General Importance of Colorectal Cancer Prevention

• One of the most common cancers in incidence for both men and women.
• Effective prevention exists through screening.
• Colorectal cancer screening is of the most important and cost-effective preventive care priorities.
• Rates of adherence to colorectal cancer screening remains sub-optimal.
Trends in Colorectal Cancer Incidence: Chinese Americans
<table>
<thead>
<tr>
<th>Population</th>
<th>Adults aged 50 to 75 y</th>
<th>Adults aged 76 to 85 y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommendation</td>
<td>Screen for colorectal cancer starting at age 50 y. Grade: A</td>
<td>The decision to screen for colorectal cancer is an individual one. Grade: C</td>
</tr>
</tbody>
</table>

**Risk Assessment**

For the vast majority of adults, the most important risk factor for colorectal cancer is older age. Other associated risk factors include family history of colorectal cancer, male sex, and black race.

**Screening Tests**

There are numerous screening tests to detect early-stage colorectal cancer, including stool-based tests (gFOBT, FIT, and FIT-DNA), direct visualization tests (flexible sigmoidoscopy, alone or combined with FIT; colonoscopy; and CT colonography), and serology tests (SEPT9 DNA test). The USPSTF found no head-to-head studies demonstrating that any of these screening strategies are more effective than others, although they have varying levels of evidence supporting their effectiveness, as well as different strengths and limitations.
## Benefits of Screening

### A. Benefit: Life-years gained per 1000 individuals screened

<table>
<thead>
<tr>
<th>Screening Method and Frequency</th>
<th>Middle</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible sigmoidoscopy every 5 y</td>
<td>221</td>
<td>181</td>
<td>227</td>
</tr>
<tr>
<td>FIT-DNA every 3 y</td>
<td>226</td>
<td>215</td>
<td>250</td>
</tr>
<tr>
<td>FIT every year</td>
<td>244</td>
<td>231</td>
<td>260</td>
</tr>
<tr>
<td>HsGFOBT every year</td>
<td>247</td>
<td>232</td>
<td>261</td>
</tr>
<tr>
<td>CT colonography every 5 y</td>
<td>248</td>
<td>226</td>
<td>265</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy every 10 y plus FIT every year</td>
<td>256</td>
<td>246</td>
<td>270</td>
</tr>
<tr>
<td>FIT-DNA every year</td>
<td>261</td>
<td>246</td>
<td>271</td>
</tr>
<tr>
<td>Colonoscopy every 10 y</td>
<td>270</td>
<td>248</td>
<td>275</td>
</tr>
</tbody>
</table>

### B. Benefit: Colorectal cancer deaths averted per 1000 individuals screened

<table>
<thead>
<tr>
<th>Screening Method and Frequency</th>
<th>Middle</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible sigmoidoscopy every 5 y</td>
<td>20</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>FIT-DNA every 3 y</td>
<td>20</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>FIT every year</td>
<td>22</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>HsGFOBT every year</td>
<td>22</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>CT colonography every 5 y</td>
<td>22</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy every 10 y plus FIT every year</td>
<td>23</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>FIT-DNA every year</td>
<td>23</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>Colonoscopy every 10 y</td>
<td>24</td>
<td>22</td>
<td>24</td>
</tr>
</tbody>
</table>
### Harms and Burden of Screening

#### Model Estimates, Complications per 1000 Screened

<table>
<thead>
<tr>
<th>Screening Method and Frequency</th>
<th>Middle</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible sigmoidoscopy every 5 y</td>
<td>10</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>FIT-DNA every 3 y</td>
<td>9</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>FIT every year</td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>HSgFOBT every year</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>CT colonography every 5 y</td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy every 10 y plus FIT every year</td>
<td>11</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>FIT-DNA every year</td>
<td>12</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Colonoscopy every 10 y</td>
<td>15</td>
<td>14</td>
<td>15</td>
</tr>
</tbody>
</table>

### Burden: Lifetime No. of colonoscopies per 1000 individuals screened

<table>
<thead>
<tr>
<th>Screening Method and Frequency</th>
<th>Model Estimates, Lifetime Colonoscopies per 1000 Screened</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible sigmoidoscopy every 5 y</td>
<td>1820 1493 2287</td>
</tr>
<tr>
<td>FIT-DNA every 3 y</td>
<td>1714 1701 1827</td>
</tr>
<tr>
<td>FIT every year</td>
<td>1757 1739 1899</td>
</tr>
<tr>
<td>HSgFOBT every year</td>
<td>2253 2230 2287</td>
</tr>
<tr>
<td>CT colonography every 5 y</td>
<td>1743 1654 1927</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy every 10 y plus FIT every year</td>
<td>2289 2248 2490</td>
</tr>
<tr>
<td>FIT-DNA every year</td>
<td>2662 2601 2729</td>
</tr>
<tr>
<td>Colonoscopy every 10 y</td>
<td>4049 4007 4101</td>
</tr>
</tbody>
</table>
Up To Date for Colorectal Cancer Screening

Fedewa, Cancer Epidemiol Biomarkers Prev; 25(6); 995–1000.
Up To Date for Colorectal Cancer Screening

Fedewa, Cancer Epidemiol Biomarkers Prev; 25(6); 995–1000.
Improving Colorectal Cancer Screening Among Chinese Americans

Interventions by San Francisco Asian American Network for Cancer Awareness, Research and Training (SF-AANCART)

• Continuing Medical Education
• Mailing FOBT kits
• Flu-FIT
• Lay Health Worker Outreach
Continuing Medical Education

• CME with Chinese Community Health Care Association physicians 2005
• 56 physicians attended
• Pre-CME and Post-CME surveys
CME Outcomes: Knowledge

• Colorectal cancer is 2nd leading cause of U.S. cancer deaths
  – 55% pre-CME vs. 85% post-CME, p<0.001

• Colorectal cancer is the 2nd most common cancer for Chinese Americans
  – 47% pre-CME vs. 92% post-CME, p<0.0001

• Fecal occult blood test detects 30% cancer
  – 26% pre-CME vs. 79% post-CME, p<0.0001
Screening Interval Knowledge

• Colonoscopy every 10 years
  – 58% pre-CME vs. 77% post-CME, p<0.002

• Fecal occult blood test annually
  – 79% pre-CME vs. 94% post-CME, p<0.02

• Sigmoidoscopy every 5 years
  – 42% pre-CME vs. 66% post-CME, p<0.05

• Patient with adenoma should have repeat screening in 3-5 years
  – 26% pre-CME vs. 74% post-CME, p<0.001
## Mailing FOBT Kits Study

<table>
<thead>
<tr>
<th>Participation status % (n)</th>
<th>All participating PCPs (N = 54)</th>
<th>Immediate Intervention (n = 29)</th>
<th>Delayed Intervention (n = 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>63.7% (42)</td>
<td>69.0% (20)</td>
<td>88.0% (22)</td>
</tr>
<tr>
<td>Refusals</td>
<td>27.3% (12)</td>
<td>31.0% (9)</td>
<td>12.0% (3)</td>
</tr>
</tbody>
</table>

### Pre-Study (Sept 06 – Sept 07)

- **Total patents due for CRCS**: 1688
- **Average per PCP (range)**: 31 (0 – 173)
- **Mailers sent out (% out of pts due)**: 0 (0%)

### Year 1 (Oct 07 – Oct 08)

- **Total patents due for CRCS**: 2355
- **Average per PCP (range)**: 44 (1 – 286)
- **Mailers sent out (% out of pts due)**: 915 (38.8%)

### Year 2 (Dec 08 – Dec 09)

- **Total patents due for CRCS**: 2924
- **Average per PCP (range)**: 54 (0 – 250)
- **Mailers sent out (% out of pts due)**: 830 (28.4%)
Mean CRC Screening Rates (FOBT, colonoscopy or sigmoidoscopy) by Intervention Periods and Conditions

- **Pre-study (Sept 06-Sept 07)**
  - Immediate (20 PCPs; mailers sent during Year 1): 23%
  - Delayed (22 PCPs; mailers sent during Year 2): 27%
  - Refused (12 PCPs; no mailers were sent): 20%

- **Year 1 (Oct 07-Oct 08)**
  - Immediate: 39%
  - Delayed: 30%
  - Refused: 28%

- **Year 2 (Dec 08-Dec 09)**
  - Immediate: 54%
  - Delayed: 43%
  - Refused: 27%
Adjusted CRC Screening Rates

* OR = 1.25; 95% CI: 1.16 – 1.36, p < 0.001

** OR = 1.24; 95% CI: 1.17 – 1.30, p < 0.001
Adjusted proportions of PCPs who achieved 50% or higher in CRC Screening rates

- **Any CRC Screening >50%**
  - With FOBT Mailers: 67% *
  - No Mailer: 12%

- **FOBT > 50%**
  - With FOBT Mailers: 58% **
  - No Mailer: 6%

*OR = 15.5; 95% CI: 4.0 – 59.6, p < 0.001

**OR = 23.9; 95% CI: 5.0 - 113.0, p < 0.001
FOBT Distribution at Influenza Vaccine Clinic Appointments

• San Francisco General Hospital primary care clinics
• 17 Influenza Clinics, Fall of 2006
• Pre-intervention chart review of patients with influenza vaccination appointments to determine if due for CRC screening
• Patients randomized to intervention or control group

Potter, Ann Fam Med 2009
Randomized Controlled Trial

- Intervention group (N=268)
  - FOBT kit
  - Language-appropriate FOBT instruction sheet
  - Mailer with stamp for kit
- Control group (usual care) (N=246)
  - FOBT at time of primary care appointment
  - Kit returned in person
- 52% were Asians (Chinese, Vietnamese)
Colorectal Cancer Screening and you

流感是可以預防的! 結腸癌也是可以預防的！

每年檢查糞便一次， 簡單並容易進行。

每年檢查糞便一次，可以保護您的生命。

我們的醫生及護士一致推薦，50歲至79歲的健康男性及女性們，應接受結腸檢查。

你何時需要測試？我們就今天告訴你。

Flu is Preventable!
Colon Cancer is Preventable!

- Yearly home stool tests are easy to do.

- Yearly home stool tests could save your life.

- All our doctors and nurses recommend Colon Screening for healthy men and women aged 50 to 79.

- When you should get tested? We will tell you today.
收集糞便之前，請閱讀以下提示：

需要收集三次大便樣本。如果有痔瘡出血症狀，請要收集大便。

女士們：不要在月經期間收集大便。

在檢查前幾天，您可能要在飲食或藥物上作些改變。

藥物方面：
從收集大便前七天開始，直到大便樣本收集結束期間，不要服用布洛芬類的止痛藥如Advil，Motrin。一天內不要服用超過一片阿司匹林。但如果您一直有服用醋氨酚(Tylenol)，則無需要停止。

飲食方面：
從收集大便前兩天開始，直到大便樣本收集結束期間，不要吃未完全煮熟的紅肉。不要吃山葵，哈蜜瓜，白蘿蔔，西蘭花，椰菜花，小蘿蔔或防風草。亦不要吃豬紅或用豬血做成的香腸。

收集糞便的步驟：
a. 讓糞便像往常一樣掉入水中。
b. 使用信封內的小木棒，來收集小量的大便樣本。
c. 將小量糞便抹在標有“A”的地方。
d. 在糞便另一個位置上，取小量糞便，抹在“B”的地方。
e. 待收集卡乾後，再關上前蓋。
f. 不要將收集卡弄濕。

按照同樣的步驟，收集另外兩次的糞便。
Table 2. Preintervention and Postintervention Changes in Percentage of Study Participants Up-to-Date with Colorectal Cancer Screening in the Control and Intervention Groups

<table>
<thead>
<tr>
<th>CRCS Status</th>
<th>Control (n = 246)</th>
<th>Intervention (n = 268)</th>
<th>Between Group P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRCS up-to-date before influenza season (October 16, 2006), %</td>
<td>52.9</td>
<td>54.5</td>
<td>.711\textsuperscript{a}</td>
</tr>
<tr>
<td>CRCS up-to-date after influenza season (March 31, 2007), %</td>
<td>57.3</td>
<td>84.3</td>
<td>&lt;.001\textsuperscript{a}</td>
</tr>
<tr>
<td>Percentage point change</td>
<td>+4.4 (−0.7 to 9.7)</td>
<td>+29.8 (23.7 to 36.0)</td>
<td>&lt;.001\textsuperscript{b}</td>
</tr>
<tr>
<td>Preintervention to postintervention P value\textsuperscript{c}</td>
<td>.071</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

CRCS = colorectal cancer screening.
\textsuperscript{a} Pearson χ\textsuperscript{2} test.
\textsuperscript{b} 2-sample Wilcoxon rank-sum test on the preintervention-postintervention difference scores.
\textsuperscript{c} McNemar test.
Table 4. Multivariate Logistic Regression Analysis of Predictors of Being Up-to-Date with Colorectal Cancer Screening at End of Influenza Season (March 31, 2007) for Study Participants (N = 514)

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Patients Initially Overdue for CRCS (n = 238) OR (95% CI)</th>
<th>Patients Initially Up-to-Date for CRCS (n = 276) OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study arm, intervention (vs control)</td>
<td>11.3 (5.8-22.0)</td>
<td>5.8 (1.5-22.0)</td>
</tr>
<tr>
<td>Age, 50-64 y (vs 65-79 y)</td>
<td>0.8 (0.4-1.5)</td>
<td>1.0 (0.3-3.4)</td>
</tr>
<tr>
<td>Sex, male (vs female)</td>
<td>1.1 (0.6-2.1)</td>
<td>2.5 (0.7-9.3)</td>
</tr>
<tr>
<td>Ethnicity, Hispanic (vs Asian)</td>
<td>0.8 (0.4-1.6)</td>
<td>0.4 (0.1-1.3)</td>
</tr>
<tr>
<td>Other (vs Asian)</td>
<td>0.5 (0.2-1.1)</td>
<td>1.7 (0.2-15.9)</td>
</tr>
<tr>
<td>Primary language, English (vs non-English)</td>
<td>0.8 (0.4-1.8)</td>
<td>2.0 (0.4-10.0)</td>
</tr>
<tr>
<td>Insurance, insured (vs uninsured)</td>
<td>1.4 (0.6-3.2)</td>
<td>1.3 (0.3-5.2)</td>
</tr>
<tr>
<td>Income, above median (vs below)</td>
<td>2.0 (1.1-3.8)</td>
<td>0.7 (0.2-2.0)</td>
</tr>
<tr>
<td>Primary care visits, above median (vs below median)</td>
<td>2.0 (1.0-3.7)</td>
<td>0.7 (0.2-2.3)</td>
</tr>
</tbody>
</table>

CRCS = colorectal cancer screening; OR = odds ratio.

* P < .001 for comparison with reference category.

* P < .05 for comparison with reference category.
Lay Health Workers and Colorectal Cancer Screening among Chinese Americans

Healthy Living
Chinese Lay Health Worker Outreach Project

National Cancer Institute 5R01CA138778
National Cancer Institute U54CA153499
Randomizes 58 lay health workers (LHWs) into

29 Experimental LHWs

Recruit 360 experimental participants

Pre-educational session survey

Two LHW sessions on CRC screening + CRC brochure

Post-educational session survey

29 Comparison LHWs

Recruit 365 comparison participants

Pre-educational session survey

Two health educator lectures on healthy eating & physical activities + CRC brochure

Post-educational session survey
Chinese Colorectal Cancer Screening Flipchart

我們如何預防大腸癌？
How Can We Prevent Colon Cancer?
Participants

- 58 LHWs and 725 participants completed the study
- 19% of LHWs and 19% of participants are men
- 99% retention rate over 6 month-period
### Characteristics of Chinese American participants aged 50-75, San Francisco, N=725

<table>
<thead>
<tr>
<th>Sociodemographic characteristics</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>19%</td>
</tr>
<tr>
<td>Married</td>
<td>74%</td>
</tr>
<tr>
<td>Limited English proficiency</td>
<td>95%</td>
</tr>
<tr>
<td>Less than high school education</td>
<td>72%</td>
</tr>
<tr>
<td>Income &lt; $20,000</td>
<td>60%</td>
</tr>
</tbody>
</table>

### Health and health care access

<table>
<thead>
<tr>
<th>Health and health care access</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair/ Poor</td>
<td>65%</td>
</tr>
<tr>
<td>Has at least 1 chronic health condition</td>
<td>60%</td>
</tr>
<tr>
<td>Visited MD in the last 12 months</td>
<td>80%</td>
</tr>
<tr>
<td>Has regular place of care</td>
<td>90%</td>
</tr>
<tr>
<td>Uninsured</td>
<td>9%</td>
</tr>
</tbody>
</table>
Participants Knowledge/Beliefs About Colorectal Cancer Causes

- Age 18.1%
- Polyp 54.1%
- Family history 32.4%
- Diet 66.9%
- Heredity 40.6%
- Lack of exercise 38.9%
- Being unhappy 17.2%
- Alcohol 25.7%
- Toxin 28.4%
- Karma 3.0%
Participants Knowledge/Beliefs About Colorectal Cancer Prevention

• Get screening 58.1%
• Take aspirin 2.3%
• Exercise 53.5%
• Eat more fiber 81.8%
• Have regular bowel movements 65.4%
• Drink enough water 66.5%
• Take herbs 10.9%
• See traditional healers 8.1%
• Nothing 1.1%
## Health Care Related Factors

<table>
<thead>
<tr>
<th></th>
<th>Adjusted Odds Ratio (95% Confidence Interval) *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ever Had CRC Screening</td>
</tr>
<tr>
<td>Has primary care provider (PCP) (vs. no PCP)</td>
<td>2.01 (0.80-5.04)</td>
</tr>
<tr>
<td>Has a Chinese PCP (vs. non-Chinese)</td>
<td>0.65 (0.31-1.34)</td>
</tr>
<tr>
<td>MD recommended no CRC screening tests (vs. FOBT)</td>
<td>0.05 (0.03-0.09)</td>
</tr>
<tr>
<td>MD recommended sigmoidoscopy/colonoscopy (vs. FOBT)</td>
<td>0.40 (0.14-1.08)</td>
</tr>
<tr>
<td>MD recommended both FOBT &amp; sigmoidoscopy/colonoscopy (vs. FOBT)</td>
<td>4.13 (1.19-14.30)</td>
</tr>
</tbody>
</table>
FOBT should be done once a year (% Correct)

% change*: 10.4% vs. 28.6% *p = 0.001
Colonoscopy Should Be Done Every 10 Years (% Correct)

% change*: 17.5% vs. 33.0%  *p = 0.046
Ever Screened for CRC? (% Yes)

% change*: 7.2% vs. 14.4%  *p = 0.0003
Up-to-date on FOBT, Sigmoidoscopy or Colonoscopy? (% Yes)

Control (NPA)  |  Intervention (CRC)
---             |  ---
58.1%          |  64.1%  
60.0%          |  60.0%  
64.1%          |  78.1%  

% change*: 6.0% vs. 18.1% *p = 0.0004
# Multivariable Models of Intervention Effects

<table>
<thead>
<tr>
<th></th>
<th>Ever Had CRC Screening</th>
<th>Up-to-date for CRC Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention Effect</td>
<td>1.94 (1.34, 2.79)</td>
<td>2.02 (1.40, 2.90)</td>
</tr>
<tr>
<td>US Residence &gt;10 yrs.</td>
<td>1.65 (1.11, 2.46)</td>
<td>1.37 (0.94, 2.00)</td>
</tr>
<tr>
<td>Fair/poor health</td>
<td>1.52 (1.07, 2.15)</td>
<td>1.29 (0.97, 1.73)</td>
</tr>
<tr>
<td>Had regular place for healthcare</td>
<td>1.81 (1.01, 3.25)</td>
<td>1.81 (0.99, 3.29)</td>
</tr>
<tr>
<td>Had primary care doctor</td>
<td>2.64 (1.42, 4.92)</td>
<td>2.66 (1.47, 4.83)</td>
</tr>
<tr>
<td>Have health insurance</td>
<td>2.51 (1.34, 4.68)</td>
<td>2.60 (1.37, 4.94)</td>
</tr>
</tbody>
</table>

Model adjusted for LHW cluster, age, gender, education, income, marital status, English fluency, employment
Available Educational Materials

- How to do FOBT/FIT video in Cantonese and Mandarin
- Pamphlet
- Lay health worker flipchart
- FOBT/FIT instructions in Chinese

asianarch.org/materials.html
Conclusions

- Colorectal cancer screening is an important and effective prevention method.
- Chinese Americans still do not meet colorectal cancer screening guidelines.
- There are several strategies that are proven to be effective in getting Chinese Americans screened for colorectal cancer:
  - Mailed FOBT/FIT
  - Flu-FIT
  - Lay health workers
  - Others: in-clinic health educators
Thank you!

Tung.Nguyen@ucsf.edu

AsianArch.org

@ARCHDrNguyen
Ever Had FOBT? (% Yes)

% change*: 4.9% vs. 13.9%  *p = 0.003
Ever Had Sigmoidoscopy or Colonoscopy? (% Yes)

% change: 5.5% vs. 6.6%  \( p = 0.625 \)