Numeracy, communication and shared decision making

Adherence is poor

• Roughly 25% of ALL new prescriptions are NEVER filled\(^1\)

• Fewer than 30% of patients put on antidepressants continued them for 6 months\(^2\)

• Only 1 in 3 patients started on antihypertensive or lipid-lowering therapy still taking at 6 months\(^3\)

• Only 25% of elderly given a statin for CHD risk reduction regularly using at 5 years\(^4\)

Perception of "high risk"

![Bar chart showing the perception of high risk by patients and clinicians.](chart.png)

Side Effects: What Patients think when we say it’s Uncommon?

<table>
<thead>
<tr>
<th>Description</th>
<th>EU Assigned Meaning</th>
<th>Patients Perceived Chance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Common</td>
<td>&gt;10%</td>
<td>65%</td>
</tr>
<tr>
<td>Common</td>
<td>1-10%</td>
<td>45%</td>
</tr>
<tr>
<td>Uncommon</td>
<td>0.1-1%</td>
<td>18%</td>
</tr>
<tr>
<td>Rare</td>
<td>0.01 – 0.1%</td>
<td>8%</td>
</tr>
<tr>
<td>Very Rare</td>
<td>&lt;0.01%</td>
<td>2%</td>
</tr>
</tbody>
</table>

- Patients over estimated risk by 5 to 200 times.

307 subjects using a written questionnaire and interview.

Results

<table>
<thead>
<tr>
<th>Patients</th>
<th>Median acceptable absolute % benefit threshold</th>
<th>% that would take a “safe” drug for 5 years</th>
<th>Absolute % benefit they felt they were getting from their drug</th>
<th>% who wanted to be told percent chance of benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post MI patients</td>
<td>20</td>
<td>32</td>
<td>69</td>
<td>70</td>
</tr>
<tr>
<td>On drugs</td>
<td>20</td>
<td>29</td>
<td>74</td>
<td>68</td>
</tr>
<tr>
<td>No drugs</td>
<td>30</td>
<td>21</td>
<td>56</td>
<td>-</td>
</tr>
</tbody>
</table>

Clin Med 2002;2:527-33

Osteoporosis medications

- Physicians estimate 69% adhere to osteoporosis meds
  - However, only 49% even fill their scripts

- When physicians & patients are given absolute fracture risk (versus simply high/mod/low)
  - Prescribing rates go down 7-10%

- What fracture risk should someone have before you offer bisphosphonate therapy?

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Doctors</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>10%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Did NOT ask patients to consider side effects or drug cost, just the dosing regimen, in the decision

“A typical patient in our study required a 50% absolute fracture risk and 50% relative risk reduction (giving an absolute risk reduction of 25%) before considering long-term drug therapy”

“A prominent current guideline for treatment to prevent fractures, based on cost-effectiveness analyses, recommends pharmacologic intervention at thresholds of 10-year risk of 20% for major osteoporotic fracture or 3% for hip fracture; applying these cut points, 125 (77%) of doctors in our study would recommend treatment, but only 24 (21%) of our patient cohort would consider treatment justified.”

Osteoporos Int 2012;23:2135–40

for benefit 88% of study authors concluded that participants overestimated benefits

for harm 67% underestimated harm

JAMA Intern Med 2015;175:274-86
Estimates of baseline risk, absolute risk reduction - by speciality

“The mean degree of over-estimation, expressed in relative terms, was larger for low-risk scenarios (mean physician estimate 7.8 times Framingham estimate), intermediate for medium risk scenarios (2.8 times), and smaller (1.5 times) for high-risk scenarios”
Quality of Life & The Care of Patients?

• Quality of Life in Diabetes

<table>
<thead>
<tr>
<th>Event</th>
<th>QOL Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Stroke</td>
<td>0.70</td>
</tr>
<tr>
<td>Angina</td>
<td>0.64</td>
</tr>
<tr>
<td>Diabetic Neuropathy</td>
<td>0.66</td>
</tr>
<tr>
<td>Comprehensive Diabetes Care</td>
<td>0.64</td>
</tr>
</tbody>
</table>

Dialysis patients willing to trade
- 7 months of life to reduce weekly hospital visits from 4 to 3
- 15 months of life to improve travel restrictions (e.g. very to somewhat restricted)
Shared Informed Decisions: Do Patients Want It?

- Results vary but 27-55% of population wants\(^1\)
- Factors\(^1\)
  - presenting problem (more for procedures)
  - age (more if younger)
  - gender (more if female)
  - social class/education (more if more)
- “some patients clearly gain reassurance from the medical profession adopting the politically incorrect paternalistic approach.”
  - Example: ~62% preferred doctors opinion over any presentation (pictures or numbers) for CVD interventions\(^1b\)


Patient preferences for shared decisions: A systematic review

Betty Chewning\(^a\,*\), Carma L. Bylund\(^b\), Bupendra Shah\(^c\), Neeraj K. Arora\(^d\), Jennifer A. Gueguen\(^e\), Gregory Makoul\(^f\)

“In three quarters of the cancer studies and invasive procedure studies, the majority of patients preferred shared or autonomous decision making. In contrast, this was true for only about half of the studies with non- disease specific study populations or other chronic conditions, many of which incorporated hypothetical scenarios”

“studies suggest that the number of patients who prefer participation has increased over the past three decades so that the majority of patients prefer to participate in decisions during the encounter”

What do Decision-Aids Accomplish

- **Time:** 8 minutes less to 23 longer (median 2.55 minutes longer)

<table>
<thead>
<tr>
<th></th>
<th>Usual care</th>
<th>Decision Aid</th>
<th>Studies (patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge score: from 0 (none) - 100 (perfect)</strong></td>
<td>57%</td>
<td>70%</td>
<td>42 studies (10,842 patients)</td>
</tr>
<tr>
<td><strong>Proportion who Understand Risk</strong></td>
<td>30%</td>
<td>54%</td>
<td>19 studies (5868 patients)</td>
</tr>
<tr>
<td><strong>Congruence between choice and values</strong></td>
<td>32%</td>
<td>50%</td>
<td>13 studies (4670 patients)</td>
</tr>
<tr>
<td><strong>Decisional conflict (&lt;25 decisions made; &gt;38 delayed decision)</strong></td>
<td>13-49</td>
<td>7 lower</td>
<td>22 studies (4343 patients)</td>
</tr>
<tr>
<td><strong>Decision made by Practitioner</strong></td>
<td>17%</td>
<td>10%</td>
<td>14 studies (3234 patients)</td>
</tr>
</tbody>
</table>


Summary: Review of methods for promoting shared informed decision-making

- 91 studies
- Visual aids (icon arrays and bar graphs) improved understanding and satisfaction.
- Absolute risk > RRR for maximizing accuracy
  - But RRR more likely to get people to accept therapy.
- NNT reduces understanding.

Evidence-based risk communication

“There is likely no single best method of communicating probabilities to patients but rather several good options with some better suited to certain risk scenarios.”

Recommended approaches

GENERAL SUGGESTIONS - these are “relative”
use percentages or natural frequencies(numerator/denominator)
use absolute terms
add bar graphs or icon arrays
use incremental risk format with icon arrays in the same array
avoid use of NNTs
if use relative risks add baseline risks
## Thinking about numbers: Benefits

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Condition</th>
<th>Relative Risk Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisphosphonate</td>
<td>Fracture</td>
<td>20% (non-vertebral) - 50% (hip)</td>
</tr>
<tr>
<td>Low Potency Statin</td>
<td>Cardiovascular Disease</td>
<td>25%</td>
</tr>
<tr>
<td>High Potency Statin</td>
<td>Cardiovascular Disease</td>
<td>35%</td>
</tr>
<tr>
<td>Warfarin</td>
<td>A Fib - Stroke</td>
<td>66%</td>
</tr>
</tbody>
</table>

### Heart Failure

In systolic heart failure, 3 drugs do Big things

- Aldosterone antagonists\(^1,2\) ~25%
- \(\beta\)-blockers\(^3\) ~29%
- ACE inhibitors\(^4,5\) ~23%

Assuming mortality = 25%/yr (after 1\(^{st}\) hospitalization),\(^6\)

Number needed to Treat are

- Aldosterone antagonists = NNT 16
  
  25% of 25% = 6.25% ➔ 100/6.25 = 16

- \(\beta\)-blockers = NNT 14
  
  29% of 25% = 7.25% ➔ 100/7.25 = 14

- ACE inhibitors = NNT 18
  
  23% of 25% = 5.8% ➔ 100/5.8 = 18

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