Is it time to change our views on post-polypectomy surveillance?

Catherine Dubé, MD MSc FRCPC
University of Ottawa

Quality Award Presentation

Montreal February 2020

CanMEDS Roles Covered

X	**Medical Expert** (as *Medical Experts*, physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centered care. *Medical Expert* is the central physician Role in the CanMEDS Framework and defines the physician's clinical scope of practice.)
X	**Communicator** (as *Communicators*, physicians form relationships with patients and their families that facilitate the gathering and sharing of essential information for effective health care.)
	Collaborator (as *Collaborators*, physicians work effectively with other health care professionals to provide safe, high-quality, patient-centred care.)
X	**Leader** (as *Leaders*, physicians engage with others to contribute to a vision of a high-quality health care system and take responsibility for the delivery of excellent patient care through their activities as clinicians, administrators, scholars, or teachers.)
X	**Health Advocate** (as *Health Advocates*, physicians contribute their expertise and influence as they work with communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the mobilization of resources to effect change.)
X	**Scholar** (as *Scholars*, physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and by teaching others, evaluating evidence, and contributing to scholarship.)
X	**Professional** (as *Professionals,* physicians are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.)

Conflict of Interest Disclosure

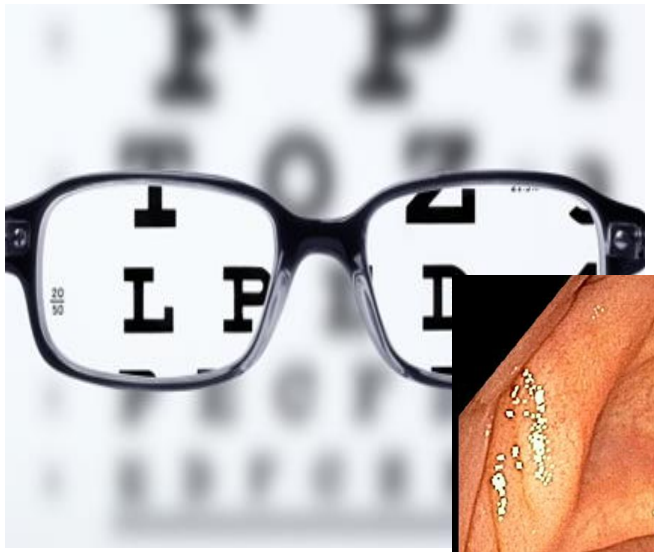
(Over the past 24 months)

Commercial or Non-Profit Interest	Relationship
Organization	Committee Member, Chair
Cancer Care Ontario – Ontario Health	Clinical lead, ColonCancerCheck program

Quality=> diagnostic accu

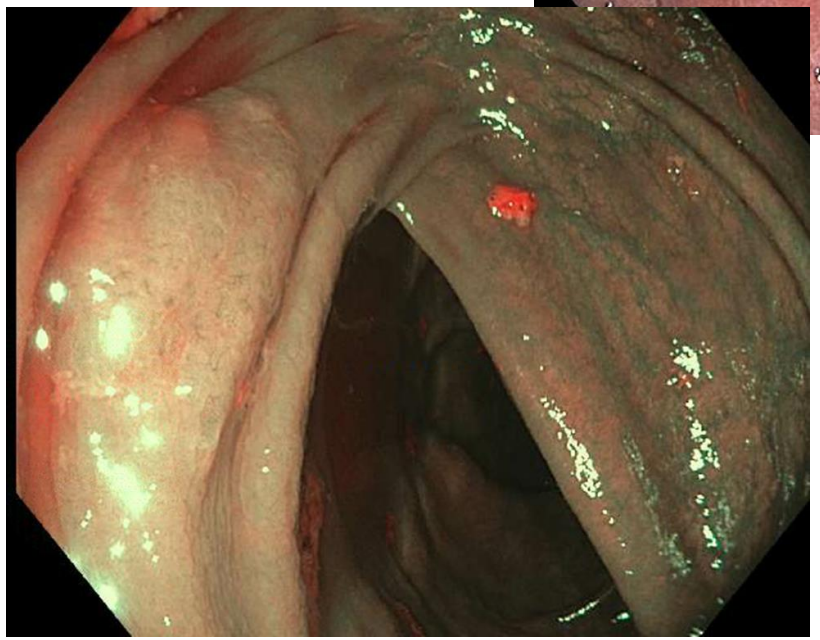
Slow meticulous withdrawal

Position change
Antispasmodics
Retroflexion
Water exchange
High definition
Virtual chromoendoscopy



High quality bowel

complete examination of the cecum



Quality polypectomy

“What matters to a patient having an endoscopy?”

The Domains of the GRS

- Clinical Quality
  - Consent
  - Safety
  - Comfort
  - Quality of the procedure
  - Appropriateness
  - Communicating with referrer

- Quality of patient experience
  - Equity of access
  - Timeliness
  - Booking and choice
  - Privacy and dignity
  - Aftercare
  - Providing Feedback

Quality=maximizing benefits and minimizing harms

How do the expected benefits compare to the risks of adverse events?

What is the best use of limited endoscopy resources?

- Mr Smith, a 74 yo pt
- Colonoscopy for abnormal FIT 3 years ago:
  - High quality procedure:
    - Adequate prep, complete to cecum
    - 14-minute withdrawal with hyoscine, position changes and rectal retroflexion
  - Findings:
    - Moderately severe sigmoid diverticulosis
    - 15mm pedunculated polyp sigmoid → tubular adenoma with no HGD
- Now due for post-polypectomy surveillance

- The patient is sole caregiver for his wife who suffers from dementia
- Would prefer not to undergo a surveillance colonoscopy and wonders why this should be done

What do you answer?

How do we know what his actual risk of CRC is and what benefit to expect from surveillance?

Adherence to post polypectomy surveillance guidelines is poor

Baseline results	Adherence to guideline	Recommend shorter interval	Recommend longer interval	N studies
Any findings	48.8% (37.3-60.4)	42.6% (32.9-52.7)	7.9% (0-26.4)	16
Normal	53.7% (34.4-72.3)	42.6% (24.2-62.2)	1.6% (0-6.0%)	6
Hyperplastic polyps	37.1% (11.2-67.9)	62.9% (32.1-88.8)	0% (0-0.6)	4
LRAs	44.7% (24.2-66.3)	52.4% (31.5-72.8)	1.4% (0-5.8)	6
HRAs	54.6% (41.4-67.4)	30.8 % (22.7-39.5)	14.7% (4.0-30.0)	6

I^2 >75%

50% chance that recommendation is not in keeping with guideline

50% chance that recommendation will be earlier than guideline

Djinbachian R, et al. Endoscopy 2019; 51: 673–683

Why are we so confused about post-polypectomy recommendations?

- Numerous guidelines
- Inconsistent categorization of risk
- Uncertainty around the risk of CRC and CRC death post-polypectomy
  - Focus on the incidence of high risk adenomas as a surrogate marker
- Uncertainty around the goals of post-polypectomy surveillance
  - No RCT to date of the benefits of post-polypectomy surveillance

Evidence base for post-polypectomy surveillance

Prior to 2014
Small studies
RCTs of impact of polypectomy
Selected populations (e.g. VA)
Colonoscopy quality not assessed
Low definition colonoscopy (prior to ~2006)
Used incidence of HRA as surrogate marker to CRC incidence and/or mortality

Since 2014
Colonoscopy quality routinely assessed
High definition colonoscopy (since ~2006)
Growing amount large studies with long-term CRC incidence and mortality data
3 studies looked at impact of surveillance on CRC incidence
Emerging evidence of long-term outcomes after removal of sessile serrated lesions

Adenoma-related predictors of advanced colorectal neoplasia (ACN)

Adenoma characteristics at index colonoscopy	Evidence of increased risk of ACN at surveillance		
	Consistency of evidence	Lesion type	GRADE
Adenoma size ≥20mm	Consistent	HRA, CRC	Moderate
Multiplicity of adenomas (≥3)	Consistent	HRA	Moderate
	Inconsistent	CRC	Moderate
Tubulovillous/villous histology	“Fairly” consistent	HRA, CRC	Moderate
High grade dysplasia	Inconsistent	HRA, CRC	Moderate
Adenoma size ≥10mm	Inconsistent	HRA, CRC	Moderate
Proximal adenomas	Inconsistent	HRA, CRC	Low
Sessile or flat morphology	No consistent evidence	HRA, CRC	Low

Rutter MD, et al. Gut 2019;0:1–23. doi:10.1136/gutjnl-2019-319858

Adenoma type and Risk level – USMSTF, ESGE

Low Risk Adenomas

- 1-2 tubular adenoma(s) <10mm with no HGD

High Risk Adenomas

- ≥3 adenomas; ≥10mm; tubulo-villous/villous; HGD

Adenoma type and Risk Level – old BSG

Low Risk Adenomas

- 1-2 adenomas <10mm

Intermediate Risk Adenomas

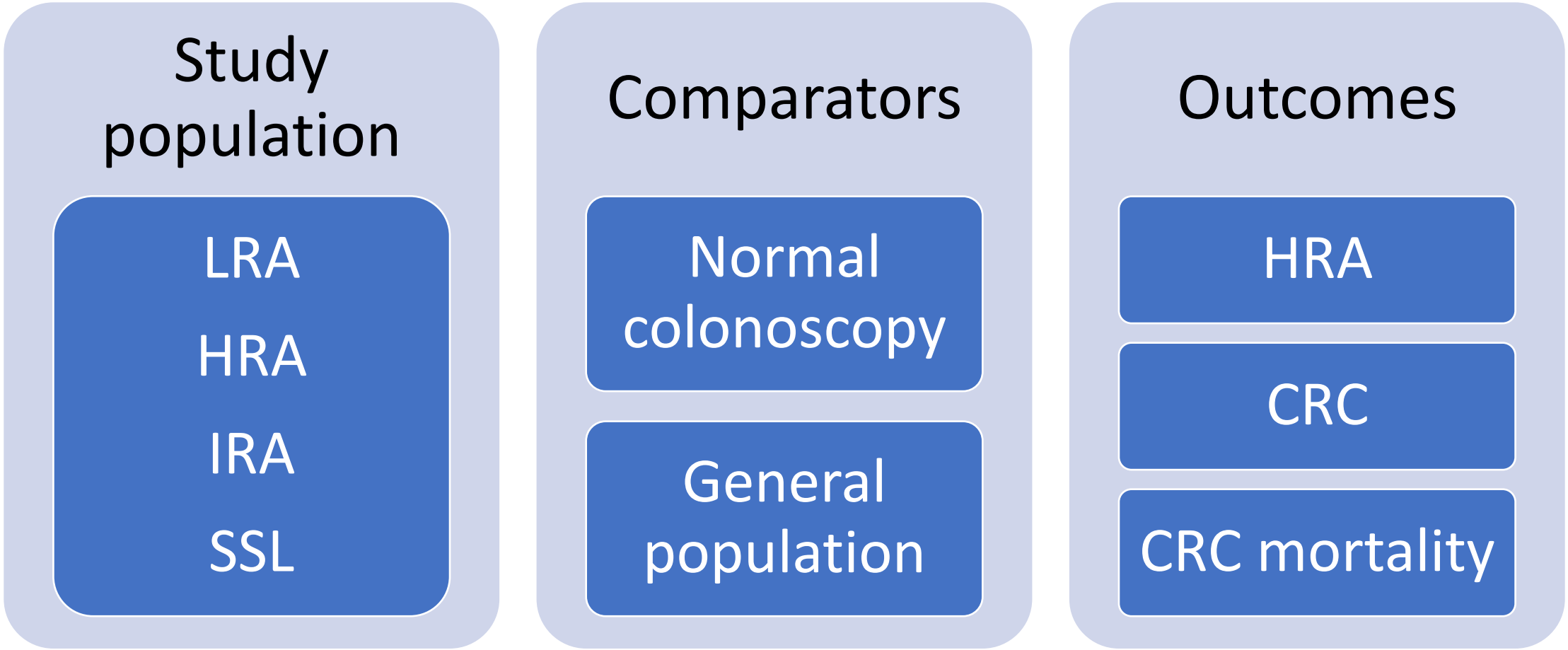
- 3-4 adenomas <10mm or
- 1-2 adenomas with at least one ≥10mm

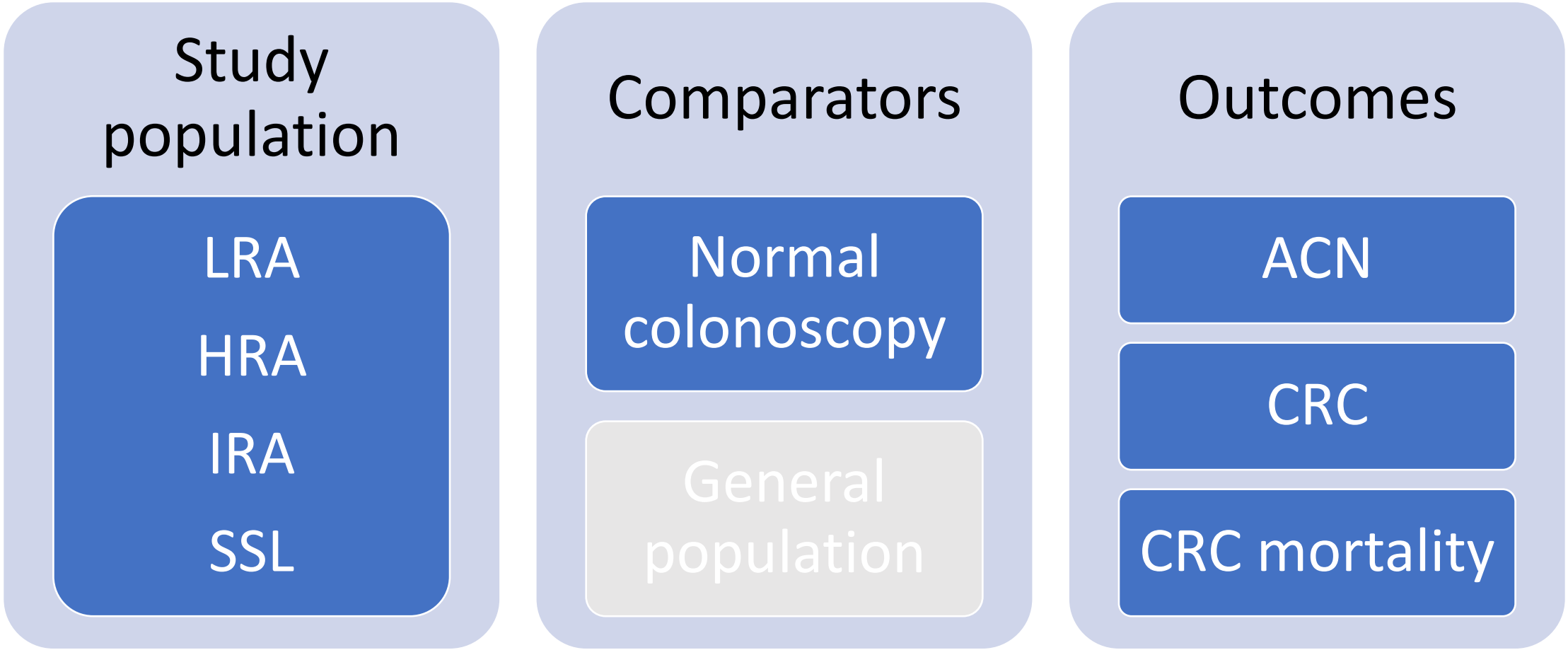
High Risk Adenomas

- ≥5 adenomas <10mm or
- ≥3 adenomas with at least one ≥10mm

Based exclusively on minimum size and number of polyps

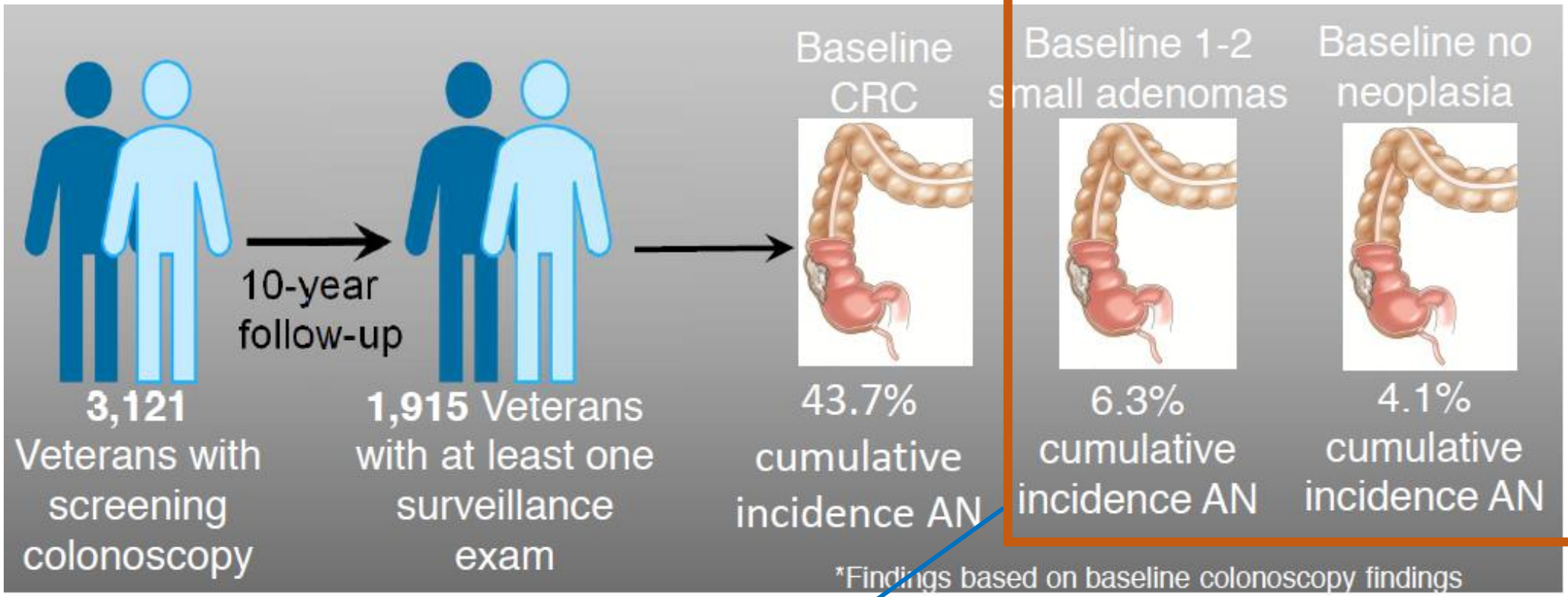
Sorting out the literature on post-polypectomy risks of CRC and CRC death




Study population
LRA
HRA
IRA
SSL
Comparators
Normal colonoscopy
General population
Outcomes
ACN
CRC
CRC mortality

Risk of ACN after index colonoscopy- No adenomas vs LRAs vs HRAs vs CRC

No different when adjusting for surveillance

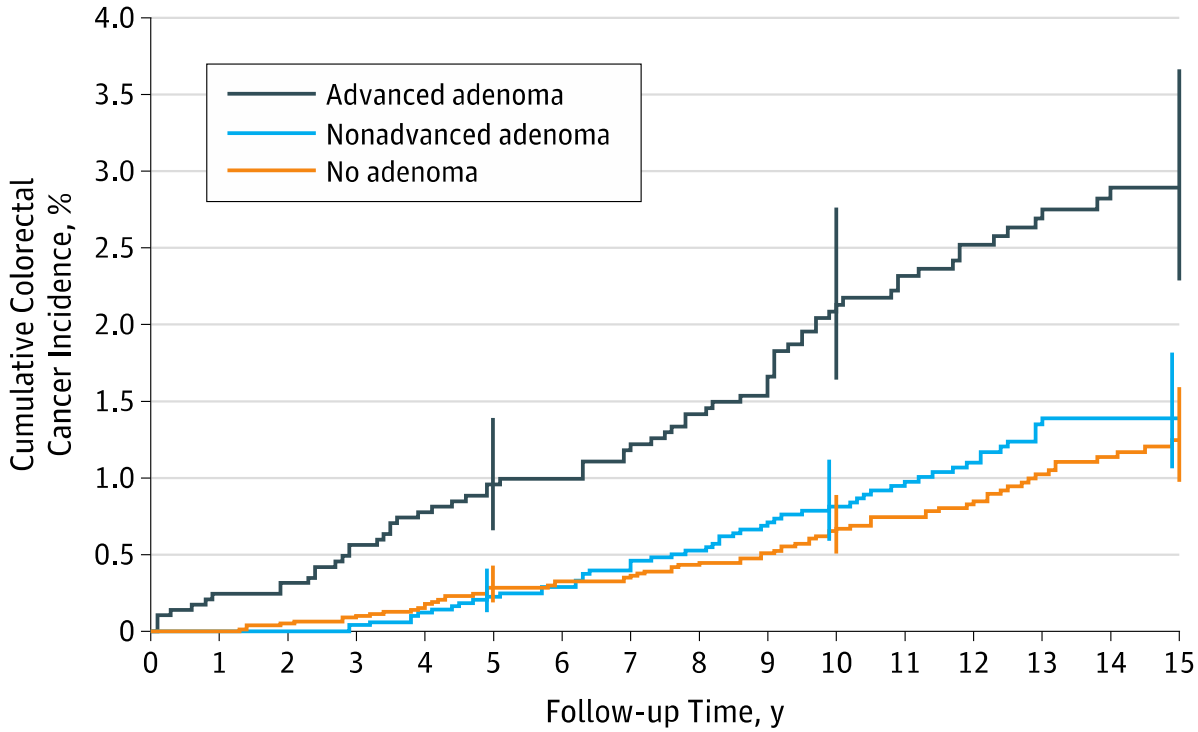


Baseline HRA: 21.9%

Lieberman D, et al. Gastroenterol 2020
doi.org/10.1053/j.gastro.2019.07.052

Risk of CRC after index colonoscopy- No adenomas vs LRAs vs HRAs

PLCO study, N=15 935



Risk of CRC in people with Low Risk (non-advanced) adenomas is comparable to those with no adenomas

- Rate ratio 1.2 [95% CI 0.8-1.7]; P = .30

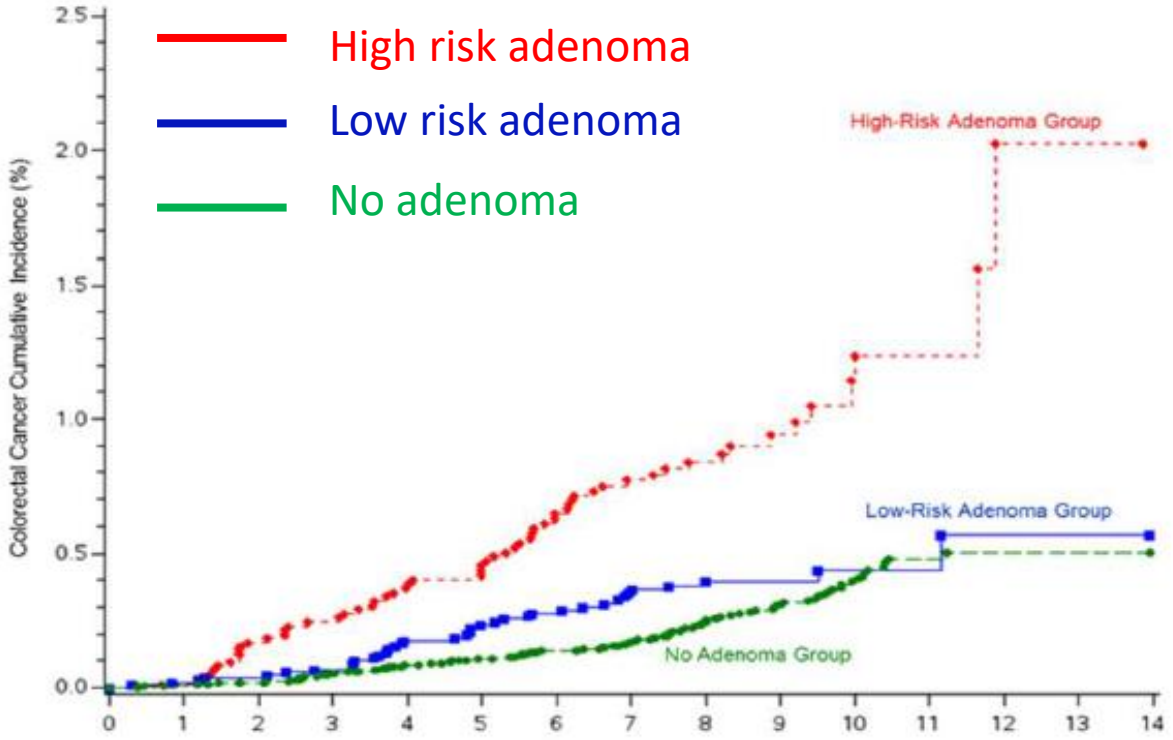
Risk of CRC in people with High risk (advanced) adenomas is significantly higher compared with people with no adenoma

- Rate ratio 2.7 [95%CI 1.9-3.7]; *P* < .001)

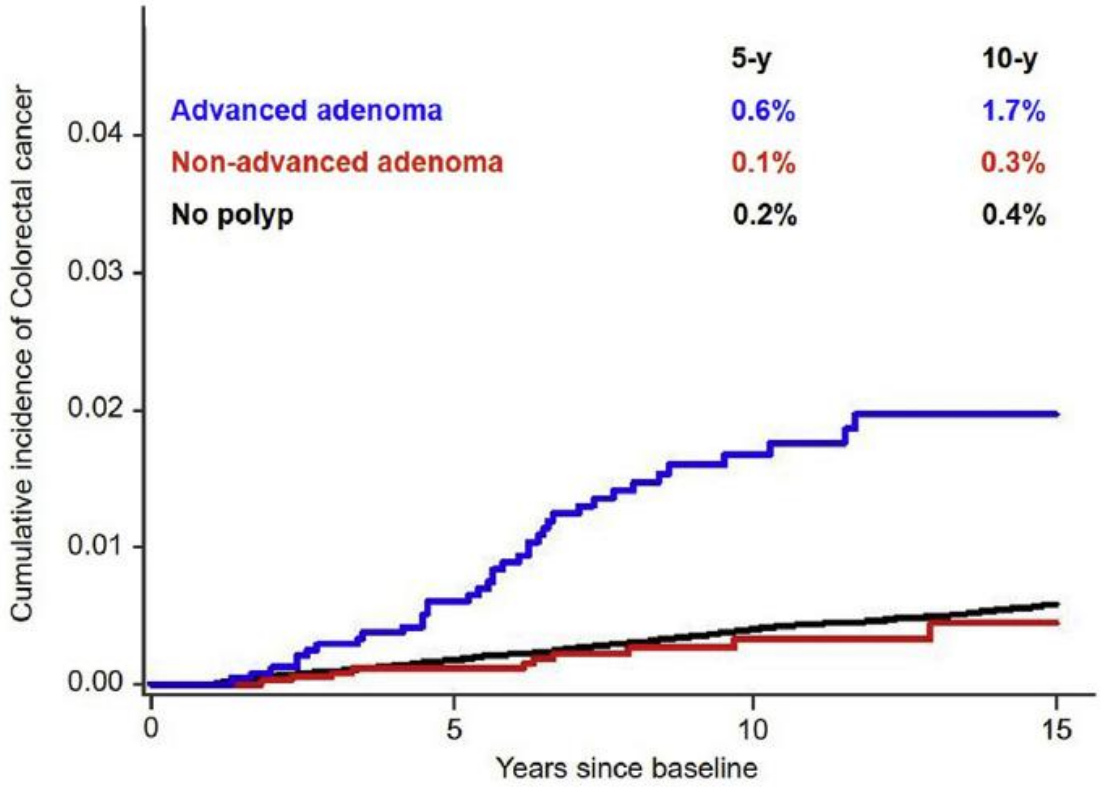
Click B, et al. JAMA 2018; 319(19):2021-2031

Risk of CRC after index colonoscopy- No adenomas vs LRAs vs HRAs (2)

KPNC N= 64 422



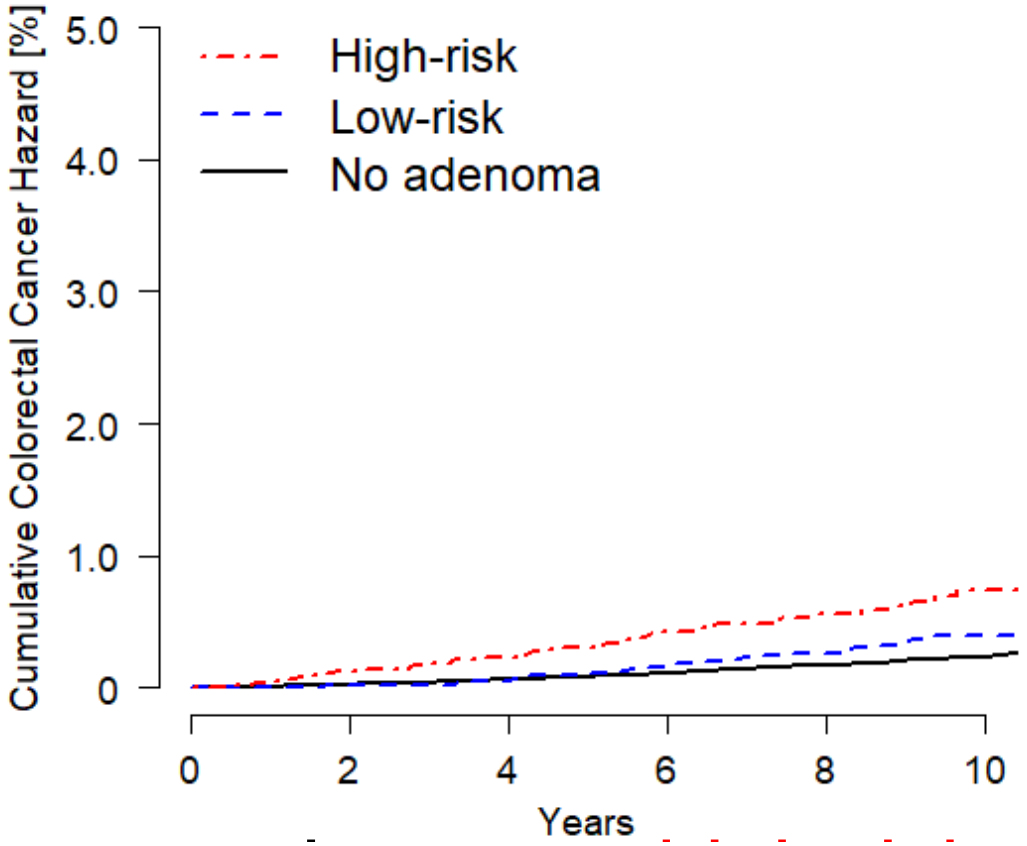
NHS, PHS N= 122 899

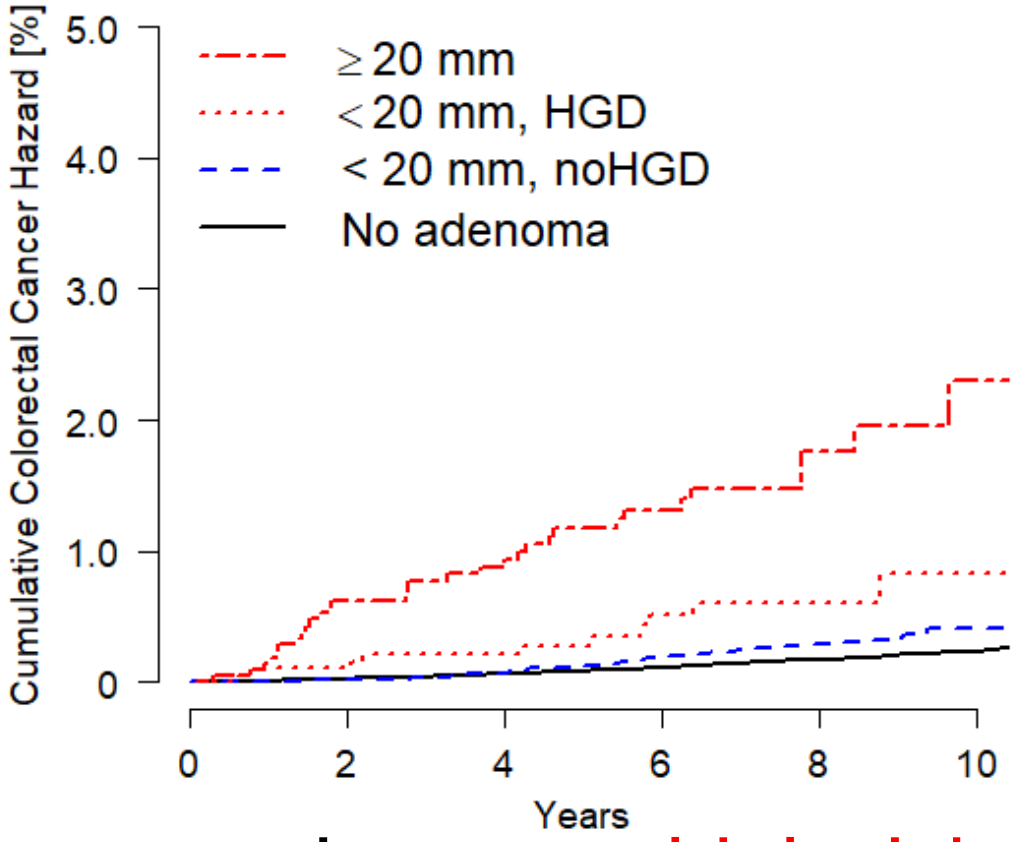


Lee JK, et al. Gastroenterol 2019; doi.org/10.1053/j.gastro.2019.09.039
He X, et al. Gastroenterol 2020 doi.org/10.1053/j.gastro.2019.06.039

Risk of CRC after index colonoscopy- No adenomas vs LRAs vs HRAs (3)

Polish Screening Program N= 236 089

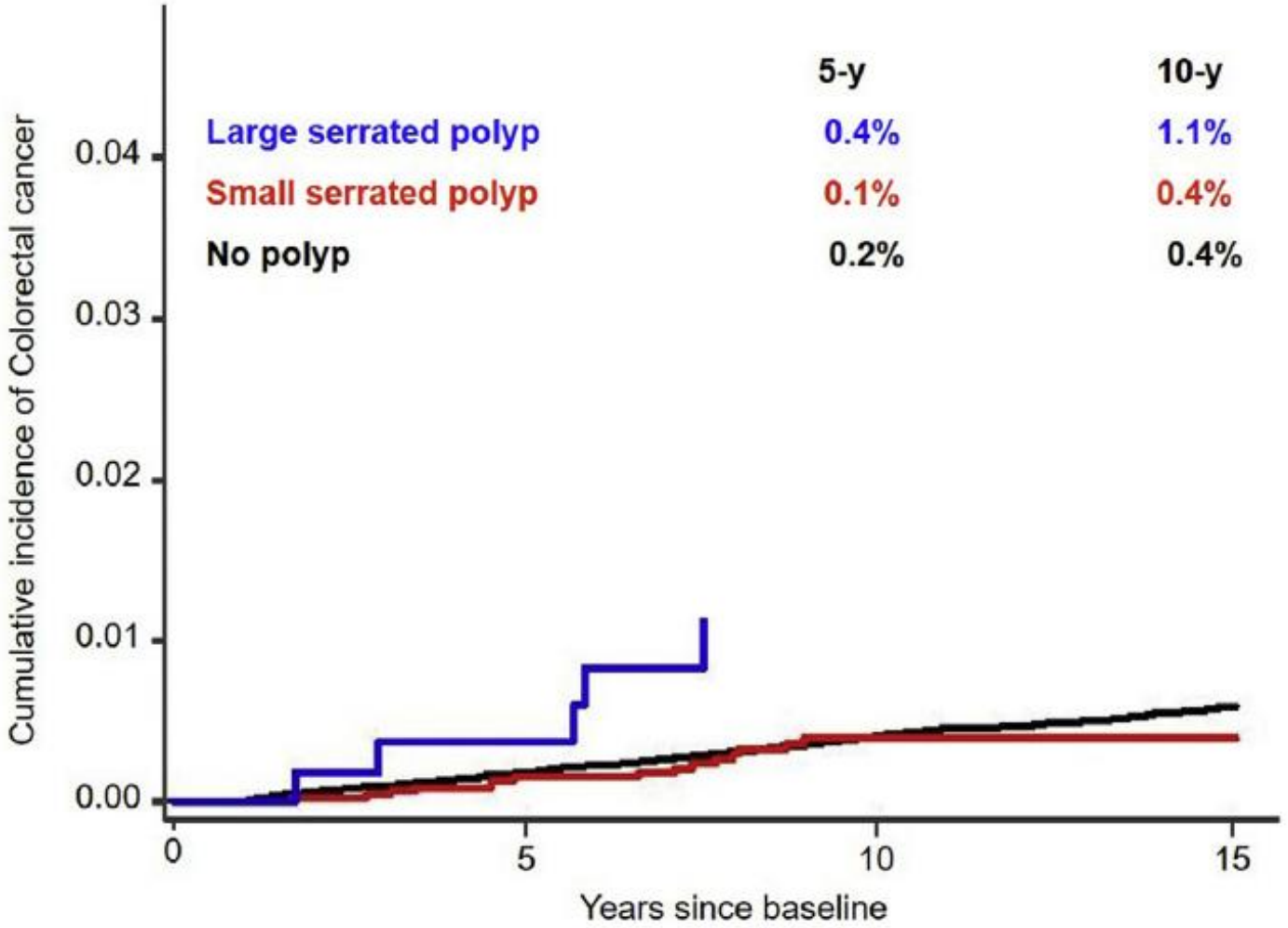




Wieszczy P et al. Gastroenterol 2020. doi: 10.1053/j.gastro.2019.09.011

CRC risk in serrated polyps

NHS, PHS N= 122 899

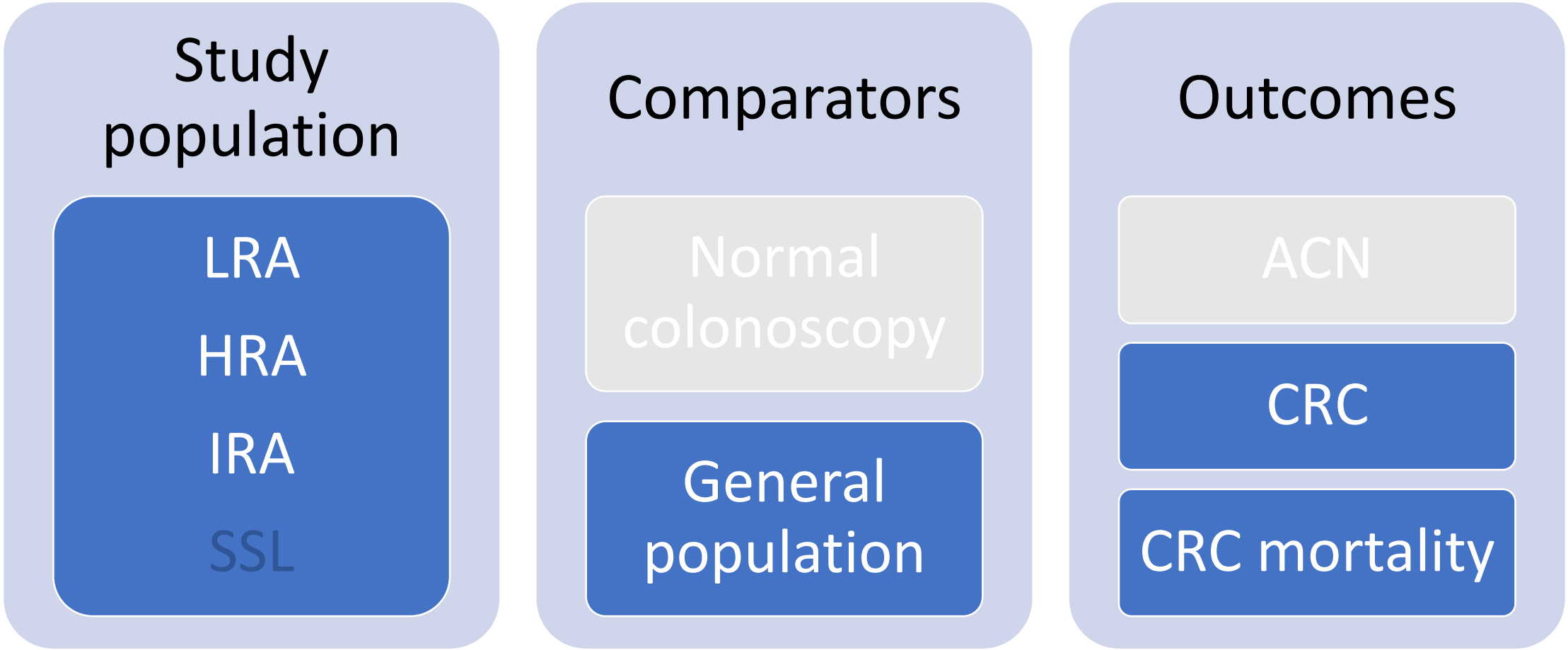


He X, et al. Gastroenterol 2020 doi.org/10.1053/j.gastro.2019.06.039

CRC Mortality after index colonoscopy- No adenomas vs LRAs vs HRAs

Study	No adenoma	Low Risk adenoma	High Risk adenoma
PLCO cohort[1]	1.0	RR 1.2 [95% CI, 0.5-2.7]	RR 2.6 [95% CI, 1.2-5.7]
KPNC cohort[2]	1.0	HR 0.65 [95% CI, 0.19–2.18]	HR 3.94 [95% CI, 1.90–6.56]
Polish screening[3]	1.0	HR 1.48 [95% CI, 0.88-2.46]	HR 2.16 [95% CI, 1.29-3.62]

[1]Click B, et al. JAMA 2018; 319(19):2021-2031
[2]Lee JK, et al. Gastroenterol 2019;doi.org/10.1053/j.gastro.2019.09.039
[3]Wieszczy P et al. Gastroenterol 2020. doi:10.1053/j.gastro.2019.09.011


Study population
LRA
HRA
IRA
SSL
Comparators
Normal colonoscopy
General population
Outcomes
ACN
CRC
CRC mortality

Risk of CRC- Hx of adenoma vs general population

Study	Low Risk adenoma	High Risk adenoma
Cottet, France[1] N=5,779 Median f/u 7.7y	SIR 0.68 (0.44–0.99)	SIR 2.23 (1.67–2.92)
Polish Screening[2] N=236,089 Median f/u 7.1y	SIR 0.35 (0.26-0.45)	SIR 0.65 (0.51-0.82)

[1]Cottet et al., Gut 2012;61(8): 1180-6.
[2]Wieszczy P et al. Gastroenterol 2020. doi: 10.1053/j.gastro.2019.09.011

Risk of CRC- Hx of adenoma vs general population

Study	Low Risk adenoma	High Risk adenoma	<20mm no HGD	<20mm + HGD	≥20mm
Cottet, France[1] N=5,779 Median f/u 7.7y	SIR 0.68 (0.44–0.99)	SIR 2.23 (1.67–2.92)			
Polish Screening[2] N= 236,089 Median f/u 7.1y	SIR 0.35 (0.26-0.45)	SIR 0.65 (0.51-0.82)	SIR 0.35 (0.28-0.44)	SIR 0.79 (0.39-1.41)	SIR 2.07 (1.40-2.93)

[1]Cottet et al., Gut 2012;61(8): 1180-6.
[2]Wieszczy P et al. Gastroenterol 2020. doi: 10.1053/j.gastro.2019.09.011

Risk of CRC- Hx of adenoma vs general population

Study	Low Risk	Intermediate Risk		High risk
Atkin, UK[3] N= 11,944 Median f/u 7.9y		SIR 1.09 (0.91-1.30)	Low intermediate risk SIR 0.51 (0.29-0.84) High intermediate risk 1.30 (1.06-1.57)	Higher-risk: HGD, ≥2cm, proximal, poor quality

[3]Atkin W, et al. Lancet Oncol 2017. doi.org/10.1016/S1470-2045(17)30187-0
[4]Cross AJ, et al. Gut 2020;0:1–14. doi:10.1136/gutjnl-2019-320036

Risk of CRC- Hx of adenoma vs general population

Study	Low Risk		Intermediate Risk		High risk	
Atkin, UK[3] N= 11,944 Median f/u 7.9y			SIR 1.09 (0.91-1.30)	Low risk SIR 0.51 (0.29-0.84)		
				High risk 1.30 (1.06-1.57)		
Cross, UK[4] N= 28,972 Median f/u 9.6y	SIR 0.86 (0.73-1.02)	Low risk SIR 0.51 (0.35-0.73)	SIR 1.16 (0.97-1.37)	Low risk SIR 0.70 (0.48-0.99)	SIR 1.91 (1.39-2.56)	Low risk SIR 1.10 (0.64-1.76)
		High risk SIR 1.07 (0.88-1.28)		High risk SIR 1.46 (1.19-1.78)		High risk SIR 3.55 (2.34-5.17)

Higher-risk: HGD, poor quality, proximal, ≥2cm

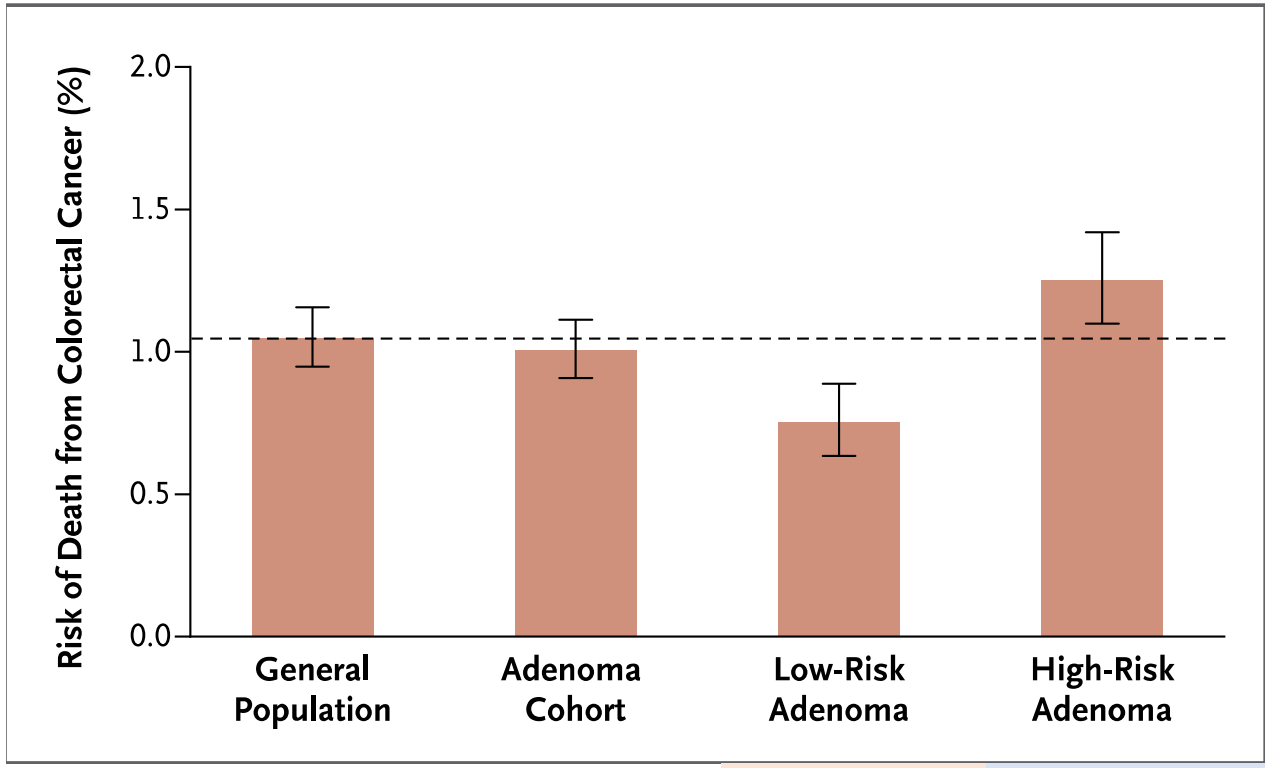
Higher-risk: tubulovillous/villous, right-sided, incomplete

Higher-risk: HGD, incomplete, proximal

[3]Atkin W, et al. Lancet Oncol 2017. doi.org/10.1016/S1470-2045(17)30187-0

[4]Cross AJ, et al. Gut 2020;0:1–14. doi:10.1136/gutjnl-2019-320036

Risk of CRC mortality-
Hx of adenoma vs general population



SMR 0.75 (0.63-0.88)	SMR 1.16 (1.02-1.31)

In the absence of post-polypectomy surveillance, people with LRA have a lower risk of death from CRC than the general population

Loberg et al. N Engl J Med 2014;31(9): 799-807.

Risk of CRC mortality-
Hx of adenoma vs general population

Polish Screening Program

	No adenomas	1-2 LRAs	HRAs	
Standardized Mortality Ratio (95% CI)	0.20 (0.17-0.24)	0.22 (0.13-0.36)	0.33 (0.19-0.53)	

Wieszczy P et al. Gastroenterol 2020. doi:10.1053/j.gastro.2019.09.011

Risk of CRC mortality- Hx of adenoma vs general population

Polish Screening Program

	No adenomas	1-2 LRAs	HRAs	
Standardized Mortality Ratio (95% CI)	0.20 (0.17-0.24)	0.22 (0.13-0.36)	0.33 (0.19-0.53)	
			<20mm no HGD	0.20 (0.13-0.30)
			<20mm + HGD	0.50 (0.10-1.46)
			≥20mm	1.14 (0.49-2.25)

Wieszczy P et al. Gastroenterol 2020. doi:10.1053/j.gastro.2019.09.011

Summary – Long term post-polypectomy outcomes

- The risks of CRC and CRC mortality in people with LRA are LOW
  - They are the same as for people with normal colonoscopy
  - They are lower than those of the general population
- The risk of CRC in people with HRA depends on the lesion(s)
  - People with polyps ≥2cm or with HGD remain at high risk of CRC post-polypectomy
- Poor colonoscopy quality falsely categorizes some high risk patients as low risk

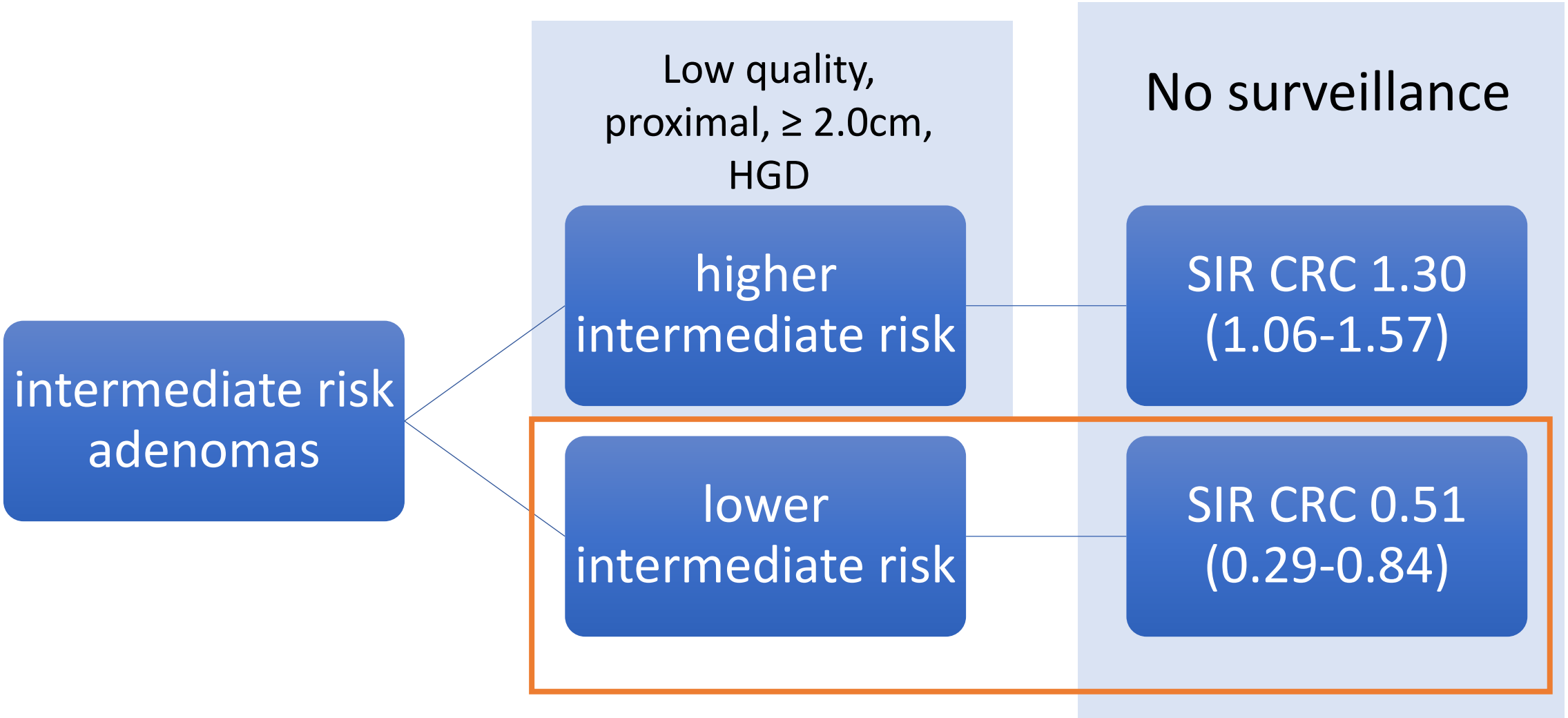
What is the benefit of surveillance beyond a high quality baseline colonoscopy?

CRC risk pre- and post- surveillance

Study	LRA	IRA	HRA
Cottet	↔		↓
Cross	**All BSG LRA:↓** Low risk BSG LRA: ↔ High risk BSG LRA: ↓	**All BSG IRA: ↓** Low risk BSG IRA: ↔ High risk BSG IRA: ↓	**All BSG HRA: ↓**

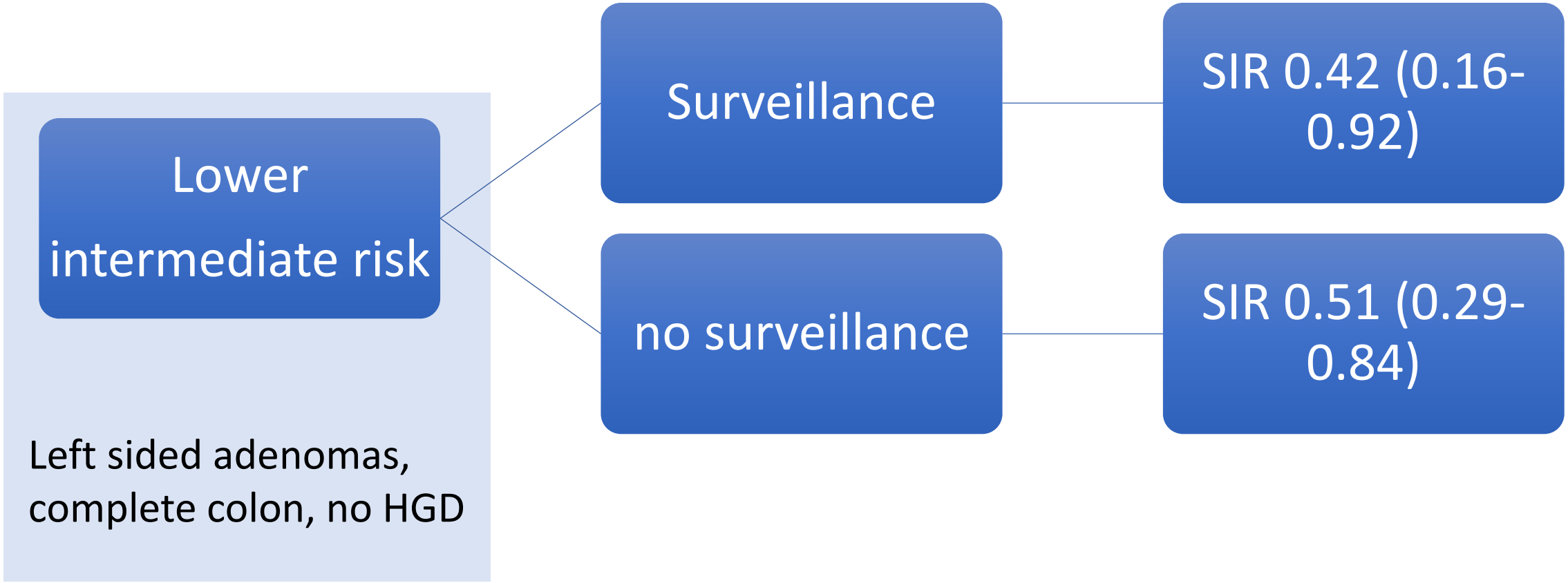
Cottet et al, Gut 2012;61(8): 1180-6
Cross AJ, et al. Gut 2020;0:1–14. doi:10.1136/gutjnl-2019-320036
Atkin W, et al. Lancet Oncol 2017. doi.org/10.1016/S1470-2045(17)30187-0

Back to our patient…



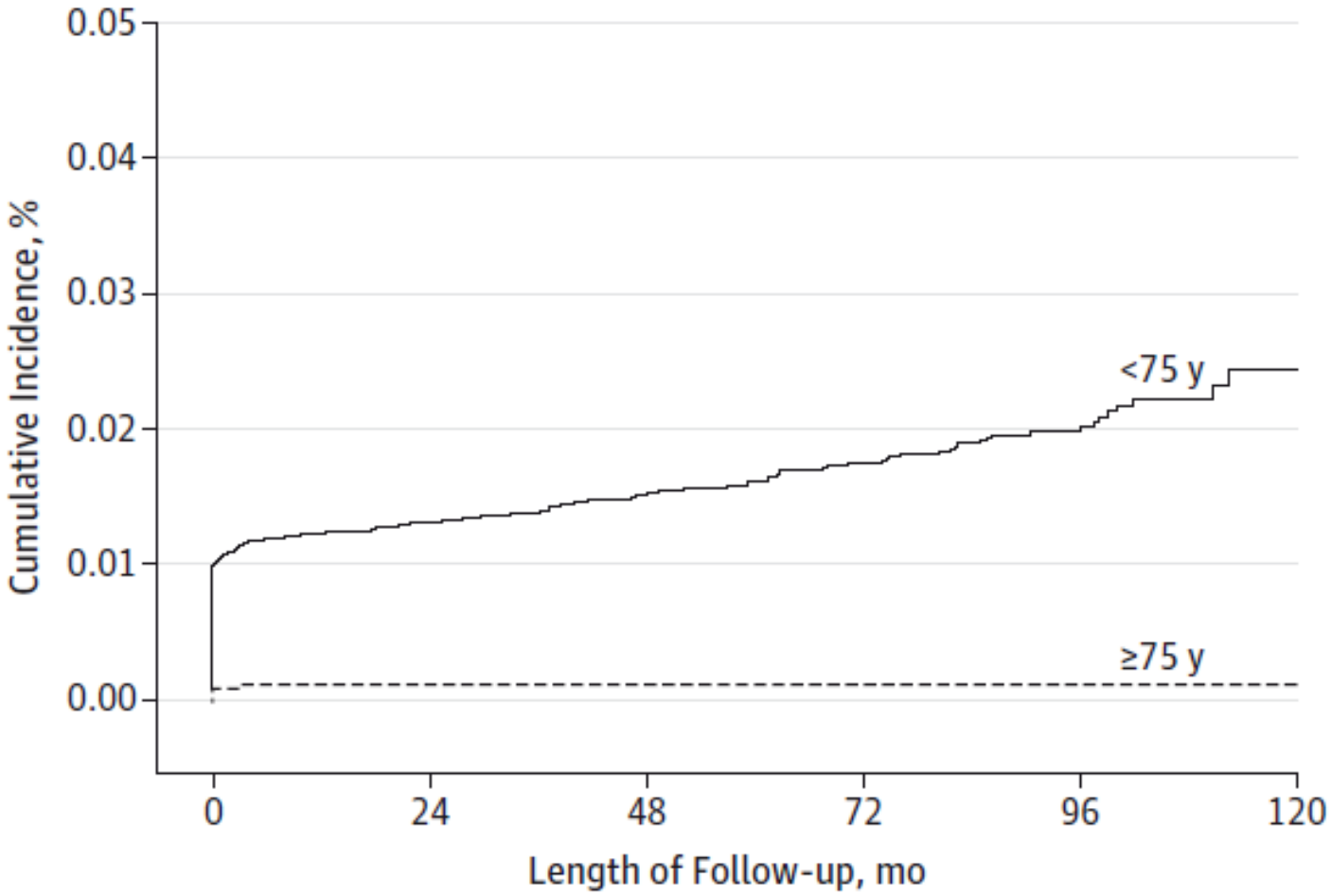
Atkin W, et al. Lancet Oncol 2017. doi.org/10.1016/S1470-2045(17)30187-0

Would surveillance further decrease his CRC risk?



Atkin W, et al. Lancet Oncol 2017. doi.org/10.1016/S1470-2045(17)30187-0

Impact of surveillance in the elderly

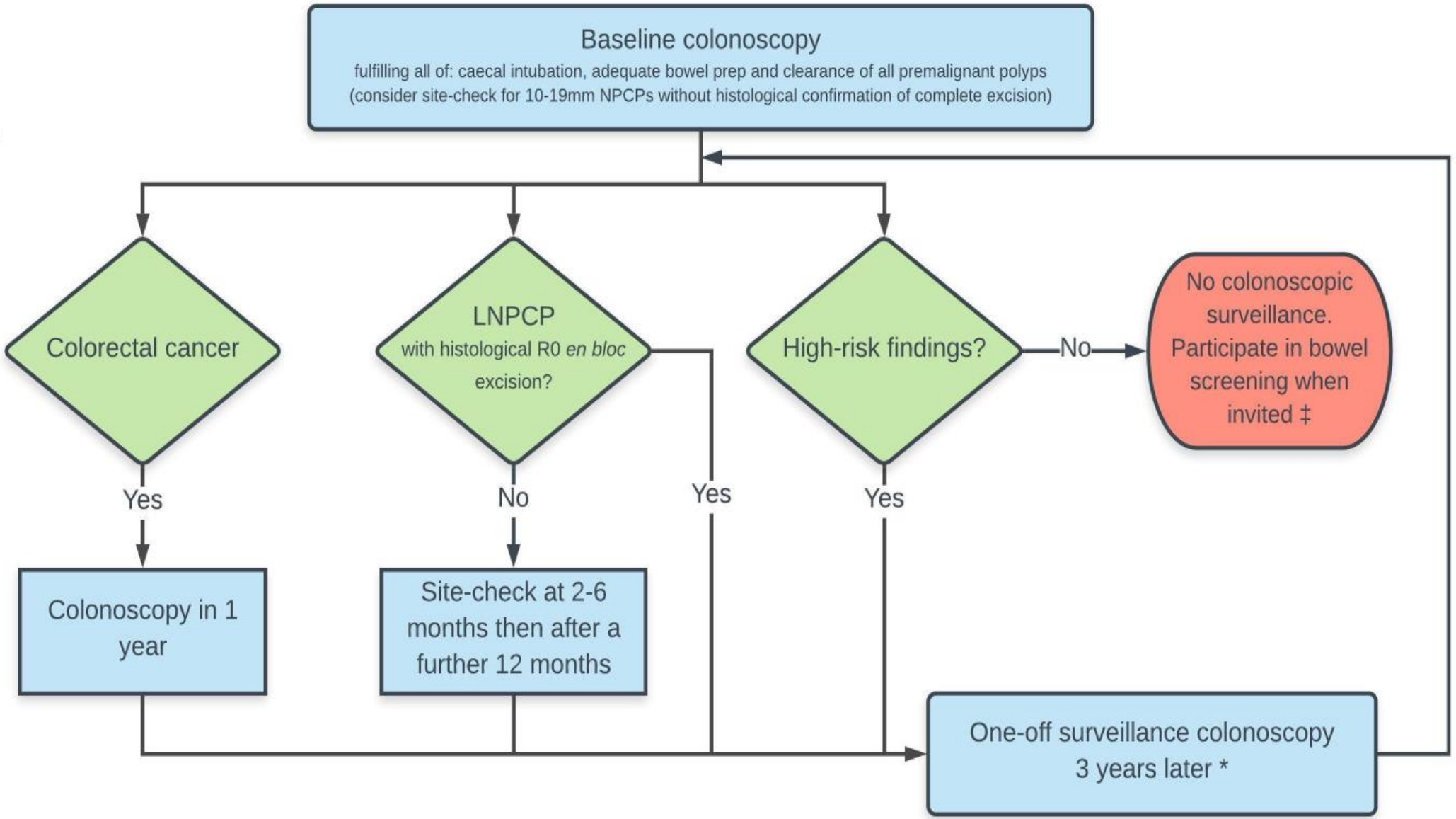


HR CRC in the elderly undergoing surveillance:
0.06 (95%CI, 0.02-0.13)

OR post colonoscopy hospitalization in the elderly:
1.28 (95%CI, 1.07-1.53)

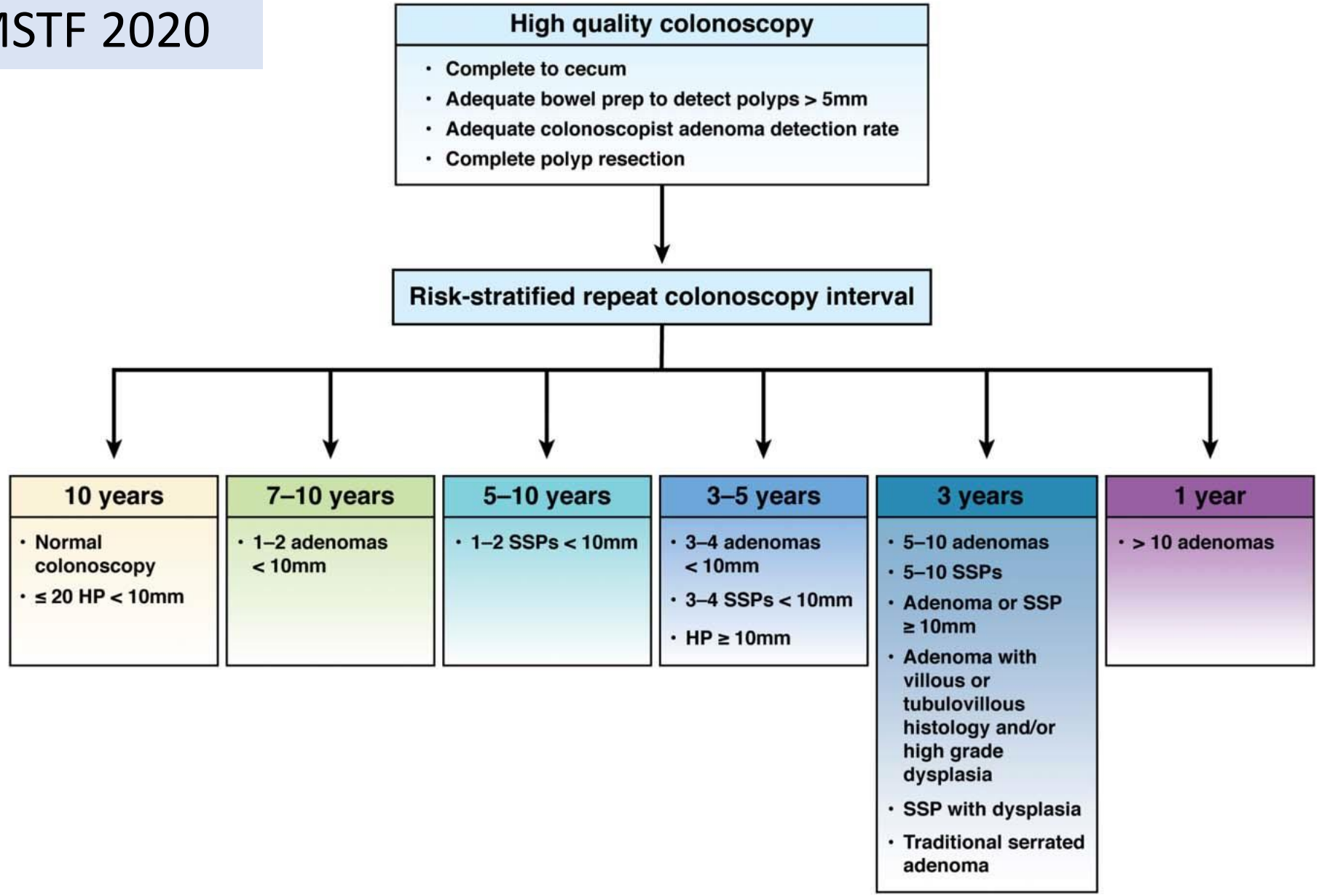
Tran HL et al. JAMA Intern Med. 2014;174(10):1675-1682

BSG/PHE/ACPGBI Guidelines for Post-polypectomy and Post-cancer-resection Surveillance



Rutter MD, *et al*. *Gut* 2019;**0**:1–23. doi:10.1136/gutjnl-2019-319858

USMSTF 2020

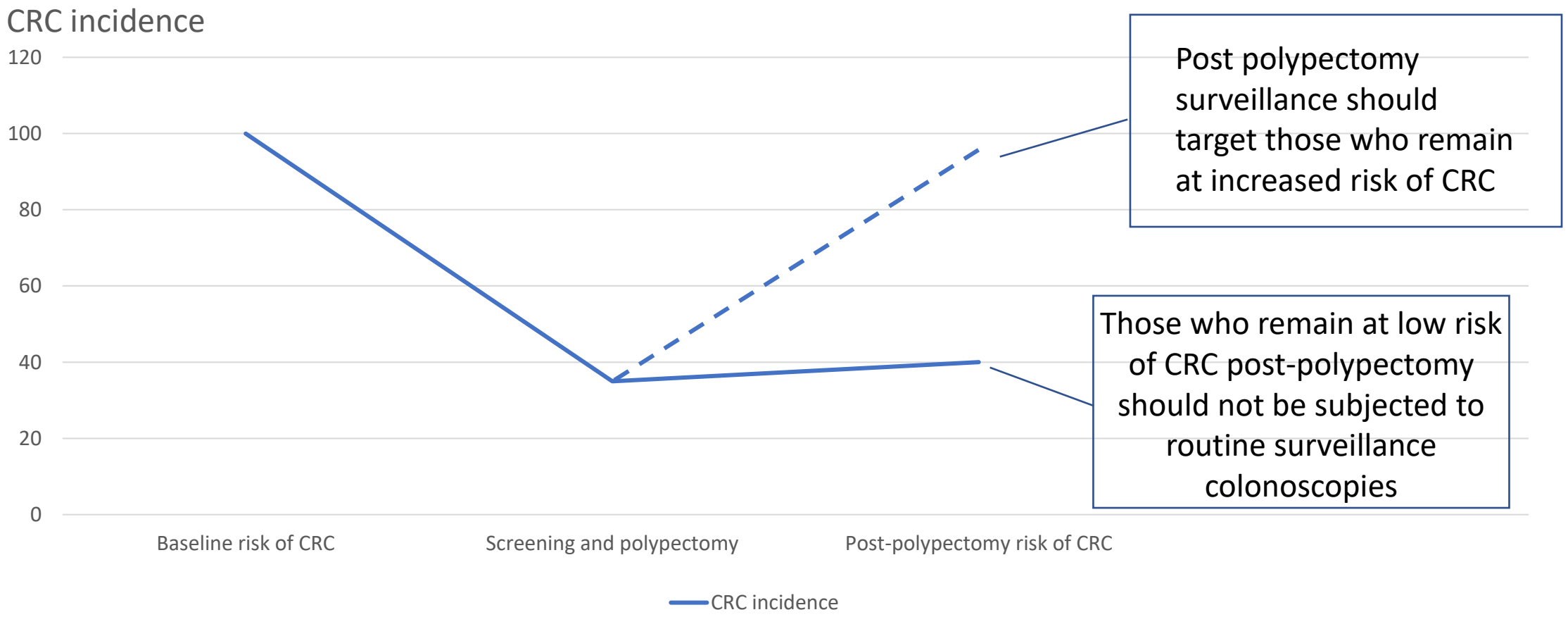


Gupta S, et al. Am J Gastroenterol 2020

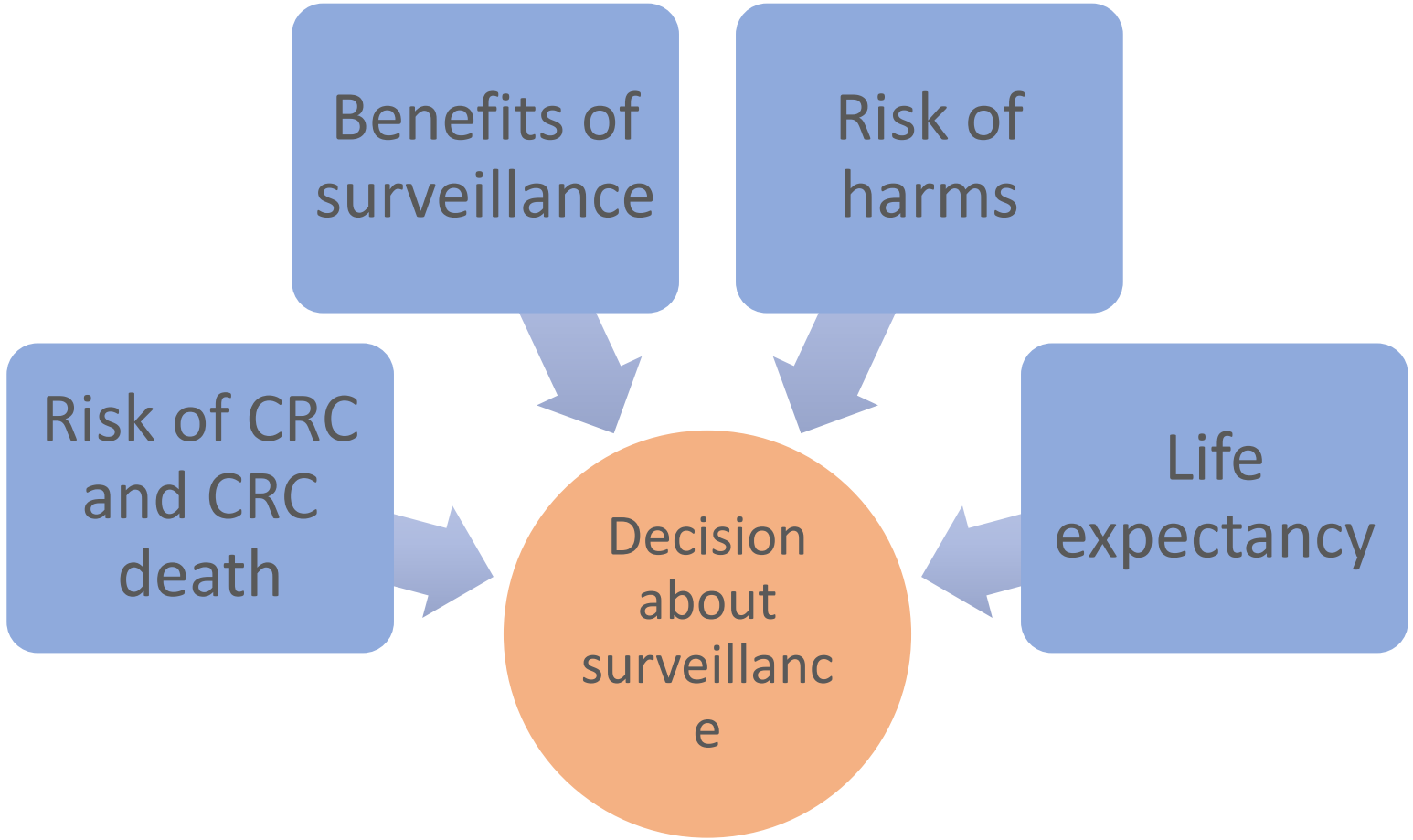
Is it time to change our views on post polypectomy surveillance?

YES

- Only a minority of people with a history of polyps are at high risk of CRC and CRC mortality
- Surveillance has no impact in the very low risk adenomas
- The most impactful intervention is the initial clearing of the colon from polyps, rather than the post-polypectomy surveillance


CRC incidence
120
100
80
60
40
20
0
Baseline risk of CRC
Screening and polypectomy
Post-polypectomy risk of CRC
CRC incidence
Post polypectomy surveillance should target those who remain at increased risk of CRC
Those who remain at low risk of CRC post-polypectomy should not be subjected to routine surveillance colonoscopies

Surveillance is a decision, not a kneejerk reflex



Merci!