

Predictors of Preference for Colorectal Cancer Genetic and Environmental Risk Assessment (R01-CA11230)

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Outline

- **Conceptualizing Genetic and Environmental Risk Assessment (GERA)**
- **Study Design and Preference Clarification in the GERA Study**
- **Identifying Predictors of Preference for GERA**
- **Decision Factors in GERA**
- **Conclusions**

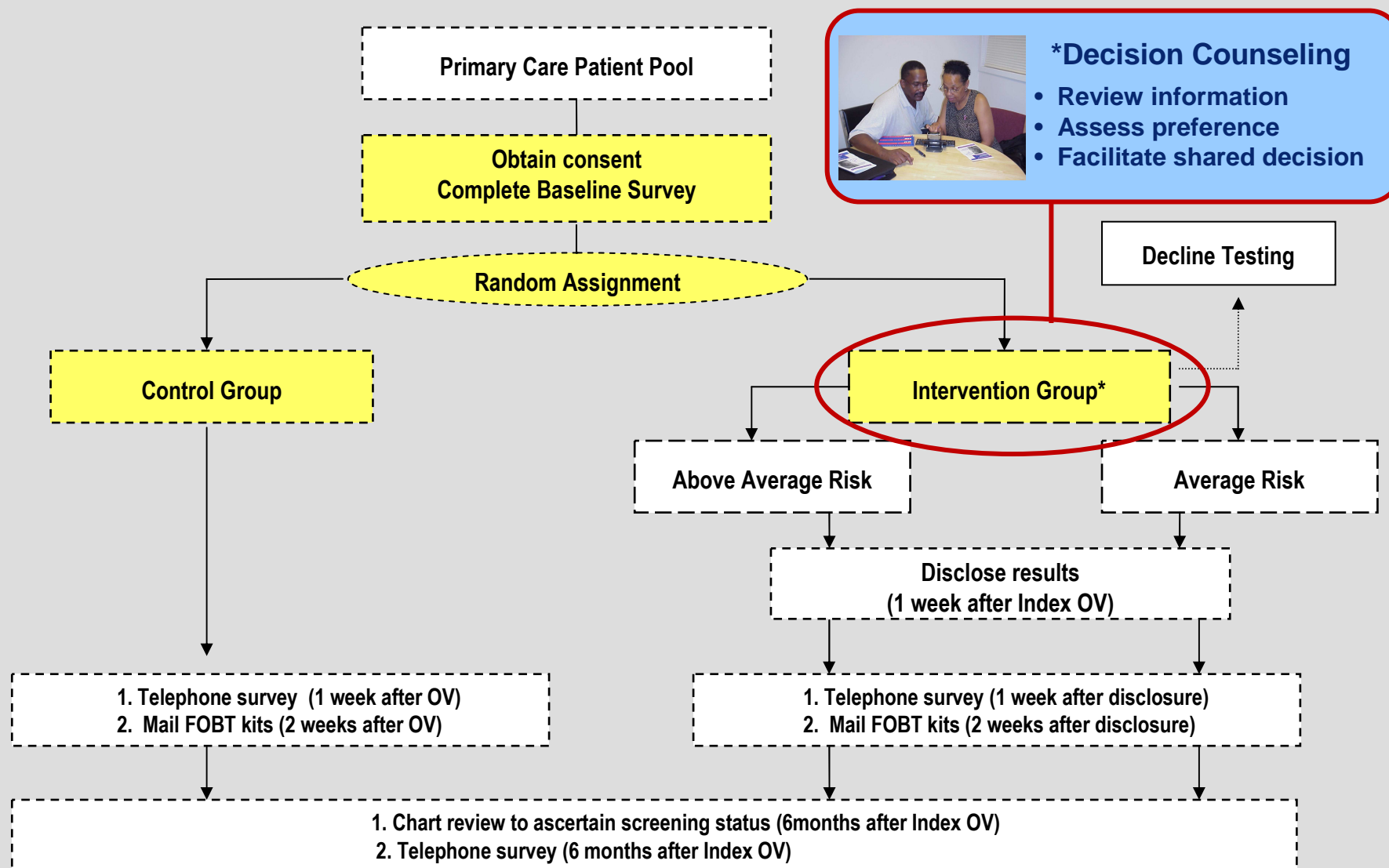
No conflicts of interest to declare concerning the presentation,
“Predictors of Preference for Colorectal Cancer
Genetic and Environmental Risk Assessment.”

Risk Feedback and Preventive Health Behavior

<u>Study</u>	<u>Design</u>	<u>Behavioral Outcome</u>
Arkadianos et al., 2007	Genomic risk feedback vs Usual care	Increased diet change and weight loss
Chao et al., 2008)	Genomic risk feedback vs Family/gender risk feedback (AD and alipoprotein E (<i>APOE</i>) gene)	Increased prev. behaviors (diet, exercise, vitamins)
Lerman et al., 1997	Biomarker +genetic risk feedback vs biomarker feedback vs counseling	No impact on smoking
Hamajima et al., 2006)	Genomic risk feedback vs Genomic risk feedback (high v low number of variants)	Decreased smoking
Beery and Williams, 2007 (Review of high-risk studies)	Genomic risk feedback vs Controls	Increased cancer screening

Gene-Environment Risk Assessment GERA (*MTHFR* & Folate) and CRC Screening: Study Design

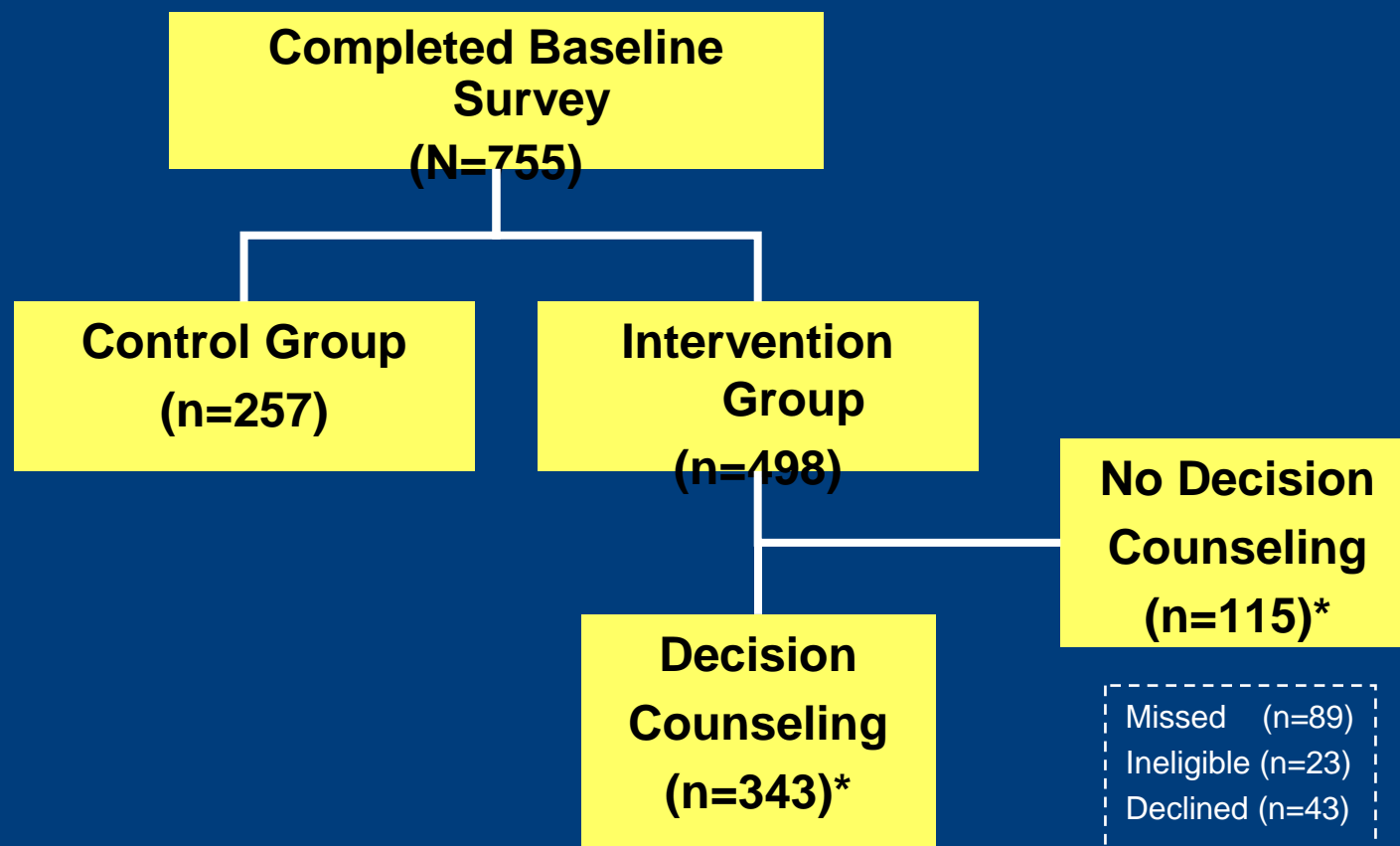
Research Design



Study Aims

- 1. Determine if CRC screening is higher in the Intervention Group than in the Control Group**
 - H1: CRC screening will be higher in the Intervention Group than the Control Group
- 2. Determine if GERA feedback has an impact on CRC screening**
 - H2: CRC screening will be higher among Intervention Group participants who receive GERA+ feedback than those who receive GERA- feedback

Focus on Preference Related to GERA



* Participants who were African American or had \leq HS education were more likely to undergo decision counseling than those who were white or had $>$ HS education ($p < 0.001$ and $p = 0.009$, respectively)

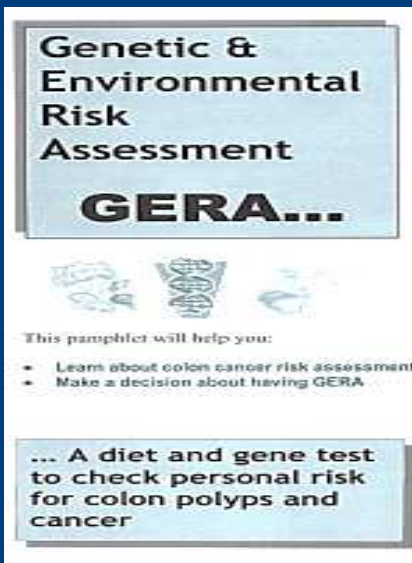
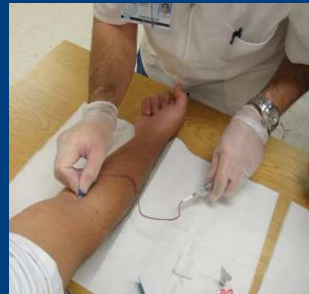
Study Population and Procedures

- Eligible patients: 50 to 79 years of age and eligible for CRC screening, consented, and completed a baseline survey.
- Control Group:
 - Usual care

Intervention Group: Decision Counseling

- Review GERA brochure
- Identify top decision factors (pros and cons)
- Rank factors and determine factor weights
- Compute preference score (0.000-1.000)
- Assess agreement with preference measure

Education and Preference Clarification



Above Average Risk:

- MTHFR 677/1298
- Low Folate

Average Risk:

- No MTHFR 677/1298
- Normal Folate

Pro Con Weight Decision Factors

<input checked="" type="radio"/>	<input type="radio"/>	Factor 1	Select Weight
<input type="radio"/>	<input checked="" type="radio"/>	Factor 2	Select Weight
<input checked="" type="radio"/>	<input type="radio"/>	Factor 3	Select Weight

Weight of Influence:

None, A Little, Some, Much,
Very Much, Overwhelming

Compare Decision Factors

Factor 1-2	Select Weight
Factor 2-3	Select Weight
Factor 1-3	Select Weight

Relative Weight of Influence:

About the Same, A Little
More, Somewhat More
Much More, Very Much
More, Overwhelmingly More

Computing a Decision Preference Score

**Decision Factor Direction
and Level of Factor Influence
Preference**

**Score
Range**

Con

— Overwhelming	1.9	0.000 – 0.333
— Very Much	1.7	0.334 - 0.356
— Much	1.5	0.357 - 0.383
— Somewhat	1.3	0.384 - 0.416
— A little	1.1	0.417 - 0.454

Neutral

1.0 0.455 - 0.545

Pro

— A little	1.1	0.546 - 0.583
— Somewhat	1.3	0.584 - 0.616
— Much	1.5	0.617 - 0.643
— Very Much	1.7	0.644 - 0.666
— Overwhelming	1.9	0.667 - 1.000

High

Moderate

Low

Neutral

Low

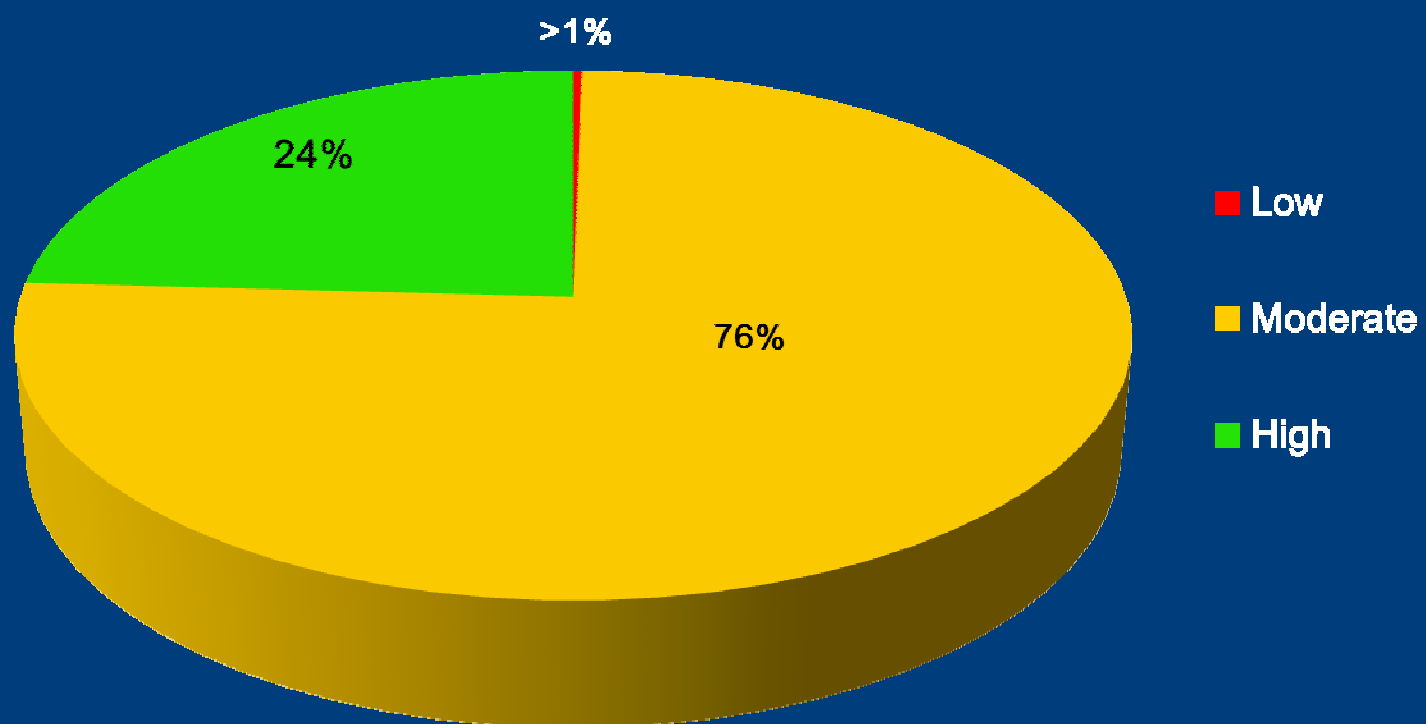
Moderate

High

Methods: Analysis of GERA Preference

- GERA preference scores for participants in the intervention group were determined (N=343)
- Preference scores were dichotomized as low to moderate (0.00-0.666) versus high (0.667-1.00)
- Univariable and multivariable analyses were performed to identify predictors of high preference
- Decision factors were coded and tallied.

GERA Preference Scores (n=343)



Participants & Decision Factors

- Pros (Altruism, Knowledge, Worry, Convenience)
 - “The test will help make find out what I can do to prevent colon cancer.”
 - “I want to contribute to science.”
 - “A blood test is a quick, and painless, safe .”
 - “It makes sense. I'm concerned about my health.”
- Cons (Fear, Worry, Trust, Discomfort)
 - “I'm afraid of finding out I'm at higher risk.”
 - “I don't like blood tests.”
 - “I'm worried about ulterior motives of research institutions.”
 - “I'm concerned about my privacy.”

**Decision Factors
(n=557)**

**96% Pros
4% Cons**

GERA Preference Scores (n=343)

Who is in the 24%
(High Preference for GERA)?

Univariable Analysis of Preference for GERA

Knowledge about CRC Screening (n=324)	Low/Mod (n=243)		High (n=81)		P-value
	n	%	n	%	
≤ 50	50	20.58	25	30.86	0.0573
> 50	193	79.42	56	69.14	

Knowledge about GERA (n=272)	(n=203)		(n=69)		P-value
	n	%	n	%	
≤ 50	80	39.41	29	42.03	0.7012
> 50	123	60.59	40	57.97	

Univariable Analysis of Preference for GERA

Variable	Low/Mod (n=260)		High (n=83)		P-value
	n	%	n	%	
Race					0.0001
White	165	63.95	33	40.24	
non-White	93	36.05	49	59.76	
Age					0.7094
50 – 59 years	176	67.69	58	69.88	
60 – 79 years	84	32.31	25	30.12	
Gender					0.4604
Male	109	41.92	31	37.35	
Female	151	58.08	52	62.65	

Univariable Analysis of Preference for GERA

Variable	Low/Mod (n=260)		High (n=83)		P-value
	n	%	n	%	
Education					0.0015
<= High School Graduate	60	23.08	34	40.96	
> High School Graduate	200	76.92	49	59.04	
Marital Status					0.4602
Living as Couple	128	49.23	37	44.58	
Living Alone	132	50.77	46	55.42	
Baseline Decision Stage					0.0214
< DTD	37	14.23	4	4.82	
DTD	223	85.77	79	95.18	

Univariable Analysis of Preference for GERA

Variable	Low/Mod (n=260)		High (n=83)		Total (n=343)		P- value
	n	%	n	%	n	%	
Salience & Coherence							1.0000
≤3	13	5.00	4	4.82	17	4.96	
>3	247	95.00	79	95.18	326	95.04	
Susceptibility							0.4829
≤3	215	82.69	65	79.27	280	81.87	
>3	45	17.31	17	20.73	62	18.13	
Worries and Concerns							0.4703
≤3	134	51.54	39	46.99	173	50.44	
>3	126	48.46	44	53.01	170	49.56	

Univariable Analysis of Preference for GERA

Variable	Low/Mod (n=260)		High (n=83)		P-value
	n	%	n	%	
Response Efficacy					0.1209
≤3	20	7.69	2	2.44	
>3	240	92.31	80	97.56	
Social Support & Influence					0.2292
≤3	39	15.00	8	9.76	
>3	221	85.00	74	90.24	

Multivariable Analysis of Preference for GERA

Variable	OR	95% Confidence Interval	P-value
Race			0.0028
White	1.00		
non-White	2.25	(1.32, 3.82)	
Education			0.0145
<=HS	1.00		
>HS	0.50	(0.29, 0.87)	
Baseline Decision Stage			0.0398
< DTD	1.00		
DTD	3.17	(1.06, 9.52)	

Results

- 24% of participants had a high preference for GERA
- Predictors of high preference
 - Being nonwhite
 - \leq High school education
 - Decided to do CRC screening
- Frequently expressed reasons for high preference
 - Desire for knowledge about risk for CRC
 - Worry about developing CRC in the future

Conclusions

- People differ in terms of their strength of preference for genetic and environmental risk testing
- Strength of preference for such testing may vary in population subgroups
- Research is needed to learn about factors that motivate subgroup preference for such testing
- Mediated decision support should be provided to facilitate informed, shared decision making about testing and preventive health behavior

Observation

“Genetic information based on single-gene variants with low risk probabilities has little impact – either positive or negative – on emotions, cognitions, or behavior . . . There is a need to accelerate research in evaluating whether new understandings of genetic risk can favorably influence health behavior.”

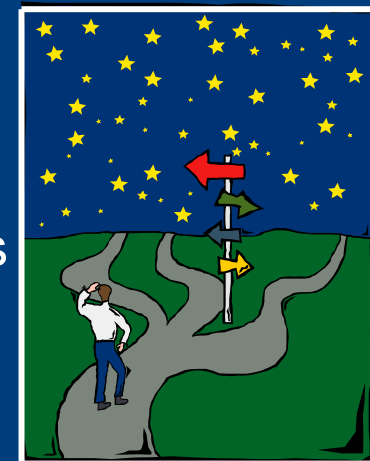
McBride et al., 2010

Patient-Centered Care

- **Patient-centered care** is “care that is respectful of and responsive to individual patient preferences, needs, and values (and ensures) that patient values guide all clinical decisions.”

(Crossing the Quality Chasm, IOM, 2001)

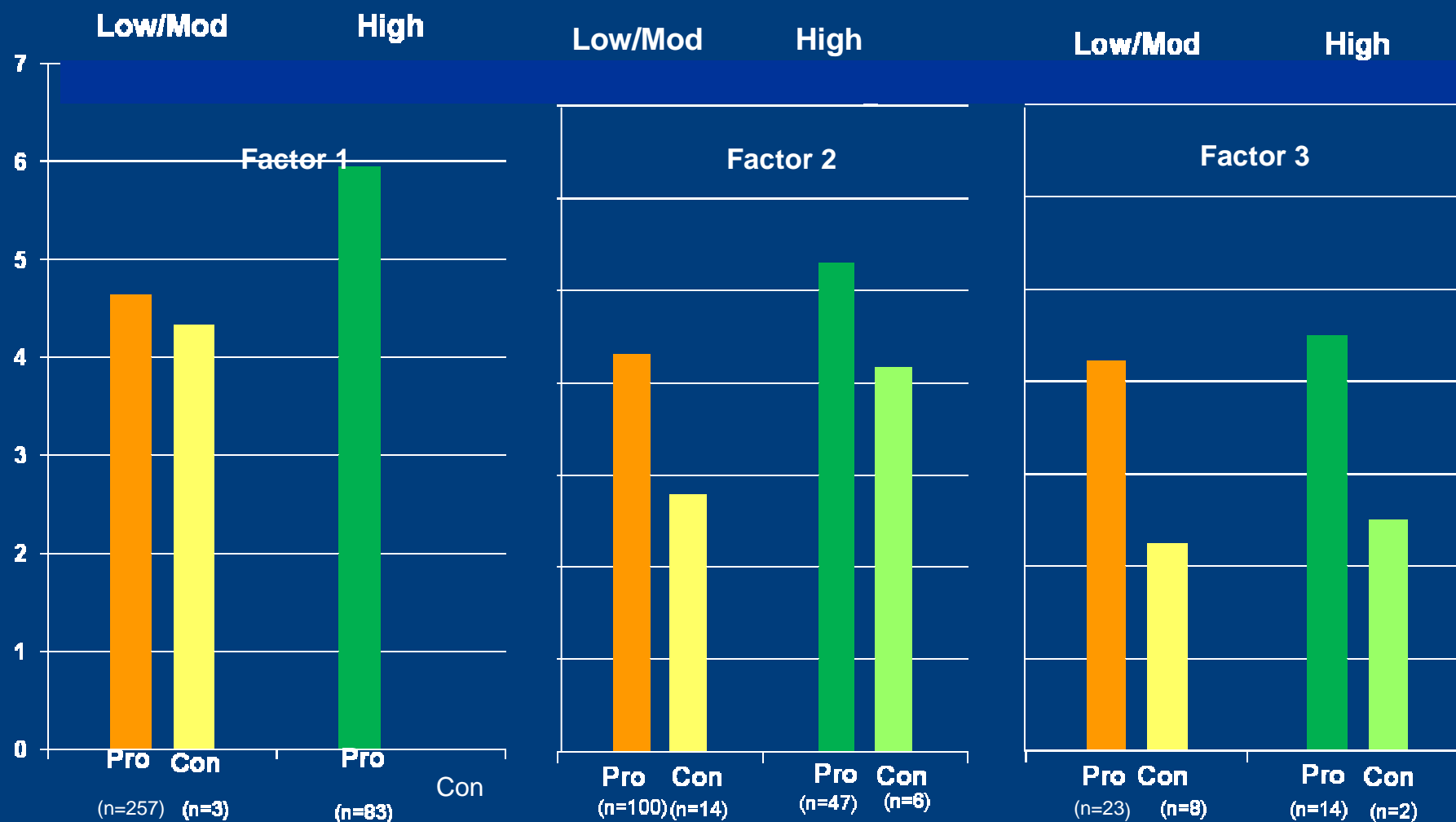
“the most important attribute of patient-centered care is the active engagement of patients when fateful health care decisions must be made – when an individual patient arrives at a crossroads of medical options, where the diverging paths have different and important consequences with lasting implications.”



(Barry and Edgman-Levitan, NEJM, 2012)

Influence of Pro and Con Decision Factors (n=343)

(1=No Influence, 6=Overwhelming Influence)



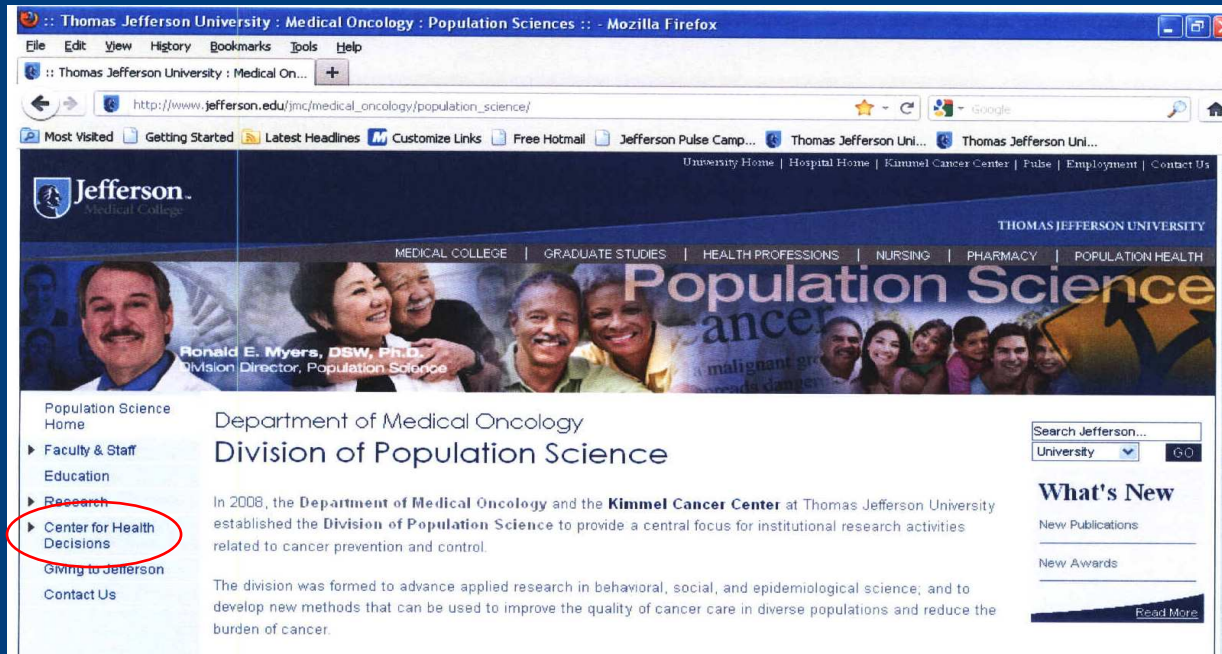
Decision Support Interventions Defined

- “Decision support interventions help people think about choices they face; they describe where and why choice exists; (and) they provide information about options, including where reasonable, the option of taking no action.”
- Decision support interventions can be used for one-way delivery of information to patients (non-mediated) or in the context of a two-way interaction between a patient and a health care provider (mediated)

(Elwyn et al., 2010)

Center for Health Decisions

(http://www.jefferson.edu/jmc/medical_oncology/divisions/population_science/)

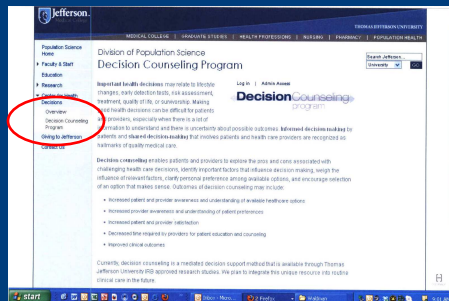
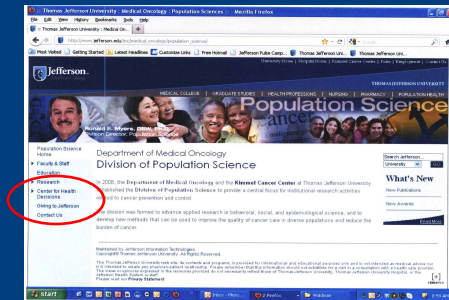


Research in the Center focuses on informed/shared decision making; patient, provider, and population response to mediated decision support; and the impact of decision counseling on patient behavior, provider practice patterns, population health, disparities in cancer care, and patient-centered outcomes.



**Decision Counseling
Report for <Patient>**

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Population Science Decision Counseling Program

Campus Key:

Password:

**Decision Counseling
program**

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FEEDBACK

Determine Preference and Produce Report

Division of Population Science

Decision Counseling Report: Colon Cancer Vaccine Study

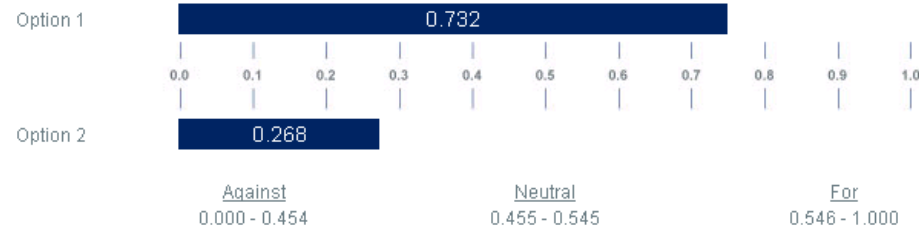
pause session

print page

log out

Decision to be Made - Option 1: **Join the Study** or Option 2: **Not to join the Study**

Session results indicate that you prefer to join the study.



Top Decision Factors and Direction of Influence:

Factor	Direction
I am worried that I might develop colon cancer	Pro
I am worried about insurance coverage and cost	Con
I just don't trust researchers	Con

Comments:

Address Mr. Doe's concern about cost and insurance coverage

☒ I understand and agree with the Decision Counseling Report results shown above.

Participant ID: 03192012

Decision Counselor: NAME

Participant First Name:

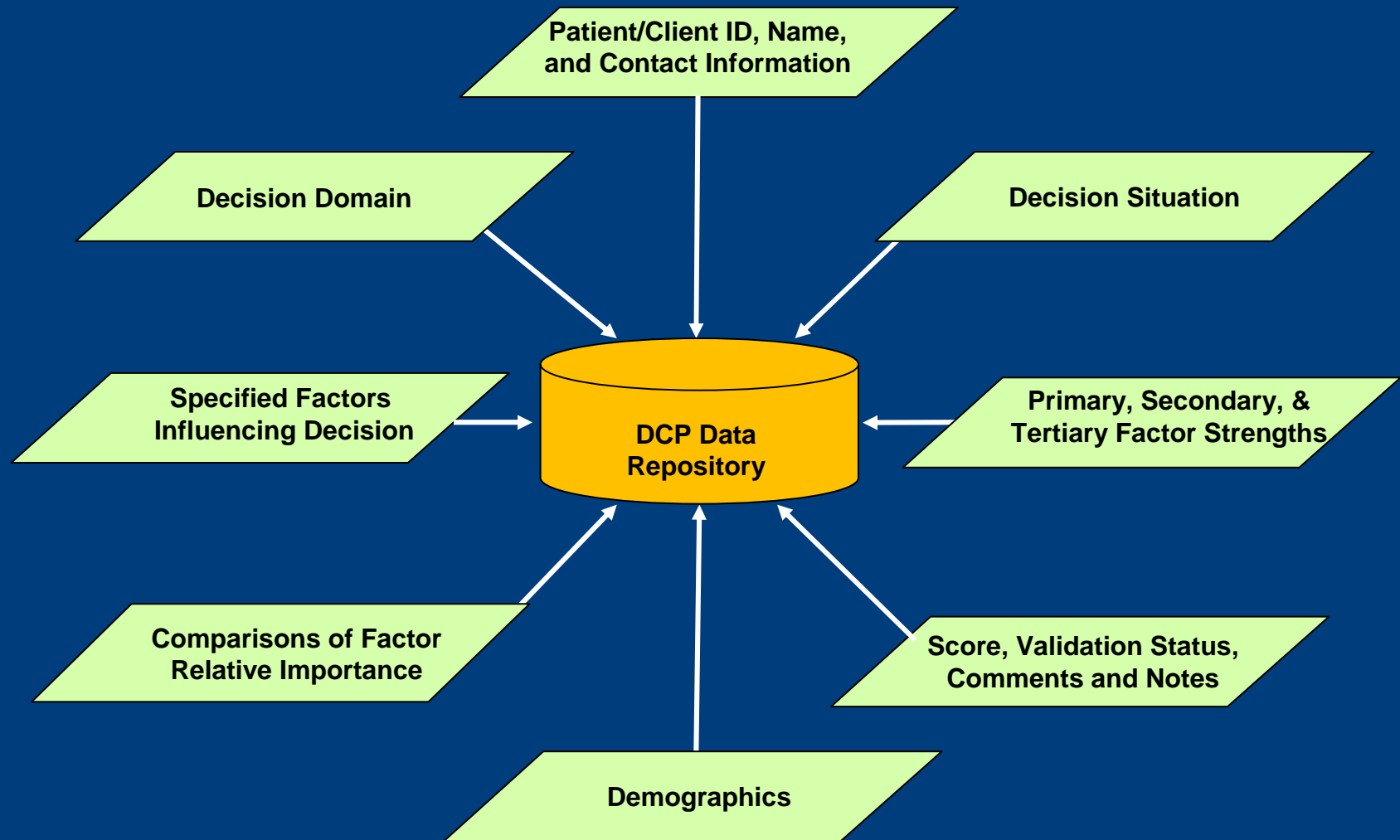
John

Participant Last Name:

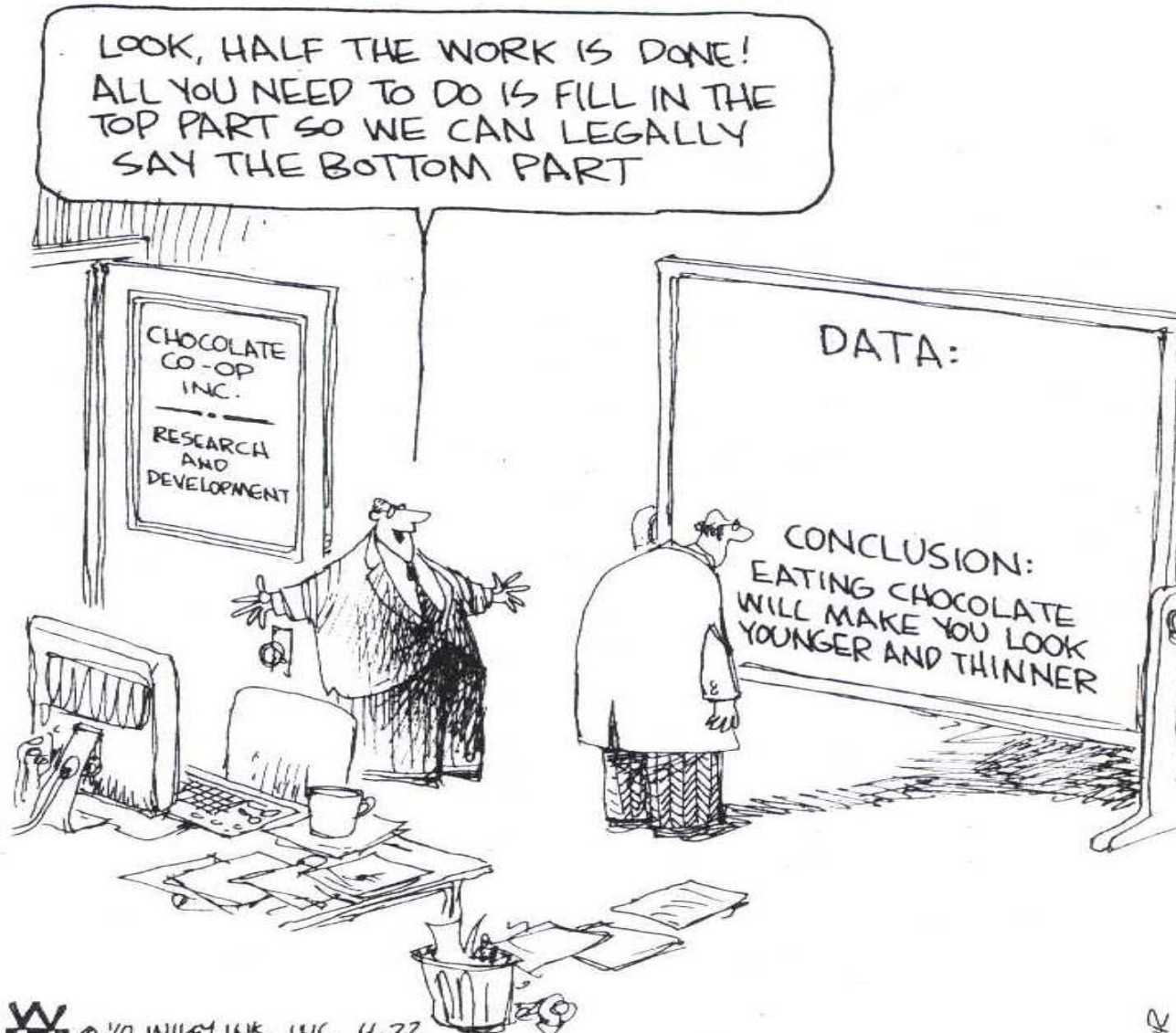
Doe

Participant Signature: _____

Decision Counseling Program Data Flow



Non Sequitur



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Distribution of Preference Scores

Con	<u>Preference Score</u>	<u>Total</u>
– Overwhelming	0.000 – 0.333	1
– Very Much	0.334 - 0.356	-
– Much	0.357 - 0.383	-
– Somewhat	0.384 - 0.416	-
– A little	0.417 - 0.454	-
Neutral	0.455 - 0.545	4
Pro		
– A little	0.546 - 0.583	18
– Somewhat	0.584 - 0.616	19
– Much	0.617 - 0.643	60
– Very Much	0.644 - 0.666	1
– Overwhelming	0.667 - 1.000	83