Values Clarification in Men with Prostate Cancer

Christopher Saigal MD, MPH
Professor and Vice Chair
Dept of Urology
Geffen School of Medicine at UCLA
Disclosures

WiserCare
Terms:

**Values:** Personal beliefs that make certain aspects of any one treatment more or less attractive

**Values clarification:** The process of identifying what is important to a patient related to a healthcare decision

**Preferences:** Inclinations to treatments that align with values

**Preference elicitation:** The process of identifying treatment options that match patients
Let a hundred flowers bloom

* Systematic review of values clarification (n=110)
* 62% had no basis in theory (most common were EUT and conjoint analysis)
* Most (58%) used direct scaling/rating
* 37% created ratio-level values out of responses
* 29% connected treatments to values clarification

Witteeman MDM 2016
How can we measure what matters to a patient?
Utility measurement

* Derived from classical economics
* A health ‘utility’ is a number, ranging from 0.0 to 1.0, which corresponds to a person’s desire for a health state
* Determined under conditions of uncertainty
* Expected utility theory is a ‘normative’ description

Von Neumann and Morgenstern 1944
Standard Gamble

- Life with a health condition
- Normal life
- Death

Probability P and 1-P
Standard Gamble

Pros: Theoretically supported, long history

Cons: complex, hard to perform, risk aversion issues, axioms of EUT are often violated in practice (Prospect theory)
Series of choices

“Would you prefer 10 years of life with urinary incontinence to 2 years of life in perfect health?”

“Would you prefer 10 years of life with urinary incontinence to 3 years of life in perfect health?”
Value converted to a 0-1 scale and then standardized against 1 year

If 10 years with current erections are equivalent to 8.5 years with impotence, then the utility for impotence is 0.85
Time Trade Off

* Pros: simpler to use, still mimics some aspects of medical decision making

* Cons: not strictly speaking, a utility still vulnerable to ‘framing biases’ useful for more serious medical outcomes
Rating Scale

Severe Post-Thrombotic Syndrome

100% of Perfect Health

Perfect Health
Death

Find the level that you feel reflects your quality of life with this condition.
Rating Scale

Pros: Simplest to understand

Cons: biases in using scales, very unclear if these are ratio level numbers

Derived from studies of perception on light, totally different theoretical background/relationship to medical decision making.
57 men with advanced CAP ranked 8 health states in an ordinal manner

Measured utilities for those states with SG, TTO, RS, and willingness to pay

Calculated differentiation and inconsistency scores

Giesler Med Care 1999
Problems

Rating scale allowed unique assignment of value to 70% health states, other methods around 40%

All had similar levels of inconsistency, around 10% of states mis-ordered
Problems

Are these numbers ratio level numbers?

Is moving from 6.0 to 7.0 the same as moving from 1.0 to 2.0?

Ceiling effects

How do you incorporate risk aversion
Cost-Utility Analysis of Chemotherapy Using Paclitaxel, Docetaxel, or Vinorelbine for Patients With Anthracycline-Resistant Breast Cancer

RESULTS: Each of the three drugs led to a similar duration of quality-adjusted progression-free survival. Vinorelbine was the least costly strategy, with an overall treatment expenditure of $3,259 per patient, compared with $6,039 and $10,090 for paclitaxel and docetaxel.

CONCLUSION: Palliative chemotherapy with vinorelbine in anthracycline-resistant metastatic breast cancer patients has economic advantages over the taxanes and provides at least equivalent quality-adjusted progression-free survival. These benefits are largely related to its lower drug acquisition cost and better toxicity profile.

Lueng, JCO 1999

Used time trade off method to assess utility. Are these ratio level numbers?
Other approaches: conjoint analysis/DCE

- Developed in mathematical psychology, marketing, and business research literature
- Proven method to measure consumer preferences and predict consumer behavior
- Courtyard by Marriott, smartphones, glucometers are examples of products developed using conjoint analysis
* Can more easily incorporate non-clinical treatment attributes of importance to patients

* More accurate assessments of values may lead to treatment choices more congruent with patients’ goals

* May improve public policy/ CEA estimates
Conjoint Analysis

* Designed to help decide between products with varying levels of attributes

* Usually one product or service is more desirable in terms of one attribute, while the others have different desirable attributes
Conjoint Analysis

- Users are presented with two or more products, each with varying attributes
- Limited number of possible combinations shown
- Strength of preferences for attribute levels is determined by one of a few modeling approaches
Consumer preference measurement: discrete choice experiment

**Phone A**
- Touch screen
- 2 month wait
- 4G network

**Phone B**
- Keyboard
- No wait
- 3G network
Data are examined using multinomial logit regression to estimate a utility function:
\[ V = B_1 X_1 + B_2 X_2 + B_3 X_3 + \ldots + B_n X_1 \]

* \( V \) is the utility of the treatment, \( X_j (j=1, 2, \ldots, n) \) are the different attributes of the treatment, and \( B_j (j=1, 2, \ldots, n) \) are the coefficients of the model to be estimated.

* Coefficients indicate the relative importance of each attribute in composing the final overall treatment utility.
Conjoint Analysis

Pros:
Lower cognitive burden: CA rated as ‘difficult’ or ‘very difficult’ much less frequently than the traditional methods in knee arthroscopy evaluation

Proven to predict consumer behavior: empiric evidence that preferences are being captured

Cons:
Limited track record with patient-level estimation, requires specialized software packages

Byrne J Clin Epi 2006
Conjoint analysis in health care

* CA survey of patients with peripheral vascular disease
* Preferences for treatment near home were strong
* Subjects willing to accept higher mortality and morbidity rates for treatment near home

Shackley J Health Svc Res Pol 2001
Phase 1: ‘Voice of the customer” analysis

Phase 2: Develop/pilot preference assessment tools

Phase 3: Two randomized controlled trials:

- Conjoint analysis vs TTO or RS in men s/p prostate biopsy (300 men)

  *Compare predictive ability (“hold outs”)*

- Decision aid with or without conjoint analysis in newly diagnosed men (160 men)

  *Compare decision quality, time requirements*
60-90 min. Interviews: treatments, Side effects, outcomes

Side effects
Outcomes
1,000 quotes

Research Team Identifies 15 Themes

Researchers Narrow From 1,000 to 70 quotes

Patients Group Similar Quotes into piles

Researchers Analyze piles Using AHC for consensus groupings

Team Identifies Conjoint Attributes From piles

Listen Parse Themes Select Affinity Analyze Translate

Objective Subjective More Subjective

Voice of the Patient
Sample narratives from men treated for prostate cancer

**Treatment Issues**

*Cutting*: I don't want to be cut

*Others’ Advice*: I only follow doctors’ advice up to a point. Not 100%

*Caution*: I could wait for a while if the numbers stay stable...

*Action*: I was just thinking "we have got to do something"

**Side Effects**

*Sex*: If you have an understanding partner, the ED thing can be ok.

*Urinary*: Changing pads frequently…feels as if you don't have control of your life.

*Lifespan*: It is more important to stay alive, regardless of the side effects.

*Bowel*: The bowel issue is the biggest deal because it is socially unacceptable.
Patient-derived attributes

* Sexual function effects
* Urinary function effects
* Bowel function effects
* Survival
* Opinion of others
* Need for incision
* Treatment makes man feel like he is “taking action”
Adaptive best/worst

Treatment 1
- Doctor and Family Support this treatment
- Sex: Decreased compared to before treatment
- Caution: Treatment gives me months or longer to decide
- No Cutting: Treatment does NOT require any surgery
- Bowel: No problems
- Lifespan: Live my expected lifespan

Treatment 2
- Doctor and Family Support this treatment
- Sex: Decreased compared to before treatment
- Active: Treatment requires action within weeks
- Cutting: Surgery with some risks and hospital time
- Bowel: No problems
- Lifespan: Live 5 years fewer than expected

Treatment 3
- Doctor and Family do not favor this treatment
- Sex: Unable to engage in sex
- Caution: Treatment gives me months or longer to decide
- No Cutting: Treatment does NOT require any surgery
- Bowel: No problems
- Lifespan: Live 5 years fewer than expected

Treatment 4
- Doctor and Family Support this treatment
- Sex: Unable to engage in sex
- Caution: Treatment gives me months or longer to decide
- Cutting: Surgery with some risks and hospital time
- Bowel: No problems
- Lifespan: Live 5 years fewer than expected

Best
Worst

45% Complete
Prostate Cancer Treatment Preferences

Wednesday, January 05, 2011

About this report: Men with prostate cancer face several treatment choices. Often, their personal values are important in deciding which of these treatments is best for them.

The chart below was created by analyzing your answers to the study questions. The chart shows how important each of the treatment factors or side effects were to you.
* The length of the bars show how important the items are relative to each other, in your view, when considering a treatment that could result in any of the side effects or factors described.
* The longest bar represents the most important factor to you, based on your answers.

Please feel free to show this to your doctor as a way to start the conversation about how prostate cancer will affect the most important things to you about your quality of life.

If you have any questions about this chart, please ask the study coordinator.

<table>
<thead>
<tr>
<th>Category</th>
<th>Ranking</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex Life</strong></td>
<td><strong>MOST</strong></td>
<td>57%</td>
</tr>
<tr>
<td>Treatment preserves</td>
<td>partial or</td>
<td></td>
</tr>
<tr>
<td>or full sexual function</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Urination</strong></td>
<td>2nd most</td>
<td>24%</td>
</tr>
<tr>
<td>Treatment preserves</td>
<td>partial or</td>
<td></td>
</tr>
<tr>
<td>or full urinary function</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bowel</strong></td>
<td>5th most</td>
<td>1%</td>
</tr>
<tr>
<td>Treatment preserves</td>
<td>full bowel function</td>
<td></td>
</tr>
<tr>
<td><strong>Lifespan</strong></td>
<td>3rd most</td>
<td>5%</td>
</tr>
<tr>
<td>Treatment enables you</td>
<td>to live your full lifespan</td>
<td></td>
</tr>
<tr>
<td><strong>Avoid Surgery</strong></td>
<td>LEAST</td>
<td>1%</td>
</tr>
<tr>
<td>Treatment does not</td>
<td>require any surgery</td>
<td></td>
</tr>
<tr>
<td><strong>Others Approve</strong></td>
<td>6th most</td>
<td>1%</td>
</tr>
<tr>
<td>Doctor &amp; those close to you agree with your choice</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Active &amp; Immediate</strong></td>
<td>4th most</td>
<td>-1%</td>
</tr>
<tr>
<td>You're taking quick and decisive action</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Accuracy (r-sqr): 97% of the variation in your answers are explained by the above chart.
RCT of different methods

* Recruited men at the VA urology clinic undergoing prostate needle biopsy for suspicion of prostate cancer

* Eligible men:

  Negative biopsy, able to read English

* Subjects and task order randomized to:

  Rating Scale vs. Adaptive Best-worst Conjoint

  Time Tradeoff vs. Adaptive Best-worst Conjoint
Results

Outcome metrics:
- Compared internal validity of methods
- Comparative ability of stated preference data to predict preferences for health states that were not explicitly rated by patient
- Compared patient acceptability in men being evaluated for prostate cancer
Results: Internal validity

\( R^2 = \% \text{ of variance in 16 stimuli scores explained by utility functions} \)

Mean \( R^2 \)

<table>
<thead>
<tr>
<th>Method</th>
<th>Mean R^2</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conjoint</td>
<td>88%</td>
<td>&gt;.05</td>
</tr>
<tr>
<td>Ratings</td>
<td>87%</td>
<td>.001</td>
</tr>
<tr>
<td>Time Tradeoff</td>
<td>55%</td>
<td></td>
</tr>
</tbody>
</table>

P-values are from paired comparisons (t-tests) with conjoint analysis.
Results: Predictive validity for 3 methods
(hit rate: 1\textsuperscript{st} choice out of 4 options)

P-values are from paired comparisons (McNemar tests) with conjoint analysis.
Results: Three **most important** attributes

- **Sex**
- **Live Full Lifespan**
- **Urinary**
- **No Cutting**
- **Others Approve**
- **Bowel**
- **Active Treatment**

**Note:** TTO highlights **Lifespan**
## Results: Patient satisfaction and Ease-of-Use scores

### Preference assessment method ease of use and satisfaction (categories collapsed)

<table>
<thead>
<tr>
<th></th>
<th>Conjoint analysis (N = 31)</th>
<th>Time tradeoff (N = 15)</th>
<th>Rating scale (N = 16)</th>
<th>Conjoint vs. time tradeoff (N = 15)</th>
<th>Conjoint vs. rating scale (N = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ease of use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very easy/easy/ somewhat easy</td>
<td>18 (58%)</td>
<td>10 (67%)</td>
<td>14 (88%)</td>
<td>P = .99</td>
<td>P = .03</td>
</tr>
<tr>
<td>Somewhat/very difficult</td>
<td>13 (42%)</td>
<td>5 (33%)</td>
<td>2 (12%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Satisfaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely/somewhat</td>
<td>26 (84%)</td>
<td>9 (60%)</td>
<td>13 (81%)</td>
<td>P = .38</td>
<td></td>
</tr>
<tr>
<td>Neutral/not very/not at all</td>
<td>5 (16%)</td>
<td>6 (40%)</td>
<td>3 (19%)</td>
<td></td>
<td>P = .99</td>
</tr>
</tbody>
</table>

P-values obtained by comparing responses within same subjects using the exact version of McNemar’s test of paired proportions.

Rating Scale perceived to be **easier** than Conjoint... but Conjoint’s **satisfaction** ratings are just as good.
Conclusions

* Conjoint analysis is a feasible method to collect real-time, individual level preferences from patients

* Conjoint analysis is viewed by patients as a highly satisfactory way to collect preference data, though challenging
Conclusions

* Conjoint analysis and rating scale-derived utility functions outperform time trade off in regards to explanation of variance in stated preferences

* Conjoint analysis has superior predictive validity compared to the other two methods regarding preferences for novel health states
RCT of conjoint analysis and decision quality

Recruited men at VA urology clinic undergoing prostate needle biopsy

Eligible men:
positive biopsy, localized disease, able to read English

Subjects randomized to:
- Educational pamphlet
- Educational pamphlet followed by preference assessment
Men randomized to education and preference assessment receive a report detailing their preferences.

Counseling physicians briefed on report interpretation.

Physicians could use the report during the counseling session.
Methods

Decision quality measures (pre/post):

- Satisfaction with care
- Disease specific knowledge
- Decisional Conflict Scale
- Shared decision making questionnaire
- Yes/No has made a treatment choice
Decisional conflict:
Improvements in:
- Uncertainty
- Perceived effective decision making

Satisfaction with cancer care:
“Thoroughness of main cancer practitioner”
(1.6 vs 1.2, p = 0.04)

No difference to date in measures of shared decision making, knowledge
Conjoint analysis is a feasible method to collect real-time, individual level preferences from patients in a busy clinic.

Addition of preference assessment to education results in:
-reduced elements of decisional conflict after CA
-perception of physician thoroughness enhanced with CA
IPDAS (2005) Collaboration core attributes for effective decision aid:

* Feeling informed about treatment options, risks, benefits, and consequences
* Value clarity
* Patient goals, concerns, and preferences
* Patient involvement

Can we do this in practice?
Assuming all other effects are the same, which outcome would be more acceptable to you?

You are able to return to work and daily activities immediately.

You are unable to have erections immediately after treatment. Gradually it becomes easier, and within 12 months you return to where you were before the treatment.

or

You require four weeks at home to recover, including two weeks with a urinary catheter.

Your ability to have erections does not change.

- This outcome is much more acceptable
- Both outcomes are equally acceptable
- This outcome is much more acceptable

← Previous  Continue →
**Report: Wilson Carlos**

Carlos favors more aggressive treatments, weighing the removal of the cancer above other concerns. Carlos is accepting of most outcomes as part of the treatment process.

## Patient Values

<table>
<thead>
<tr>
<th><strong>High Importance</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Erectile Dysfunction</td>
<td>Green</td>
</tr>
<tr>
<td>Reduced Longevity</td>
<td>Green</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Moderate Importance</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Transfusion</td>
<td>Blue</td>
</tr>
<tr>
<td>Frequent trips to the bathroom to urinate</td>
<td>Blue</td>
</tr>
<tr>
<td>Extended Recovery Time</td>
<td>Blue</td>
</tr>
<tr>
<td>Risk of Surgical Complications</td>
<td>Blue</td>
</tr>
<tr>
<td>Inpatient surgery/ overnight hospital stay</td>
<td>Blue</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Low Importance</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of urinary control (wearing a diaper or pad)</td>
<td>Dark Grey</td>
</tr>
<tr>
<td>Outpatient Surgery</td>
<td>Dark Grey</td>
</tr>
<tr>
<td>Frequent trips to the bathroom for a bowel movement</td>
<td>Dark Grey</td>
</tr>
</tbody>
</table>

## Treatment Options

1. Best Fit
   - Surgery
2. Radiation Therapy
3. Active Surveillance
4. Brachytherapy
Treatment Options

The following treatments best fit your value preferences.

1. Surgery
   Radical prostatectomy is a surgery that involves removing the prostate and seminal vesicles. Usually, as part of the surgery, the surgeon also performs a removal of nearby lymph nodes, called a lymphadenectomy. Radical prostatectomy can be done using assistance from a surgical robot (robotic prostatectomy) or via the traditional technique using only the surgeon’s hands ("open" radical prostatectomy).

2. Radiation Therapy
   Radiation therapy kills prostate cancer cells by damaging the cancer cell’s DNA and inducing "programmed cell death." Radiation therapy can be delivered by several techniques, including ones that rely on traditional X-ray energy and ones that rely on protons to deliver energy. Radiation is painless, but must be carefully directed to avoid damaging normal tissue.

3. Active Surveillance
   Active Surveillance is a treatment option for some men with newly diagnosed prostate cancer. Sometimes you will hear this called "watchful waiting." Doctors know that not all prostate cancers will shorten a man's life or even cause symptoms before a man dies. Under active surveillance, men are followed closely and treated with radiation or surgery only if the cancer shows itself to be a serious one. Men selected for active surveillance tend to be older, with aggressiveness ("Gleason") scores in the low or moderate risk range. These men also usually have low PSA values at the time of diagnosis and no physical exam abnormalities.

4. Brachytherapy
   Radiation therapy kills prostate cancer cells by damaging the cancer cell’s DNA and inducing "programmed cell death." Brachytherapy is a method of delivering high-dose radiation therapy using radioactive pellets (or "seeds"). There are some brachytherapy systems that do not leave seeds in the prostate, but must leave them in permanently. After the seeds have emitted all of their radioactive, they remain harmlessly in the prostate gland.

Save Your Report
Your report can be accessed from anytime from My Reports. You can also Print or Save a PDF for your records, or to share and discuss with friends or family.

Medical Evidence
Want to learn more about the studies we used to help calculate your results? The full list of studies is available to view.

View Studies

Disclaimer
The WebCare site and resulting report are for educational purposes only and meant to prepare you for your consultation with your physician. The information provided on the WebCare site is presented in summary form in order to impart general information relating to prostate cancer treatments, symptoms, and side effects. Such information is not complete and should not be used as a substitute for a consultation or visit with your physician or other health care provider. Information accessed through the WebCare website is not exhaustive and does not cover all diseases, ailments, physical conditions or their treatments. WebCare makes no warranty as to the information's completeness, reliability or accuracy. Should you have any health care related questions please see your physician or other health care provider promptly.
Results

Improvement in DCS Score Before and After Completion of WiserCare – Question Subsets

- Total Decisional Conflict (Q1-16): 37%
- Informed Subscore (Q1-3): 55%
- Values Clarity Subscore (Q4-6): 49%
- Support Subscore (Q7-9): 35%
- Uncertainty Subscore (Q10-12): 25%
- Effective Decision Subscore (Q13-16): 30%
Towards better decisions for men with prostate cancer

* Make the evidence useful for patients and physicians when deciding
* Find ways to support incorporation of patient values into the discussion
* Measure and report the quality of decision making
Thank You