Awareness of Colorectal Cancer Screening in Primary Care Physicians

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Objective: *Colorectal cancer is one of the leading causes of cancer related death worldwide. Primary care physicians play an important role in colorectal cancer screening. However, the awareness and knowledge on the methods for colorectal cancer screening are still lacking. The authors aimed to assess Thai primary care physicians' knowledge and practice regarding colorectal cancer screening.*

Material and Method: *Between October and December 2010, questionnaires were distributed to 447 Thai physicians. The questionnaires included demographic data, self-responded knowledge, and practice. Their responses were analyzed.*

Results: *Three hundred eighty seven physicians completed the questionnaires (86.5% response rate). Of these, 44.7% were internists, 27.4% general practitioners (GPs), 11.9% surgeons, and 16.0% other specialists. Two hundred forty of physicians (62%) routinely recommended colorectal cancer screening to asymptomatic, average-risk patients. Only 43% gave the correct recommendation for the correct starting age. Colonoscopy (47.5%) and fecal occult blood test (40.0%) were preferred by the majority of physicians, whereas flexible sigmoidoscopy, double contrast barium enema, and CT colonoscopy were chosen by 5.7%, 4.4%, and 1.8% of physicians respectively. Surgeons had more knowledge of test efficacy and frequency. They also were more aware of colorectal cancer screening than internists. Patient ignorance (66.1%), unavailability of the test (64.6%), unawareness of physicians (57.9%), and financial problems (41.1%) were determined as barriers for colorectal cancer screening.*

Conclusion: *Although the majority of physicians are aware of colorectal cancer screening, the correct knowledge is lacking. Colonoscopy and FOBT are their most preferred tests. Patient ignorance, unavailability of the test, unawareness of physician, and financial problems are the main barriers for colorectal cancer screening. Improvement in academic support services and standard clinical practice guideline are needed to improve overall morbidity and mortality of colorectal cancer.*

Keywords: *Colorectal cancer screening, Primary care physicians, Awareness*

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In Thailand, colorectal cancer is the second most common cancer in men and third in women. The estimated numbers of new cancer cases from the National Cancer Institute of Thailand[1] were 31,582 in men and 33,678 in women. The estimated age-standardized incidence rates (ASR) were 11.3 per 100,000 in men and 7.9 per 100,000 in women. The highest incidence rates for both genders are found in Bangkok (ASR 16.9 per 100,000 in men and 11.8 per 100,000 in women). The number of patients with colorectal cancer in both genders has been rapidly increasing[1,2]. Early screening and surveillance can reduce colorectal cancer morbidity and mortality[3,4]. The standard screening guideline for colorectal cancer recommended by national expert groups is to start in asymptomatic average-risk adults at the age of 50[5-9].

From the US survey of Primary Care Physicians (PCPs)' Recommendations and Practices for Breast, Cervical, Colorectal, and Lung Cancer Screening in 2006 and 2007[10], 99% of US physicians routinely recommend colorectal cancer screening to their asymptomatic, average-risk patients. Ninety-five percent of physicians routinely recommended screening colonoscopy and 80% of US physicians recommended fecal occult blood testing (FOBT). In Thailand, PCPs play an important role in arranging and referring patients for colorectal cancer screening. From a previous study on Thai general surgeons[11] practice in colorectal cancer screening, 84% of them routinely offered colorectal cancer screening to asymptomatic, average-risk population. Most started screening in an average-risk patient is 50-years-old and they stopped

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screening in populations at the age above 80 years. Colonoscopy is the most preferred screening tool. However, the present study did not collect any data on other PCPs. Therefore, the authors have conducted a questionnaire survey of PCPs to assess knowledge and practice regarding colorectal cancer screening.

Material and Method

Between October and December 2010, questionnaires were distributed to 447 Thai PCPs, mainly to those who worked in the medical school. Most of PCPs were in a subspecialty training program. Systematic, stratified random sampling was designed to estimate the knowledge and practices of those four physicians' groups, general practitioners, internists, surgeons, and other specialists. The authors estimated that a sample size of 368 would give a confidence level of 95%. Descriptive and analytic statistics were used. The results were presented as percentage and mean ± standard deviation (SD) by comparing between each two groups. Statistical analysis of the results was done with Chi-square test or Fishers' exact test or Student t-test where appropriate. A p-value of < 0.05 was indicated as significant result. SPSS version 17.0 was used for statistical analysis. The present study was approved by the ethic committee of King Chulalongkorn Memorial Hospital. The questionnaire was pilot-tested on 20 PCPs (5 internists, 5 general practitioners, 5 surgeons, and 5 other specialists). Reliability testing was also performed with 20 PCPs using the test-retest method and revealed a median agreement of 70%. Most of the questions (90%) were properly understood. Reliability was faired (agreement = 50 to 60%) to good (60 to 80%) for almost all knowledge- and practice-based questions related to knowledge and practice for colorectal cancer screening. The final version of questionnaire was modified based on the results of pre-testing.

Results

Three hundred eighty seven PCPs responded to the survey. Absolute response rate was 86.5% Demographics data of PCPs are shown in Table 1. Their mean age was 27 ± 4.1 years and 54.5% of them were female. Most respondents practiced from urban areas and the average working experience was 3.6 ± 3 years.

Knowledge and practice of colorectal cancer screening in primary care physicians

Most of PCPs knows that obesity (60.7%), smoking (80.4%), and history of colorectal cancer in first-degree relatives (95.1%) are risk factors of colorectal cancer. With respect to knowing the frequency for performing screening tests, 65.9% of PCPs correctly indicated that FOBT should be done annually, 24.3% knew that flexible sigmoidoscopy (FS) is recommended at five years interval, and 25.3% were aware that colonoscopy is recommended at 10-year intervals. Few PCPs knew that double-contrast barium enema (DCBE; 12.1%) and CT colonoscopy (CTC; 18.3%) are recommended at five year intervals. Only 44.6% of PCPs knew that polypectomy is indicated if the polyp is larger than 5 mm.

Colonoscopy is the most popular tool used for colorectal cancer screening (47.5%), followed by FOBT (40.6%), FS (5.7%), DCBE (4.4%), and CTC (1.8%). Patient ignorance (66.1%), unavailability of the test (64.6%), unawareness of physicians (57.9%), and a financial problem (41.1%) were important

Table 1. Characteristics of primary care physicians and their practice settings (n = 387)

Physician characteristic	n	Percentage (%)
Specialty		
Internists	173	44.7
Surgeons	46	11.9
Other specialists	62	16.0
General practitioners	106	27.4
Gender		
Female	211	54.5
Age (years)		
20-29	286	73.9
30-39	96	24.8
≥ 40	5	1.3
Work place		
Medical school	257	66.4
Non-medical school	130	33.6
In training program		
Yes	216	55.8
Location of work		
Urban	243	62.8
Rural town	144	37.2
Work experience		
1-5 years	287	74.1
6-10 years	86	22.2
> 10 years	14	3.7

barriers for colorectal cancer screening. Knowledge and practice divided by group of PCPs is shown in Table 2. Most of them worked in medical school except GPs. Awareness of CRC screening in GPs and other specialists was quite low, less than 60% routinely recommended CRC screening and correct knowledge of suitable starting age.

Knowledge and practice of colorectal cancer screening in internists vs. surgeons

In the present study, subgroup analysis was done for comparing the difference of awareness and practice between internists and surgeons. Table 3 shows that the mean ages were not different between the two groups. Surgeons significantly recommended colorectal cancer screening in their routine practice than internists (89.1% vs. 65.3%; $p < 0.05$), but there was no difference in the recommended starting age (63.0% vs. 52.6%; $p = 0.26$). With respect to correct knowledge of test efficacy and interval, surgeons knew more than internists significantly (colonoscopy every 10 years, 50% vs. 28.3%; $p = 0.009$, FS every five years, 45.7% vs. 21.4%; $p = 0.002$, and DCBE every five years, 32.6% vs. 10.4%; $p < 0.05$). Colonoscopy was the most preferred tools in both groups.

Discussion

The present study shows that awareness of colorectal cancer screening among Thai PCPs is low as compared to other cancers such as breast and cervical cancer. Only two-thirds of PCPs routinely recommended colorectal cancer screening to their asymptomatic average-risk patients. Although the authors have clinical practice guideline[12] in colorectal cancer screening advised by the National Cancer institute of Thailand since 2009[12], the practices in those PCPs still did not follow the provided guideline.

Another important finding in the present study is that many PCPs generally provided suboptimal standard in recommending colorectal cancer screening such as recommending at the inappropriate age or recommending incorrect interval. Poor distribution of screening guideline and training program by professional organization may have been factors.

Annual FOBT, Colonoscopy every ten years, FS every five years, and DCBE every five years are recommended options for colorectal cancer screening by the clinical practice guideline from the National Cancer Institute of Thailand[12]. CRC screening should be suggested to high-risk patients and asymptomatic average-risk at the age of 50. High-risk patients include patients with a history of colorectal cancer in first-

Table 2. Knowledge and practice of colorectal cancer among primary care physicians

	Internists (n = 173)	Surgeons (n = 46)	General practitioners (n = 106)	Other specialists (n = 62)
Age (years)	30.0 ± 3.5	28.3 ± 1.5	26.9 ± 2.6	28.3 ± 2.3
Gender (% female)	90 (52%)	15 (32.6%)	48 (45.3%)	11 (17.7%)
Work in medical school	141 (81.5%)	46 (100%)	14 (13.2%)	56 (90.3%)
Routinely recommended for colorectal cancer screening	113 (65.3%)	41 (89.1%)	62 (58.5%)	24 (38.7%)
Starting age (years) ≥ 50 years	91 (52.6%)	29 (63.0%)	44 (41.5%)	16 (26.7%)
Test and frequency (years)				
FOBT every 1 year	115 (66.5%)	33 (71.7%)	69 (65.1%)	38 (61.3%)
Colonoscopy every 10 years	49 (28.3%)	23 (50.0%)	23 (21.7%)	3 (4.8%)
FS every 5 years	37 (21.4%)	21 (45.7%)	23 (21.7%)	13 (21%)
DCBE every 5 years	18 (10.4%)	15 (32.6%)	12 (11.5%)	2 (3.2%)
CTC every 5 years	11 (6.4%)	6 (13.0%)	8 (7.5%)	7 (11.3%)
Suitable test				
FOBT	74 (42.8%)	2 (4.3%)	57 (53.8%)	28 (45.2%)
Colonoscopy	83 (48.0%)	37 (80.4%)	39 (36.8%)	20 (32.3%)

FOBT = fecal occult blood test; FS = flexible sigmoidoscopy; DCBE = double-contrast barium enema; CTC = CT colonoscopy

Table 3. Knowledge and practice of colorectal cancer among internists and surgeons

	Internists (n = 173)	Surgeons (n = 46)	p-value
Age (years)	30.0 ± 3.5	28.3 ± 1.5	0.22
Gender (% female)	90 (52%)	15 (32.6%)	0.03
Work in medical school	141 (81.5%)	46 (100%)	0.003
Routinely recommended for colorectal cancer screening	113 (65.3%)	41 (89.1%)	<0.05
Starting age (years) ≥ 50 years	91 (52.6%)	29 (63.0%)	0.27
Test and frequency (year)			
FOBT every 1 year	115 (66.5%)	33 (71.7%)	0.62
Colorectaloscopy every 10 years	49 (28.3%)	23 (50.0%)	0.009
FS every 5 years	37 (21.4%)	21 (45.7%)	0.002
DCBE every 5 years	18 (10.4%)	15 (32.6%)	<0.05
CTC every 5 years	11 (6.4%)	6 (13.0%)	0.23
Suitable test			
FOBT	74 (42.8%)	2 (4.3%)	<0.05
Colonoscopy	83 (48.0%)	37 (80.4%)	<0.05

FOBT = fecal occult blood test; FS = flexible sigmoidoscopy; DCBE = double-contrast barium enema; CTC = CT colonoscopy

degree relatives, family history of familial adenomatous polyposis or hereditary non-polyposis colon cancer, and history of colonic, or inflammatory bowel disease. Average risk patients include patients without a history of colitis, polyp, colorectal cancer, and family history of cancer. The US and other national guidelines[9,12,13] also recommend CTC as a screening tool. In the present study, colonoscopy was the most popular screening tool followed by FOBT. The difference of tool selection not only depended on the PCPs' knowledge but also the availability of the screening tools. Colonoscopy can offer tissue biopsy with possible therapeutic option in the same setting. However, due to limitation of endoscopic resources and personnel, colonoscopy is not widely available in Thailand.

FOBT can be done easily and inexpensive but the test needs to be repeated every year. The usual FOBT protocol consists of collecting two samples from each of three consecutive bowel movements from home. The limitation of FOBT is that the test has low sensitivity (37.1 to 89.4%)[14]. In addition, the test may be compromised by poor patient adherence. Nevertheless, patients with positive tests are associated with an increased risk of colorectal cancer or advanced neoplasia. Therefore, colonoscopy should be offered if the test becomes positive.

Other alternative tools such as FS and CTC can be typically performed without sedation. The limitation of FS is that there may be considerable variation, both in depth of insertion of the scope and in variation of adenoma detection by FS between different examiners. Furthermore, FS does not examine the entire colorectal. DCBE is listed as one of the options in colorectal cancer screening. However, the sensitivity of DCBE is significantly lower than colonoscopy and it does not permit removal of polyps or biopsy of cancers. Asia Pacific consensus group did not recommend DCBE as the first option for colorectal screening. There is increasing evidences to suggest CTC is an accurate screening method for the detection of colorectal cancer in asymptomatic average-risk adults[15,16]. CTC is a minimally invasive imaging examination of the entire colorectal and rectum and requires full cathartic bowel preparation and restricted diet similar to colonoscopy. If patients have one or more polyps ≥ 6 mm find by CTC, colonoscopy is recommended. Moreover, no sedation is required and patients can return to work on the same day. Risks of CTC are low. The risk of perforation is extremely low (only 0.005%)[17].

In comparison of the difference of awareness and practice between internists and surgeons, the authors found that surgeons had a more significant rate for routine recommendation on colorectal cancer screening to their asymptomatic, average-risk patient than internists. Regarding the knowledge of test

efficacy and the interval to perform colorectal cancer screening, surgeons had significantly higher awareness than internists. One possible explanation of this finding is that, colonoscopy is the procedure that has been performed more by surgeons in several provincial hospitals in Thailand than internists.

Previous studies[18,19] reported similar reasons for a low rate of colorectal cancer screening. Patient ignorance, unavailability of the test, unawareness of physician, and financial problems are important barriers for colorectal cancer screening[18,19]. PCPs should be knowledgeable about all available screening methods for colorectal cancer so that patients can be informed about their possible options and make better decisions.

The present findings should be interpreted in the context of several limitations. First, all information was based on self-report. Self-reported data were not validated with other data sources such as medical records or claims. Second, the authors can report on level of physician knowledge. The authors cannot predict how this knowledge actually influences in their practice without measuring their details of compliance.

In conclusion, the present study demonstrates that the knowledge of colorectal cancer screening remains low in Thai primary care physicians. Colonoscopy and FOBT are their most preferred tests. Patient ignorance, unavailability of the test, unawareness of physician, and financial problems are main barriers for colorectal cancer screening in Thailand. Continuing education of Thai primary care physicians and raising public awareness in colorectal cancer screening might improve its effectiveness and may further reduce the morbidity and mortality of patients with colorectal cancer.

Potential conflicts of interest

None.

References

1. Khuhaprema T, Srivatanakul P, Sriplung H, Wiangnon S, Sumitsawan Y, Attasara P. Cancer in Thailand, 2001-2003. Bangkok: Nation Cancer Institute; 2010.
2. Khuhaprema T, Srivatanakul P, Sriplung H, Wiangnon S, Sumitsawan Y, Attasara P. Cancer in Thailand, 1998-2000. Bangkok: Medical Publisher; 2007.
3. Mandel JS, Church TR, Bond JH, Ederer F, Geisser MS, Mongin SJ, et al. The effect of fecal occult-blood screening on the incidence of colorectal cancer. N Engl J Med 2000; 343: 1603-7.
4. Selby JV, Friedman GD, Quesenberry CP Jr, Weiss NS. A case-control study of screening sigmoidoscopy and mortality from colorectal cancer. N Engl J Med 1992; 326: 653-7.
5. Rhodes JM. Colorectal cancer screening in the UK: Joint Position Statement by the British Society of Gastroenterology, The Royal College of Physicians, and The Association of Coloproctology of Great Britain and Ireland. Gut 2000; 46: 746-8.
6. Canadian Task Force on Preventive Health Care. Colorectal cancer screening. Recommendation statement from the Canadian Task Force on Preventive Health Care. CMAJ 2001; 165: 206-8.
7. U.S. Preventive Services Task Force. Screening for colorectal cancer: recommendation and rationale. Ann Intern Med 2002; 137: 129-31.
8. Winawer S, Fletcher R, Rex D, Bond J, Burt R, Ferrucci J, et al. Colorectal cancer screening and surveillance: clinical guidelines and rationale-Update based on new evidence. Gastroenterology 2003; 124: 544-60.
9. Sung JJ, Lau JY, Young GP, Sano Y, Chiu HM, Byeon JS, et al. Asia Pacific consensus recommendations for colorectal cancer screening. Gut 2008; 57: 1166-76.
10. Klabunde CN, Lanier D, Nadel MR, McLeod C, Yuan G, Vernon SW. Colorectal cancer screening by primary care physicians: recommendations and practices, 2006-2007. Am J Prev Med 2009; 37: 8-16.
11. Lohsiriwat V, Lohsiriwat D, Thavichaigarn P. Colorectal cancer screening and surveillance: a survey among Thai general surgeons. Asian Pac J Cancer Prev 2009; 10: 467-70.
12. Chaiveerawattana A, Kornrarak A, Sukornyothin S. Guideline for screening, diagnosis and treatment colorectal cancer. Bangkok: National Cancer Institute of Thailand; 2009.
13. Levin B, Lieberman DA, McFarland B, Smith RA, Brooks D, Andrews KS, et al. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. CA Cancer J Clin 2008; 58: 130-60.
14. Levi Z, Rozen P, Hazazi R, Vilkin A, Waked A,

Maoz E, et al. A quantitative immunochemical fecal occult blood test for colorectal neoplasia. Ann Intern Med 2007; 146: 244-55.
15. Kim DH, Pickhardt PJ, Taylor AJ, Leung WK, Winter TC, Hinshaw JL, et al. CT colonography versus colonoscopy for the detection of advanced neoplasia. N Engl J Med 2007; 357: 1403-12.
16. Pickhardt PJ, Choi JR, Hwang I, Butler JA, Puckett ML, Hildebrandt HA, et al. Computed tomographic virtual colonoscopy to screen for colorectal neoplasia in asymptomatic adults. N Engl J Med 2003; 349: 2191-200.
17. Pickhardt PJ. Incidence of colonic perforation at CT colonography: review of existing data and implications for screening of asymptomatic adults. Radiology 2006; 239: 313-6.
18. Wee CC, McCarthy EP, Phillips RS. Factors associated with colon cancer screening: the role of patient factors and physician counseling. Prev Med 2005; 41: 23-9.
19. Janz NK, Wren PA, Schottenfeld D, Guire KE. Colorectal cancer screening attitudes and behavior: a population-based study. Prev Med 2003; 37: 627-34.

ความตระหนักในการตรวจคัดกรองมะเร็งลำไส้ใหญ่และทวารหนักของแพทย์เวชปฏิบัติในประเทศไทย

เกศรินทร์ ถานะภิรมย์, สมบัติ ตรีประเสริฐสุข, รังสรรค์ ฤกษ์นิมิตร

วัตถุประสงค์: *มะเร็งลำไส้ใหญ่และทวารหนักเป็นหนึ่งในมะเร็งที่เป็นสาเหตุการตายที่สำคัญ พบว่าการตรวจคัดกรองตั้งแต่ระยะแรกสามารถลดอัตราการตายได้ แพทย์เวชปฏิบัติมีบทบาทสำคัญในการแนะนำการตรวจคัดกรอง การศึกษานี้มีวัตถุประสงค์ที่จะสำรวจความรู้และแนวทางปฏิบัติของแพทย์เวชปฏิบัติ ทั้งกลุ่มแพทย์อายุรกรรม แพทย์ศัลยกรรม แพทย์เฉพาะทางด้านอื่น ๆ และแพทย์เวชปฏิบัติทั่วไปต่อการแนะนำการตรวจคัดกรองมะเร็งลำไส้ใหญ่และทวารหนัก*

วัสดุและวิธีการ: *เก็บข้อมูลโดยใช้แบบสอบถามทั้งสิ้น 447 ฉบับ ในช่วงเดือนตุลาคม พ.ศ. 2553 ถึงเดือนธันวาคม พ.ศ. 2553*

ผลการศึกษา: *จากแบบสอบถามทั้งสิ้น 447 ฉบับ แพทย์ 387 คน ได้ส่งคืนแบบสอบถามที่ตอบครบถ้วนสมบูรณ์ (ร้อยละ 86.5) คิดเป็นอายุรแพทย์ร้อยละ 44.7, แพทย์เวชปฏิบัติทั่วไปร้อยละ 27.4, ศัลยแพทย์ร้อยละ 11.9, แพทย์เฉพาะทางด้านอื่น ๆ ร้อยละ 16.0 จากการศึกษาพบว่าแพทย์ 240 คน (ร้อยละ 62) แนะนำประชากร ที่มีความเสี่ยงปกติต่อมะเร็งลำไส้ใหญ่และทวารหนักให้ตรวจคัดกรอง ในจำนวนนี้มีเพียงร้อยละ 43.0 ที่แนะนำให้เริ่มคัดกรองที่อายุที่ถูกต้องคือมากกว่า 50 ปี โดยส่วนใหญ่เลือกตรวจ colonoscopy (ร้อยละ 47.5) และ fecal-occult blood test (ร้อยละ 40.0) ขณะที่ส่วนน้อยเลือกส่ง flexible sigmoidoscopy (ร้อยละ 5.7), double-contrast barium enema (ร้อยละ 4.4), CT colonoscopy (ร้อยละ 1.8) ศัลยแพทย์มีความรู้เรื่องการเลือกส่งตรวจระยะเวลาที่เหมาะสม และมีความตระหนักในการแนะนำผู้ป่วยให้คัดกรองมะเร็งลำไส้ใหญ่และทวารหนักมากกว่าอายุรแพทย์ ผู้ป่วยไม่เห็นความสำคัญ (ร้อยละ 66.1) อุปกรณ์ไม่เพียงพอ (ร้อยละ 64.6) แพทย์ไม่ตระหนักถึง (ร้อยละ 57.9) และปัญหาด้านค่าใช้จ่ายเป็นอุปสรรคที่สำคัญ (ร้อยละ 41.1) ต่อการตรวจคัดกรองมะเร็งลำไส้ใหญ่และทวารหนัก*

สรุป: *แม้จะพบว่าแพทย์ส่วนใหญ่ตระหนักถึงความสำคัญของการตรวจคัดกรองมะเร็งลำไส้ใหญ่และทวารหนัก แต่พบว่ายังมีความรู้ที่ไม่ถูกต้อง การตรวจที่แพทย์ส่วนใหญ่เลือกใช้คือ colonoscopy และ fecal-occult blood test อุปสรรคที่สำคัญต่อการตรวจคัดกรองคือ ผู้ป่วยไม่ให้ความสำคัญ อุปกรณ์ไม่เพียงพอ แพทย์ไม่ตระหนักถึง และปัญหาค่าใช้จ่าย การพัฒนาและส่งเสริมด้านการให้ความรู้และแนวทางปฏิบัติมีความจำเป็นอันจะนำไปสู่การลดอัตราตายของมะเร็งลำไส้ใหญ่และทวารหนัก*

Appendix. Survey of primary care physicians' colorectal cancer screening recommendations and practices

Colorectal Cancer Screening Questionnaire

The Survey of Primary Care Physicians' Colorectal Cancer Screening Recommendations and Practices is a survey of general practitioners, general internists, obstetrician/gynecologists, surgeons and other specialists.

In this survey, we request that you answer questions about your knowledge and practices relate to colorectal cancer screening. Because the survey is designed to accommodate a wide range of primary care physicians and practice settings, you may find that some questions do not apply to you.

If you have any questions about the questionnaire, please call Dr. Kessarin Thanapirom at 083-068-5211.

Part 1. General Information

1. Sex ☐ Male ☐ Female
2. Age ..... years
3. What is your main primary care practice?
☐ General practitioner ☐ Internist ☐ Surgeon ☐ Other specialists (specify) .....
4. What is your workplace? (specify) .....
5. Province .....
6. How long do you work as physicians? (specify) ..... years
7. Are you now training in medical school?
☐ Yes ☐ No

Part 2. Colorectal cancer screening knowledge and practice

8. Which type of cancer that your main primary care practice implemented guidelines for screening? (check all that apply)
☐ Breast cancer ☐ Lung cancer ☐ Gastric cancer ☐ Prostate cancer ☐ Hepatocellular and biliary cancer
☐ Cervical cancer ☐ Colorectal cancer (please answer to question 9-16)
9. Please complete the questions below based on your actually recommendations for colorectal cancer screening. If you do not routinely recommend a particular test, check "no" and go to the next question.
9.1 What is your recommended starting age.
☐ ≥ 45 years ☐ ≥ 50 years ☐ ≥ 55 years ☐ ≥ 60 years
9.2 Which screening test would you recommend for the asymptomatic average-risk patients? (check all that apply)
9.2.1 Stool occult blood test (guiac-based or immunochemistry test)
☐ No ☐ Yes (specify) ☐ Every year ☐ Every five years ☐ Every ten years
9.2.2 Colonoscopy
☐ No ☐ Yes (specify) ☐ Every year ☐ Every five years ☐ Every ten years
9.2.3 Flexible sigmoidoscopy
☐ No ☐ Yes (specify) ☐ Every year ☐ Every five years ☐ Every ten years
9.2.4 Double-contrast barium enema
☐ No ☐ Yes (specify) ☐ Every year ☐ Every five years ☐ Every ten years
9.2.4 CT colonography
☐ No ☐ Yes (specify) ☐ Every year ☐ Every five years ☐ Every ten years
10. In your workplace, what is the suitable test for colorectal cancer screening? (choose one choice)
☐ Stool occult blood ☐ Flexible sigmoidoscopy ☐ Double-contrast barium enema ☐ Colonoscopy ☐ CT colonography
11. Do you agree with history of colorectal cancer in first degree relative is one of the risk factor of colorectal cancer.
☐ Agree ☐ Disagree
12. Do you agree with smoking increases the risk of colorectal cancer?
☐ Agree ☐ Disagree
13. Do you agree with obesity increases the risk of colorectal cancer?
☐ Agree ☐ Disagree
14. Do you agree with early colorectal cancer screening can reduce mortality?
☐ Agree ☐ Disagree
15. Do you agree with some type of polyp are premalignant lesion and should be removed?
☐ Agree (specify, what size should be removed?) ☐ ≥ 5 millimeter ☐ ≥ 10 millimeter
☐ Disagree
16. In your opinion, what are the main barriers of colorectal cancer screening? (check all that apply)
☐ Lack of physician awareness ☐ Unavailable of test ☐ Financial problem ☐ Patient ignorance
☐ Other (specify) .....
