

# Colon capsule will replace diagnostic colonoscopy

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# Colonoscopy (OC) vs. Colon capsule (CCE)

- Why is **colonoscopy suboptimal** as a diagnostic procedure?
- Why should we **replace** it with **colon capsule**?

# When do we need ,diagnostic‘?

**Prevalence  
Advanced Neoplasia**

**Low (<10%)    Diagnostic**

(i.e. CRC screening, non-alarm symptoms,  
post-polypectomy surveillance)

~~**High (>10%)    Operative**~~

~~(i.e. alarm symptoms, g. FOBT/FIT+  
post-CRC surveillance)~~

# Ideal Diagnostic Test

- Acceptable
- Effective
- Safe
- Efficient

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Acceptability

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Is colonoscopy **acceptable**?
  - In CRC screening, **adherence** to colonoscopy **inferior to**:
 

	OR	
• FIT	0.63	<i>Quintero NEJM 2012</i>
• Sigmoidoscopy	0.74	<i>Segnan Gastro 2007</i>
• CT colonography	0.64	<i>Stoop Lancet Onc 2012</i>
  
- Can **CCE** improve endoscopic **acceptability**?
  - When excluding preparation, acceptability is not an issue (i.e. equal to SB-CCE)
  - 4L PEG (OC)  $\approx$  4L PEG + **30-45 ml NaP** (CCE)

# A Survey of Potential Adherence to Capsule Colonoscopy in Patients Who Have Accepted or Declined Conventional Colonoscopy

*Douglas K. Rex, MD and David A. Lieberman, MD*

	Had Undergone Prior Colonoscopy* (%)	<u>Had Declined</u> <u>Colonoscopy (%)</u>
Screening test choice after baseline profile (C1)		
Capsule colonoscopy	43	69
Colonoscopy	51	22
Stool test	4	3
Nothing—I would not get screened	3	6
Screening test choice after build profile (C6)		
<u>Capsule colonoscopy</u>	24	49
Colonoscopy	73	42
Stool test	1	2
Nothing—I would not get screened	3	7

\* $P < 0.0001$ .

# A Survey of Potential Adherence to Capsule Colonoscopy in Patients Who Have Accepted or Declined Conventional Colonoscopy

*Douglas K. Rex, MD and David A. Lieberman, MD*

**TABLE 7.** Subjects' Appraisal of Features of Capsule Colonoscopy Relative to Conventional Colonoscopy After Reviewing all Information (Appendix Question C 11, Part 2)

	Score
Accuracy	3.4*
<u>Convenience</u>	<u>5.7</u>
<u>Invasiveness</u>	<u>5.8</u>
Bowel preparation	4.0
<u>Need for sedation</u>	<u>5.9</u>
<u>Safety</u>	<u>5.1</u>
<u>Need for a ride home</u>	<u>5.7</u>
Boosters	3.4
Ability to screen and treat	2.8
Cutting edge technology	5.4

\*Subjects' selected rating between 1 and 7 (1 = much worse than colonoscopy; 4 = same, 7 = much better than colonoscopy).



# Colonoscopy (OC) vs. Colon capsule (CCE)

- Acceptability
- Efficacy

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Is colonoscopy **effective**?

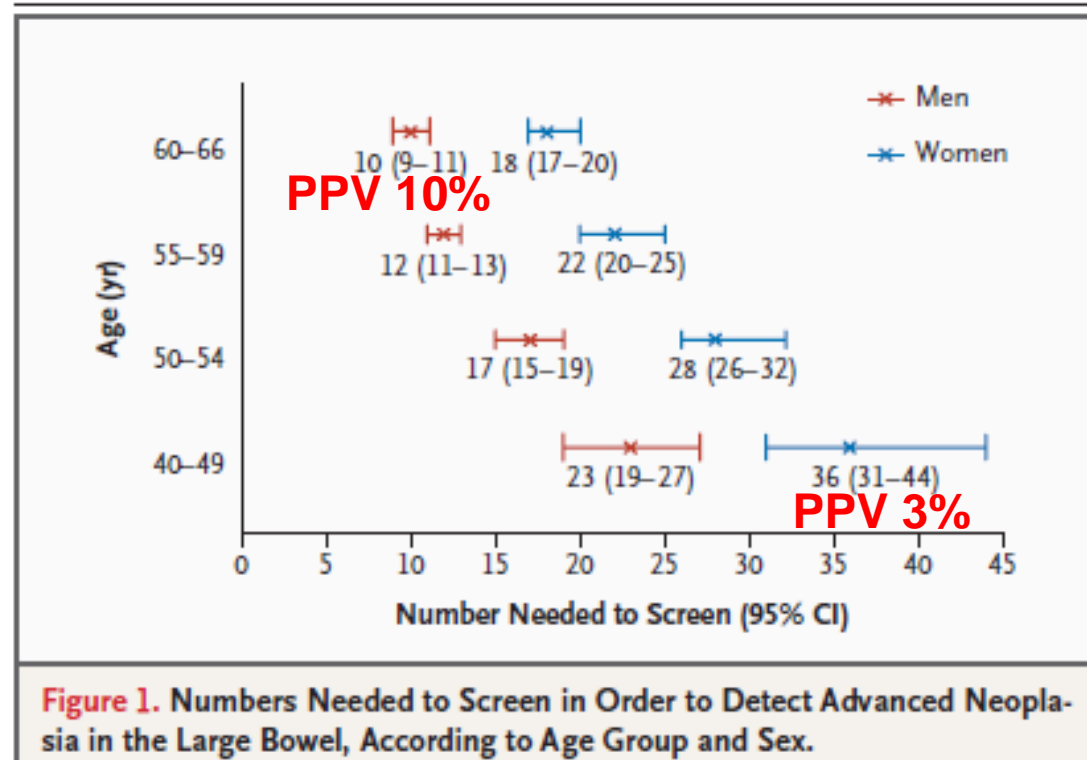
- High sensitivity for adv. neoplasia

High NPV

- **Low specificity** for adv. neoplasia

**Low PPV**

**PPV (OC) AN  
5.9%**



Regula et al. NEJM 2006

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Is colonoscopy **effective**?

- High sensitivity for adv. neoplasia
- **Low specificity** for adv. neoplasia

High NPV  
**Low PPV**

- Can **CCE** improve endoscopic **efficacy**?

CCE-2 studies	Pts.	Sensitivity	Specificity
		for >10 mm lesions	
Eliakim et al.	104	<b>88%</b>	<b>89%</b>
Spada et al.	117	<b>88%</b>	<b>92%</b>

Theor.  
PPV AN

30%

Theor.  
NPV AN

98%

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Acceptability
- Efficacy
- Safety

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Is colonoscopy **safe**?

- Perforation rate (diagnostic)
- Expected CRC mortality reduction
- Colonoscopy death risk

0.04% *Panteris 2009*

0.2% *Atkin 2010*

0.003% *Panteris 2009*

Patient characteristics	
<i>Age, years</i>	
40 – 59 [21]	1.0 (referent)
≥ 60	5.2 (1.4 – 19.2)
65 – 69 [13]	1.0
≥ 75 – 79	3.7 (1.7 – 8.2)
<i>Sex [21]</i>	
Male	1.0
Female	2.3 (0.9 – 6.0)
<i>Co-morbidities [13]</i>	
0	1.0
≥ 2	3.2 (1.6 – 6.1)
<i>Indications [13]</i>	
Screening	1.0
Diverticulosis	2.3 (1.3 – 4.0)
Obstruction	2.9 (1.3 – 6.7)

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Is colonoscopy **safe**?

- Perforation rate (diagnostic) **0.04%** *Panteris 2009*
- Expected CRC mortality reduction **0.2%** *Atkin 2010*
- Colonoscopy death risk **0.003%** *Panteris 2009*

- Can **CCE** improve endoscopic **safety**?

- No harm (perforation/death)
- 10,000 CCE **————→** no capsule retention
- **Sodium-phosphate** toxicity (low dose, possible alternatives)

# Colonoscopy (OC) vs. Colon capsule (CCE)

- Acceptability
- Efficacy
- Safety
- Efficiency

## Economy

- Human resources
- Techno. resources
- Logistic resources

## Finance

- Money

**Qualitative/Quantitative**

**Quantitative**

Rational choice

Cost-effectiveness ratio  
Automatic ranking



Make your (economic) choice



**Find the correct price  
with cost-effectiveness**

# Colonoscopy (OC) vs. Colon capsule (CCE)

- How many resources are exploited by colonoscopy?
  - In-Hospital/Office
  - Endoscopist physician/nurse
  - Anesthetist
  - Day-off-work
- Can **CCE** reduce the exploitation of resources?
  - Out-of-clinic/home
  - No (dedicated) nurse/physician (?)
  - No sedation/No day-off-work
  - Same day-polypectomy

# CCE: Out-of-clinic procedure

- 28 patients were enrolled
- Travel time home <-> clinic was <40min, bowel prep + inclusion criteria as published (s. MA-201)
  
- Results:
  - 10/28 called clinic (successful handled)
  - 24/28 had complete study (excreted capsule)
  - Findings were present in 20/28 (71%) patients
  - Five patients subsequently underwent colonoscopy which confirmed the findings, including one colon carcinoma

*Adler et al. UEGW 2011*

# CONCLUSIONS

- When considering the similar preparation, CCE likely to be more **acceptable** than OC
- In subjects at low risk of AN, CCE may substantially increase the **PPV** for AN
- CCE likely to minimize serious **complications** for diagnostic procedures
- CCE may rationalize the use of **medical and technological resources**