Colorectal Cancer Screening: Costs, Compliance and Couric

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Colorectal Cancer Screening Agenda

- Is there a preferred screening strategy?
- Which strategies are cost-effective?
- Are there disparities in screening?
- What will increase adherence?

CRC Screening
U.S. Preventive Services Task Force

- Recommended strategies:
  - Fecal occult blood testing
    - Annual testing with high-sensitivity FOBT*
  - Sigmoidoscopy every 5 years
    - With high-sensitivity FOBT every 3 years
  - Colonoscopy every 10 years
- Ages 50-75 years
  - 76-85 years: do not screen routinely
  - Older than 85 years: do not screen
- Insufficient evidence:
  - CT colonography
  - Fecal DNA testing

*Hemoccult Sensa or FIT

CRC Screening Guideline

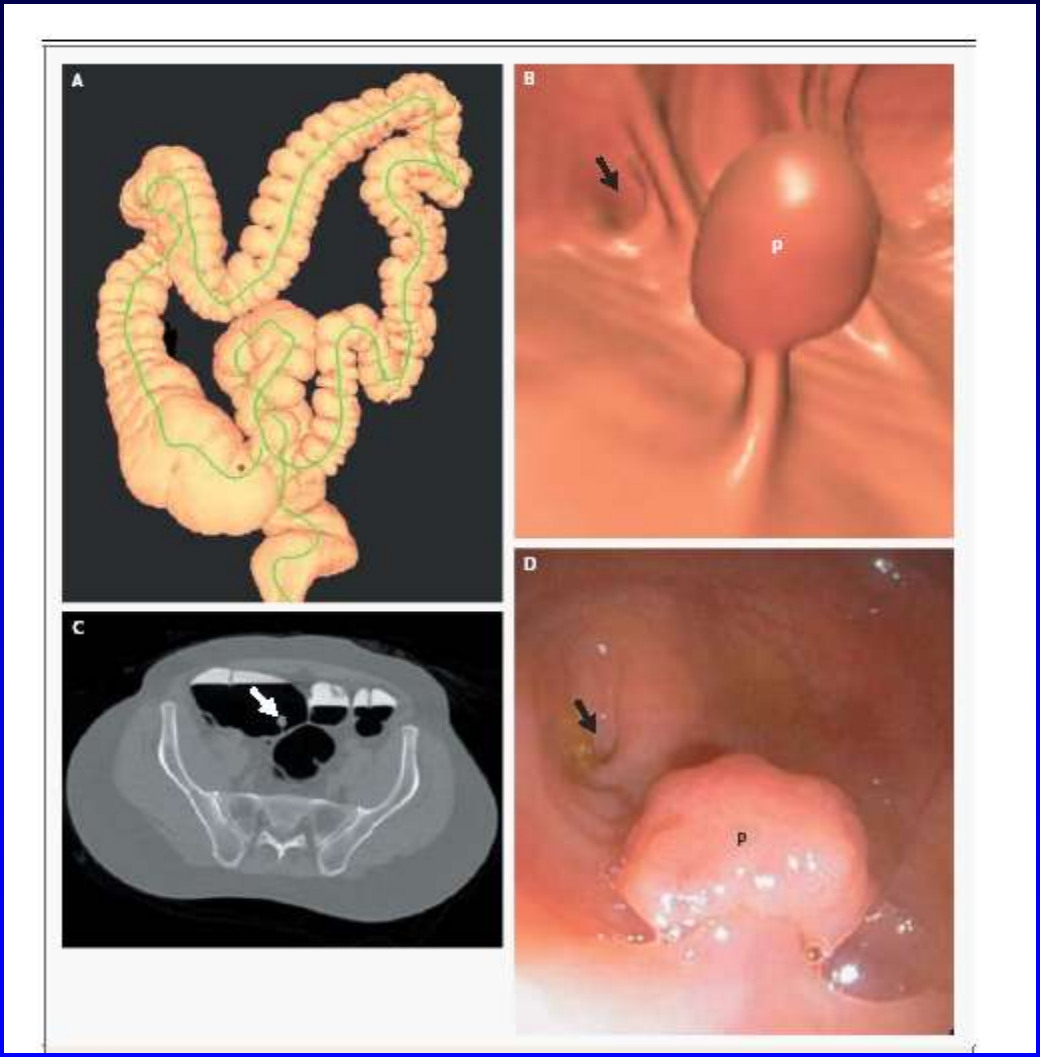
American Cancer Society, U.S. Multi-Society Task Force, American College of Radiology

Strategy	Interval
• Flexible sigmoidoscopy	5 years
• Colonoscopy	10 years
• DCBE	5 years
• CT colonography	5 years
• gFOBT or FIT	1 year
• sDNA	unknown

"Strong opinion that colon cancer prevention should be the primary goal of screening"

Is Virtual Better than Optical Colonoscopy?

CT Colonography - "Virtual Colonoscopy"



Pickhardt. NEJM 2003

Can VC be Cost-Effective?

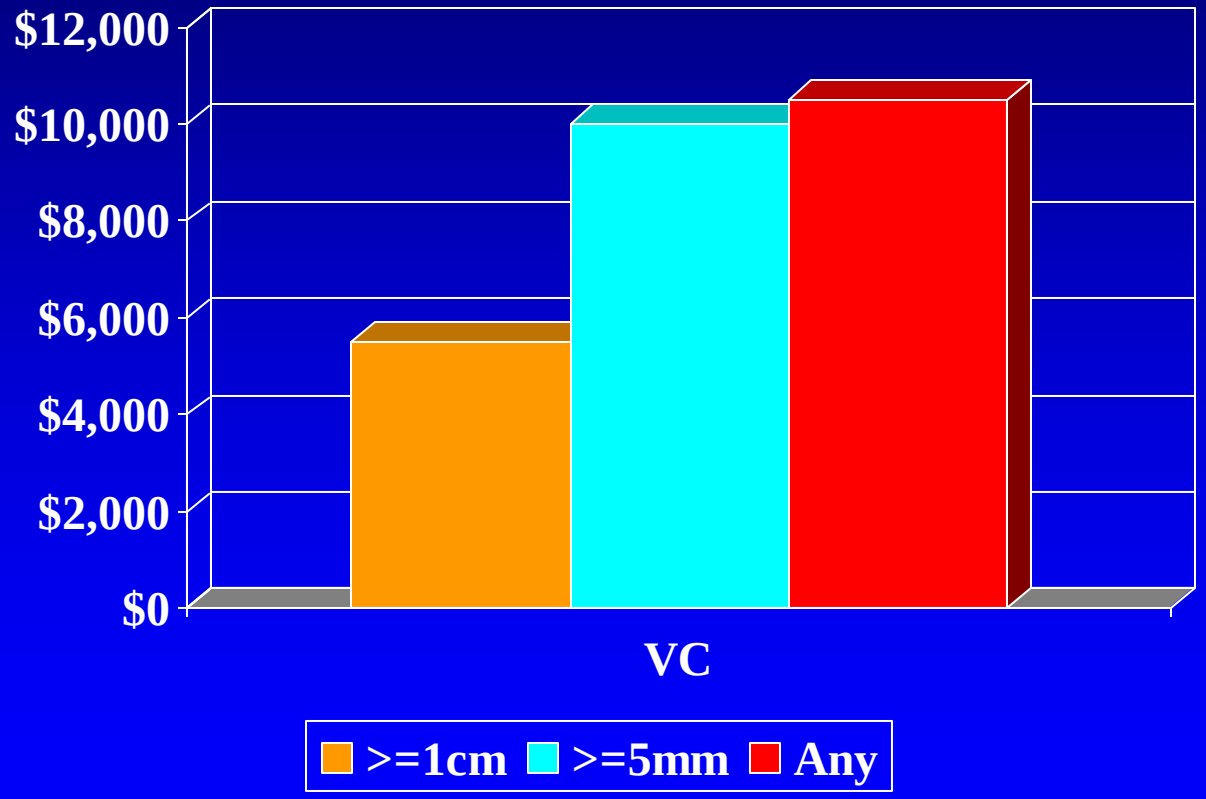
- Average-risk U.S. residents
- Options:
  - Observation (do nothing)
  - Colonoscopy every 10 years
  - VC every 10 or 5 years
- Third-party insurer perspective (CMS)
- VC test characteristics – best case scenario

Vijan, Huang, Inadomi et al. Am J Gastroenterol 2007;132:809-811

Cost-Effectiveness

VC compared to no screening

Stratified by polyp size referred for CC



Conventional vs Virtual Colonoscopy

Incremental Cost-Effectiveness Ratio

Scenario	Results
Base Case (VC $558)	CC dominates VC

Dominates = more effective and less expensive

Conventional vs Virtual Colonoscopy

Incremental Cost-Effectiveness Ratio

Scenario	Results
Base Case (VC $558)	CC dominates VC
Cost of VC $100-480	CC cost-effective

Dominates = more effective and less expensive
Cost-effective = <$50,000 per life year saved

Conventional vs Virtual Colonoscopy

Incremental Cost-Effectiveness Ratio

Scenario	Results
Base Case (VC $558)	CC dominates VC
Cost of VC $100-480	CC cost-effective
Cost of VC <$100	VC preferred

Dominates = more effective and less expensive
Cost-effective = <$50,000 per life year saved
Preferred = ICER for CC vs VC >$50,000 per life year saved

Conventional vs. Virtual Colonoscopy
Summary

- Virtual colonoscopy may be a viable alternative to conventional colonoscopy for CRC screening in the future
- However, virtual colonoscopy must:
  - Demonstrate adequate sensitivity for polyps
  - Be considerably less expensive than CC
  - Forego referral of small polyps to CC
  - Have greater adherence than CC

Do We Have Adequate Capacity?

A Short Story of Discovery

What is the incremental increase in procedure requirement with colonoscopic CRC screening?

1. Estimate the number of procedures required
2. Subtract the procedures already done for "screening"
   - Colonoscopies for positive FOBT or Flex Sig
3. Sources
   - CORI
   - Insurance database

Inadomi & Sonnenberg. Gastrointest Endosc 2000 / Vijan, Inadomi, et al. APT 2004

Colonoscopy Demand

Colonoscopy and F/S plus FOBT strategies

Strategy	Annual Colonoscopies
Colonoscopy age 60	3,548,091
Colonoscopy age 55	4,144,043
Colonoscopy age 50	4,880,237
FS q5 yrs + FOBT q1 yr	4,455,936
Colonoscopy ages 55 & 65	6,249,845
Colonoscopy ages 50 & 60	7,502,908

Inadomi & Sonnenberg. Gastrointest Endosc 2000 / Vijan, Inadomi, et al. APT 2004

Colonoscopic Resource Use
Conclusions

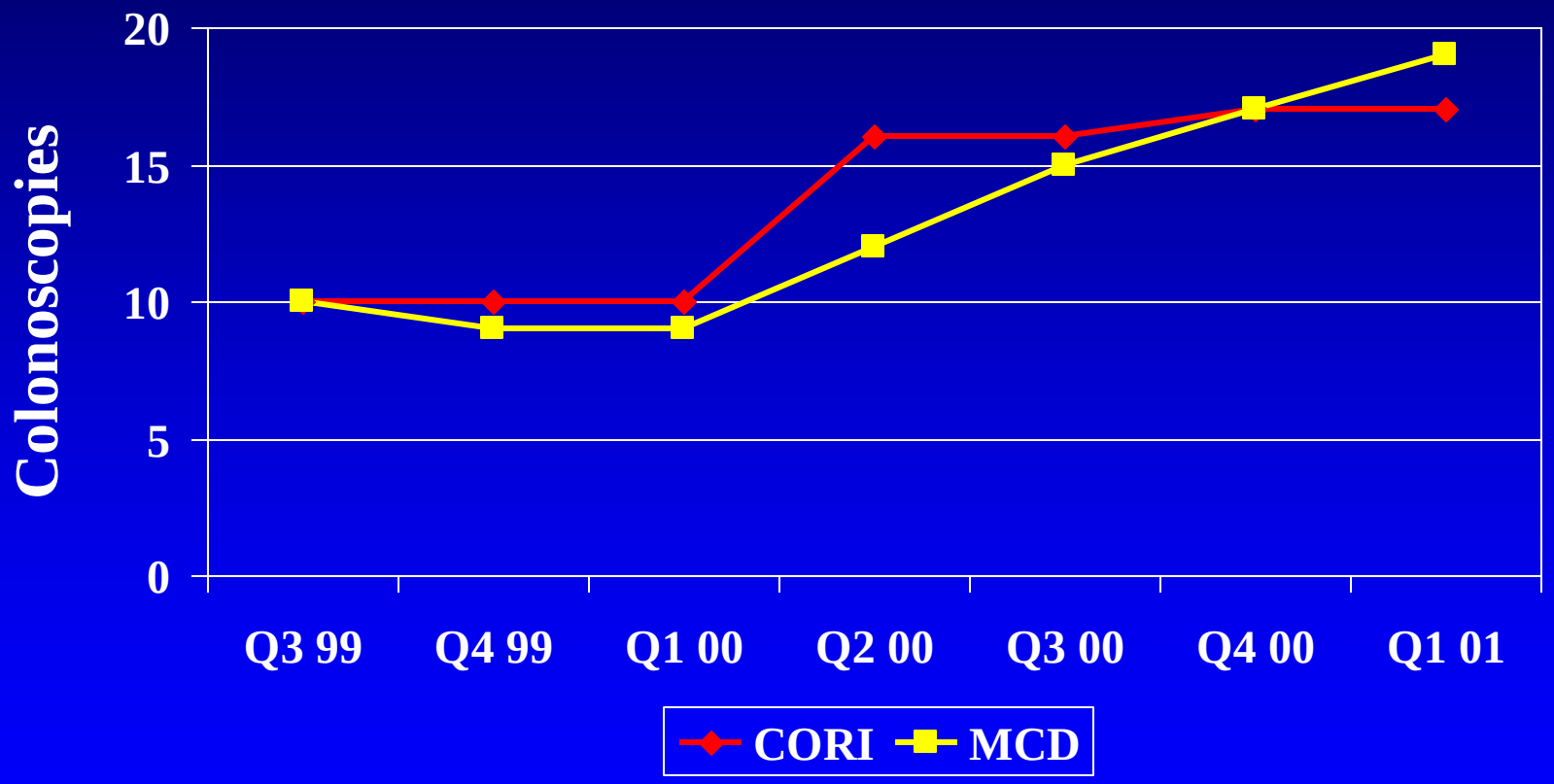
- Required the average endoscopist to perform an incremental 28 to 60 colonoscopies per month
- Alternatively, the health-care system could train an additional 3,500 endoscopists

Inadomi & Sonnenberg. Gastrointest Endosc 2000 / Vijan, Inadomi, et al. APT 2004

Results We Didn't Expect

- Examined data by provider and month
  - Calculate the mean number of procedures
- Discontinuity of data
  - CORI: y-intercept of regression
  - Medicare claims database: slope of regression
- March, 2000

Data
Screening Colonoscopies



The Couric Effect
How to Increase Adherence

- March, 2000
- Katie Couric hosted series of programs to increase awareness of colorectal cancer and prevention
  - Husband died at age 42 of colorectal cancer
  - Colonoscopy performed live on the Today Show
- Effect of a healthy celebrity spokesperson on screening behavior
- ACG guideline publication on CRC screening had no effect on mean number of procedures

Cram, Fendrick, Inadomi et al. Arch Intern Med 2003;163:1601-1605

Adherence to CRC Screening

- Behavioral Risk Factor Surveillance System
  - 34% FS or colonoscopy within 5 years
  - 21% FOBT within the previous year
- Interventions to increase screening (telephone reminders, educational booklets, educational calls)
  - 27-47% completed FOBT screening

Choice and Adherence

- Multiple competing options
- No clear superior strategy
- Negative consequences to all choices Leads to:
- Deferment of choice = non-adherence
- Preference Uncertainty Hypothesis:
  - Lack of clearly defined preference causes decision deferment

Redelmeier & Shafir. JAMA 1995; Anderson. Psychol Bull 2003.

Research Question

- What are the rates of adherence associated with different CRC screening strategies, and how do they impact the cost-effectiveness of screening?
- Hypotheses:
  - Adherence is heterogeneous
    - Depends on the strategy
  - Current method of recommendation is flawed
    - Requiring patients to make a choice between strategies contributes to non-adherence

Specific Aims

1. Compare the proportion of subjects who adhere to CRC screening strategies of FOBT plus FS or colonoscopy
2. Compare adherence after counseling for both strategies with adherence after counseling for a single-strategy

Study Methods

- Design:
  Randomized Clinical Trial
- Population:
  Average risk U.S. veterans age 50–80 years
- Exclusions:
  IBD, previous polyps, FHx of CRC, symptoms
- Location:
  Single center (Ann Arbor VA Healthcare System)

Study Methods

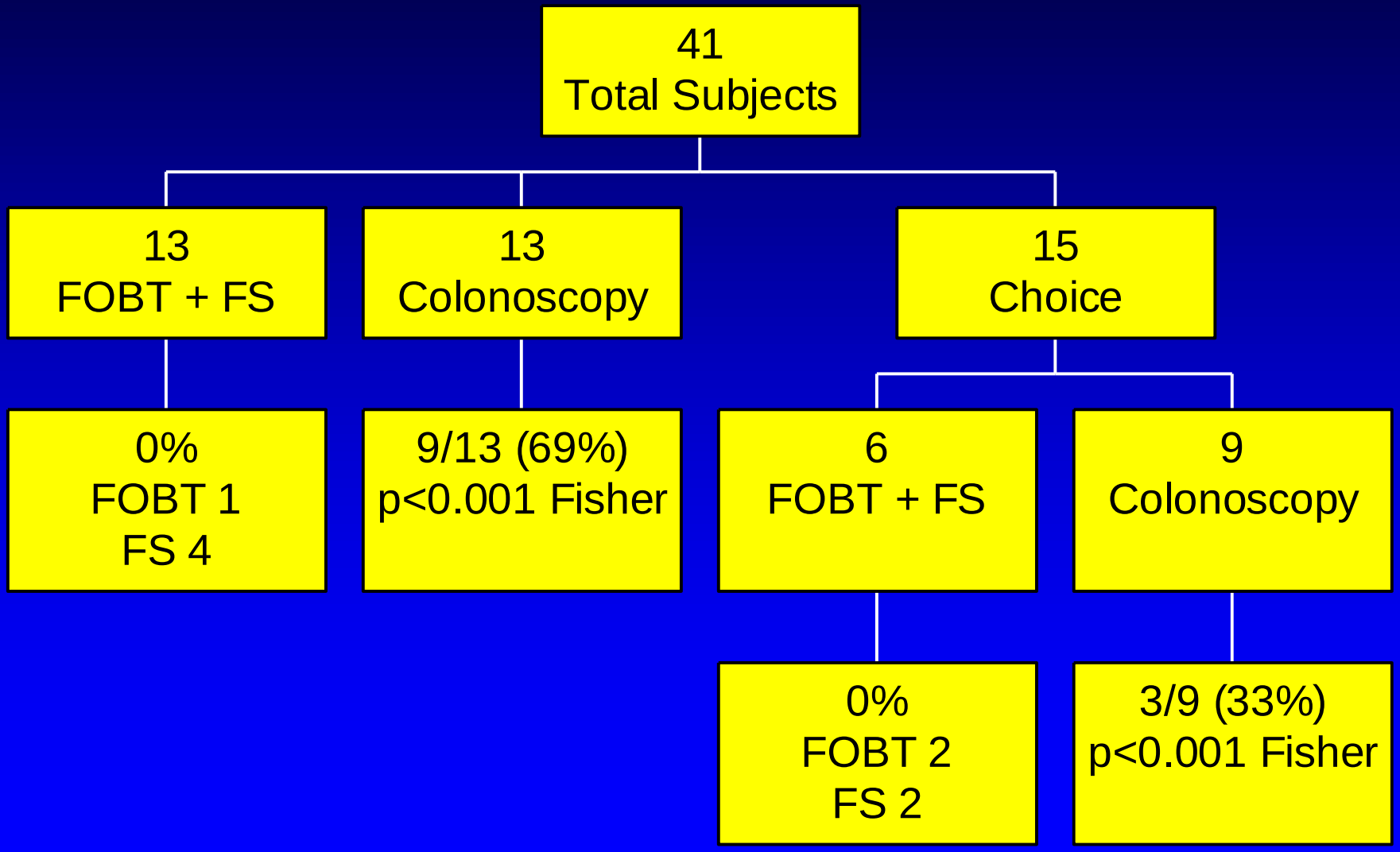
Consenting subjects were randomized via concealed allocation to undergo counseling about:

1. FOBT plus FS
2. Colonoscopy
3. Both strategies (the Choice arm)

Outcomes
Primary Outcome = Preventive Behavior

- Adherence to CRC screening tests
  - FOBT x 3 received by laboratory
  - FS performed
  - Colonoscopy
- Adherence to follow-up tests if screening is positive (FOBT and FS)
- Assessed through CPRS and subject contact 6 months after enrollment

Results


41
Total Subjects
13
FOBT + FS
13
Colonoscopy
15
Choice
0%
FOBT 1
FS 4
9/13 (69%)
p<0.001 Fisher
6
FOBT + FS
9
Colonoscopy
0%
FOBT 2
FS 2
3/9 (33%)
p<0.001 Fisher

Study Conclusions

- There is heterogeneity in adherence between competing CRC screening strategies
  - Adherence to colonoscopy > FOBT/FS
- Strategy of combined FOBT + FS is unviable
- Presenting multiple choices may adversely affect adherence
- Limitations
  - Small number of subjects
  - Single site
  - Men only

Adherence to CRC Screening

- Hypotheses:
  - There is heterogeneity in adherence between competing CRC screening strategies
  - Choice may impact adherence
- Specific Aims:
  - Compare adherence between FOBT and Colonoscopy
  - Determine whether allowing people to choose adversely affects adherence

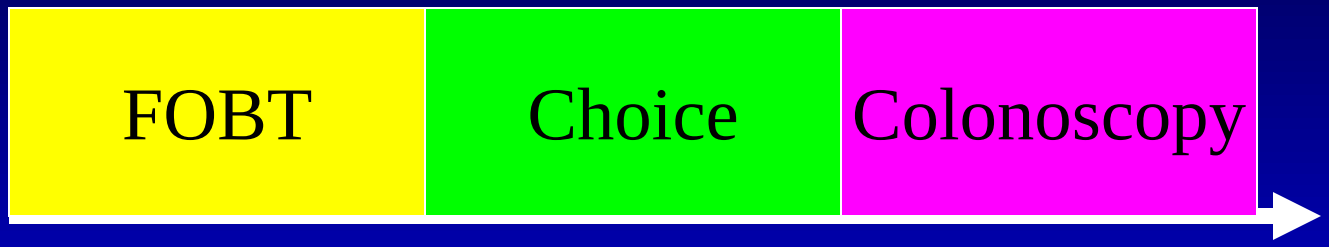
Methods

- Design
  - Prospective cohort study
  - Interventions:
    - FOBT only
    - Colonoscopy only
    - Choice of FOBT or colonoscopy
- Setting
  - SFGH and the CHN
  - General Medicine, Family Health, PHP

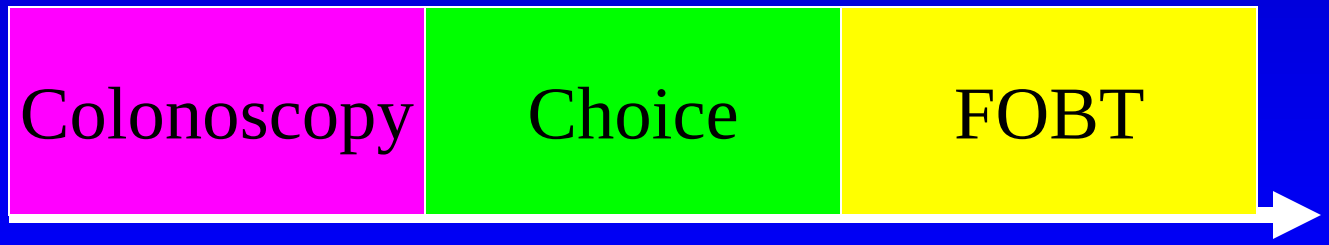
Methods

- Subjects
  - Average risk for development of CRC
    - No family history of CRC
    - No personal history of CRC or adenomas, IBD
  - Not up-to-date with CRC screening
- Outcomes
  - Preventive intent (what they say they will do)
  - Preventive behavior (what they actually do)

Methods
Study Design – Interrupted Time Series



General Medicine Clinic



Family Health Center and Positive Health Program

Methods
Reducing System Barriers

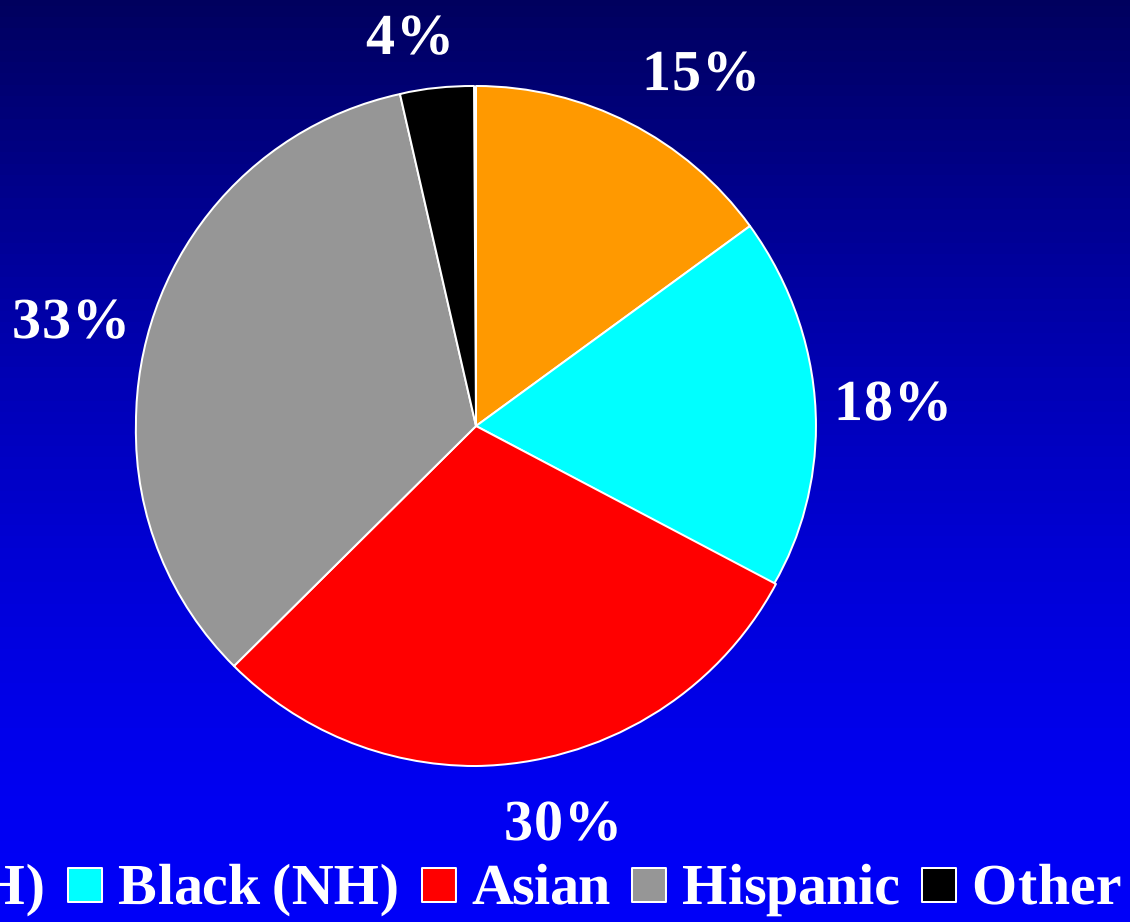
- Goal of study:
  Identify patient factors associated with adherence
- Requirement: reduce systems/access barriers
  - One encounter
    - Open access colonoscopy
  - Language
    - Spanish, Cantonese, Mandarin, English
  - Capacity
    - < 2 week wait for colonoscopy
  - Cost
    - Healthy San Francisco
  - Support
    - Rides to / from hospital if necessary

Methods

- Standardized information in clinics
- Research personnel enroll subjects
  - Study survey
    (factors associated with screening adherence)
- PCP counsels patient about CRC screening and specific test(s) available to the clinic
  - Identify preventive intent
  - Follow-up to determine adherence

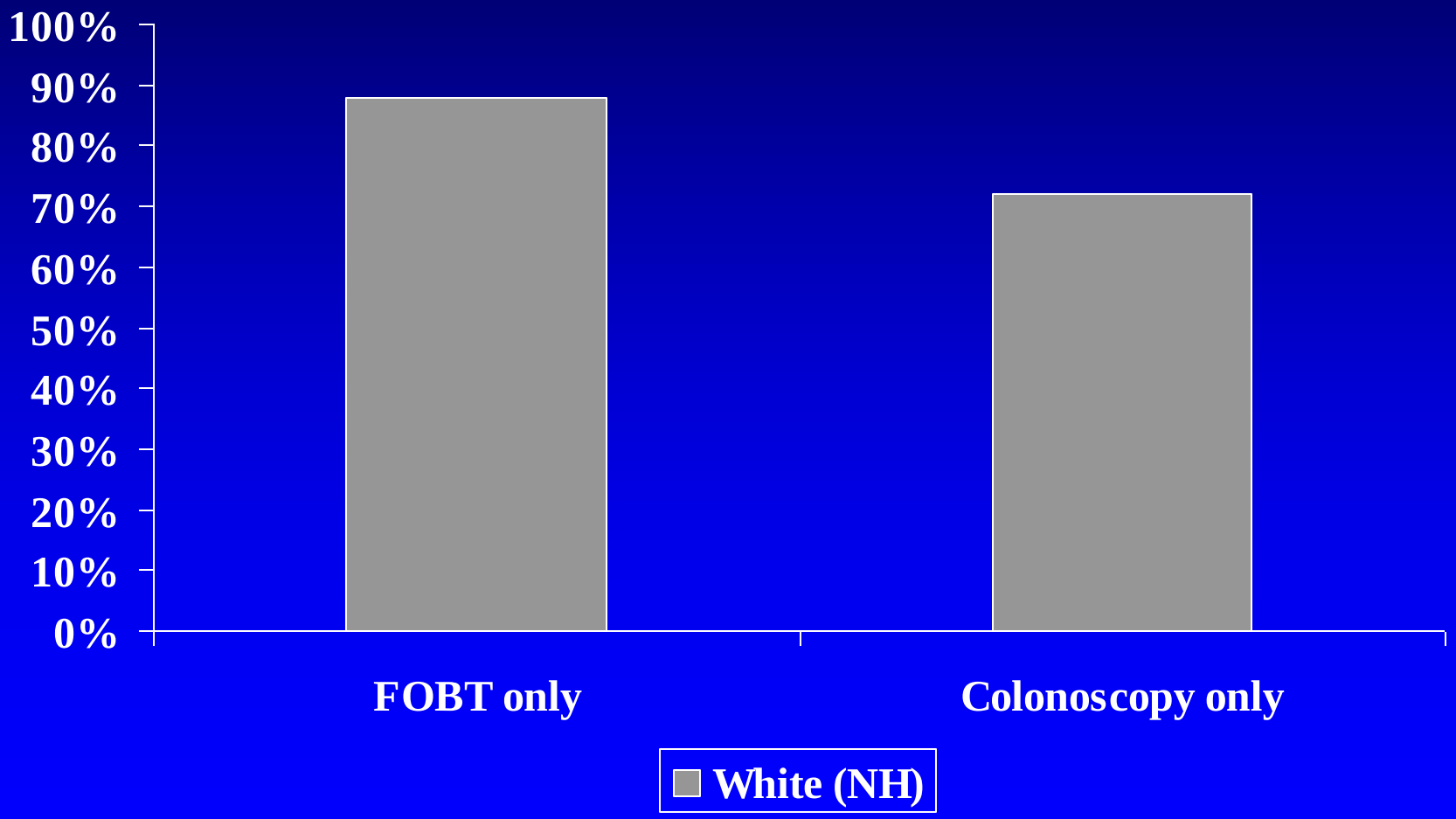
Preliminary Results

Subjects: 1,000 enrolled



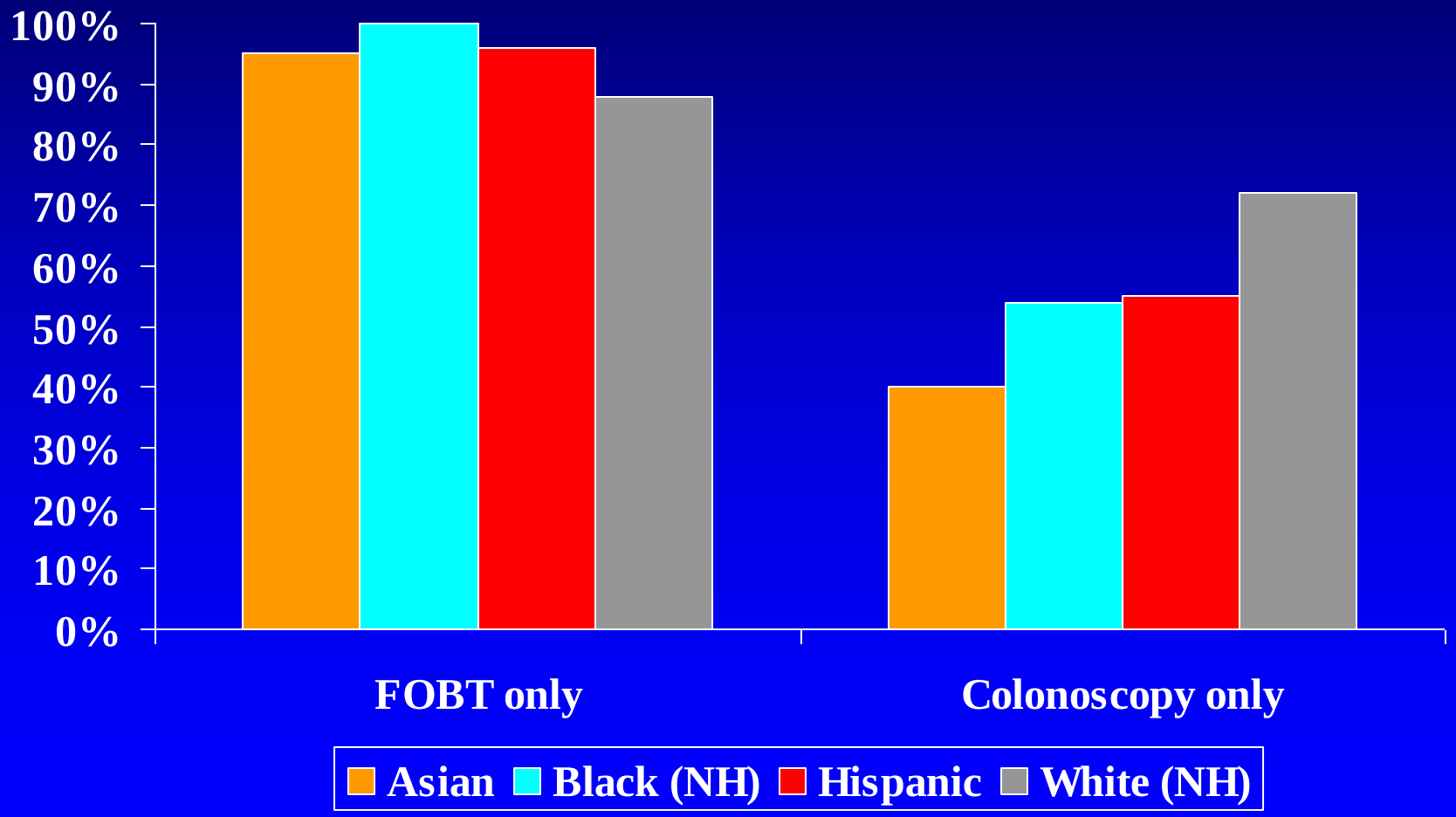
Preventive Intent – Single Strategy

Whites: similar intent between colonoscopy and FOBT



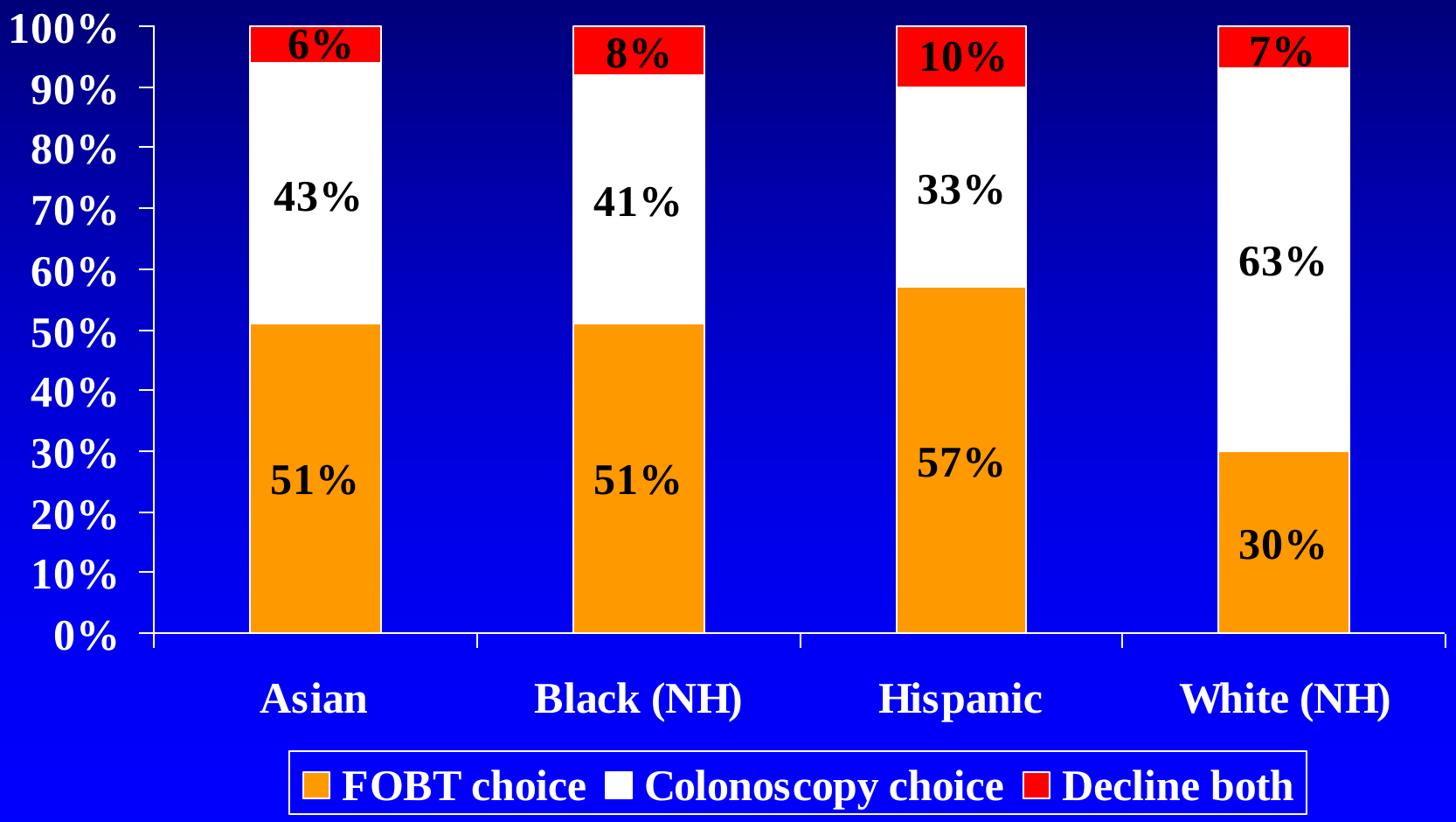
Preventive Intent - Single Strategy

Among Non-Whites, Access to Colonoscopy Alone Reduces Intent to Pursue Screening

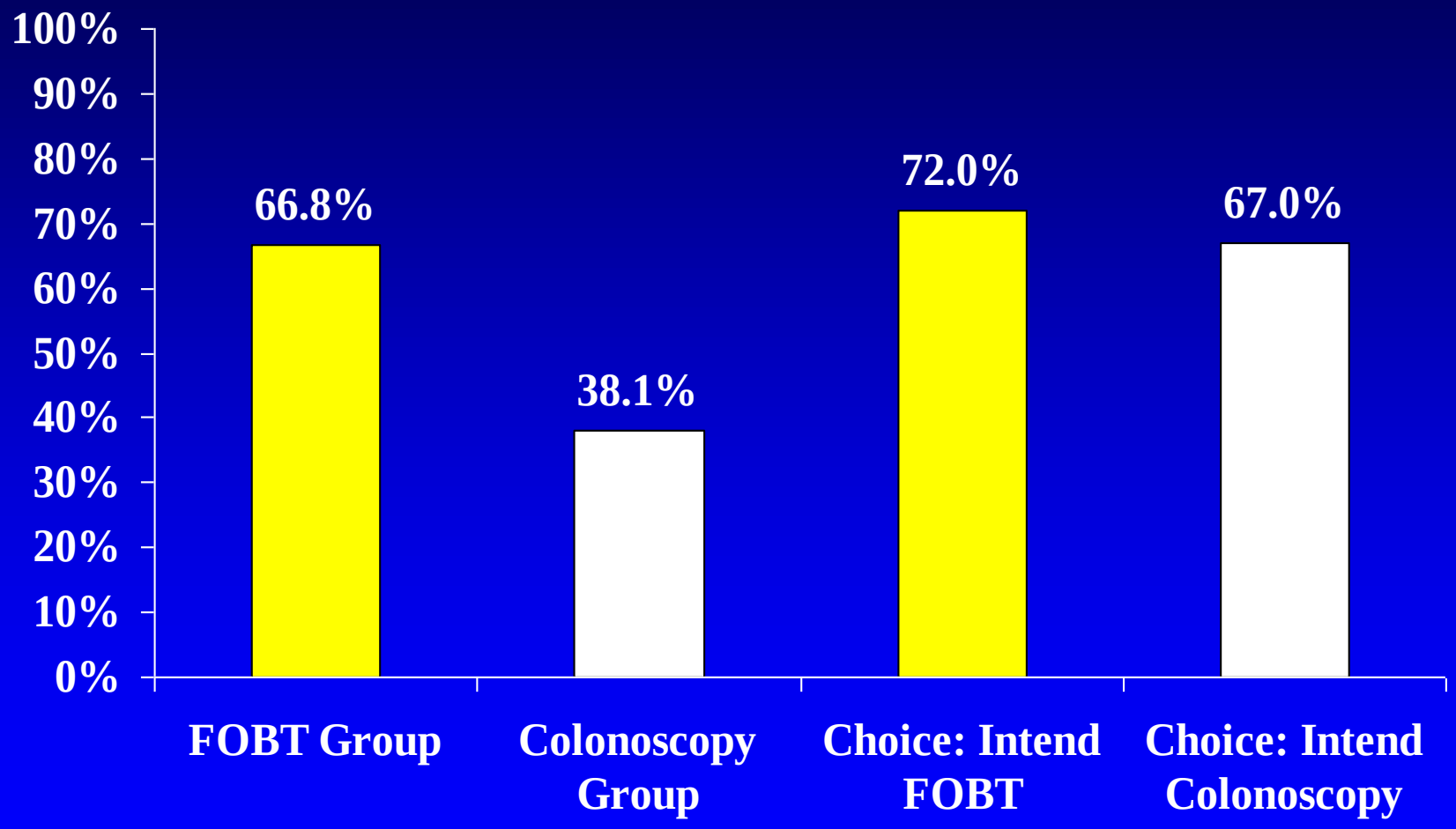


Preventive Intent – Choice of Strategy

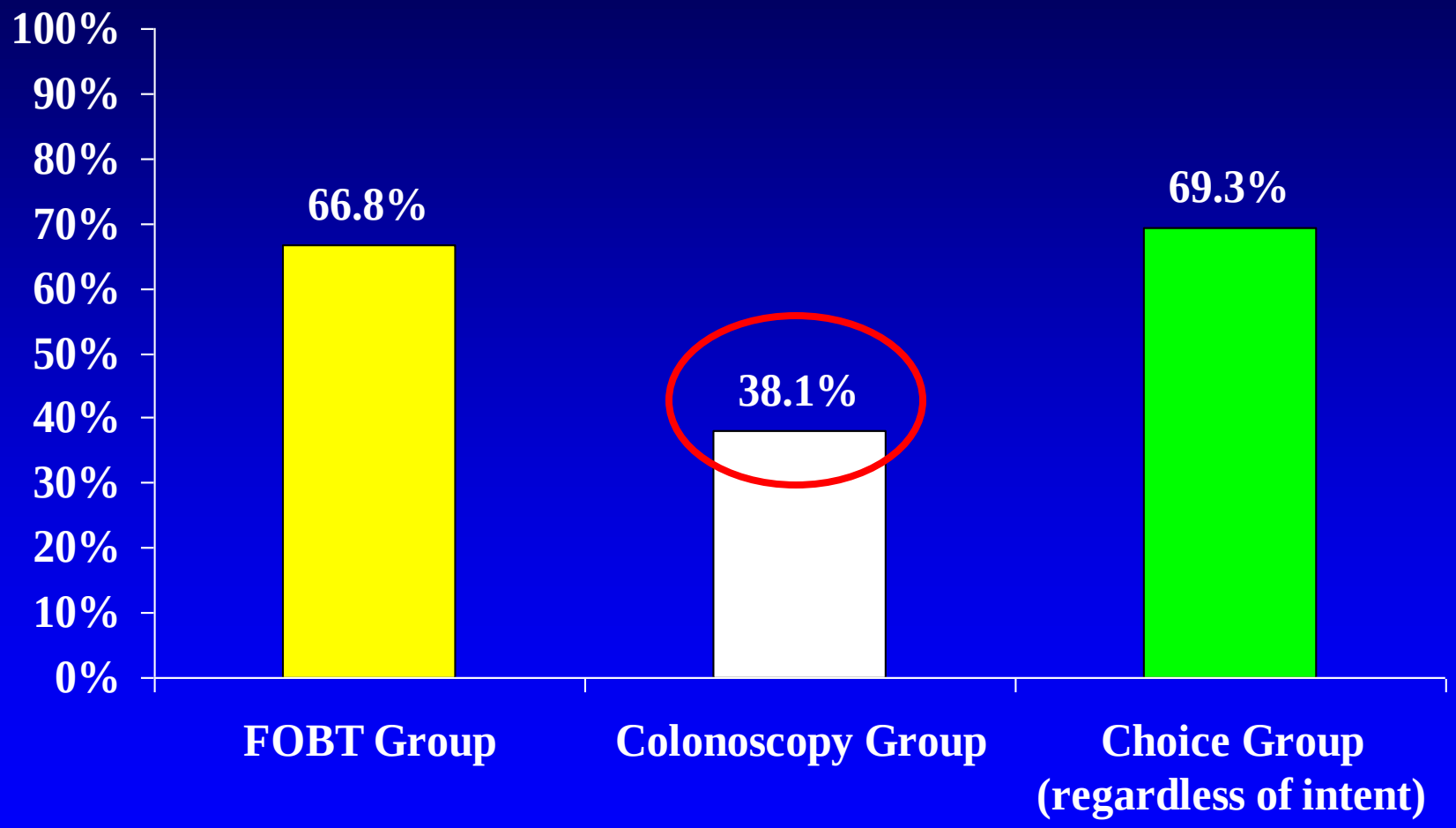
Choice of Strategy Varies by Race/Ethnicity



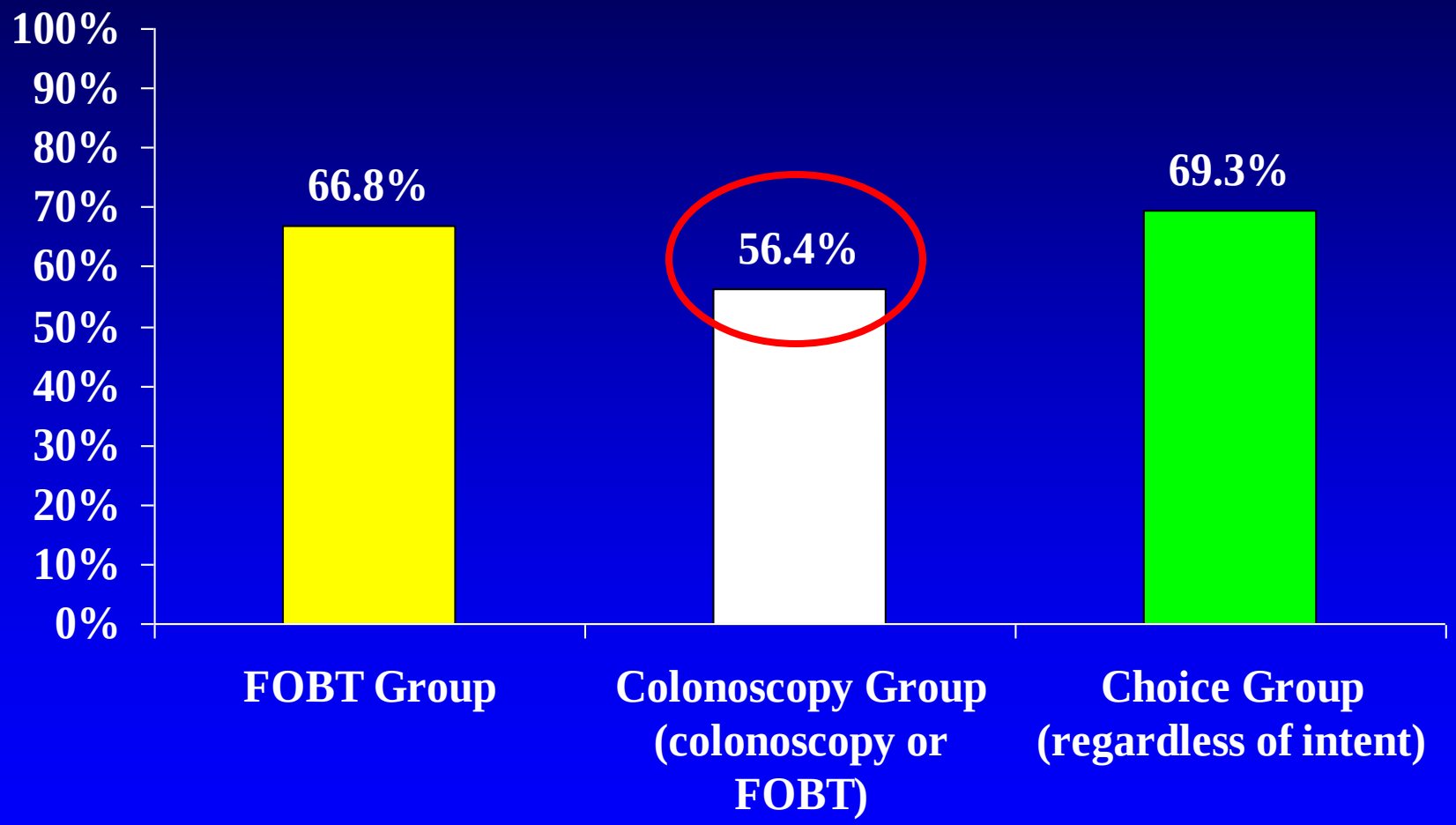
Preliminary Results
Adherence



Preliminary Results
Adherence



Preliminary Results
Adherence to Any Test



Predictors of Non-Adherence preliminary

- Race and ethnicity
  - Blacks, Asians, Hispanics compared to Whites
- “afraid of cancer treatment”
  - Colostomy
- “fear of screening test”
  - Colonoscopy

preliminary findings

- Patients in our public healthcare system limited to colonoscopy less likely to adhere than those limited to FOBT
- Among patients given a choice, non-whites less likely to choose colonoscopy
- Patients choosing colonoscopy more likely to adhere than those who were limited to colonoscopy

Implications

- Current guideline emphasis on colonoscopy may reduce adherence in selected populations
- Factors associated with race/ethnicity impact choice of test and adherence
- Current research
  - Identifying the factors that underlie race (surrogate)
    - Health beliefs
    - Salience and coherence, trust, language concordance
- Determining the goal
  - Convincing patients to undergo colonoscopy, vs.
  - Recommending the test they will complete

Can We Reduce Disparities?

- Does everyone have access to colonoscopy?
  - No
- Will everyone undergo colonoscopy?
  - Should we convince them?
  - Is the decision based on deficient knowledge?
  - Should we allow them to choose the test that fits their health beliefs?
- Are alternative necessary?

Next Steps…

- Colonoscopy is not for everyone
  - Adherence
  - Capacity
  - Costs
- Alternatives are necessary, but choice may be bad
- How can one optimize adherence while preserving options?

The Decider-Guider

- Hypothesis
  - A decision tool that identifies individual patient preference will allow recommendation of the single best strategy
- Specific Aim
  - Compare adherence between intervention and usual care among patients provided multiple alternatives for CRC screening
  - Intervention: decision aid based on conjoint analysis to identify patient preference

Intervention

Preference Identification: Conjoint Analysis

Would you prefer:

- Option A
  - A test that finds over 90% of cancers and polyps
  - Performed once every 10 years
  - Has a 2 in 1000 risk of bleeding or puncture
- Option B
  - A test that detects 60-90% of cancers
  - Performed every year
  - No complications

Methods

- Population
  - Average risk for development of CRC
  - Not up-to-date with CRC screening
- Design
  - Randomize subjects to receive intervention or information
- Outcome
  - Adherence to CRC screening strategy
    - FOBT, flexible sigmoidoscopy, colonoscopy
- Study funded by NCI
  - Translating decision aid into Spanish
  - Recruitment to begin in this Summer, 2009

Summary

- Costs
  - Strategies to reduce mortality from colorectal cancer screening are cost-effective
- Compliance
  - The optimal strategy is the one to which the patient will adhere
- Couric
  - Advocacy for screening by celebrity spokesperson increases adherence
- Colonoscopy is not the only answer
  - Matching strategy to patient preference