

CAG and CAGS Webinar

May 6 2020

19:00-20:30

PPE for Endoscopy During the COVID-19 Pandemic

Frances Tse

MD, MPH, FRCPC

CAG Practice Affairs Chair

Associate Professor

Division of Gastroenterology

McMaster University



What kind of PPE should we wear?



Flying on an airplane
London to Hong Kong



Doing a sigmoidoscopy
South Korea

What kind of PPE should we wear?

**Mt. Sinai
nurses
wearing
garbage
bags as
coronavirus
supplies
run dry**

Mt. Sinai West
nurses revealed
yesterday what they
were reduced to
wearing because of a
lack of gowns and
other supplies.

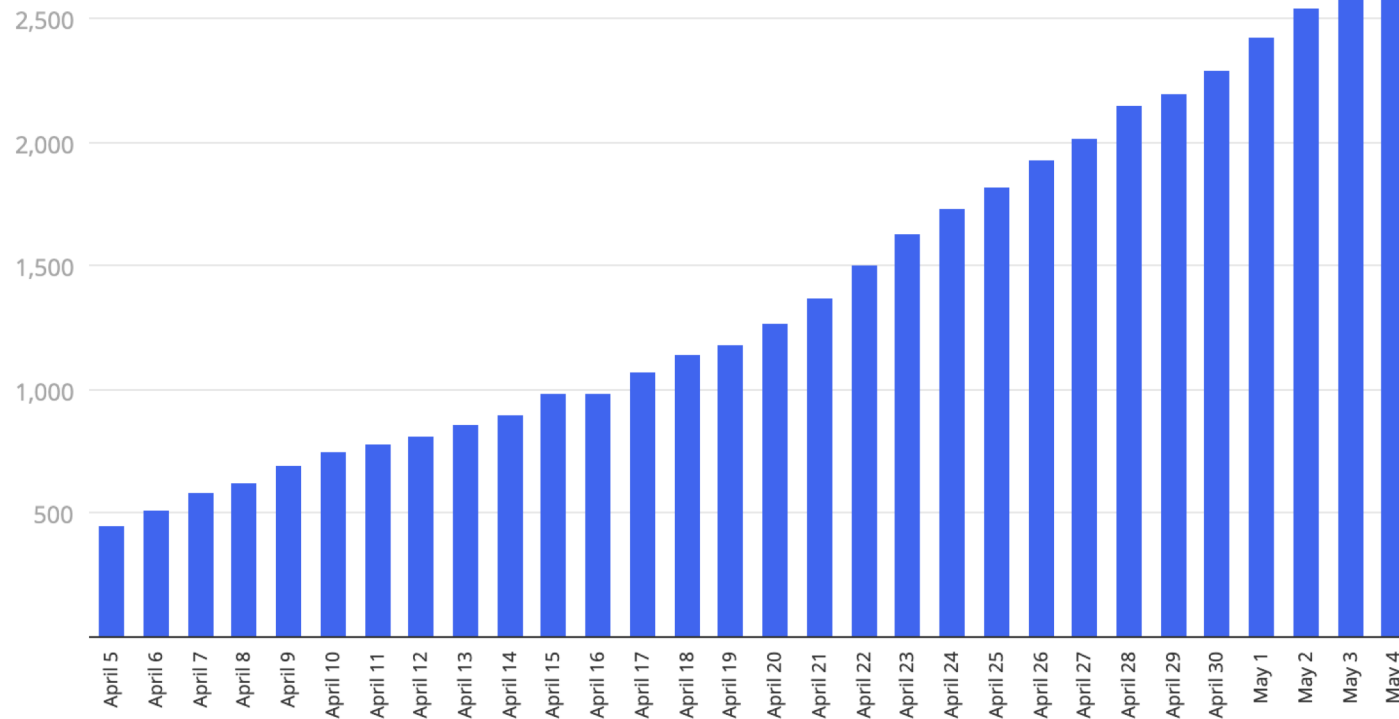
TREATED LIKE TRASH

PLUS Finally! \$2 trillion aid bill passes FULL COVERAGE: PAGES 4-11



Confirmed COVID-19 cases among Ontario healthcare workers

N = 2900

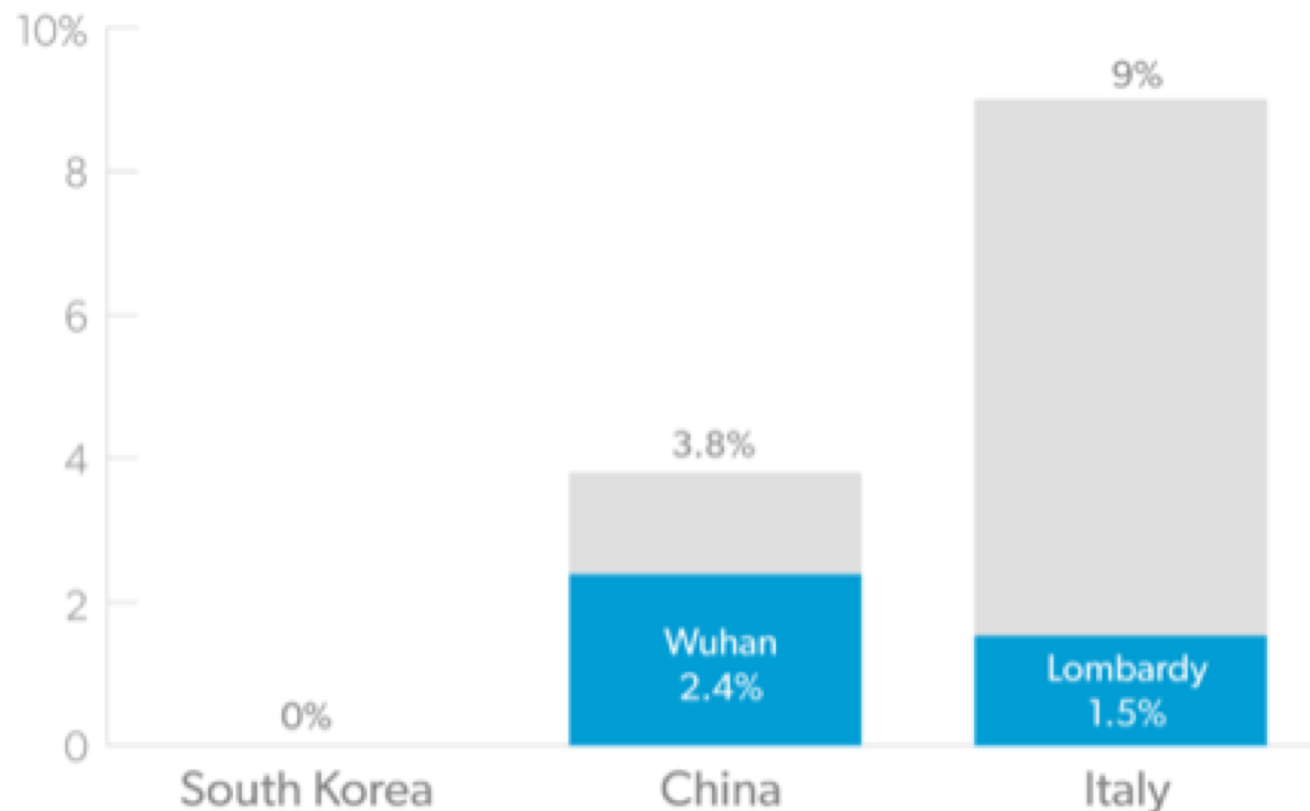


Source: Province of Ontario

 **CBCNEWS**

16% of all COVID-19 cases are HCWs

Percentage of COVID-19 Cases That Are Health Care Workers



Source: Dennis Normile, "Coronavirus Cases Have Dropped Sharply in South Korea. What's the Secret to Its Success?," *Science*, March 17, 2020, <https://www.sciencemag.org/news/2020/03/coronavirus-cases-have-dropped-sharply-south-korea-whats-secret-its-success>; Zunyou Wu and Jennifer M. McGoogan, "Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China," *Journal of the American Medical Association*, February 24, 2020, <https://jamanetwork.com/journals/jama/fullarticle/2762130>; Edward Livingston and Karen Bucher, "Coronavirus Disease 2019 (COVID-19) in Italy," *Journal of the American Medical Association*, March 17, 2020, <https://jamanetwork.com/journals/jama/fullarticle/2763401>; and Andrea Remuzzi and Giuseppe Remuzzi, "COVID-19 and Italy: What Next?," *Lancet*, March 13, 2020, [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30627-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30627-9/fulltext).

Objectives

- Review COVID-19 transmission routes
- Discuss the recommended PPE when performing endoscopic procedures in the COVID-19 environment
 - CAG position statement (*March 16*)
 - AGA and the Joint GI Society (AGA, ACG, ASGE, AASLD) recommendations (*March 31 and April 1*)
- Discuss the PPE Decision Tree (*ACG Apr 27*)

COVID-19 Transmission Routes

What We Know So Far...

- Respiratory droplets and contact transmission¹
- Airborne transmission may occur with procedures that generate aerosols¹
- Possible fecal-oral transmission¹
- Transmission can occur from both symptomatic and asymptomatic patients
- About half of COVID-19 positive cases have no symptoms²
- Undocumented infections were the infection source for 79% of documented cases³

1. WHO Scientific brief March 29 2020

2. Gudbjartsson et al. NEJM 2020 Apr 14

3. Li et al. Science 2020 May 1; 368(6940):489-493



“Seriously people - STOP BUYING MASKS!
They are not effective in preventing the general
public from catching #Coronavirus”

Feb 29 Surgeon General Jerome Adams



Mounting evidence of COVID-19 'silent spreaders' contradicts government's earlier messages



Growing body of research shows coronavirus infections can spread by people with no obvious symptoms

Infectious Disease > COVID-19

It's Official: CDC Recommends Public Wear Face Masks

— Stresses use of cloth coverings, not medical grade, for ordinary people

by Shannon Firth, Washington Correspondent, MedPage Today April 4, 2020



The CLOROX Cure

“FROM THE BOTTOM UP”



Universal Masking

Universal Masking Policy Now in Place

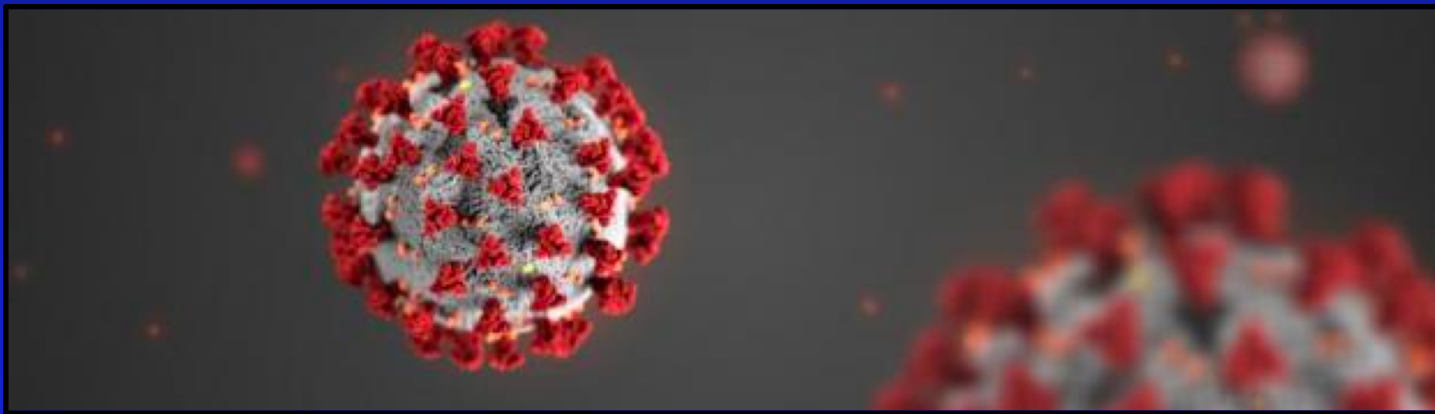


Applies to all center teammates and patients.



How do we decide what PPE to wear for endoscopic procedures during COVID-19 pandemic?

- Risk of patients for COVID-19 infection
- Risk of procedure for COVID-19 transmission



Who are the high risk vs. low risk patients?

Prescreen All Patients

- Risk assessment and stratification of patients should occur prior to any endoscopic procedure. There should be specific triage protocol in place to stratify the risk of COVID-19 upon patient arrival, and ideally prior to arrival as well. This strategy should be repeatedly adjusted based on the rapidly evolving local and global epidemiology of COVID-19.

CAG Mar 16

- Patients should be asked about history of fever or respiratory symptoms, family members or close contacts with similar symptoms, any contact with a confirmed case of COVID-19, and recent travel to a high-risk area.

Joint GI Society Mar 15

- Low risk patients would be considered those with no symptoms, negative pre-procedure PCR test, no exposure to patients with COVID-19, and those living in a non-hot spot or low prevalence area

ACG April 27

All patients are presumed to be high risk for COVID-19

- “Given that community transmission from apparently asymptomatic patients with COVID-19 has already been documented in China and Italy, and now in Canada, and the fact that the prevalence of the disease is likely to be underestimated due to limited testing and restricted criteria for testing in Canada, we suggest regarding **all upper GI procedures as high-risk procedures regardless of whether patients are considered low or high risk for COVID-19.**”

CAG Mar 16

- Once community-spread has been established in these pandemic phases and there is documentation of spread via asymptomatic individuals, pre-screening checklists have limited utility. **All patients undergoing endoscopy should be considered potentially infected or capable of infecting others.**

AGA Mar 31

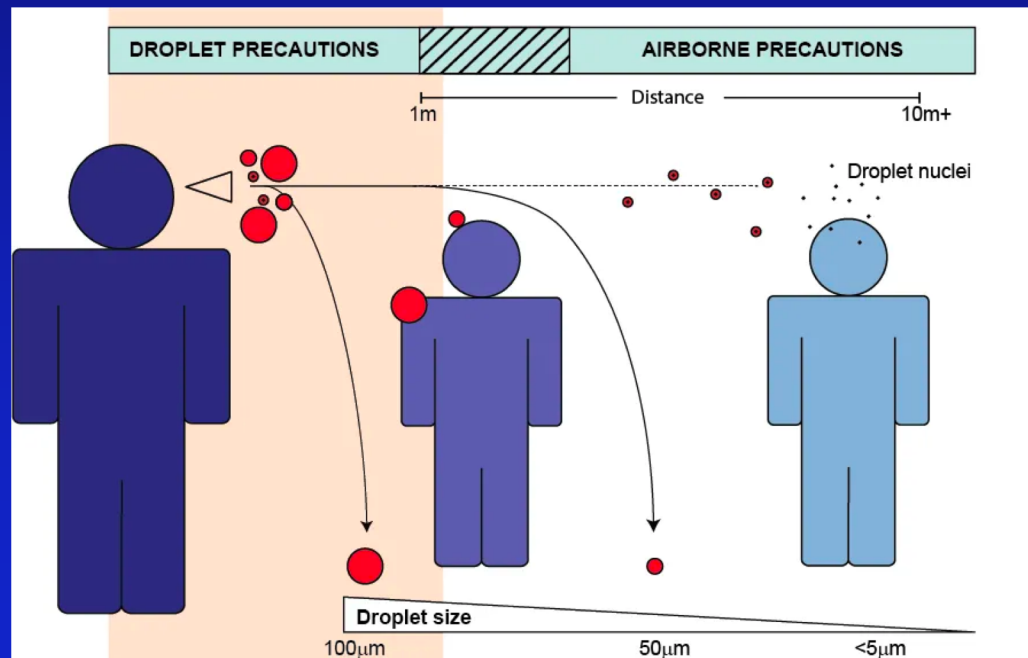
- Given this high rate of infection transmission from pre-symptomatic individuals, **all patients undergoing GI endoscopy in an area of community-spread need to be considered “high risk”.**

Joint GI Society Apr 1

What are the high risk procedures?

Aerosol Generating Medical Procedures (AGMP) are high risk for COVID-19 transmission

- AGMP: any procedure carried out on a patient that induce the production of aerosols
- Aerosols: liquid or solid particles suspended in air with variable size cutoff (2 μ m – 100 μ m)



Commonly Accepted AGMPs

Procedures Considered AGMPs

- Intubation, extubation and related procedures e.g. manual ventilation and open suctioning
- Tracheotomy/tracheostomy procedures (insertion/open suctioning/removal)
- Bronchoscopy
- Surgery* and post-mortem procedures involving high-speed devices
- Some dental procedures (e.g., high-speed drilling)
- Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP)
- High-Frequency Oscillating Ventilation (HFOV)
- Induction of sputum with nebulized saline
- High flow nasal oxygen (high flow nasal cannula therapy)

AGMPs	Pooled Estimate (OR) Risk of transmission of SARs to HCWs
Tracheal intubation (4 cohort)	6.6 (2.3, 18.9)
Non-invasive ventilation (2 cohort)	3.1 (1.4, 6.8)
Tracheotomy (1 case control)	4.2 (1.5, 11.5)
Manual ventilation before intubation (1 cohort)	2.8 (1.3, 6.4)
Bronchoscopy (2 cohort)	1.9 (0.2, 14.2)
Nebulizer treatment (3 cohort)	0.9 (0.1, 13.6)
High flow O2 (1 cohort)	0.4 (0.1, 1.7)
Induction of Sputum (1 cohort)	2.7 (0.9, 8.2)

Very Low Quality Evidence

CAG Position Statement Mar 16

- Upper GI procedures are considered AGMP
- Prospective study of 1100 EGDs
- Endoscopists wore face shields
- Face shields were swabbed pre and post



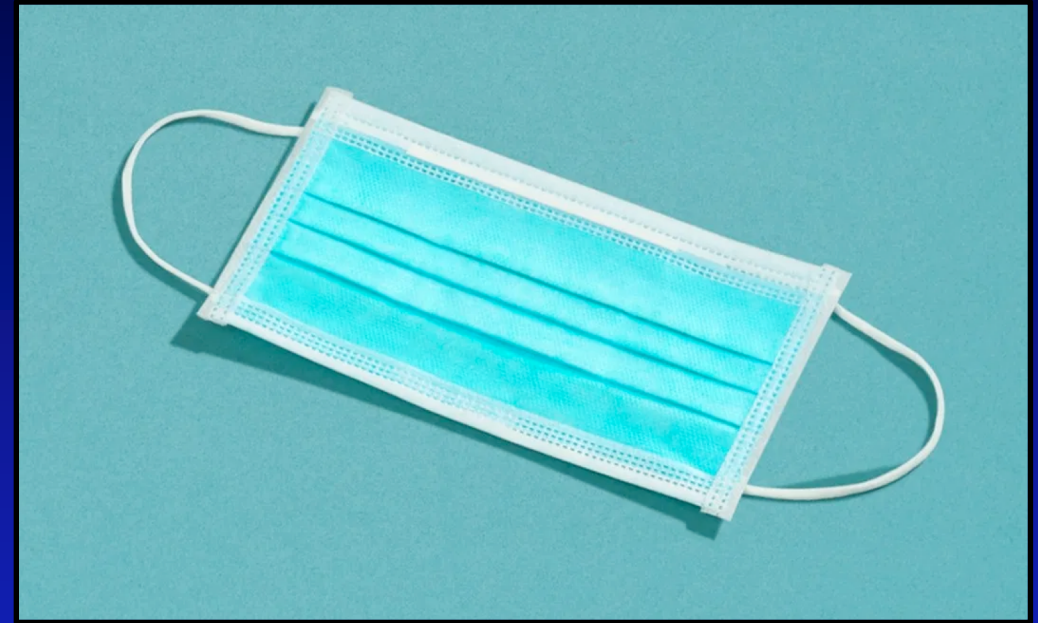
TABLE 1. Comparison of face shield bacterial CFUs for endoscopist's face and controls

	Pre-endoscopy		Postendoscopy		χ^2 analysis
	Positive CFUs	No growth (no CFUs)	Positive CFUs	No growth (no CFUs)	
Endoscopist face, n = 227	11 (4.8%)	216 (95.2%)	104 (45.8%)	123 (54.2%)	$P < .001$
Suite wall, n = 117	4 (3.4%)	113 (96.6%)	25 (21.4%)	92 (78.6%)	$P < .001$
Negative control, n = 50	1 (2%)	49 (98%)	8 (16%)	42 (84%)	$P = .036$
Positive control, n = 49	NA	NA	44 (89.8%)	5 (10.2%)	NA

CAG Position Statement Mar 16

- Upper GI procedures are considered high risk procedures. Therefore, airborne, contact and droplet precautions with appropriate selection and use of PPE including N95 masks, gloves, gown, facial protection (e.g. goggles and/or face shield) and hairnet are required.
- We suggest regarding all upper GI procedures as high-risk procedures regardless of whether patients are considered low or high risk for COVID-19.

N95 vs. Surgical Masks



- Filter $\geq 95\%$ of airborne particles
- Reduce wearer's exposure to aerosols and large droplets

- Protect the patient from the wearer's respiratory emissions
- Provides the wearer protection against large droplets, splashes, or sprays

N95 vs. Surgical Masks

Table 4A. Evidence Profile: N95 compared to surgical masks for COVID19 prevention for GI upper endoscopic procedures

Certainty assessment							№ of patients		Effect		Certainty
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	N95	surgical masks	Relative (95% CI)	Absolute (95% CI)	
SARS Infection											
3	observational studies	serious ^a	not serious	not serious ^b	serious ^c	none	4/141 (2.8%)	24/452 (5.3%)	OR 0.86 (0.22 to 3.33)	7 fewer per 1,000 (from 41 fewer to 104 more)	⊕○○○ VERY LOW
Viral Respiratory Infection											
3	randomised trials	not serious ^d	not serious	serious ^e	serious ^c	none	48/1740 (2.8%)	52/1274 (4.1%)	OR 0.78 (0.54 to 1.14)	9 fewer per 1,000 (from 18 fewer to 5 more)	⊕⊕○○ LOW

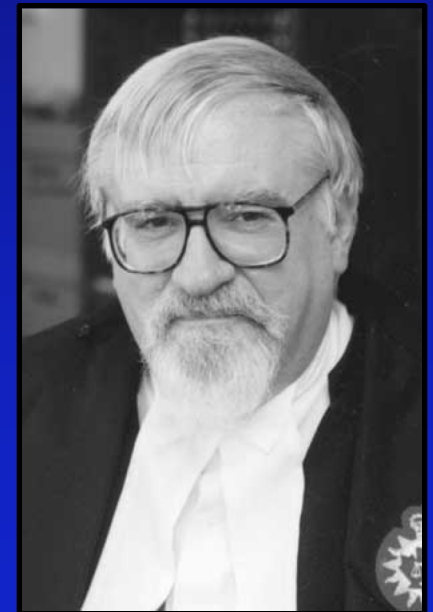
Explanations

- a. Concern for recall bias
- b. Although studies are on SARS population given the similarities in the virus we did not rate down for indirectness
- c. Low event rate and crosses the clinical threshold
- d. Although the compliance to the assigned mask type was self reported and is not clear if there is a performance, bias study staff was doing regular checks on the study participants to control for performance bias, thus, we did not rate down for risk of bias
- e. Not only coronaviruses but other URI viruses

Precautionary Principle

- “Scientific uncertainty and scientific debate can go on forever. The point is not who is right and who is wrong about airborne transmission. The point is not science but safety.”
- “If the commission has one single take-home message, it is the precautionary principle that safety comes first, that reasonable efforts to reduce risk need not wait scientific proof. Ontario needs to enshrine this principle and to enforce it throughout our entire health system.”

Justice Campbell, Chair of the SARS Commission



CAG Position Statement Mar 16

- No study assessed whether colonoscopy is an AGMP
- Although COVID-19 viral RNA has been detected in fecal samples from suspected cases suggesting possible fecal-oral transmission, there is currently insufficient evidence to consider lower GI procedures high-risk procedures for COVID-19 transmission
- The use of appropriate PPE including surgical masks, gloves, gown, eye protection and hairnet are recommended.
- More evidence may change this consideration

CAG Position Statement Mar 16

- In patients with known or highly suspected COVID-19 infection, endoscopic procedures should only be performed if strongly indicated.
- Given potential staff shortages through illness, self-quarantine and isolation, or redeployment, endoscopy facilities should discuss locally and consider whether to reduce non-essential endoscopic activities (e.g. screening and surveillance) to reduce or delay the spread of COVID-19
- Given the limited resources of N95, each institution will have to decide on the criteria for “essential” GI procedures. If the resources are too low, the institution may have to severely restrict GI procedures to only life threatening GI bleeding, obstruction of esophagus by food bolus or foreign body, and ascending cholangitis.

AGA and Joint Society Recommendations

Recommendation 1: In health care workers performing *upper GI procedures*, regardless of **COVID-19 status***, the AGA recommends use of N95 (or N99, or PAPR) masks instead of surgical masks, as part of appropriate personal protective equipment (Strong recommendation, moderate certainty of evidence)

Recommendation 2: In health care workers performing *lower GI procedures*, regardless of **COVID-19 status***, the AGA recommends the use of N95 (or N99 or PAPR) masks instead of surgical masks as part of appropriate personal protective equipment. (Strong recommendation, low certainty of evidence)

Recommendation 3: In health care workers performing *any GI procedure*, in known or presumptive **COVID-19 patients**, the AGA recommends **against** the use of **surgical masks only**, as part of adequate personal protective equipment (Strong recommendation, low certainty of evidence)

*These recommendations assume the absence of widespread reliable and accurate rapid testing for the diagnosis of COVID-19 infection or immunity

AGA and Joint Society Recommendations

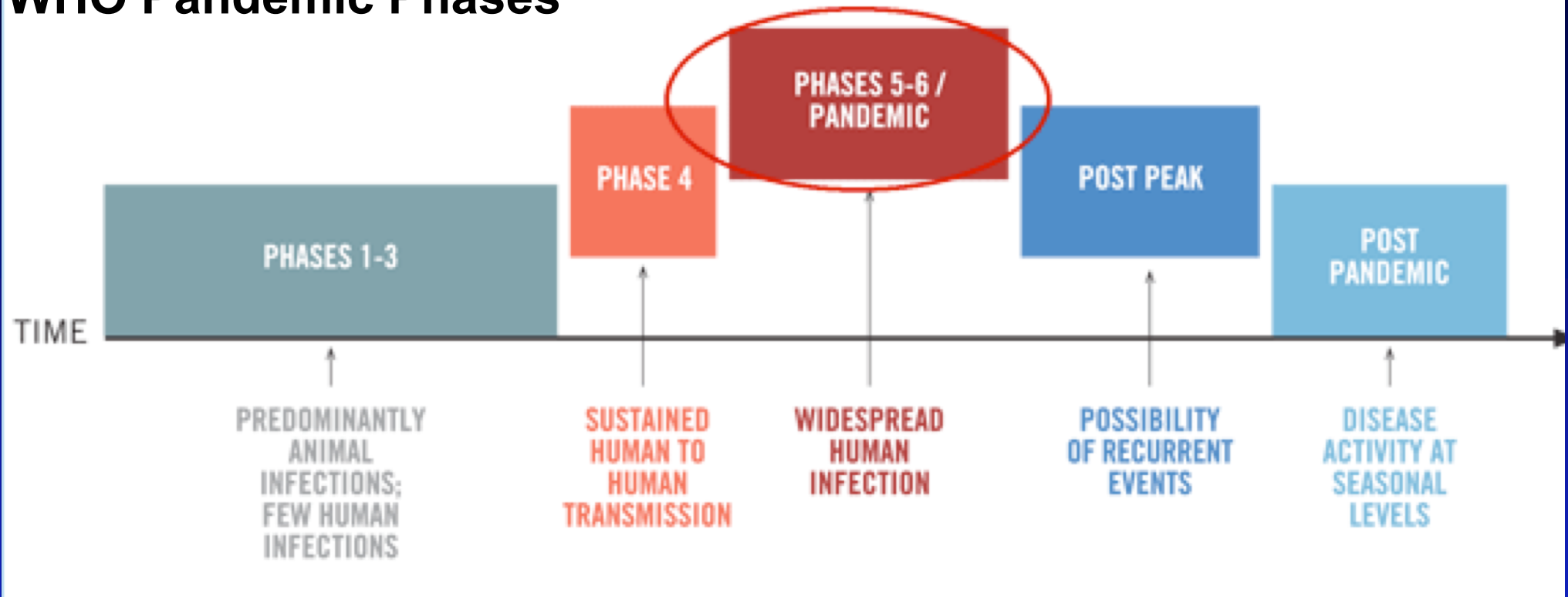
Recommendation 4: In extreme resource-constrained settings involving health care workers performing ***any GI procedures***, regardless of **COVID-19 status**, the AGA suggests extended use/re-use of N95 masks over surgical masks, as part of appropriate personal protective equipment. (Conditional recommendation, very low certainty evidence).

Recommendation 5: In health care workers performing ***any GI procedure***, regardless of **COVID-19 status**, the AGA recommends the use of double gloves compared with single gloves as part of appropriate personal protective equipment (Strong recommendation, moderate quality evidence)

Recommendation 6: In health care workers performing ***any GI procedure***, with **known or presumptive COVID-19**, the AGA suggests the use of negative pressure rooms over regular endoscopy rooms, when available (Conditional recommendation, very low certainty of evidence).

Assumptions Made in the Recommendations

WHO Pandemic Phases



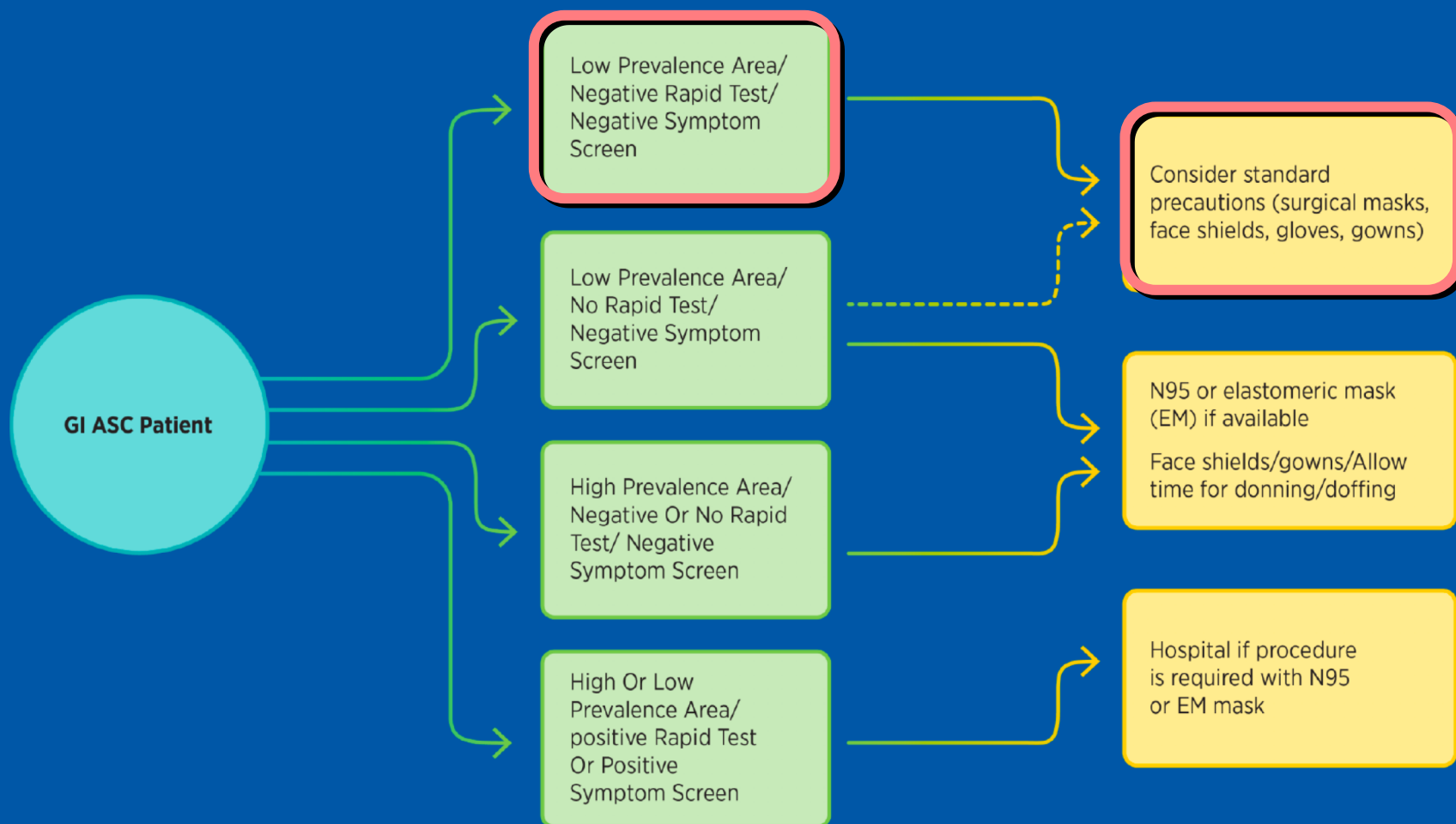
- Widespread asymptomatic and symptomatic community spread
- Small proportion of persons are negative or have recovered
- Limited testing capacity

ACG: A roadmap to Safely Resuming Endoscopy



COVID-19: A Roadmap to Safely Resuming Endoscopy

PPE DECISION TREE



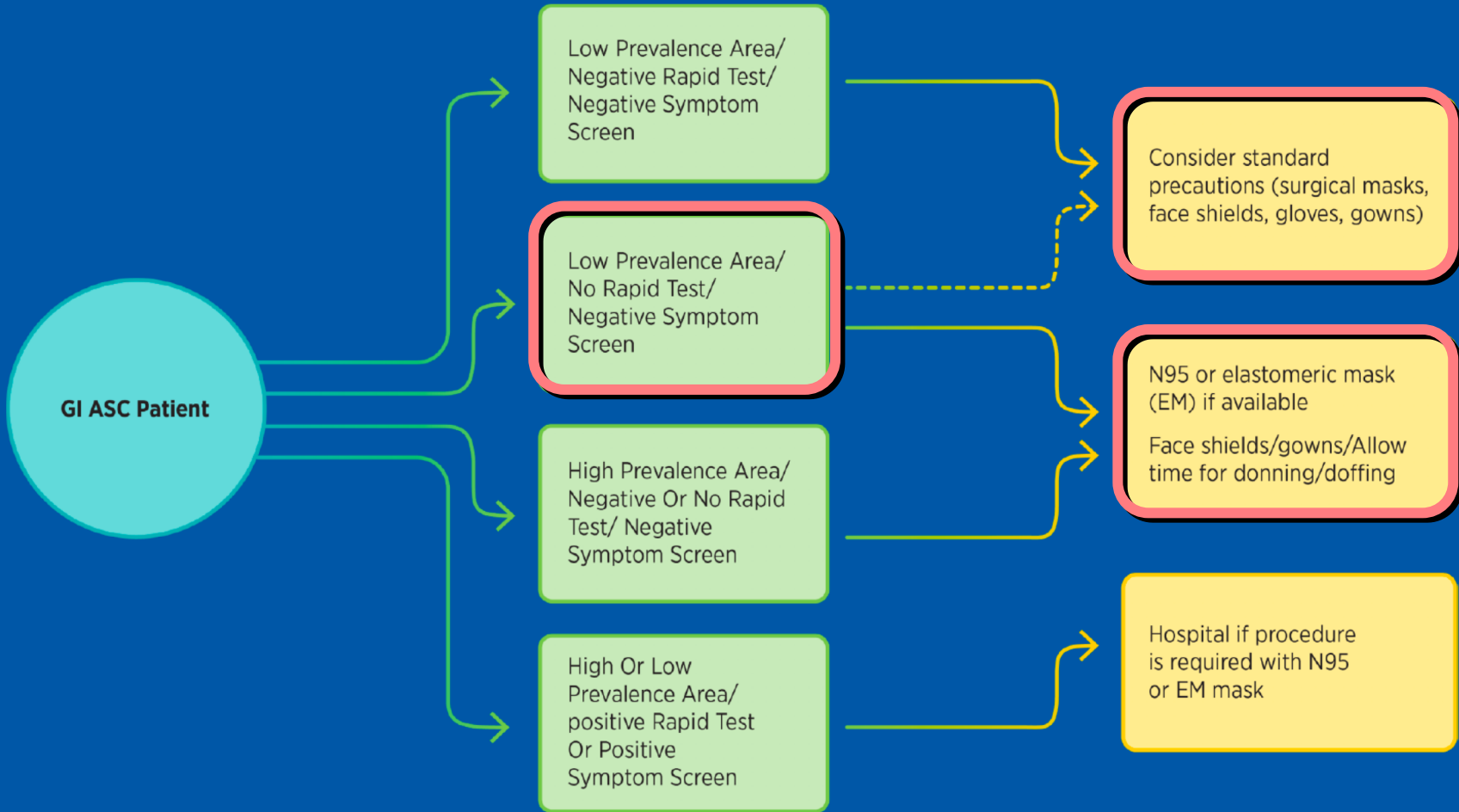
More Info: gi.org/COVID19

ACG: A roadmap to Safely Resuming Endoscopy



COVID-19: A Roadmap to Safely Resuming Endoscopy

PPE DECISION TREE



More Info: gi.org/COVID19

Good News from Italy: PPE Works

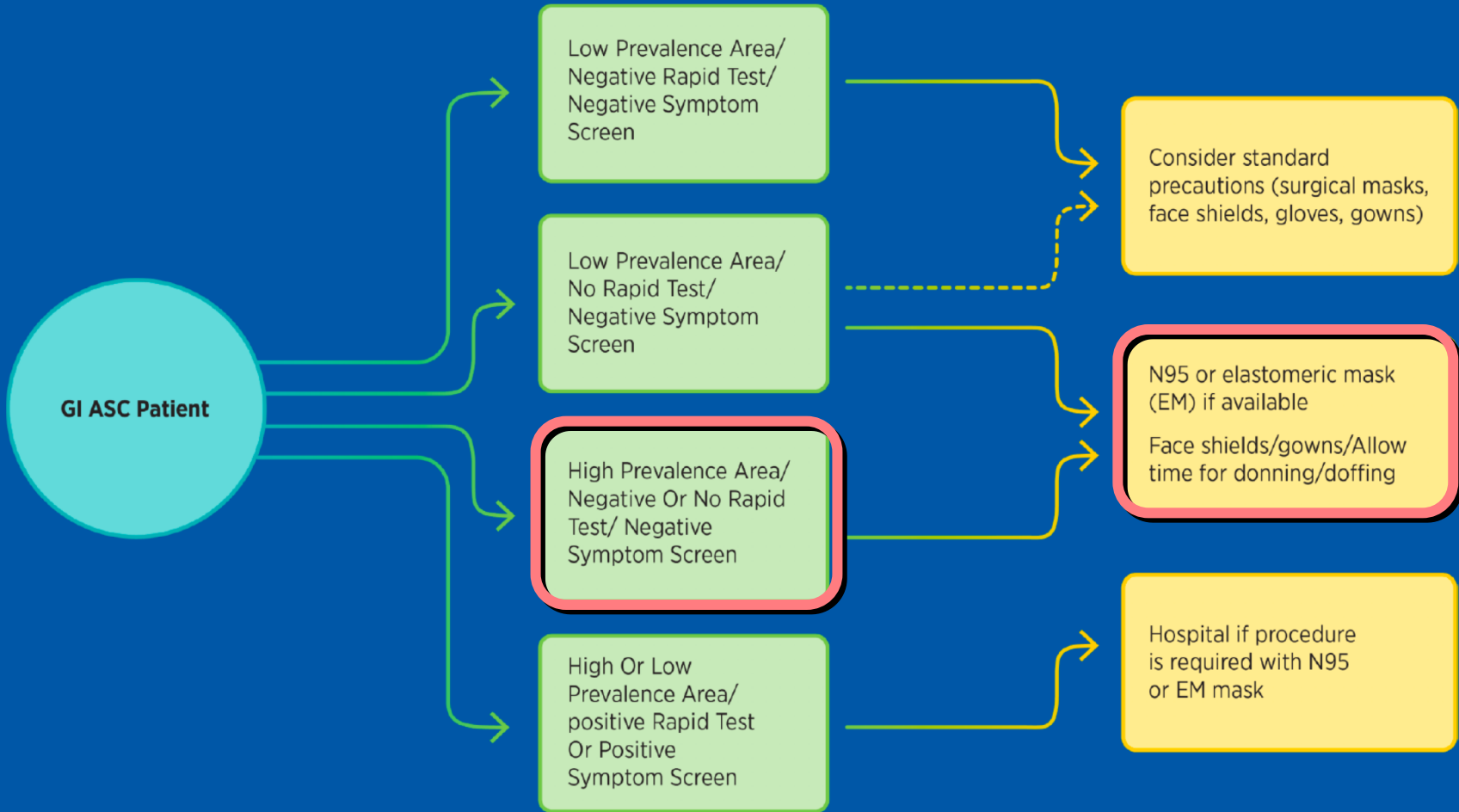
- Retrospective survey study
- 42 hospitals in Northern Italy
- 968 HCWs in endoscopy setting
- 42 positive for COVID-19 (4.3%)
 - 6 hospitalized (0.6%)
 - No deaths
 - 85.7% occurred before the introduction of safety measures (PPE/case selection/ reduction in GI endoscopy)
- Only surgical masks were available for most of the procedures in Northern Italy (N95 or equivalent reserved for COVID-19 infected or high risk cases)

ACG: A roadmap to Safely Resuming Endoscopy



COVID-19: A Roadmap to Safely Resuming Endoscopy

PPE DECISION TREE



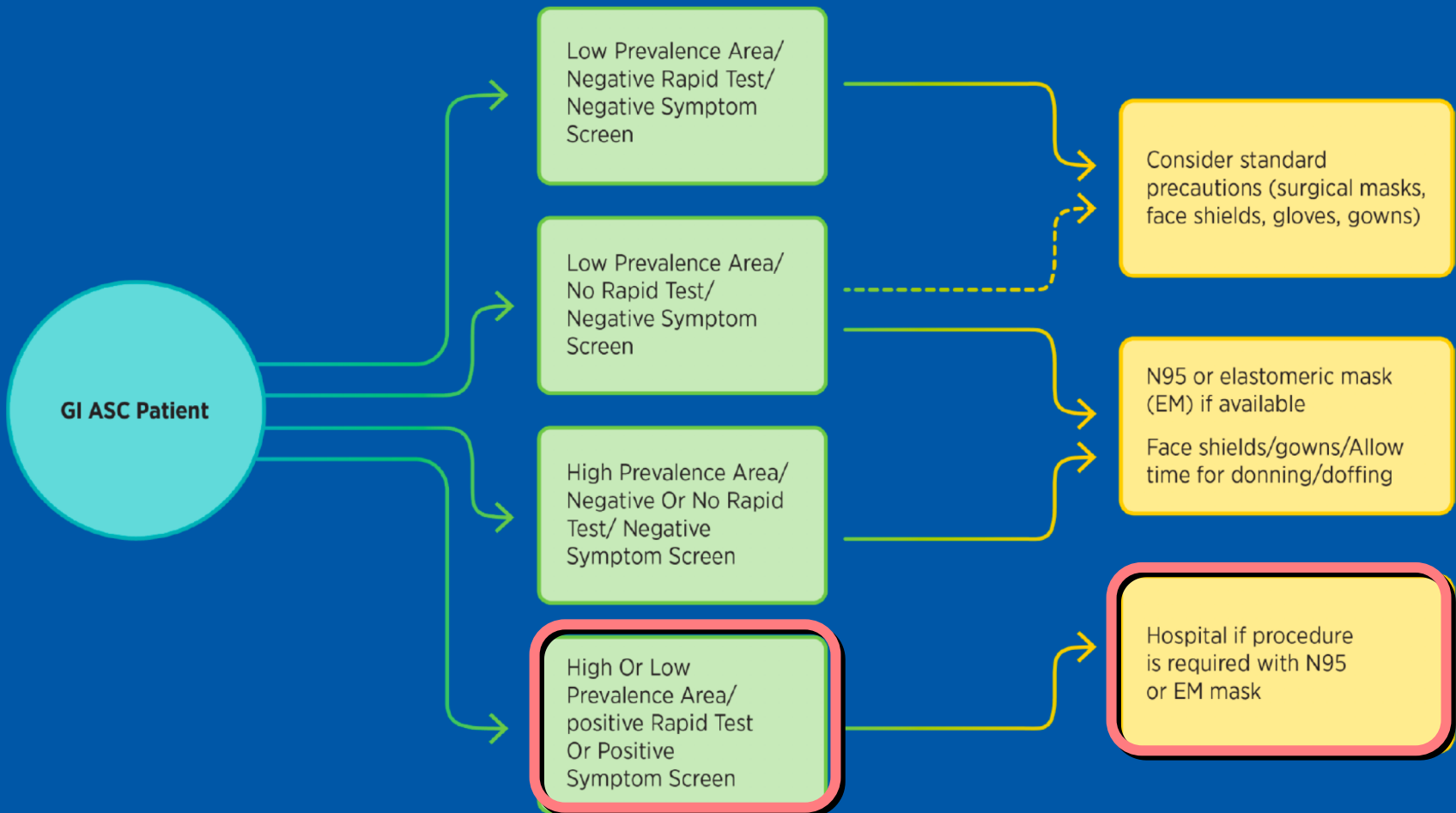
More Info: gi.org/COVID19

ACG: A roadmap to Safely Resuming Endoscopy



COVID-19: A Roadmap to Safely Resuming Endoscopy

PPE DECISION TREE



More Info: gi.org/COVID19

Besides PPE...

- Proper hand washing protocols / hygiene
- Proper sequence and techniques of donning and doffing of gowns, gloves, masks, shields etc
- Remove all extraneous potential sources of infection / transmission
- Implementation of a work flow and process to avoid cross contamination of working stations with the staff
- Limit number of personnel working in each room and changing of personnel to conserve PPE

Besides PPE...

- Ensure all patients are properly screened prior to coming to the center
- Limit patient movement in the center and avoid unnecessary contact
- Have all patients wear a surgical mask
- Physical distancing in pre- and post- areas
- Keep all family members out of the center if possible; pick up at front door policy

Summary

- Upper GI procedures are considered AGMP until proven otherwise
- Insufficient evidence to consider colonoscopy as AGMP
- Best approach in the post-peak phase is to risk stratify patients according to:
 - Prevalence of disease in your area
 - Pre-screening of patients
 - Pre-procedure testing whenever possible

1. Airborne Contaminant Removal

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency *

ACH § ¶	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8