



## Prospective or Retrospective ?

- ⊙ Retrospective Adherence
  - ⊙ Can tell us whether current or past adherence can predict preferences
  - ⊙ Essentially treats adherence as an individual-specific characteristic
- ⊙ Prospective Adherence
  - ⊙ Attempts to use preferences to predict future adherence behaviour

24

## WHAT CAN PATIENT PREFERENCE STUDIES TELL US ABOUT PATIENT ADHERENCE? A NOVEL INSIGHT INTO AN OLD PROBLEM

A. Brett Hauber, PhD

RTI Health Solutions

RTI (b)(6), RTI HEALTH SOLUTIONS\*

23



## Approaches to prospective adherence

- ⊙ For a given profile or pair of profiles ask respondents to rate likely adherence or non-adherence
- ⊙ Elicit preferences over adherence and outcomes jointly
- ⊙ Collect data on preferences and actual adherence simultaneously (revealed and stated preference)



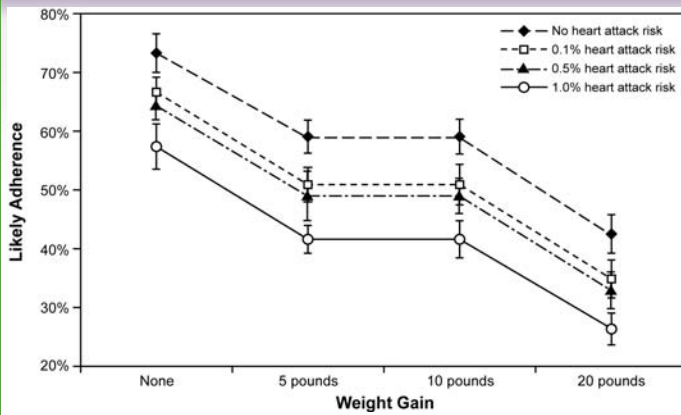
## Likely Adherence Ratings

Medication Feature	Medication A	Medication B
HbA1c change		
Number of hypoglycemic events per month	1 to 2	More than 2
Water retention	Yes	No
Weight gain in first 6 months	None	10 pounds
Mild stomach upset	Mild nausea and vomiting or diarrhea that continues as long as you take the medicine	No stomach problems
Chance of a heart attack	No additional person (0%) will have a heart attack	10 additional people out of 1,000 (1.0%) will have a heart attack
Which medication would you choose?	I would choose Medication A <input type="checkbox"/> I would choose Medication B <input type="checkbox"/>	
How likely would you be to miss or skip doses of each medication?	Much more likely to miss or skip doses with Medication A <input type="checkbox"/>	A little more likely to miss or skip doses with Medication A <input type="checkbox"/> Equally likely to miss or skip doses with Medication A and Medication B <input type="checkbox"/> A little more likely to miss or skip doses with Medication B <input type="checkbox"/> Much more likely to miss or skip doses with Medication B <input type="checkbox"/>

Source: Hauber et al., Diabetic Medicine 2009



## Predicted Likely Adherence



Source: Hauber et al., Diabetic Medicine 2009

27



## Summary – Likely Adherence

- ⊙ Benefits:
  - ⊙ Provides a measure of the likely influence of treatment outcomes on adherence
- ⊙ Limitations:
  - ⊙ Subject to social acceptability bias
  - ⊙ Doesn't estimate preference and adherence jointly
  - ⊙ Provides a measure of likely adherence, but does not indicate the extent of non-adherence
  - ⊙ Does not account for the effect of non-adherence on outcomes

28



## Joint Elicitation

Medicine Feature	Take Almost All the Time (Miss about 1-2 days per month)	Take Most of the Time (Miss about 3-5 days per month)	Take More Than Half the Time (Miss about 6-10 days per month)
Chance that the medicine works well	75 out of 100 (75%)	60 out of 100 (60%)	40 out of 100 (40%)
Mild-to-moderate acute side effects per month			
Weight gain			
Number of pills prescribed per day			
Personal cost to you each month	\$100	\$80	\$50
What would you choose to do?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29

## Summary: Joint Elicitation

- ⊙ Benefits:
  - ⊙ Less subject to social acceptability bias
  - ⊙ Provides a measure of preference over both outcomes and adherence
  - ⊙ Explicitly links non-adherence to changes in outcomes
- ⊙ Limitations:
  - ⊙ More difficult to model due to interaction effects between non-adherence and outcomes
  - ⊙ Required more complicated experimental design to ensure sufficient variation in adherence rates

30



## Revealed and Stated Preference

- Modeling Observed Behavior in Clinical Trials
  - Enrollment in a clinical trial
    - Motives for enrollment
  - Experienced changes in health status
    - Efficacy, side effects, and adherence
  - Dropping out of the trial
    - Rational response to efficacy and side effects

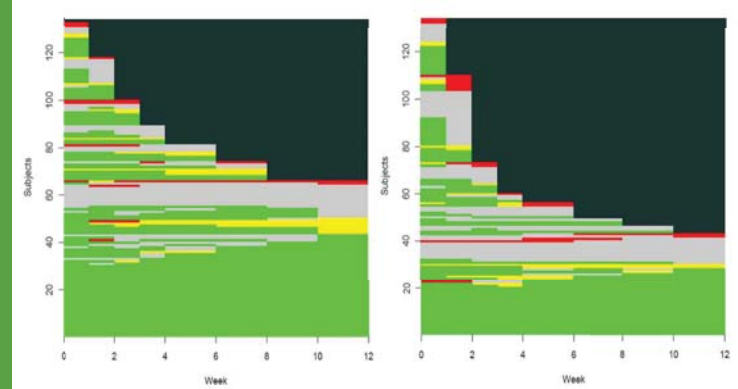
31



## Revealed Preference & Persistence

### Hydromorphone

### Placebo



Source: Norton, ASA Joint Statistical Meeting, 2011



## Stated Preference & Persistence

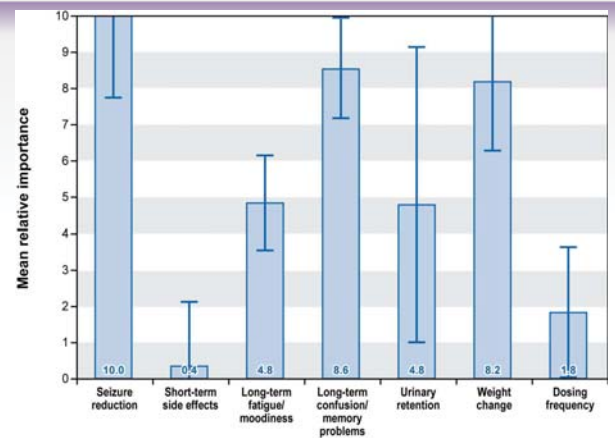
Medicine Features	Medicine A	Medicine B
Number of seizures	No seizures	75% fewer
Short-term side effects	None	Last br <b>1 week</b>
Long-term side effect: Mood changes	Cause some difficulty doing everyday activities	None
Long-term side effect: Confusion	Cause some difficulty doing everyday activities	None
Difficulty urinating	Half the time	Almost always
Weight change in 6 months	Lose 15 pounds	Gain 15 pounds
How often you take the medicine	Once a day	3 times a day
Personal medicine cost	\$150 per month (\$450 every 3 months)	\$25 per month (\$75 every 3 months)
Which add-on medicine is better?	<input type="radio"/> <b>Medicine A</b>	<input type="radio"/> <b>Medicine B</b>
Which would you choose?	<input type="radio"/> I WOULD add Medicine [A or B] to my current medicine or medicines. <input type="radio"/> I WOULD NOT add Medicine [A or B] to my current medicine or medicines.	

Source: Manjunath et al., American Epilepsy Society 2010

33



## Attribute Relative Importance



Source: Manjunath et al., American Epilepsy Society 2010

34

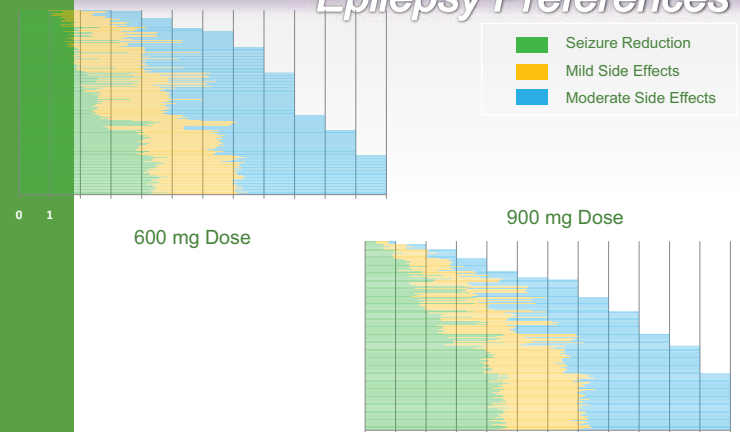


## Trial Dropout Simulation

- ⊙ Data
  - ⊙ Preference parameter estimates
  - ⊙ Frequency distribution of trial outcomes (but no dropout information)
- ⊙ Assumptions
  - ⊙ Dropout rate = 1 – predicted uptake rate
  - ⊙ Rate constant for each week in 12-week trial period
  - ⊙ Model assumptions for random-parameters logit



## Simulated Trial Data Based on Epilepsy Preferences



## Revealed and Stated Preference

- ⊙ Benefits
  - ⊙ Persistence behavior in clinical trial reveals something about patients' preferences
  - ⊙ Combining revealed and stated preference data can help us understand both preferences and adherence in a near real-world setting
- ⊙ Limitations
  - ⊙ Current work has focused on persistence, not adherence
  - ⊙ Measuring adherence precisely in a clinical setting is difficult
  - ⊙ Requires that stated-preference data be collected in clinical trials



## Conclusions

- ⊙ Patient adherence (and persistence) behavior reveals their preferences
- ⊙ The relationship between preferences and adherence is dynamic because adherence behavior affects outcomes
  - ⊙ Stated-preference studies should model this interaction explicitly
  - ⊙ Elicit preferences over outcomes and changes in outcomes resulting from changes in adherence
- ⊙ Combining revealed data (retrospectively or prospectively) with stated data can provide a more complete picture of the relationship between preferences and adherence