION HEALTH AND HEALTH POLICY
Explore this journal >

Original Investigation

The Mass Production of Redundant, Misleading, and Conflicted Systematic Reviews and Meta-analyses

JOHN P.A. IOANNIDIS

First published: 13 September 2016 Full publication history

DOI: 10.1111/1468-0009.12210 View/save citation

Cited by (CrossRef): 11 articles Check for updates | Citation tools ▼

Guidelines – for the obedience of fools

Abstract

Full text links

Clinical Medicine › Full text click here

Clin Med (Lond). 2003 May-Jun;3(3):279-84.

Guidelines--for the obedience of fools and the guidance of wise men?

Hampton JR[1].

Author information

Abstract

Guidelines for medical management are now part of medical life. A fool--loosely defined as someone who does not know much about a particular area of medicine--will do well to follow guidelines when treating patients, but a wise man (again, loosely defined as someone who does know about the disease in question) might do better not to follow them slavishly. The problem is that the evidence on which guidelines are based is seldom very good. Clinical trials have a variety of problems which often make their relevance to 'real world' medicine dubious. The interpretation of trial results depends heavily on opinion, and a guideline that purports to be evidence based is actually often opinion based. A guideline will depend on the opinions of those who wrote it, and the wise man will use his judgement and give due weight to his own opinions and expertise.

PMID: 12848267 [PubMed - indexed for MEDLINE]

Judgment

C. Michael Gibson MD
@CMichaelGibson

Following

Good judgment comes from experience.

Experience comes from bad judgment. -Bob Packwood

#cmgsays

RETWEET 1 LIKES 20

9:12 AM - 23 Apr 2017

1 1 20

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Malvinder S. Parmar,
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Timmins & District Hospital, Timmins, Ontario, Canada

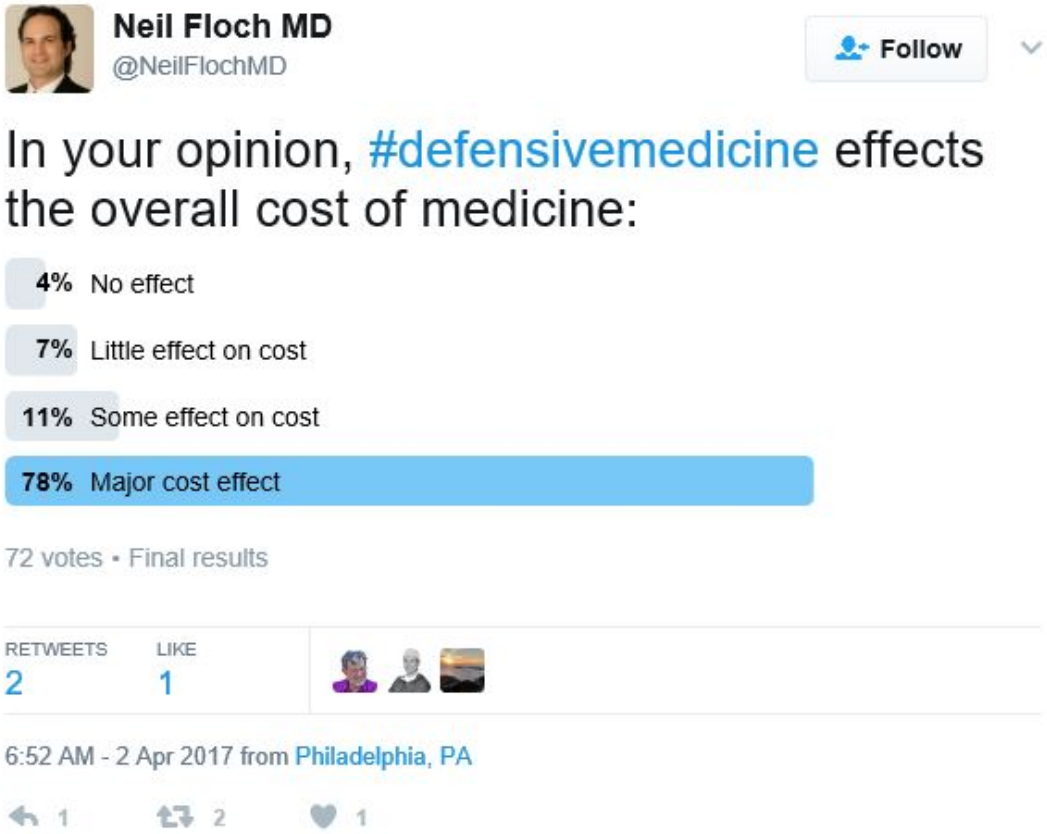
Send response to journal:
Re: We do things, because

or because patient wants so, and think we should do so; or because of more incentives [unnecessary tests (especially by procedure oriented physicians) and visits], we think we should do so; or because of the fear [by the legal system, audits] we feel that we should do so [so called covering oneself];

Competing interests: None declared

Diaper Medicine: *No matter what! One Can not cover all the time!*

DEFENSIVE MEDICINE



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; or because we need some time [to let the nature takes its course], so we do so; finally and more commonly, that we have to do something [justification] and we fail to apply common sense, so we do so.

Competing interests: None declared

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Competing interests: None declared

Cited in: **TESTING TREATMENTS**, 2nd ed.
Imogen Evans, Hazel Thornton, Ian Chalmers and Paul Glasziou

FACTORS RESPONSIBLE

MEDIA TENTALISATIONS

FEAR OF LITIGATION

MAKING SURE!

"PEACE-OF MIND"

EXPLOITING FAMILY HISTORY

EVIDENCE MADE MEDICINE

NEW IS BETTER

RULE OUT MEDICINE

AGEING FEAR

PSYCHOLOGY OF REGRET

PREVENTION IS BETTER THAN CURE!

PUBLICATION "BIAS"

POOR TRAINING

GOING WITH THE FLOW

LOOKING FOR ZEBRAS!

DIVERSIONAL MEDICINE

FASHION BASED MEDICINE

EMR SILOS

GUIDELINES

CHASING MIRANCAS

CHART OVERLOAD SYNDROME

IMPROPER AUDITS

PROTOCOLISATIONS

OVER-SENSITIVE ASSAYS

IT LIMITATIONS

PROTECTING THE "TURF"

UNTESTED TECHNOLOGIES

SCREENING INCENTIVES

BROADENING DEFINITIONS

LITTLE KNOWLEDGE IS DANGEROUS

LOCUM PROVIDERS

"TOO MANY COOKS SPOILS THE BROTH"

OVER-DIAGNOSIS: A SYSTEMATIC EVALUATION OF FACTORS

OVER-Investigations: *Culture-based*

Related to culture of practice of medicine, universal

OVER-Investigations: *Culture-based*

- **Fear of litigation**
- Psychology of regret
- "**Prevention is better than cure**" – Often Equating Early diagnosis and treatment to Prevention.
- "**New is Better**"
- **Medicalisation** of various ageing issues
- **Evidence-made medicine** – often the evidence is created under industry influence
- **Publication bias** - Journals publishing/promoting newer technologies, rare cases
- **Media tentalizations** - promoting new technologies
- Industry **expanding the markets** for tests/treatments

OVER-Investigations: *System-based*

Result of local/regional health policies, governed by political decisions, specialty socities and disese-groups

OVER-Investigations: *System-based*

- **IT limitations** – archiving of older films, difficult to retrieve
  - **Electronic Medical Record (EMR) silos** – EMRs not linked together
- **Untested technologies** – No RCTs for implementing technologies
- **Guidelines/Protocoliz(s)ation**
  - **Screening**: guidelines, **incentives**
- **Audits assessing application of guidelines than outcomes/utilization**
- Speciality socities
  - '**protecting the turf**'
  - Broadening of definitions
  - Recommending/endorsing over-sensitive assays, without clarity
- **Nurse-practioners ordering diagnostic studies**
- **Locum providers**
- **Poor training** - lack of clinical skills, dependence on Imaging
- Maintaining skills/justifying positions at smaller centers
- Repeat studies at tertiary care centers

OVER-Investigations: *Receiver-based*

Based on the individual beliefs, needs and anxiety

OVER-Investigations: *Receiver-based*

- User-demand
- "**peace-of-mind**"
- Stressed populations
- Ageing fear
- Deconditioning
- **Exploiting "Family history" or blaming "genes"**


IF YOU'RE FAT, IT MAY NOT BE YOUR FAULT. YOU MAY HAVE THE 'COUCH POTATO GENE.'
WHO SAYS THERE'S NO GOOD NEWS.
LANGER

Diabetes: Rising Prevalence

Is it genetics?

"Genes didn't change much in the past 50 years, it's the external factors that are responsible for this."

OVER-Investigations: *Provider-based*

Influenced by the beliefs, attitudes and needs of the health-care providers - PCP's, specialist(s) and Radiologists.

OVER-Investigations: *Provider-based (1)*

- **Over-sensitive test(s)** in inappropriate clinical context
- Inappropriate timing of studies – eg., Protein C/S in acute DVT
- Practicing "**Rule-out Medicine**" – Trying to find out, "What you don't have?", "**Making-sure**!"
- **Looking for Zebras**, when clearly hearing hoofs!
- Substitute for lack of knowledge/confidence
- Don't want to be "Odd-man out" – **Fashion-based medicine**
- **Exploiting "Family history"**
- Confirming what is obvious – "**A picture worth a thousand words**', but then Chasing **MIRANDaS** (Multiple Incidental Radiological Abnormalities of No or Doubtful clinical Significance)
- **Inability to separate wheat from the chaff** – unable to differentiate what is significant and what is not significant.

OVER-Investigations: *Provider-based (2)*

- **Chart over-load syndrome**
- Buying time
- **Diversional Medicine**
- **Failure to practice "Masterly inactivity**" – has to do "something"
- **Specialists**:
  - asking/requesting for imaging studies before clinical assessments
  - Specialists advising or ordering studies beyond their field
  - Specialists suggesting unnecessary Imaging studies, especially during a telephone or corridor consult
  - Lifestyle- work balance
- **Radiologists** suggesting further imaging studies (**self-referral**), when they do not have complete clinical information about the patient or their co-morbidities
- **Treating thy-self**

A systematic evaluation of factors contributing to over-investigations and over-diagnosis.

[Oral presentation, September 10th 2013]

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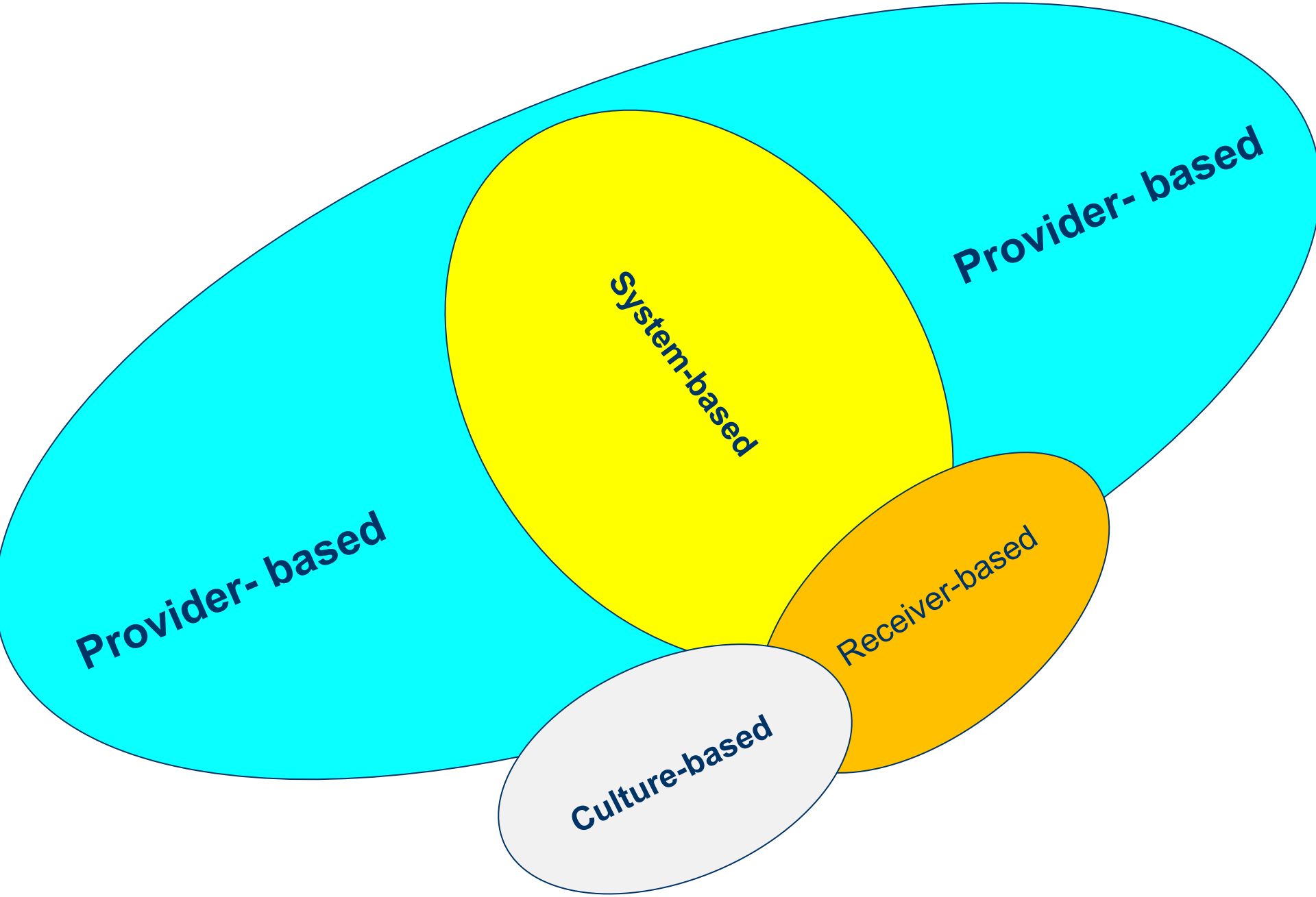
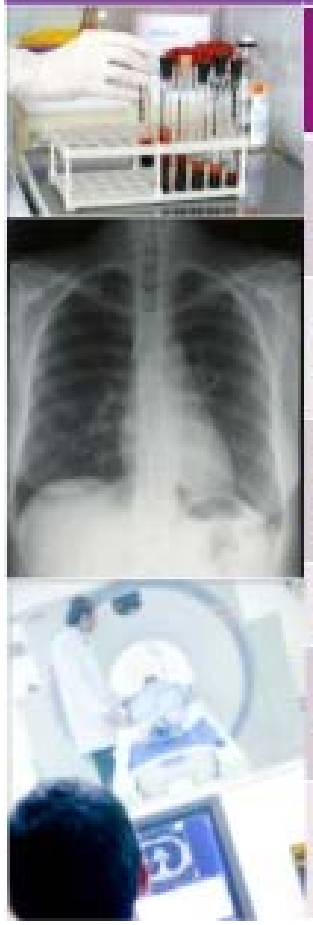
Culture-based	System-based	User-based	Provider-based
Related to the culture of practice of Medicine (universal)	Result of local/regional health policies, governed by political decisions, specialty socities and disese-groups	Based on the individual beliefs, needs and anxiety	Influenced by the beleifs, attitudes and needs of the health-care providers, PCP's, specialist(s) and radiologists.
• Fear of litigation • Psychology of regret • "**Prevention is better than cure**" – Equating Early diagnosis and treatment to Prevention. • **Medicalisation** of various ageing issues • **Evidence-made medicine** – often the evidence is created under industry influence • **Publication bias** - Journals publishing/promoting newer technologies, rare cases • **Media tentalizations** - promoting new technologies • Industry **expanding the markets** for tests/treatments • "**New is Better**" • Medicine as a BUSINESS than Care	• **Electronic Medical Record (EMR) silos** – Different users, different EMRs, not linked together • **Incentives** _ Procedure based • Screening populations/guidelines • Screening incentives • IT limitations – archiving of older films, difficult to retrieve, hence repeating studies • Untested technologies – Technology often doesn't go though a RCT, like drugs • **Guidelines** • **Protocolisation** • Maintaining skills/justifying positions at smaller centers • Repeating studies at tertiary care centers • Audits assessing utilization of guidelines than outcomes • Quality measures – remuneration incentives • Speciality socities 'protecting the turf' • Broadening of definitions • Specialities recommending/endorsing over-sensitive assays without understanding their long-term implications • **Team-work – "Going with the flow" than asking questions** • Nurse-practioners ordering diagnostic studies • **Locum physician providers**	• User-demand • "**peace-of-mind**" • Stressed populations • Ageing fear • Deconditioning • Exploiting "Family history"	• **Sensitivity trumps specificity** - Using over-sensitive test(s) in inappropriate clinical context • Practicing "**Rule-out Medicine**" – Trying to find out, "What you don't have?" • **Looking for Zebras**, when clearly hearing hoofs! • Substitute tests for lack of knowledge/confidence • Don't want to be "Odd-man out" – **Fashion-based medicine** • **Exploiting "Family history"** • "**Making-sure**!" • Confirming what is obvious – "A picture worth a thousand words', but then chasing incidental findings • Chasing **MIRANCaS** (Multiple Incidental Radiological Abnormalities of No Clinical Significance) • **Chart over-load syndrome** – Rather than the primary care provider (PCP) going through a thick chart, orders the investigation again, when they often spend couple of minutes for each clinical encounter with the patient • Buying time – when nature often would take care of the issue at hand • **Failure to practice "Masterly inactivity**" – has to do "something" • Specialists asking/requesting for imaging studies before clinical assessments, eg., CT/MRI before Neurologist appointment and ECHO/Stress test before Cardiologists appointment etc. • Specialists advising or ordering studies beyond their field • **Diversional Medicine** – Specialist suggesting PCP to refer to another specialist for non-specific symptoms eg., respirologist suggesting cardiac assessment in a deconditioned patient • Specialists suggesting unnecessary Imaging to PCP, especially during a telephone or corridor consult • Incomplete information on Imaging requitions, resulting in inappropriate testing • Radiologists suggesting further imaging studies (**self-referral**), when they do not have complete clinical information about the patient or their co-morbidities • Toys or Tools! – Radiologist suggesting other imaging studies as if these are toys! • **Inability to separate wheat from the chaff** – unable to differentiate what is significant and what is not significant.


Provider- based
System-based
Provider- based
Receiver-based
Culture-based

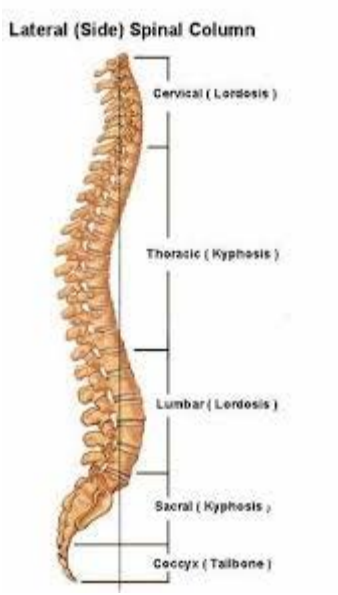
Some common examples

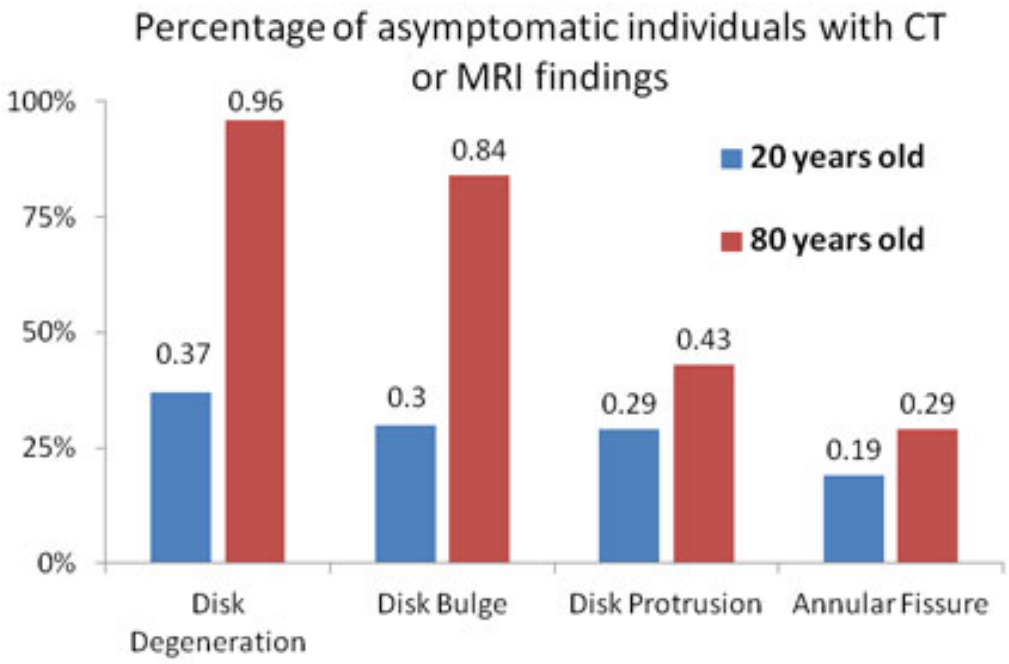


Condition	Overdiagnosis
Asthma	30% may not have asthma 66% may not require medications
Breast cancer	Upto 1/3 of mammographically detected "cancers" may be overdiagnosed
Chronic kidney disease (CKD)	1 in 10 classified as CKD under present criteria Overdiagnosis in the elderly
High BP	Substantial overdiagnosis
High cholesterol	Up to 80% of people with near normal cholesterol treated for life may be overdiagnosed
Prostate cancer	Overdiagnosis of 60% in those detected using the prostate specific antigen (PSA) test

Spine Imaging

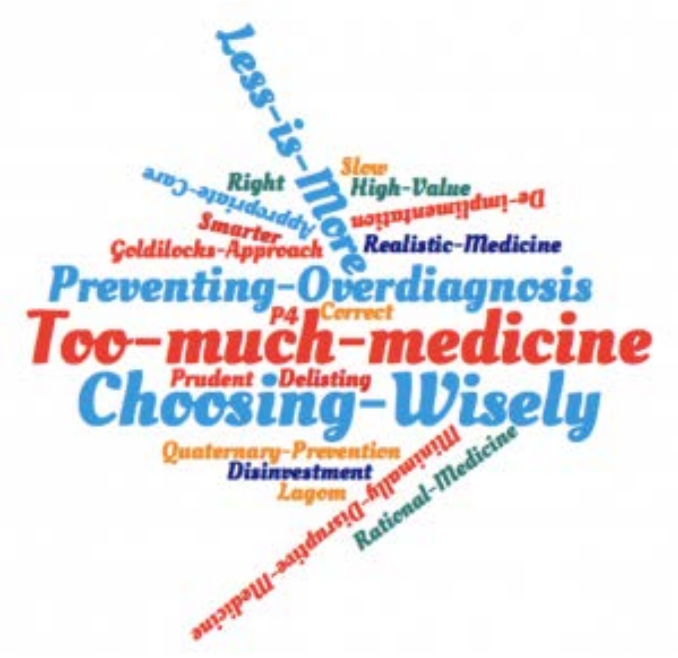
Brinjilkji et al. AJNR April 2015





Information obtained from AJNR Apr 2015 Brinjilkji et al

What could be done?

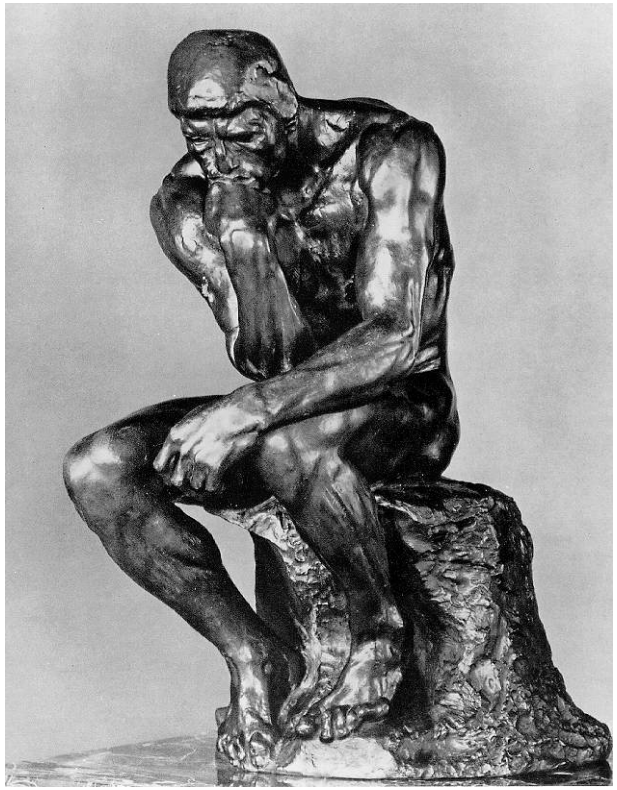


THE RECEIVERS!

CHOOSING WISELY

- Do I really need this test, treatment or procedure?
- What are the down sides?
- Are there simpler, safer options?
- What happens if I do nothing?

THE PROVIDERS!

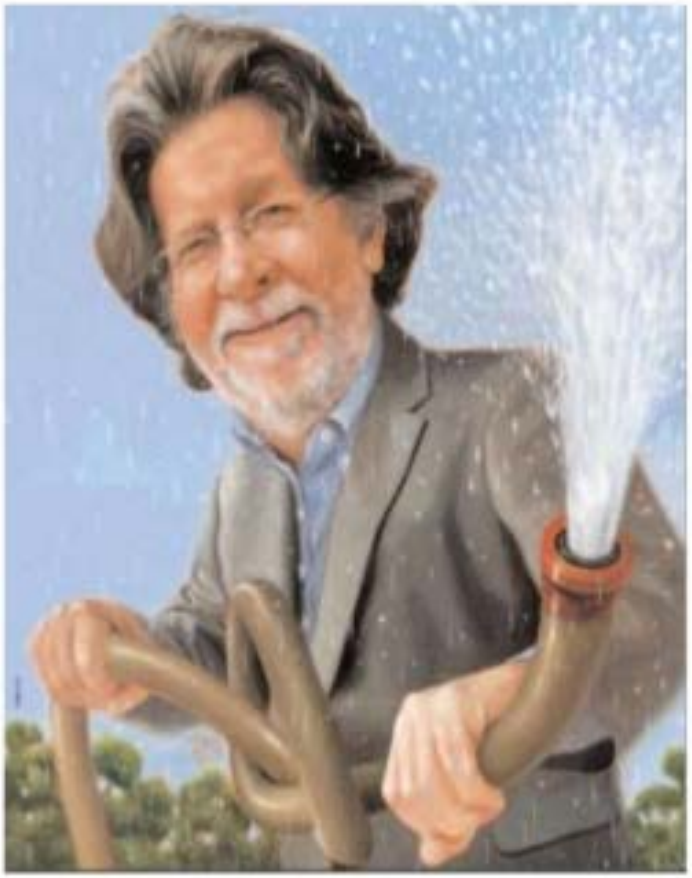


- Don’t be a blind follower!
  - Guidelines/protocols/Evidence
- Is this test/therapy **really** required for this individual?
- Am I **really** going to make a difference in this individual?
- Stop treating thy-self

CHOOSING WISELY

- Choosing Wisely - ABIM Foundation (www.choosingwisely.org)
- Preventing Overdiagnosis (www.preventingoverdiagnosis.net)
- Too Much Medicine!
- **Canada** (www.choosingwiselycanada.org)
- Right Care (Lown Institute – www.rightcarealliance.org)

Infoxication

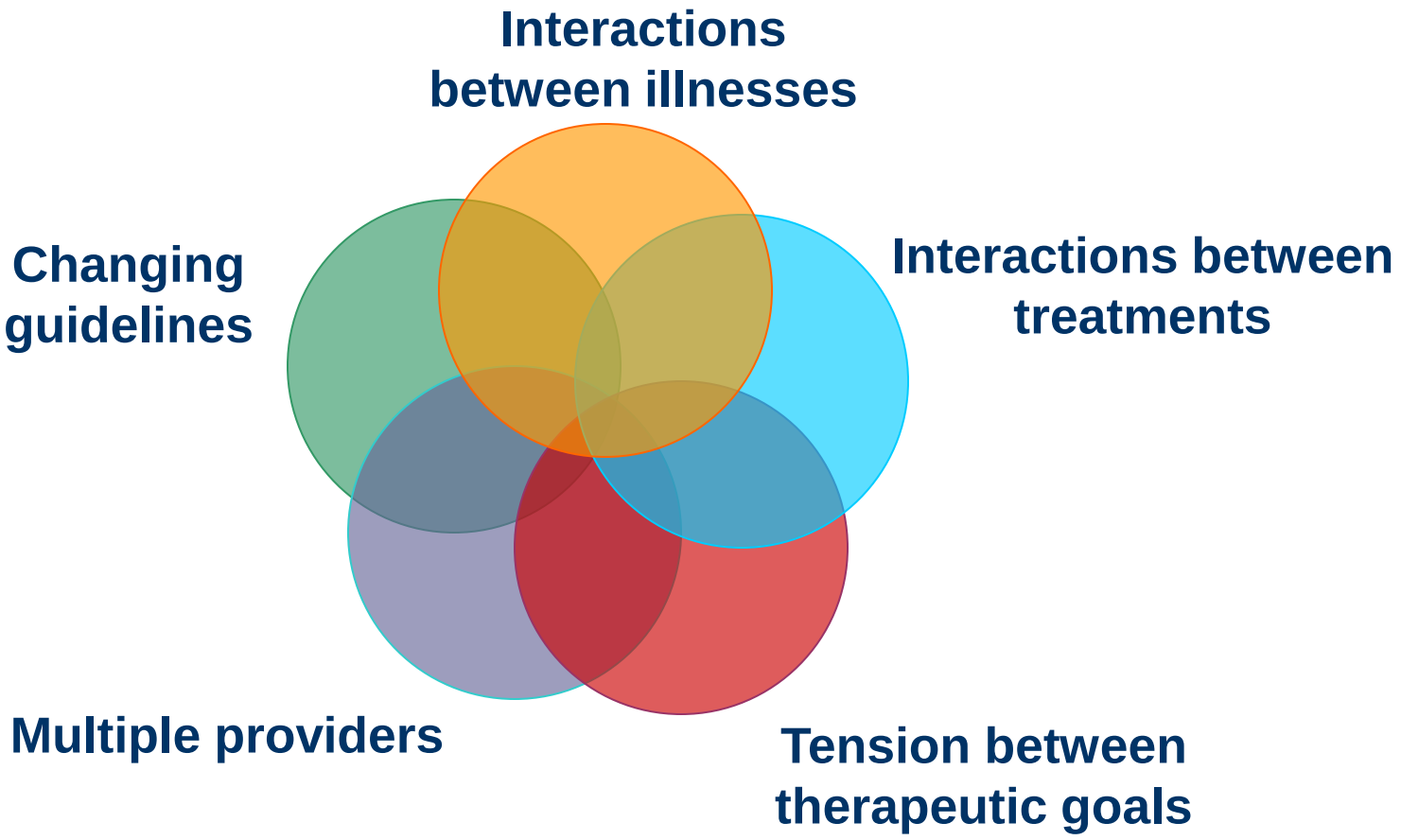


- Information intoxication
- Like trying to get a drink from a firehose
- Like a giant tsunami washing over the American public every day
  - Health care marketing messages
  - DTC drug ad disease mongering
  - News & Talk shows
  - Journals competing for public attention
  - Medical center/industry news releases
  - Editorial cartoons
  - Patient advocacy groups
  - Social media messages

THE SYSTEM

- Public education
- Auditing utilization
- Improve IT issues
- Stop incentives!
- RCTs before implementing untested technologies
- Limit legal liabilities
- Think Long-term consequences

CHALLENGES


Interactions between illnesses
Changing guidelines
Interactions between treatments
Multiple providers
Tension between therapeutic goals

Does number of providers help?

Or, they Spoil the broth!

One Patient, Too Many Doctors: The Terrible Expense of Overspecialization

JUL 22, 2016 @ 10:09 AM 20,708

Out-Of-Control Physicians: Too Many Doctors Are Doing Too Many Things To Too Many Patients

Peter Ubel, CONTRIBUTOR

I explore medical controversies thru behavioral econ and bioethics. FULL BIO

Opinions expressed by Forbes Contributors are their own.

TWEET THIS

Indeed, 40% of patients expected to live five or fewer years received PSA tests from experienced physicians, versus only 25% receiving care from trainees

So what's going on with all these questionable tests and treatments? It's not just about the money.

THE PERILS OF OVERDIAGNOSIS & OVERTREATMENT

Cured yesterday of my disease, I died last night of my physician.

Matthew Prior, 1714

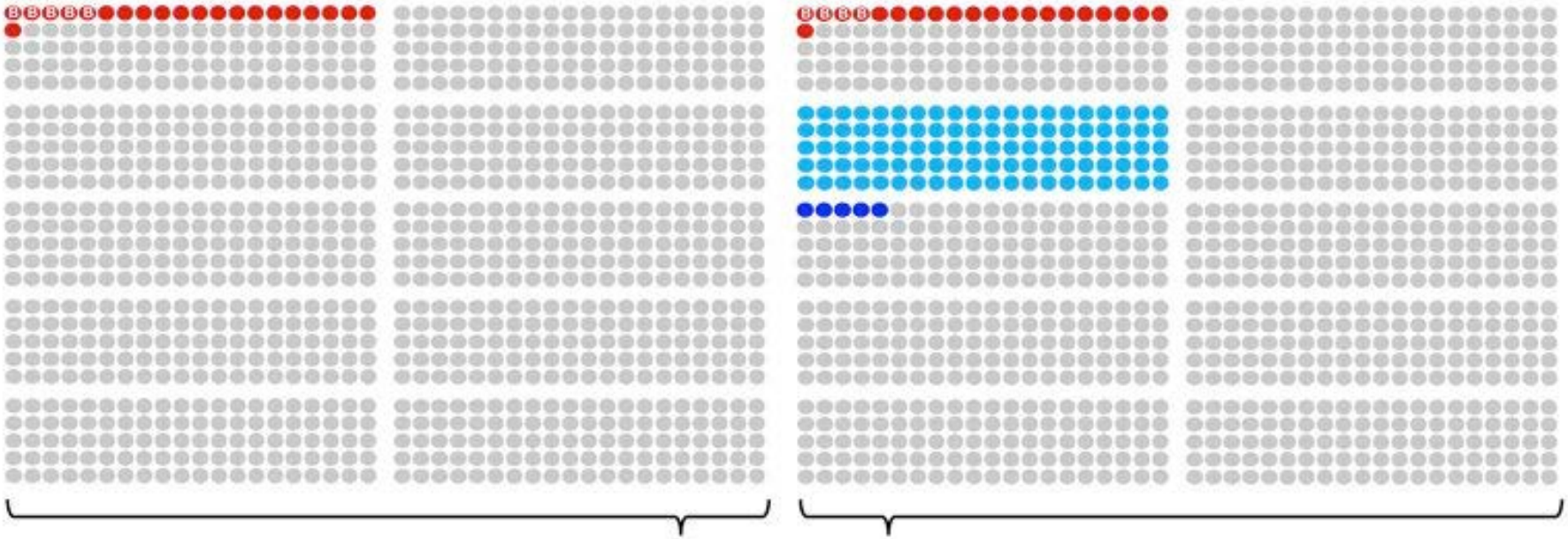
Breast Cancer Early Detection

HARDING CENTER FOR RISK LITERACY

by mammography screening

Numbers for women aged 50 years or older who participated in screening for 10 years or more

1000 women without screening: **1000 women with screening:**

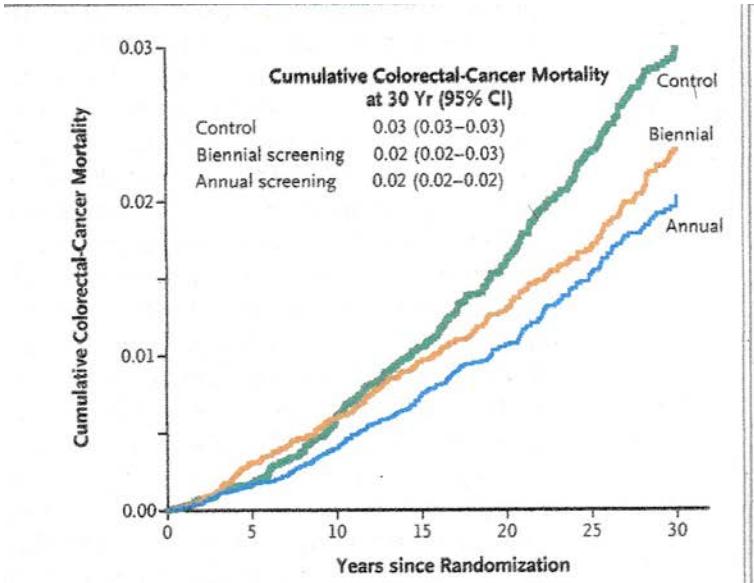


	1000 women without screening	1000 women with screening
Women who died from breast cancer:	5	4
Women who died from all types of cancer:	21	21
Women who learned after a biopsy that their diagnosis was a false-positive:	–	100
Women who were diagnosed and treated for breast cancer unnecessarily:	–	5
Remaining women:	979	874

Source:
Gøtzsche, PC, Jørgensen, KJ (2013). *Cochrane Database of Systematic Reviews* (6): CD001877
Numbers in the facts box are rounded. Where no data for women above 50 years of age are available, numbers refer to women above 40 years of age.
www.harding-center.mpg.de

Minnesota 30-year colon cancer study

Shaukat A. et al. NEJM 2013;369:1106



No. at Risk						
Control	14,497	13,103	11,320	9157	6741	4450
Biennial screening	14,635	13,243	11,445	9323	6802	4583
Annual screening	14,658	13,294	11,437	9219	6802	4498

Figure 1. Cumulative Colorectal-Cancer Mortality.

Cumulative colorectal-cancer mortality was assessed on the basis of Kaplan–Meier estimates, evaluated at monthly time points. Point estimates and 95% confidence intervals at 30 years are also shown.

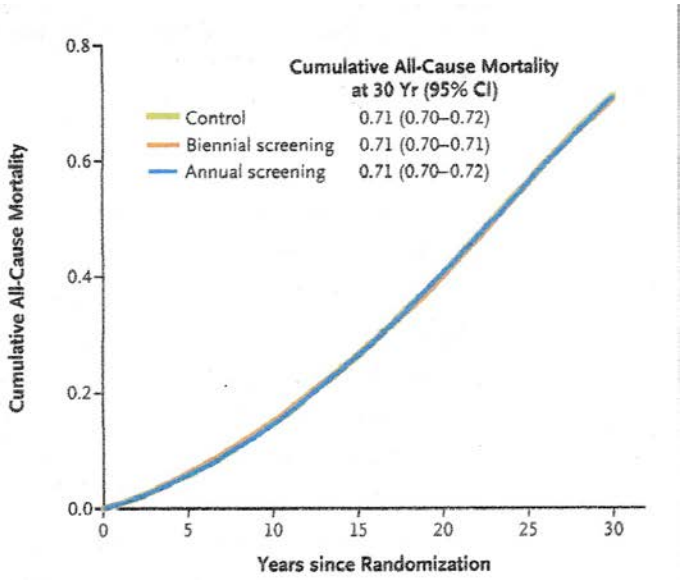


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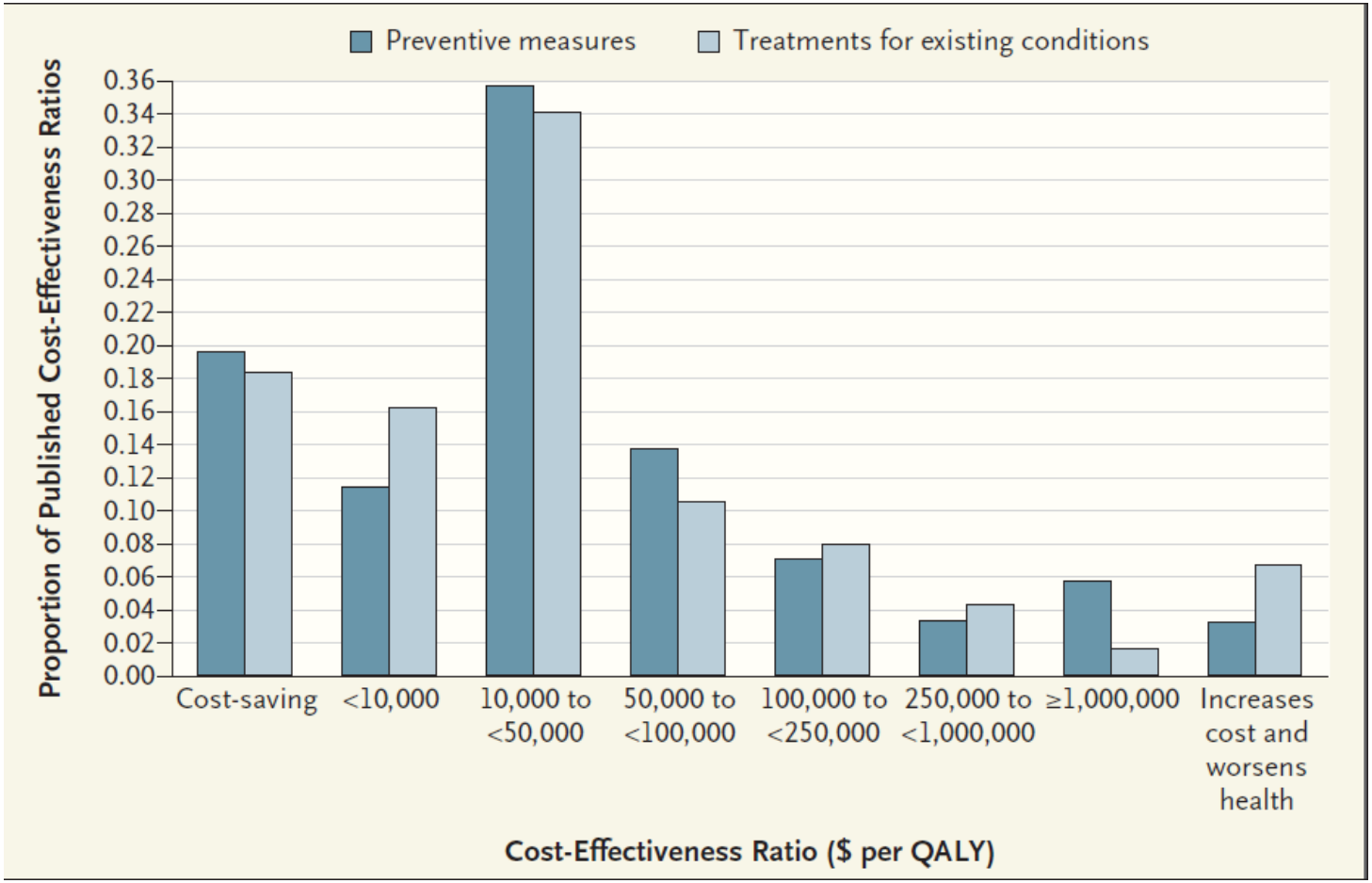
Figure 2. Cumulative All-Cause Mortality.

Cumulative all-cause mortality was assessed on the basis of Kaplan–Meier estimates, evaluated at monthly time points. Point estimates and 95% confidence intervals at 30 years are also shown.

Does preventive care saves money?

Cohen JT et al. NEJM 2008; 358:7

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