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Colorectal cancer screening guidelines for average-risk and high-risk individuals: A systematic review

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Abstract

Aims: This review aims to summarize the different colorectal cancer guidelines for average-risk and high-risk individuals from various countries.

Methods: A comprehensive literature search regarding guidelines, consensus recommendations, or position statements about colorectal cancer screening published within the last 10 years (1st January 2012 to 27th August 2022), was performed at EBSCOhost, JSTOR, PubMed, ProQuest, SAGE, and ScienceDirect.

Results: A total of 18 guidelines were included in this review. Most guidelines recommended screening between 45 and 75 years for average-risk individuals. Recommendations regarding colorectal cancer screening in high-risk individuals were more varied and depended on the risk factor. For high-risk individuals with a positive family history of colorectal cancer or advanced colorectal polyp, screening should begin at age 40. Some frequently suggested screening modalities in order of frequency are colonoscopy, FIT, and CTC. Furthermore, several screening intervals were suggested, including colonoscopy every 10 years for average-risk and every 5–10 years for high-risk individuals, FIT annually in average-risk and every 1–2 years in high-risk individuals, and CTC every five years for all individuals.

Conclusion: All individuals with average-risk should undergo colorectal cancer screening between 45 and 75. Meanwhile, individuals with higher risks, such as those with a positive family history, should begin screening at age 40. Several recommended screening modalities were suggested, including colonoscopy every 10 years in average-risk and every 5–10 years in high-risk, FIT annually in average-risk and every 1–2 years in high-risk, and CTC every five years.

Keywords: Colorectal cancer; Colon cancer screening; Colonoscopy; Fecal immunochemical test; Guideline; Systematic review; Virtual colonoscopy.

What is new? What is important?

There have been several guidelines that discussed colorectal cancer screening in average-risk dan high-risk individuals. However, many of these have different recommendation. Our review aims to summarize and compare the different guidelines of colorectal cancer screening. To our knowledge, our article is the first to summarize the different guidelines of colorectal cancer screening in high-risk individuals, in whom screening is vital.

INTRODUCTION

Colorectal cancer is the second leading cause of death in the United States of America (USA), following lung cancer. It is also the third most common cancer in both men and women. A study predicted approximately 147,950 new cases of colorectal cancer would emerge, and 53,200 individuals would die from the disease by 2020 [1]. Between 2011 and 2015, the average yearly incidence of colorectal cancer for every 100,000 population is 45.9 and 34.6 in men and women,

 DOI: 10.2478/rjim-2023-0038

respectively [2]. Another study also predicted that there will be 3.2 million new cases of colorectal cancer by 2040 [3].

In the mid-1980s to 2000s, the incidence of colorectal cancer decreased by 3–4% annually. During 2011–2019, the incidence of colorectal cancer continues to decline by approximately 1% annually [4]. This phenomenon was made possible not only through surgeries and medications, but also through risk factor modification, early detection of cancer via colorectal cancer screening, and removal of precancerous polyps during colonoscopy [5–7]. A cohort study of 1418 patients found that patients who had polypectomy had a lower-than-expected incidence for colorectal cancer ($P<0.001$) [6]. Furthermore, another study also revealed that polypectomy was able to reduce colorectal cancer mortality by 53% (12 vs. 25.4 expected deaths) [7].

Screening modalities such as colonoscopy, sigmoidoscopy, computed tomography (CT) colonography, and stool testing during early stages are sufficient to detect advanced adenomatous polyps. Meanwhile, colonoscopy is optimal for detecting sessile serrated lesion (SSL) [6, 7]. This systematic review summarizes the different guidelines regarding colorectal cancer screening in average-risk and high-risk individuals.

MATERIAL AND METHODS

STUDY REGISTRATION AND METHODOLOGY

This review was conducted based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020.

SEARCH STRATEGY

A comprehensive literature search was performed at EBSCOhost, JSTOR, PubMed, ProQuest, SAGE, and ScienceDirect. Studies included in this review were published within the last 10 years (from 1st January 2012 to 27th August 2022). The following keywords were used in the search: (((Screening) OR ("Early Detection of Cancer"[Mesh])) AND (((((((("Colorectal Neoplasms"[Mesh]) OR (Colorectal Neoplasm)) OR (Colorectal Neoplasms)) OR (Colorectal Neoplasma)) OR (Colorectal Cancer)) OR (Colorectal Cancers)) OR (Colorectal Malignancy)) OR (Colorectal Malignancies))) AND (((((("Practice Guideline" [Publication Type]) OR (Guideline)) OR (Recommendation)) OR (Statement)) OR (Consensus)).

STUDY SELECTION

The results obtained from the literature search were subjected to a screening process based on the title and abstract performed by two independent reviewers. Subsequently, the articles were evaluated based on the inclusion and exclusion criteria.

The inclusion criteria were: (1) Guideline, consensus recommendation, or position statement regarding colorectal cancer screening in average-risk or high-risk individuals; (2) published within the last 10 years (from 1st January 2012 to 27th August 2022); (3) written in English.

The exclusion criteria were: (1) Articles that discussed an existing guideline; (2) an older version of an existing guideline; (3) a regional guideline when a national guideline is available.

DATA EXTRACTION

The data extraction was performed by two independent reviewers based on the eligibility criteria above. Any differences will be resolved through a discussion with a third reviewer. The data extracted were: publication year, country, organization, recommended age for screening, screening modality, screening interval, and recommendation level.

RESULTS

After conducting a thorough literature search and removing duplicates, 10,993 articles were identified. Following an initial screening, 26 articles were deemed eligible for further evaluation based on the full text. Subsequently, 18 articles were ultimately included. The PRISMA flow diagram for this study is shown in Figure 1.

STUDY CHARACTERISTICS

The guidelines included in this systematic review were published from 2012 to 2022. Eight are from the USA [5, 8-14], five from Europe [15–19], one from Canada [20], and four from Asia [21–24]. About 11 guidelines discussed colorectal cancer screening in average-risk individuals [5, 8, 10–15, 21–23] and 11 guidelines about screening in high-risk individuals [5, 9–11, 16–20, 22, 24]. A summary of this systematic review is presented in Table S1.

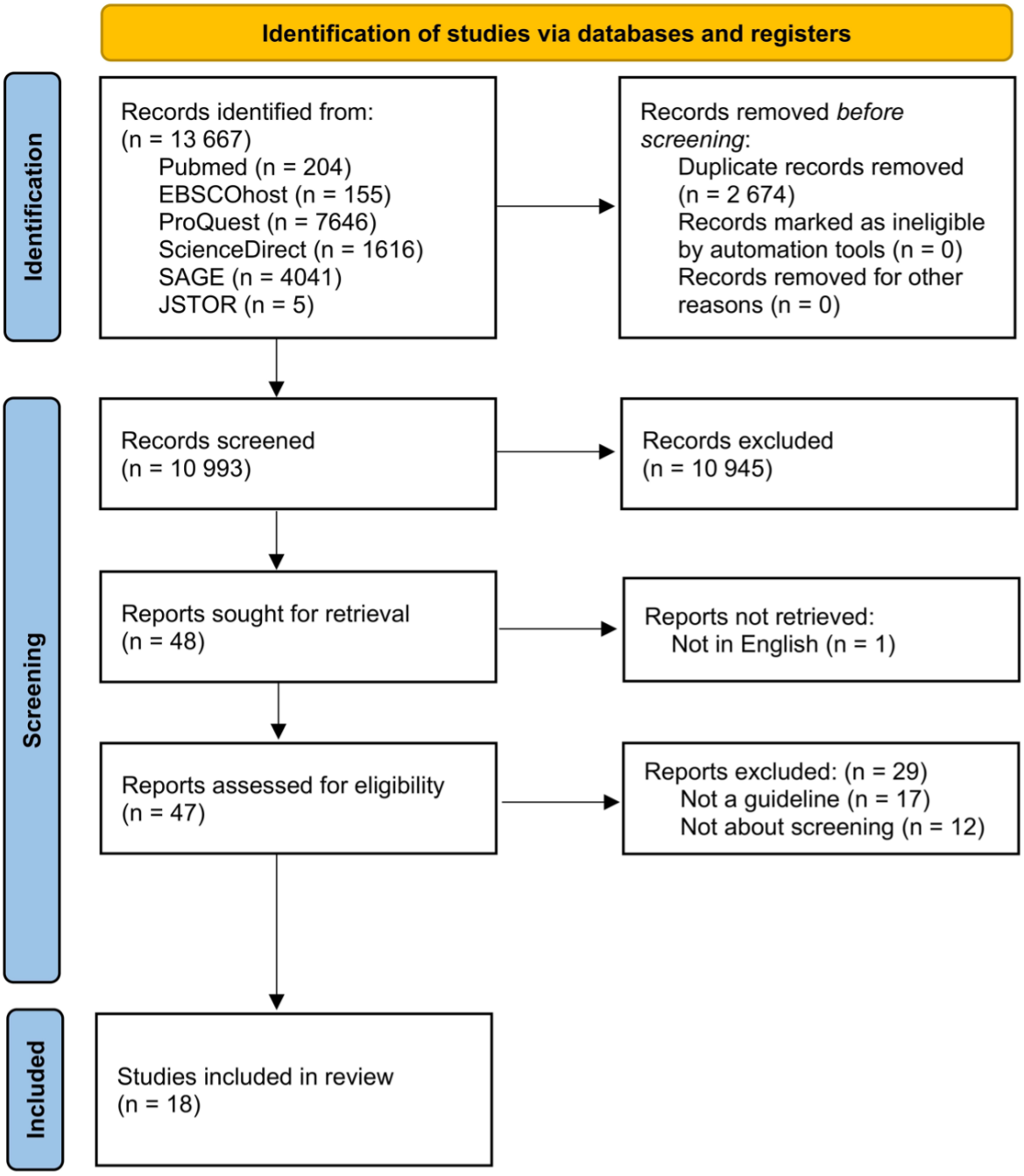


Figure 1. PRISMA flow diagram.

Table S1

Colorectal cancer screening in average-risk and high-risk population

Country/ Continent	Organization	Year	Population	Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
Korea	KMSTF	2012	Average-risk	≥ 50 years	Strong recommendation, low-quality evidence	FOBT	Strong recommendation, moderate-quality evidence	-	-	-
						FIT	Strong recommendation, low-quality evidence	-	-	
						CTC	Strong recommendation, low-quality evidence	-	-	
						Colonoscopy	Strong recommendation, low-quality evidence	5 years	Weak recommendation, very low-quality evidence	
Saudi Arabia	SSCRS, SGA, SOS	2015	Average-risk	45-69 years	Strong recommendation, low-quality evidence	Colonoscopy	Strong recommendation, low-quality evidence	10 years	Strong recommendation, low-quality evidence	-
						FS	Strong recommendation, moderate-quality evidence	3 years	Strong recommendation, moderate-quality evidence	
						FS + FIT	Strong recommendation, moderate-quality evidence	FS every 5 years + FIT annually	Strong recommendation, moderate-quality evidence	
United States of America	ACS	2018	Average-risk	45-49 years	Qualified recommendation	FIT	-	1 year	-	The decision to continue screening at 76-85 years depends on the patient's preferences, life expectancy, health status, and previous screening history.
				50-75 years	Strong recommendation	gFOBT	-	1 year	-	
				76-85 years	Qualified recommendation	mtsDNA	-	3 years	-	

Table S1 (continued)

Country/ Continent	Organization	Year	Population	Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
						Colonoscopy	-	10 years	-	
						CTC	-	5 years	-	
						FS	-	5 years	-	
United States of America	ACP	2019	Average-risk	50-75 years	-	FIT	-	2 years	-	-
						gFOBT	-	2 years	-	
						Colonoscopy	-	10 years	-	
						FS + FIT	-	FS every 10 years + FIT every 2 years	-	
Europe	ESMO	2020	Average-risk	50-74 years	Grade C, evidence level V	Colonoscopy	Grade B, evidence level II	10 years	Grade C, evidence level III	-
						FS + FOBT	FS: Grade B, evidence level II FOBT: Grade B, evidence level III	FS every 5 years + FOBT every 2 years	FS: Grade B, evidence level II FOBT: Grade B, evidence level III	
						FIT	Evidence level III	1-3 years	Grade B, evidence level I	
United States of America	USPTF	2021	Average-risk	45-49 years	Grade B	HSgFOBT	-	1 year	-	Screening at 76-85 years is only selectively offered to patients.
				50-75 years	Grade A	FIT	-	1 year	-	
				76-85 years	Grade C	mtsDNA + FIT	-	1-3 years	-	
						CTC	-	5 years	-	
						FS	-	5 years	-	
						FS + FIT	-	FS every 10 years + FIT annually	-	
						Colonoscopy	-	10 years	-	

Table S1 (continued)

Country/ Continent	Organization	Year	Population		Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
United States of America	USMSTF	2022	Average-risk		45-75 years	Strong recommendation, low-quality evidence	Colonoscopy	Strong recommendation, moderate-quality evidence	10 years	Strong recommendation, moderate-quality evidence	Screening at 76-85 years is performed based on several considerations, such as age and comorbidities.
					76-85 years	Strong recommendation, low-quality evidence	FIT	Strong recommendation, moderate-quality evidence	1 year	Strong recommendation, moderate-quality evidence	
							FS	Strong recommendation, high-quality evidence	5-10 years	Strong recommendation, high-quality evidence	
							CTC	Strong recommendation, high-quality evidence	5 years	Strong recommendation, high-quality evidence	
							FIT-fecal DNA	Strong recommendation, high-quality evidence	3 years	Strong recommendation, high-quality evidence	
							CC	Weak recommendation, low-quality evidence	5 years	Weak recommendation, low-quality evidence	
China	CSG	2014	Average-risk		50-74 years	-	Questionnaire	-	3 years	-	-
							FOBT	-	-	-	
			High-risk	Identified through a questionnaire	-	-	Colonoscopy	-	-	-	-
							Sigmoidoscopy	-	-	-	
				Familial colorectal tumors LS/family history of LS	Start at 20-25 years or 10 years before earliest onset in family	-	Colonoscopy	-	1-2 years until age 34, then annually	-	-

Table S1 (continued)

Country/ Continent	Organization	Year	Population		Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
				APC gene-associated polyposis (FAP, Gardner syndrome, Turcot syndrome)	Start at 10-12 years	-	Colonoscopy	-	1-2 years	-	-
							Sigmoidoscopy	-	1-2 years	-	
				PJS	Start at 18 years	-	Colonoscopy	-	2-3 years	-	-
				JPS	Start at < 15 years	-	Colonoscopy	-	2-3 years	-	-
			Other familial CRCs	FDR with CRC onset at 50-60 years	Start at 40 years	-	Colonoscopy	-	3 years	-	-
				FDR with CRC onset < 60 years or ≥ 2 relatives with CRC	Start at 40 years or 10 years before earliest onset in family	-	Colonoscopy	-	3-5 years	-	-
				FDR with CRC onset > 60 years or ≥ 2 SDRs with CRC	Start at 50 years	-	Colonoscopy	-	5 years	-	
			IBD	Low-risk	-	-	Colonoscopy	-	5 years	-	Low-risk: stable colonic lesions or only found in the left colon.
				Moderate-risk	-	-	Colonoscopy	-	3 years	-	Moderate-risk: endoscopically confirmed colonic lesions that have undergone mild, active inflammatory changes, formation of polyp post-inflammation, or patients with FDR with CRC onset > 50 years.

Table S1 (continued)

Country/ Continent	Organization	Year	Population	Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
			High-risk	-	-	Colonoscopy	-	1 year	-	High-risk: endoscopically confirmed colonic lesions with moderate to severe inflammation, history of PSC, colon stenosis, or dysplasia of any grade within the last five years, has FDR with CRC onset < 50 years.
United States of America	ACR	2018	Average-risk	≥ 50 years	-	CTC	Usually appropriate	5 years	-	-
						MR Colonography	May be appropriate	5 years		
						DCBE	May be appropriate	5 years		
			Moderate-risk	-	-	CTC	Usually appropriate	5 years	-	-
						MR Colonography	May be appropriate	5 years		
						DCBE	May be appropriate	5 years		
			All population (after an incomplete colonoscopy)	-	-	CTC	Usually appropriate	-	-	-
						MR Colonography	May be appropriate	-	-	
United States of America	ACG	2021	Average-risk	45-49 years	Conditional recommendation, very low-quality evidence	Colonoscopy	Strong recommendation, low-quality evidence	10 years	Strong recommendation, low-quality evidence	Screening at > 75 years should be done conditionally.
				50-75 years	Strong recommendation, moderate-quality evidence	FIT	Strong recommendation, low-quality evidence	1 year	Strong recommendation, low-quality evidence	
				> 75 years	Conditional recommendation, low-quality evidence	FS	Conditional recommendation, very low-quality evidence	5-10 years	Conditional recommendation, very low-quality evidence	

Table S1 (continued)

Country/ Continent	Organization	Year	Population	Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
						mtsDNA	Conditional recommendation, very low-quality evidence	3 years	Conditional recommendation, very low-quality evidence	
						CTC	Conditional recommendation, very low-quality evidence	5 years	Conditional recommendation, very low-quality evidence	
						CC	Conditional recommendation, very low-quality evidence	5 years	Conditional recommendation, very low-quality evidence	
			High-risk	Start at 40 years or 10 years before the earliest onset in family	Conditional recommendation, very low-quality evidence	-	-	-	-	High-risk: 1 FDR with CRC or advanced polyp at ≥ 60 years.
United States of America	NCCN	2022	Average-risk	45-75 years	2A	Colonoscopy	2A	10 years	2A	Screening at 76-85 years is performed individually.
				76-85 years	2A	gFOBT	2A	1 year	2A	
						FIT	2A	1 year	2A	
						mtsDNA	2A	3 years	2A	
						FS	2A	5-10 years	2A	
						CTC	2A	5 years	2A	
			High-risk	History of adenomatous polyp, SSP, TSA, hyperplastic polyp sizing >1 cm	-	-	Colonoscopy	2A	Low-risk adenoma: 7-10 years. Low-risk SSP: 5 years. High-risk, i.e., advanced/ multiple polyps: 3 years.	2A	Low-risk adenoma: ≤ 2 polyp, < 1 cm. Low-risk SSP: No dysplasia, ≤ 2 polyps, < 1 cm. High-risk: TSA, high grade dysplasia or SSP-d,

Table S1 (continued)

Country/ Continent	Organization	Year	Population		Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
									≥ 10 adenomatous polyps and/or SSP in one colonoscopy: 1 year.		villous or tubulovillous histology, 3-9 adenomatous polyp and/or SSP.
			History of UC or CD		Start at 8 years after onset	2A	Colonoscopy or chromoendoscopy	2A	Low-risk: 2-3 years. High-risk: 1 year.	2A	Low-risk: No active inflammation on endoscopy /histology. High-risk: Primary sclerosing cholangitis, active inflammation, family history of CRC with onset < 50 years.
			CF	History of organ transplantation	Start age ≥ 30 years or < 2 years of transplantation	2A	Colonoscopy	2A	5 years if the result is normal, 3 years if adenomatous polyp is present	2A	-
				No history of organ transplantation	Start ≥ 40 years	2A					
			Positive family history	≥ 1 FDR with CRC	Start at 40 years or 10 years before the earliest onset of CRC in family	2A	Colonoscopy	2A	5 years	2A	-
				SDR or TDR with CRC	Start at 45 years	2A	Colonoscopy	2A	10 years	2A	-
				FDR with advanced adenoma or advanced SSP	Start at 40 years or at onset of advanced adenoma/SSP in family	2A	Colonoscopy	2A	5-10 years	2A	Advanced adenoma: High grade dysplasia, ≥ 1 cm, villous or tubulovillous histology, TSA.

Table S1 (continued)

Country/ Continent	Organization	Year	Population		Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
											Advanced SSP: ≥ 1 cm, has dysplasia.
Austria	AGO	2017	High-risk	LS	Start at 20/25 years or 10 years before the earliest onset of CRC in family	-	Colonoscopy	-	1-2 years	-	-
United States of America	CFF	2018	High-risk	CF	Start at ≥ 40 years	-	Colonoscopy	-	5 years	-	-
Canada	CAG	2018	High-risk	1 FDR with CRC	Start at ≥ 40-50 years or 10 years before onset in the family	Conditional recommendation, very low-quality evidence	Colonoscopy	Conditional recommendation, very low-quality evidence	5-10 years	Conditional recommendation, very low-quality evidence	-
							FIT	Conditional recommendation, moderate-quality evidence	1-2 years	Conditional recommendation, very low-quality evidence	
				≥ 2 FDRs with CRC	Start at ≥ 40 years or 10 years before onset in the family	Conditional recommendation, very low-quality evidence	Colonoscopy	Strong recommendation, very low-quality evidence	5 years	Conditional recommendation, very low-quality evidence	-
				≥ 1 FDR with advanced adenoma	Start at ≥ 40-50 years or 10 years before onset in family	Conditional recommendation, very low-quality evidence	Colonoscopy	Conditional recommendation, very low-quality evidence	5-10 years	Conditional recommendation, very low-quality evidence	-
							FIT	Conditional recommendation, very low-quality evidence	1-2 years	Conditional recommendation, very low-quality evidence	
Europe	ESDO	2018	High-risk	LS	Start at 20-25 years	-	Colonoscopy	-	1-2 years	-	-
				FAP/AFAP	Start at 10 years	-	Colonoscopy	-	1 year	-	-

Table S1 (continued)

Country/ Continent	Organization	Year	Population			Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
					MAP	Start at ≤ 15 years	-	Colonoscopy	-	1 year	-	-
					PJS	Start at 8 years	-	Endoscopy	-	2-3 years until age 50, then every 1-2 years	-	If the baseline screening is normal, screening may be temporarily stopped and continued at age 18.
					JPS	Start at 12-15 years	-	Colonoscopy	-	2-3 years	-	-
					Serrated polyposis	-		Colonoscopy	-	1-3 years	-	-
					LFS	Start at 25 years		Colonoscopy	-	2-5 years	-	-
United Kingdom	BSG, ACPGBI, UKCGG	2020	High-risk	Positive family history of CRC	Moderate-risk	≥ 55 years	Strong recommendation, moderate GRADE evidence	Colonoscopy	Strong recommendation, moderate GRADE evidence	One time only	Strong recommendation, moderate GRADE evidence	Moderate-risk: 1 FDR with CRC onset < 50 years, or 2 FDRs with CRC onset at any age.
					High-risk	40-75 years	Weak recommendation, moderate GRADE evidence	Colonoscopy	Weak recommendation, moderate GRADE evidence	5 years	Weak recommendation, moderate GRADE evidence	High-risk: 3 FDRs with CRC across > 1 generation.
				LS	*MLH1, MSH2*	25-75 years	Strong recommendation, moderate GRADE evidence	Colonoscopy	Strong recommendation, moderate GRADE evidence	2 years	Strong recommendation, moderate GRADE evidence	-
					MSH6, PMS2	35-75 years	Strong recommendation, moderate GRADE evidence	Colonoscopy	Strong recommendation, moderate GRADE evidence	2 years	Strong recommendation, moderate GRADE evidence	-
					SPS	Start from onset until 75 years	Strong recommendation, moderate GRADE evidence	Colonoscopy	Strong recommendation, moderate GRADE evidence	1-2 years	Strong recommendation, moderate GRADE evidence	If all lesions > 5 mm have been removed from the colon, the screening interval is 1 year. Afterwards, if there is no polyp ≥ 10 mm on the next examination, the interval becomes 2 years.

Table S1 (continued)

Country/ Continent	Organization	Year	Population			Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
				FDR with SPS		Start at 40 years or 10 years before onset in the family until 75 years	Strong recommendation, moderate GRADE evidence	Colonoscopy	Strong recommendation, moderate GRADE evidence	5 years	Strong recommendation, moderate GRADE evidence	-
				MRCAs		Start from onset until 75 years	Weak recommendation, very-low GRADE evidence	Colonoscopy	Weak recommendation, very-low GRADE evidence	1-2 years	Weak recommendation, very-low GRADE evidence	MRCAs: ≥ 10 adenomas without *APC* or *MUTYH* mutation.
				FAP		Start at 12-14 years	Strong recommen-dation, low GRADE evidence	Colonoscopy	Strong recommen-dation, low GRADE evidence	1-3 years	Weak recommen-dation, low GRADE evidence	-
				FDR with FAP		Start at 12-14 years until reaches age to enroll in national screening	Weak recommendation, very-low GRADE evidence	Colonoscopy	Weak recommendation, very-low GRADE evidence	5 years	Weak recommendation, very-low GRADE evidence	-
				MAP		Start at 18-20 years	Strong recommen-dation, moderate GRADE evidence	Colonoscopy	Strong recommen-dation, moderate GRADE evidence	1 year	Strong recommen-dation, moderate GRADE evidence	-
				PJS		Baseline screening at 8 years	Weak recommendation, low GRADE evidence	Colonoscopy	Weak recommendation, low GRADE evidence	3 years	Weak recommendation, low GRADE evidence	If the baseline screen-ing is normal, screening may be stopped temporarily and continued at age 18.
				JPS		Start at 15 years	Weak recommen-dation, low GRADE evidence	Colonoscopy	Weak recommen-dation, low GRADE evidence	1-3 years	Weak recommen-dation, low GRADE evidence	-
Europe	EHTG, ESCP	2021	High-risk	LS	*MLH1, MSH2*	Start at 25 years	Moderate recommendation	Colonoscopy	Strong recommendation	2-3 years	Strong recommendation	-
					MSH6, PMS2	Start at 35 years	Moderate recommendation	Colonoscopy	*MSH6*: Strong recommen-dation. *PMS2*: Weak recommendation.	*MSH6:* 2-3 years *PMS2*: 5 years	*MSH6*: Strong recommen-dation. *PMS2*: Weak recommendation.	-

Table S1 (continued)

Country/ Continent	Organization	Year	Population		Recommended Age for Screening	Recommendation Level	Screening Modality	Recommendation Level	Screening Interval	Recommendation Level	Notes
				History of CRC and colectomy	-	-	Recto-sigmoidoscopy	Strong recommendation	2 years	Strong recommendation	-
Japan	JSCCR	2021	High-risk	FAP	Start at > 10 years	-	Colonoscopy	-	1-2 years	-	-
				AFAP	Start at 18-20 years	-	Colonoscopy	-	2-3 years	-	-
				LS/Family history of LS	Start at 20-25 years	-	Colonoscopy	Strong recommendation, evidence level B	1-2 years	-	-

ACG: American College of Gastroenterology; ACP: American College of Physicians; ACPGBI: Association of Coloproctology of Great Britain and Ireland; ACR: American College of Radiology; ACS: American Cancer Society; AFAP: Attenuated familial adenomatous polyposis; AGO: Arbeitsgemeinschaft für gynäkologische onkologie; BSG: British Society of Gastroenterology; CAG: Canadian Association of Gastroenterology; CC: Colon capsule; CD: Crohn's disease; CF: Cystic fibrosis; CFF: Cystic fibrosis foundation; CRC: Colorectal cancer; CSG: Chinese Society of Gastroenterology; CTC: Computed tomography colonography; DCBE: Double-contrast barium enema; EHTG: European Hereditary Tumour Group; ESCP: European Society of Coloproctology; ESDO: European Society of Digestive Oncology; ESMO: European Society for Medical Oncology, FAP: Familial adenomatous polyposis; FDR: First-degree relative; FIT: Fecal immunochemical test; FOBT: Fecal occult blood test; FS: Flexible sigmoidoscopy; gFOBT: Guaiac fecal occult blood test; HSgFOBT: High-sensitivity guaiac fecal occult blood test; IBD: Inflammatory bowel disease; JPS: Juvenile polyposis syndrome; JSCCR: Japanese Society for the Cancer of Colon and Rectum; KMSTF: Korean Multi-society Task Force; LFS: Li-Fraumeni syndrome; LS: Lynch syndrome; MAP: MUTYH-associated polyposis; MR: Magnetic resonance; MRCA: Multiple colorectal adenoma; mtsDNA: Multitarget stool DNA; NCCN: National Comprehensive Cancer Network; PJS: Peutz-Jeghers Syndrome; PSC: Primary sclerosing cholangitis; SDR: Second-degree relative; SGA: Saudi Gastroenterology Association; SOS: Saudi Oncology Society; SPS: Serrated polyposis syndrome; SSCRS: Saudi Society of Colon and Rectal Surgery; SSP: Sessile serrated polyp; TSA: Traditional serrated adenoma; UC: Ulcerative colitis; UKCGG: United Kingdom Cancer Genetics Group; USMSTF: United States Multisociety Task Force; USPTF: United States Preventive Task Force.

RECOMMENDED AGE FOR COLORECTAL CANCER SCREENING

Most guidelines recommend initiating colorectal cancer screening in average-risk individuals at 45 years [5, 8, 11, 12, 14, 21]. In addition, most guidelines also suggested stopping screening at age 75 [5, 8, 11, 12, 14]. However, several guidelines had differing opinions. For example, Korean Multi-Society Task Force (KMSTF), American College of Physicians (ACP), European Society for Medical Oncology (ESMO), Chinese Society of Gastroenterology (CSG), and American College of Radiology (ACR) suggested starting screening at age 50 [10, 13, 15, 22, 23].

Guidelines from American Cancer Society (ACS), United States Preventive Task Force (USPTF), United States Multi-Society Task Force (USMSTF), American College of Gastroenterology (ACG), and National Comprehensive Cancer Network (NCCN) stated that screening could still be continued above 75 years. However, this decision should be selectively conducted based on several considerations, such as the patient's life expectancy, comorbidities, preferences, and previous screening history [5, 8, 11, 12, 14]. The recommendation for when to stop screening varies from one guideline to another. Furthermore, ACS, USPTF, USMSTF, and NCCN recommended stopping screening above 85 years [8, 11, 12, 14]. Guidelines from Saudi Society of Colon and Rectal Surgery (SSCRS) – Saudi Gastroenterology Association (SGA) – Saudi Oncology Society (SOS) recommended screening only up to 69 years, while CSG up to 74 years [21, 22]. ACG, ACR, and KMSTF did not have a statement regarding when to stop screening [5, 10, 23].

High-risk individuals should initiate screening at a younger age with a range of 8–55 years [5, 9, 11, 16–20, 22, 24]. The most common recommendation in individuals with a positive family history of colorectal cancer is to start screening at 40 or 10 years before the earliest onset in the family [5, 11, 16, 20, 22].

The guideline released by NCCN recommended initiating screening at age 40 in individuals with a first-degree relative (FDR) diagnosed with colorectal cancer. In the case of second-degree relative (SDR) or third-degree relative (TDR), screening can be initiated at a later age, namely at 45 [11]. Canadian Association of Gastroenterology (CAG) had a slightly different recommendation. CAG suggested screening at 40–50 years or 10 years before onset in the family for those with one FDR. Meanwhile, screening should start at 40 years when there are two or more FDRs with colorectal cancer [20].

The guideline released by British Society of Gastroenterology (BSG) – Association of Coloproctology of Great Britain and Ireland (ACPGBI) – United Kingdom Cancer Genetics Group (UKCGG) also had differences. It stated that screening should start at age 55 for individuals with one FDR diagnosed < 50 years or has two FDRs, and at age 40 for those with three FDRs across at least two generations [16]. CSG had a similar recommendation to BSG-ACPGBI-UKCGG, namely to start screening at age 40 for individuals with an FDR diagnosed at age 50–60. It also suggested screening at age 40 or 10 years before the earliest onset in the family in individuals with an FDR with onset < 60 years, and those with at least two relatives with onset at any age. Screening should start at age 50 for individuals with an FDR with onset > 60 years or at least two SDRs [22].

Other high-risk groups include individuals with a positive personal or family history of advanced colorectal polyp, such as advanced adenoma and sessile serrated polyp (SSP). Patients with a positive family history for advanced colorectal polyp should initiate screening at 40 or 10 years before onset in the family [5, 11, 20]. ACG suggested screening at 40 or 10 years before the onset of advanced polyp in individuals with an FDR with an onset ≥ 60 years [5]. Similarly, CAG suggested screening at age 40–50 or 10 years earlier in individuals with an FDR with *advanced adenoma* [20]. NCCN had a slightly different recommendation when compared to ACG and CAG. Individuals with an FDR diagnosed with advanced adenoma or advanced SSP should initiate screening at the age of 40 or at the onset in the family [11]. Patients with a personal history of multiple colorectal adenoma (MRCA) can start screening from the onset up to 75 years [16]. Meanwhile, NCCN did not state when screening should be performed in those with a personal history of adenomatous polyp, traditional serrated adenoma (TSA), and hyperplastic polyp sized > 1 cm [11]. European Society of Digestive Oncology (ESDO) did not state when screening is best initiated in individuals with serrated polyps [19].

Table 1

Summary of recommendations for colorectal cancer screening in average-risk population

	Recommendation	**References**
Recommended age for screening	45–75 years	[5, 8, 11, 12, 14, 21]
Screening modalities and interval	Colonoscopy every10 years	[5, 8, 11–15, 21]
	FIT every 1 year	[5, 8, 11–15]
	CTC every 5 years	[5, 8, 10–12, 14]
	Sigmoidoscopy every 5 years	[5, 8, 11, 12, 14]
	FOBT every 1 year	[8, 11, 14]
	FS every 10 years + FIT every 1 year	[8, 13, 21]
	mtsDNA every 3 years	[5, 11, 14]
	CC every 5 years	[5, 12]
	mtsDNA and FIT every 1-3 years	[8, 12]
	FS every 5 years + FOBT every 3 years	[15]
	MR colonography every 5 years	[10]
	DCBE every 5 years	[10]
	Questionnaire every 3 years	[22]

CC: Colon capsule; CTC: Computed tomography colonography; DCBE: Double-contrast barium enema; FIT: Fecal immunochemical test; FOBT: Fecal occult blood test; FS: Flexible sigmoidoscopy; MR: Magnetic resonance; mtsDNA: Multitarget stool DNA.

Individuals with hereditary colorectal cancer syndrome are also at a higher risk. One such syndrome that is often mentioned in the guidelines is Lynch syndrome (LS). All patients with LS should start screening at age 25 [16–19, 22, 24]. CSG, ESDO and JSCCR recommended screening at 20-25 years [19, 22, 24]. Arbeitsgemeinschaft für gynäkologische onkologie (AGO) recommended starting screening at age 20 or 25, or 10 years before the onset of colorectal cancer in the family [18]. Several guidelines made a recommendation based on the mutation type in LS. BSG-ACPGBI-UKCGG and EHTG-ESCP suggested LS patients with *MLH1* or *MSH2* mutation initiate screening at age 25 years, while individuals with *MSH6* or *PMS2* at age 35 [16, 17]. BSG-ACPGBI-UKCGG recommends stopping screening for LS patients at age 75 [16].

Patients with familial adenomatous polyposis (FAP) are recommended to initiate screening at age 10–12, while those with attenuated FAP (AFAP) at age 10 or 18–20 [16, 19, 22, 24]. In addition, individuals with a positive family history of FAP should start screening at age 12–14. BSG-ACPBGI-UKCGG recommends individuals with FAP or an FDR with FAP to commence screening at age 12-14 [16]. Meanwhile, CSG recommended that all patients with APC gene-associated polyposis should be subjected to screening at 10–12 [22]. ESDO recommends initiating screening at age 10 for individuals with FAP or AFAP [19]. JSCCR also suggested screening at age > 10 in patients with FAP [24].

Individuals with MUTYH-associated polyposis (MAP) can start screening at ≤ 15 or 18–20 years. ESDO recommended screening at age ≤ 15, while BSG-ACPGBI-UKCGG at 18–20 years [16, 19].

BSG and ESDO suggested performing a baseline screening at eight years in Peutz-Jeghers syndrome (PJS) patients. Screening may be discontinued and resumed at age 18 when the results are normal. For an abnormal result, screening is continued [16, 19]. Different from BSG and ESDO, the guideline from CSG suggested directly starting screening at age 18 without performing a prior baseline screening at age 8 [22].

Patients with juvenile polyposis syndrome (JPS) should initiate screening at age 15 [16, 19]. The guideline from BSG-ACPGBI-UKCGG recommended initiating screening at age 15 [16]. ESDO also recommended screening at 12–15 years [19]. Meanwhile, CSG recommended screening at the age < 15 [22].

Individuals with serrated polyposis syndrome (SPS) should receive screening from the onset up to 75 years. Patients with an FDR with SPS should undergo screening at age 40 or 10 years before onset [16]. ESDO did not state when screening is initiated in individuals with SPS [19].

Cystic fibrosis (CF) patients should initiate screening at 30–40 years [9, 11]. NCCN recommended that all patients who have undergone organ transplantation should start screening at age 30 or within two years after transplantation. Individuals who have not received an organ transplant should commence screening at 40 years

[11]. Cystic Fibrosis Foundation (CFF) also recommended screening at age 40 years in CF patients [9].

Patients with inflammatory bowel disease (IBD), such as ulcerative colitis (UC) or Crohn's disease (CD), should start screening eight years from the onset of symptoms [11]. Meanwhile, CSG did not state when to initiate screening in IBD [22]. ESDO suggested that all patients with Li-Fraumeni syndrome (LFS) should be subjected to screening at age 25 [19]. ACR did not state when screening is performed in individuals with higher risks [10].

RECOMMENDED SCREENING MODALITIES AND INTERVAL

Various screening modalities were recommended by the guidelines, including fecal immunochemical test (FIT), fecal occult blood test (FOBT), multitarget stool DNA (mtsDNA), colonoscopy, sigmoidoscopy, rectosigmoidoscopy, computed tomography colonoscopy (CTC), colon capsule (CC), magnetic resonance (MR) colonography, double-contrast barium enema (DCBE), and questionnaire [5, 8–24]. The most common screening modality in average-risk and high-risk populations is colonoscopy. Screening interval for colonoscopy ranges from 5–15 years in average-risk and 1–10 years in high-risk populations [5, 8, 9, 11-21, 23, 24].

Out of nine guidelines, eight recommended colonoscopy every 10 years in average-risk individuals [5, 8, 11–15, 21]. Only KMSTF suggested colonoscopy every five years in average-risk individuals [23]. Furthermore, patients with a positive family history should receive a colonoscopy every 5–10 years [5, 11, 16, 20, 22]. ACG suggested repeating colonoscopy every 10 years in patients with an FDR diagnosed with colorectal cancer or adenomatous polyp [5]. NCCN recommended colonoscopy every five years in those with at least one FDR diagnosed with colorectal cancer, and every 10 years when there is at least one SDR or TDR affected [11]. CAG also recommended colonoscopy every 5–10 years in individuals with one FDR diagnosed with colorectal cancer, and every five years when there are at least two FDRs [20]. BSG-ACPGBI-UKCGG suggested colonoscopy every five years in high-risk individuals. For patients with moderate-risk, a one-off colonoscopy is sufficient [16]. CSG suggested repeating colonoscopy every three years in individuals with an FDR with onset at 50–60 years, every 3–5 years in those with an FDR with onset < 60 years or has at least two relatives with colorectal cancer, and every five years in patients with an FDR with onset > 60 years or has at least two SDRs [22].

Colonoscopy should be repeated every 1–3 years in individuals with an advanced colorectal polyp [11, 19]. NCCN recommended colonoscopy every 7–10 years for patients with low-risk adenoma, every five years for low-risk SSP, every three years for advanced polyp or multiple high-risk polyps, and annually when there was at least 10 adenomatous polyps and/or SSP during one colonoscopy [11]. ESDO recommended that all patients with serrated polyp should repeat colonoscopy every 1–3 years [19]. Individuals with an FDR diagnosed with advanced adenoma or advanced SSP should undergo colonoscopy every 5–10 years [11, 20].

LS patients are suggested to receive a colonoscopy every two years [16–19, 22, 24]. CSG, AGO, ESDO, and JSCCR recommended repeating colonoscopy every 1–2 years [18, 19, 22, 24]. BSG-ACPGBI-UKCGG recommended colonoscopy every two years [16]. Similarly, EHTG-ESCP suggested colonoscopy every 2–3 years. However, in the case of *PMS2* mutation, a colonoscopy may be repeated every five years [17].

FAP and AFAP patients should repeat colonoscopy every 1–2 years and every 1–3 years, respectively [16, 19, 22, 24]. CSG and JSCCR have a similar recommendation, where colonoscopy should be performed every 1–2 years in FAP patients [22, 24]. BSG-ACPGBI-UKCGG had a slightly different recommendation of conducting the process every 1–3 years [16]. ESDO suggested that FAP and AFAP patients should repeat colonoscopy annually [19]. Furthermore, JSCCR suggested AFAP patients should be subjected to colonoscopy every 2–3 years [24]. BSG-ACPGBI-UKCGG and ESDO recommend annual colonoscopy for MAP patients [16, 19].

Guidelines from BSG-ACPGBI-UKCGG and CSG suggested colonoscopy every three years in PJS patients [16, 22]. JPS patients should receive colonoscopy every 2–3 years [16, 19, 22]. CSG and ESDO have a similar recommendation, which is repeating colonoscopy every 2–3 years [19, 22]. BSG-ACPGBI-UKCGG had a slightly different recommendation, which is colonoscopy every 1–3 years [16]. SPS patients are suggested to undergo colonoscopy every 1–2 years. Guideline from BSG-ACPGBI-UKCGG suggested screening every 1–2 years, while ESDO every 1–3 years [16, 19].

Table 2

Summary of recommendations for colorectal cancer screening in high-risk population

High-risk Group	Recommended age for screening	References	Screening modalities and interval	References
Family history of CRC	Start at 40 years or 10 years before the earliest CRC onset in the family	[5, 11, 16, 20, 22]	Colonoscopy every 5-10 years	[5, 11, 16, 20, 22]
			FIT every 1-2 years	[20]
			CTC every 5 years	[10]
			MR colonography every 5 years	[10]
			DCBE every 5 years	[10]
Advanced colorectal polyp	-	-	Colonoscopy every 1-3 years	[11, 19]
Family history of advanced colorectal polyp	Start at 40 years or 10 years before onset in the family	[5, 11, 20]	Colonoscopy every 5-10 years	[11, 20]
			FIT every 1-2 years	[20]
			CTC every 5 years	[10]
			MR colonography every 5 years	[10]
			DCBE every 5 years	[10]
MRCA	Start from onset until 75 years	[16]	Colonoscopy every 1-2 years	[16]
LS	25-75 years	[16-19, 22, 24]	Colonoscopy every 2 years	[16-19, 22, 24]
			Rectosigmoidoscopy every 2 years	[17]
FAP	Start at 10-12 years	[16, 19, 22, 24]	Colonoscopy every 1-2 years	[16, 19, 22, 24]
			Sigmoidoscopy every1-2 years	[22]
Family history of FAP	Start at 12-14 years	[16]	Colonoscopy every 5 years	[16]
AFAP	Start at 10 or 18-20 years	[19, 24]	Colonoscopy every1-3 years	[19, 24]
MAP	Start at ≤ 15 years or 18-20 years	[16, 19]	Colonoscopy every 1 year	[16, 19]
PJS	Baseline screening at 8 years. If the result is normal, screening continues at age 18.	[16, 19]	Colonoscopy every 3 years	[16, 22]
JPS	Start at 15 years	[16, 19]	Colonoscopy every 2-3 years	[16, 19, 22]
SPS	Start from onset until 75 years	[16]	Colonoscopy every 1-2 years	[16, 19]
Family history of SPS	Start at 40 years or 10 years before onset in the family	[16]	Colonoscopy every 5 years	[16]
CF	Start at 30-40 years	[9, 11]	Colonoscopy every 5 years	[9, 11]
IBD	Start at 8 years after onset	[11]	Colonoscopy every 1-5 years	[11, 22]
LFS	Start at 25 years	[19]	Colonoscopy every 2-5 years	[19]

AFAP: Attenuated familial adenomatous polyposis; CF: Cystic fibrosis; CRC: Colorectal cancer; CTC: Computed tomography colonography; DCBE: Double-contrast barium enema; FAP: Familial adenomatous polyposis; FIT: Fecal immunochemical test; IBD: Inflammatory bowel disease; JPS: Juvenile polyposis syndrome; LFS: Li-Fraumeni syndrome; LS: Lynch syndrome; MAP: MUTYH-associated polyposis; MR: Magnetic resonance; MRCA: Multiple colorectal adenoma; PJS: Peutz-Jeghers syndrome; SPS: Serrated polyposis syndrome.

In addition, BSG-ACPGBI-UKCGG also suggested that all MRCA patients should receive a colonoscopy every 1–2 years. Individuals with an FDR diagnosed with SPS or FAP should be subjected to colonoscopy every five years [16]. Colonoscopy in CF patients should be repeated every five years [9, 11]. The suggested screening interval for colonoscopy in IBD patients is 1–5 years [11, 22]. In LFS patients, colonoscopy should be repeated every 2–5 years [19].

Sigmoidoscopy is another frequently mentioned screening modality in colorectal cancer with an interval range of 3–10 years in average-risk and 1–2 years in high-risk individuals [5, 8, 11, 12, 14, 21, 22]. In average-risk individuals, sigmoidoscopy should be repeated every five years [5, 8, 11, 12, 14]. NCCN, ACG and USMSTF recommended sigmoidoscopy every 5–10 years [5, 11, 12]. USPTF and ACS also had a similar recommendation, which is every five years [8, 14]. Meanwhile, SSCRS-SGA-SOS was the only one with a different recommendation, repeating the procedure every three years [21]. Sigmoidoscopy every 1–2 years can also be used as an alternative to colonoscopy in patients with APC gene-associated polyposis, such as FAP [22].

Only the guideline from EHTG-ESCP recommended rectosigmoidoscopy every two years in LS patients with a history of colorectal cancer [17]. In addition, ESDO did not mention the specific type of endoscopy suggested as a screening modality in PJS patients and only stated

to conduct an endoscopy every 2–3 years until age 50, and then annually thereafter [19].

Another frequently suggested screening modality is FIT. FIT can be repeated annually in average-risk and every 1–2 years in high-risk individuals [5, 8, 11–15, 20]. ACS, USPTF, USMSTF, ACG, and NCCN recommended annual FIT in average-risk individuals [5, 8, 11, 12, 14]. ESMO recommended FIT every 1–2 years, while ACP every two years [13, 15]. Only CAG suggested FIT in individuals with an FDR diagnosed with colorectal cancer or advanced adenoma. In this group, CAG recommended FIT every 1–2 years [20]. KMSTF did not state the interval for FIT in average-risk individuals [23].

FOBT was also suggested by six guidelines, with three out of six recommending annual FOBT in average-risk population [8, 11, 13, 14, 22, 23]. Guidelines from ACS, USPTF, and NCCN all suggested annual FOBT [8, 11, 14]. Only ACP suggested FOBT every two years [13]. KMSTF and CSG did not mention the recommended interval for FOBT [22, 23]. Another modality used in average-risk individuals is mtsDNA every three years [11, 13, 14]. Furthermore, both USMSTF and ACG suggested repeating CC every five years [5, 12].

Radiographic modalities such as CTC is often suggested in colorectal cancer screening. CTC can be repeated every five years in both average-risk and high-risk individuals. Guidelines from ACS, USPTF, USMSTF, ACR, ACG, and NCCN suggested an interval of five years for CTC in average-risk population [5, 8, 10–12, 14]. Only KMSTF did not mention the interval for CTC in average-risk individuals [23]. Other suggested radiographic modalities are MR colonography and DCBE every five years in both average-risk and high-risk individuals [10]. CSG also suggested using a questionnaire every three years as a screening modality in individuals with average-risk. High-risk individuals found using the questionnaire will then be referred for a colonoscopy [22].

Several guidelines suggested combining different screening modalities for colorectal cancer screening. An example of this is sigmoidoscopy every 10 years in combination with annual FIT in average-risk individuals [8, 13, 21]. ACP and USPTF recommended sigmoidoscopy every 10 years and FIT every 1–2 years [8, 13]. Meanwhile, SSCRS-SGA-SOS suggested sigmoidoscopy every five years and FIT annually [21]. Another combined modality that can be used in average-risk population is FIT combined with mtsDNA every 1–3 years [8, 12]. ESMO also suggested sigmoidoscopy every five years in combination with FOBT every three years [19].

DISCUSSION

Bénard *et al.* have previously performed a systematic review comparing several colorectal cancer screening guidelines. However, the systematic review only compared screening in average-risk populations. A comparison of the different colorectal cancer screening guidelines in high-risk populations was not conducted [25]. A meta-analysis by Mehraban *et al.* reported that individuals with a positive family history are 1.87 times more at risk for colorectal cancer [26]. Another meta-analysis concluded that the risks are 1.37–1.92 and 2.40–2.81 times higher in individuals with one and at least two FDRs, respectively [27]. Similarly, patients with advanced adenoma, hereditary colorectal syndrome, IBD, CF, and LFS also have a higher risk for colorectal cancer [28–32]. This showed that colorectal cancer screening plays a vital role in such populations. Therefore, a systematic review was performed to discuss colorectal cancer screening in average-risk and high-risk populations.

Most of the guidelines that were included originate from North America and Europe [5, 8–20]. This is because only guidelines published within the last 10 years were used. This showed that many countries have not updated their guidelines, specifically in Asia.

An interesting finding in this systematic review is a shift in the recommended age to start colorectal cancer screening from 50 to 45 years in patients with average-risk. The change in the recommendation to initiate screening at a younger age might be due to the trend of increasing colorectal cancer incidence at < 50 years [33–37]. This increasing trend of early-onset colorectal cancer could be linked to an increased diet of red or processed meat, alcohol, obesity, smoking, and antibiotic exposure [38]. Starting colorectal cancer screening at an earlier age may help facilitate the detection of malignancies at a lower stage, and thus, improve therapeutic outcomes. However, one of the concerns for performing screening before the age of 50 is its low cost-effectiveness, especially for colonoscopy. Not to mention, the procedure itself might also cause harm to the patients [39].

High-risk individuals with a positive family history of colorectal cancer or advanced colorectal polyp should start screening at a younger age of 40 [5, 11, 16, 20]. Patients with hereditary colorectal syndrome are also recommended to initiate screening at a younger age. For example, LS patients are suggested to receive screening at ages 25–75, FAP patients starting age 10–12, MAP patients starting ≤ 15 or 18–20 years, PJS patients undergo a baseline screening at age eight, JPS patients starting age 15, and SPS patients ever since onset up to 75 years [16–19, 22, 24]. Other high-risk groups, such as CF, IBD, and LFS, also have a similar recommendation. Patients with CF are recommended to undergo screening starting at the age of 30–40 [9, 11]. Patients with IBD have chronic inflammation that might lead to dysplasia and cancer progression [40]. Thus, individuals with IBD, such as UC and CD, are suggested to start screening eight years after the onset of IBD [11]. Studies have also found that IBD patients might benefit more from chromoendoscopy compared to white-light endoscopy [41, 42]. Similarly, LFS patients also have a higher risk for colorectal cancer and should start screening at the age 25 [19].

This systematic review also found that the colonoscopy is the most commonly recommended modality in average-risk and high-risk populations [5, 8, 9, 11–24]. In average-risk population, a colonoscopy can be repeated every 10 years [5, 8, 11–15, 21]. The screening interval for colonoscopy in high-risk population varies from one year to 10 years, with the most commonly recommended interval being 5–10 years [9, 11, 16–20, 22, 24]. Other modalities often mentioned are FIT annually in average-risk population and 1–2 years in high-risk population, as well as CTC every five years in both average-risk and high-risk population [5, 8, 10–15, 20].

CONCLUSION

All individuals with average-risk are recommended to undergo colorectal cancer screening at ages 45–75. The recommendation regarding when to start screening in high-risk individuals varies and depends on the present risk factors. In general, all high-risk individuals should start screening at age 40. The suggested screening modalities and intervals are colonoscopy every 10 years in average-risk and 5–10 years in high-risk individuals, FIT annually in average-risk and every 1–2 years in high-risk population, as well as CTC every five years.

Introducere: *Aceast articol își propune să sintetizeze ghidurile privind cancerul colorectal pentru persoanele cu risc mediu și mare din diferite țări.*

Metode: *O căutare cuprinzătoare a literaturii cu privire la ghiduri, recomandări de consens sau declarații de poziție despre screening-ul cancerului colorectal publicate în ultimii 10 ani (1 ianuarie 2012 – 27 august 2022), a fost efectuată din bazele EBSCOhost, JSTOR, PubMed, ProQuest, SAGE și ScienceDirect.*

Rezultate: *Un total de 18 articole au fost incluse în această revizuire. Majoritatea ghidurilor au recomandat screening-ul între 45 și 75 de ani pentru persoanele cu risc mediu. Recomandările privind screening-ul cancerului colorectal la persoanele cu risc crescut au fost mai variate și au depins de factorul de risc. Pentru persoanele cu risc ridicat, cu antecedente familiale pozitive de cancer colorectal sau polip colorectal avansat, screening-ul ar trebui să înceapă la vârsta de 40 de ani. Unele modalități de screening sugerate frecvent în ordinea frecvenței sunt colonoscopia, FIT și CTC. Mai mult, au fost sugerate mai multe intervale de screening, inclusiv colonoscopie la fiecare 10 ani pentru persoanele cu risc mediu și la fiecare 5–10 ani pentru persoanele cu risc ridicat, FIT anual la persoanele cu risc mediu și la fiecare 1–2 ani la persoanele cu risc ridicat și CTC la fiecare cinci ani pentru toți indivizii.*

Concluzie: *Toate persoanele cu risc mediu ar trebui să fie supuse unui screening pentru cancerul colorectal între 45 și 75 de ani. Între timp, persoanele cu riscuri mai mari, cum ar fi cele cu antecedente familiale pozitive, ar trebui să înceapă screening-ul la vârsta de 40 de ani. Au fost sugerate mai multe modalități de screening recomandate, inclusiv colonoscopie. La fiecare 10 ani la risc mediu și la fiecare 5–10 ani la risc ridicat, FIT anual la risc mediu și la fiecare 1–2 ani la risc ridicat și CTC la fiecare cinci ani.*

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Acknowledgement: The authors would like to acknowledge School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia for all the support in this research.

Declaration of interest: The authors declare that there are no conflicts of interest.

Abbreviations

ACG: American College of Gastroenterology
ACP: American College of Physicians
ACPGBI: Association of Coloproctology of Great Britain and Ireland
ACR: American College of Radiology
ACS: American Cancer Society
AFAP: Attenuated familial adenomatous polyposis
AGO: Arbeitsgemeinschaft für gynäkologische onkologie
BSG: British Society of Gastroenterology
CAG: Canadian Association of Gastroenterology
CC: Colon capsule
CD: Crohn's disease
CF: Cystic fibrosis
CFF: Cystic fibrosis foundation
CRC: Colorectal cancer
CSG: Chinese Society of Gastroenterology
CT: Computed tomography
CTC: Computed tomography colonography
DCBE: Double-contrast barium enema
EHTG: European Hereditary Tumour Group
ESCP: European Society of Coloproctology
ESDO: European Society of Digestive Oncology
ESMO: European Society for Medical Oncology
FAP: Familial adenomatous polyposis
FDR: First-degree relative
FIT: Fecal immunochemical test
FOBT: Fecal occult blood test
FS: Flexible sigmoidoscopy
gFOBT: Guaiac fecal occult blood test
HSgFOBT: High-sensitivity guaiac fecal occult blood test
IBD: Inflammatory bowel disease
JPS: Juvenile polyposis syndrome
JSCCR: Japanese Society for the Cancer of Colon and Rectum
KMSTF: Korean Multi-society Task Force
LFS: Li-Fraumeni syndrome
LS: Lynch syndrome
MAP: MUTYH-associated polyposis
MR: Magnetic resonance
MRCA: Multiple colorectal adenoma
mtsDNA: Multitarget stool DNA
NCCN: National Comprehensive Cancer Network
PJS: Peutz-Jeghers Syndrome
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-analyses
PROSPERO: International Prospective Register of Systematic Reviews
SDR: Second-degree relative
SGA: Saudi Gastroenterology Association
SOS: Saudi Oncology Society
SPS: Serrated polyposis syndrome
SSCRS: Saudi Society of Colon and Rectal Surgery

SSL: Sessile serrated lesion
SSP: Sessile serrated polyp
TDR: Third-degree relative
TSA: Traditional serrated adenoma
UC: Ulcerative colitis
UKCGG: United Kingdom Cancer Genetics Group
USMSTF: United States Multisociety Task Force
USPTF: United States Preventive Task Force

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Received 27th October 2023