Objectives

- Describe the problem of changing disease definitions
- Describe patient-centered approaches to medical gambling
- Describe how to separate serious disease decisions from non-serious ones
Illustration

- GERD
- Osteoarthritis with Achilles tendinitis
- Hyperlipidemia
- Asthma
- Mild cognitive impairment
- Obsessive-compulsive disorder
- Benign prostatic hypertrophy
Sicker Than Ever?

- Chronic Conditions
  - Before WWII - 57%
  - Baby boomers - 63%
- 1999 – 2002
  - Life expectancy - increased 0.4 years
  - Healthy life expectancy - decreased 1.2 years
A Story

* Veterans Administration study in the early 1960s

* Diastolic BP of 119 - 129

* RCT of 140 patients, 1.5 years

* NNT = 1.4
What About Lower BP?

<table>
<thead>
<tr>
<th>Degree of Hypertension</th>
<th>Five-year Risk of Bad Event</th>
<th>Chance of Benefit</th>
<th>Number Needed to Treat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Treatment</td>
<td>Treatment</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>80%</td>
<td>8%</td>
<td>72%</td>
</tr>
<tr>
<td>[Diastolic BP 115–129]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate10</td>
<td>38%</td>
<td>12%</td>
<td>26%</td>
</tr>
<tr>
<td>[Diastolic BP 105–114]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>32%</td>
<td>23%</td>
<td>9%</td>
</tr>
<tr>
<td>[Diastolic BP 90–104]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Mild11</td>
<td>9%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>[Diastolic BP 90–100]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"Prehypertension"
Bottom Line

The graph illustrates the relationship between the severity of an abnormality on the spectrum and the treatment benefit. As the severity of the abnormality increases from mild to severe (e.g., mild hypertension to severe hypertension), the treatment benefit also increases. This suggests that more intensive treatment is needed for more severe conditions.
Giving People Diseases

- Hypertension - Prehypertension
- Diabetes - Prediabetes
- High cholesterol
- Osteoporosis
- Alzheimer's – Mild Cognitive Impairment
1997 – Changed the definition

- Fasting BS went from 140 to 126

- NHLBI study – increased deaths in treatment group

“We were unable to find the precise cause of the increased risk of death”
Treating Cholesterol

- Harrison's 8th Edition - reserve treatment for over 300!
- 1990s - 240
- 1998 - AF/CAPS - 2% absolute risk reduction - lowered to 200
- 42,000,000 "new" patients with “high” cholesterol
Changed Definition
What About Osteoporosis?

- Bone mineral density (BMD) testing
- Arbitrary definition of -2.5 (compared to young women)
- Arbitrary because risk rises each point below 0
- 2003 - National Osteoporosis Foundation advocated changing definition to -2.0
- Created 6,700,000 "new" patients
## Lower Diagnostic Thresholds

<table>
<thead>
<tr>
<th>Condition</th>
<th>Change in Threshold</th>
<th>Disease Prevalence</th>
<th>New Cases</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Old Definition</td>
<td>New Definition</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11,697,000</td>
<td>13,378,000</td>
<td>1,681,000</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Fasting sugar 140 → 126</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
<td>Systolic BP 160 → 140</td>
<td>38,690,000</td>
<td>52,180,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diastolic BP 100 → 90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hyperlipidemia</td>
<td>Total cholesterol 240 → 200</td>
<td>49,480,000</td>
<td>92,127,000</td>
</tr>
<tr>
<td></td>
<td>Osteoporosis in women</td>
<td>T score −2.5 → −2.0</td>
<td>8,010,000</td>
<td>14,791,000</td>
</tr>
</tbody>
</table>
Why Does This Happen?

- Well-meaning, but misguided specialists
  - Most funded by the pharmaceutical industry
- Advocacy groups
  - Most funded by the pharmaceutical industry
- "Value" of doing something
Solutions?

- No one with drug company/device manufacturer connection on guideline panels
- Primary care directed panels
- Limit specialists on panels
- Specialists can report, but not write (like NIH Consensus Conferences)
- Government funding only
Imaging To Create Disease

- CT study of college students with colds
  - 87% of college students with uncomplicated colds have sinusitis on CT
- MRI study of people's backs
- "Depends on what you look at, obviously. But even more it depends on the way that you see." Bruce Cockburn

Gwaltney, NEJM, 1994;330:25
Massive Inflation

- **CT Scans**
  - 1980 - 3,000,000
  - 2006 - 62,000,000

- **Since 1990**
  - Head CTs – doubled
  - Abdominal CTs - tripled
  - Chest CTs - fivefold increase
  - MRIs - four to tenfold increase
What's Normal?

* In asymptomatic people:
  * 10% have gallstones on ultrasound
  * 40% have meniscal injury on MRI
  * 50% of people below 50, and 80% of those over 50, have bulging disks on MRI

Silent Strokes

Total body CT

* 86% have an abnormality

* Ave. 2.8 abn/person

Vascular Screening

<table>
<thead>
<tr>
<th>Abnormality (Setting)</th>
<th>Prevalence of Abnormality Using</th>
<th>Increase with Scanning Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal Aortic Aneurysm (201 high-risk men)</td>
<td>2.5% (abdominal ultrasound)</td>
<td>3.6-fold</td>
</tr>
<tr>
<td>Blood Clots in Leg (349 trauma patients)</td>
<td>1% (duplex ultrasound)</td>
<td>58-fold</td>
</tr>
<tr>
<td>Blood Clots in Lung (44 patients with clots in leg)</td>
<td>16% (ventilation-perfusion scan)</td>
<td>3.3-fold</td>
</tr>
</tbody>
</table>

So what are the risks of this?
Risky Screening

- Prostate screening
- Thyroid cancer
- Melanoma
- Lung Cancer
- Mammograms in young women
- Routine fetal monitoring
Prostate Screening

Over half of older men have prostate cancer – but less than 3% die from it

Goodman, NEJM, 2033;349:215, Thompson, NEJM, 2004;350:2239
Some Cancers Don't Matter

Screening can't distinguish these - and misses the worst ones!
Reducing Deaths?

New prostate cancer diagnoses and deaths (per 100,000 men)

- New diagnoses
- Deaths

Largely overdiagnosis
Why Does This Matter?

- Surgery complications
  - 50% erectile dysfunction
  - 30% incontinence
  - 0.1 to 0.2% mortality rate
- Radiation complications
  - 15% defecation problems
  - Impotence and incontinence - less but still happens

http://hcupnet.ahrq.gov
The Great Prostate Mistake - PSA testing

"...the test is hardly more effective than a coin flip"

"...can't distinguish between the two types of cancer - the one that will kill you and the one that won't."

"...a profit-driven, public health disaster"

Richard Ablin, discoverer of PSA test

Cancers Overdiagnosed?

- Thyroid
- Melanoma
- Kidney
### Incidentalomas

<table>
<thead>
<tr>
<th>Organ</th>
<th>Proportion of People with an Incidentaloma on CT scan (a)</th>
<th>Ten-year Risk of Cancer Death (b)</th>
<th>Chance That the Incidentaloma Is a Lethal Cancer [highest possible] (c = b/a)</th>
<th>Chance That the Incidentaloma Is Not a Lethal Cancer (d = 1− c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung (smokers)</td>
<td>50%</td>
<td>1.8%</td>
<td>3.6%</td>
<td>96.4%</td>
</tr>
<tr>
<td>Lung (never-smokers)</td>
<td>15%</td>
<td>0.1%</td>
<td>0.7%</td>
<td>99.3%</td>
</tr>
<tr>
<td>Kidney</td>
<td>23%</td>
<td>0.05%</td>
<td>0.2%</td>
<td>99.8%</td>
</tr>
<tr>
<td>Liver</td>
<td>15%</td>
<td>0.08%</td>
<td>0.5%</td>
<td>99.5%</td>
</tr>
<tr>
<td>Thyroid (by ultrasound)</td>
<td>67%</td>
<td>0.005%</td>
<td>&lt;0.01%</td>
<td>&gt;99.99%</td>
</tr>
</tbody>
</table>
Effective Screening

- Cervical cancer
- Colon cancer
- Breast cancer?
Is Medicine Worthless?

How do you want to gamble?

- Spectrum of Abnormality
  - Mild: Borderline hypertension, Borderline diabetes, Small aortic aneurysm, Small blood clots, Screen-detected cancers, Subtle fetal abnormalities, Weakly penetrant genes
  - Severe: Severe hypertension, Severe diabetes, Large aortic aneurysm, Large blood clots, Clinically detected cancers, Obvious fetal abnormalities, Highly penetrant genes

- Potential Benefit of Diagnosis & Treatment
  - Net Benefit
  - Net Harm

- Harms of Diagnosis & Treatment
The Horizon

**Medscape Cardiology**
The Cost of Giving Statins to Almost All of Us
Henry R. Black, MD, 1/17/12

Universal Screening and Drug Treatment of Dyslipidemia in Children and Adolescents

Effectiveness and Cost-Effectiveness of Blood Pressure Screening in Adolescents in the United States
*Journal of Pediatrics* - Volume 158, Issue 2 (February 2011)

Fecal Occult Blood Tests Can Do More Harm Than Good in the Elderly
Kistler CE, Arch Intern Med 2011;171:1344-1357
Gambles

* Pursue Health – focus on feeling well, use only proven methods to reduce risk, minimize contact with medical system unless unwell, accept slightly higher chances of disease, disability or death to minimize overdiagnosis, medicalization, and overtreatment

* Pursue Disease – do everything possible to reduce risk of death or disability, accept risk of being diagnosed, experiencing side effects or medical errors
Final Point

* No right answer
* But there is a right process – involve the patient
* They are very likely to gamble differently than you do