



**HKU
Med**

LKS Faculty of Medicine
The University of Hong Kong
香港大學李嘉誠醫學院

大腸癌篩查：何人？何時？何法？

梁偉強教授

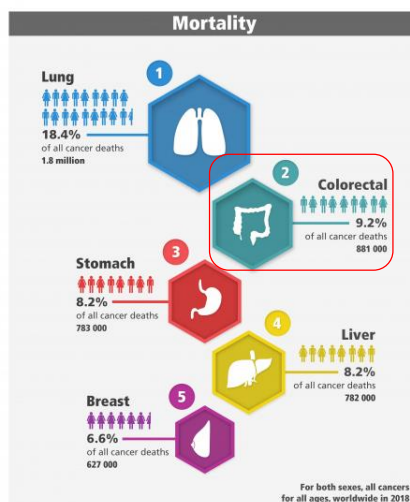
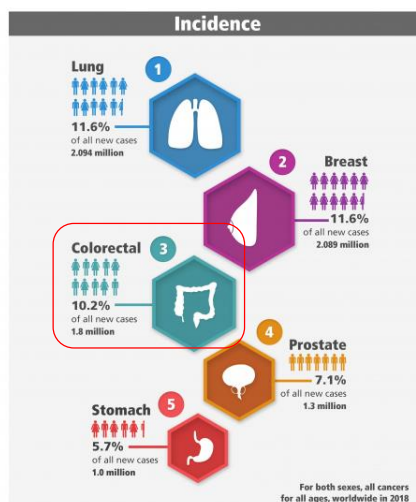
李樹芬醫學基金會基金教授（腸胃學）
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International Agency for Research on Cancer
World Health Organization

CANCER TODAY

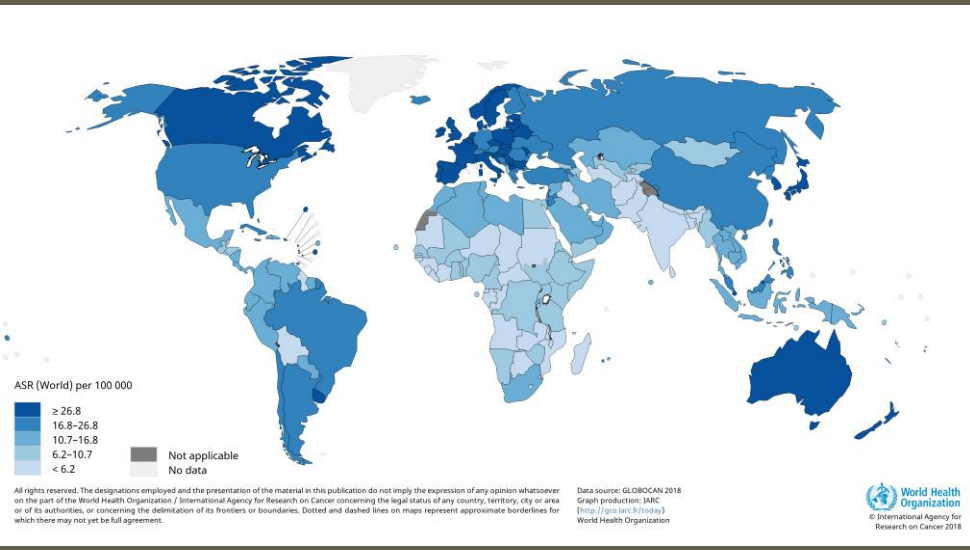
The five most commonly diagnosed cancer types

Percentages of new cancer cases and cancer deaths worldwide in 2018



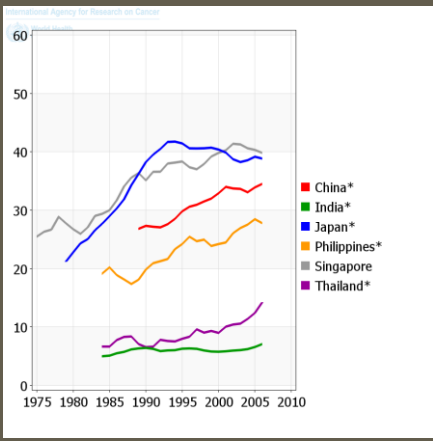
Data source: GLOBOCAN 2018
Available at Global Cancer Observatory (<http://gco.iarc.fr/>)
© International Agency for Research on Cancer 2018

ESTIMATED AGE-STANDARDIZED INCIDENCE RATES (WORLD) IN 2018,
COLORECTUM, BOTH SEXES, ALL AGES
2018年預計的年齡標準化發病比率
大腸癌，所有性別，所有年齡

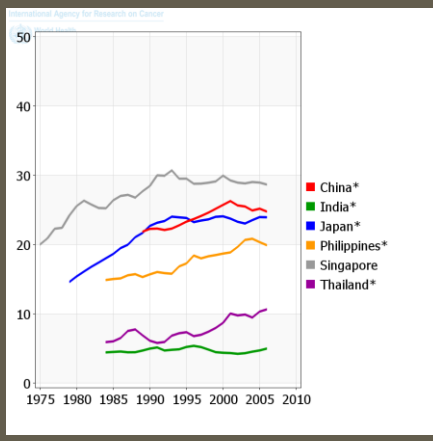


CRC INCIDENCE IN ASIA
亞洲地區的大腸癌發病率
(PER 100,000)

Men

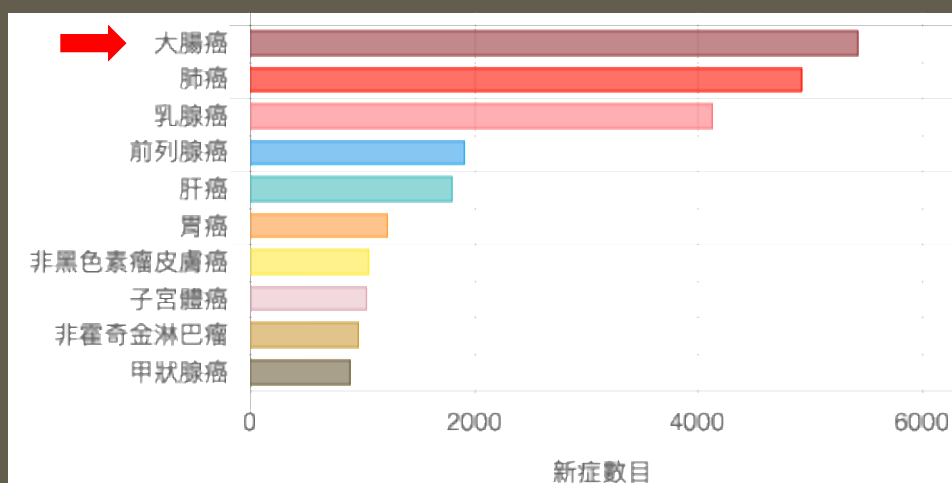


Women



Globocan 2012

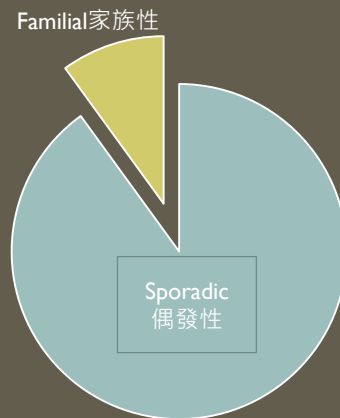
2016年香港十大常見癌症



CRC IN HONG KONG 香港的大腸癌患者

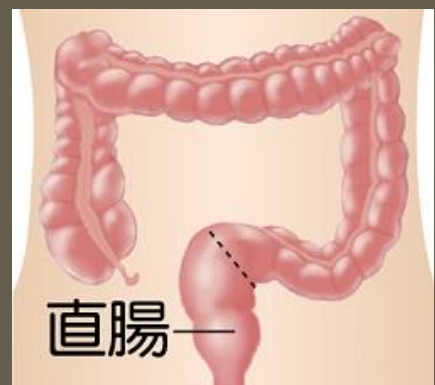
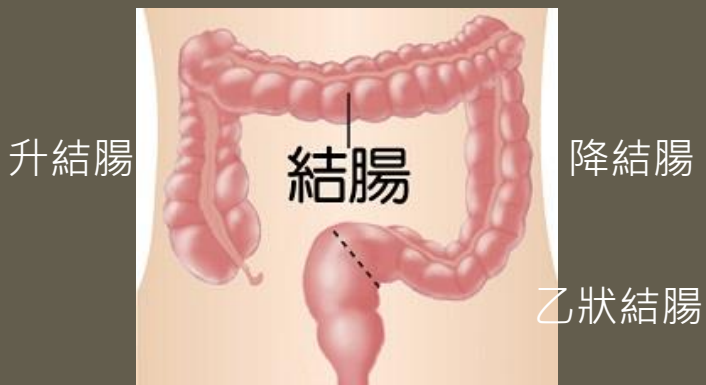
- No. 1 cancer in Men 男性癌症中第一位
- No. 2 cancer in Women 女性癌症中第二位
- Lifetime risk before age 75 75歲前的終生風險：
 - 1 in 19 (M) 十九人中有一人 (男性)
 - 1 in 32 (F) 三十二人中有一人 (女性)
- Stage at diagnosis 診斷階段：
 - Stage I: 9.5%
 - Stage IV 23.6%

COLORECTAL CANCER: SPORADIC VS FAMILIAL 大腸癌：偶發性 VS 家族性



大腸

橫結腸



COLORECTAL ADENOMA-CARCINOMA SEQUENCE

大腸腺瘤-癌序列

Microsatellite instability (MSI)
微衛星不穩定性

APC mutation
COX-2 expression
DNA methylation

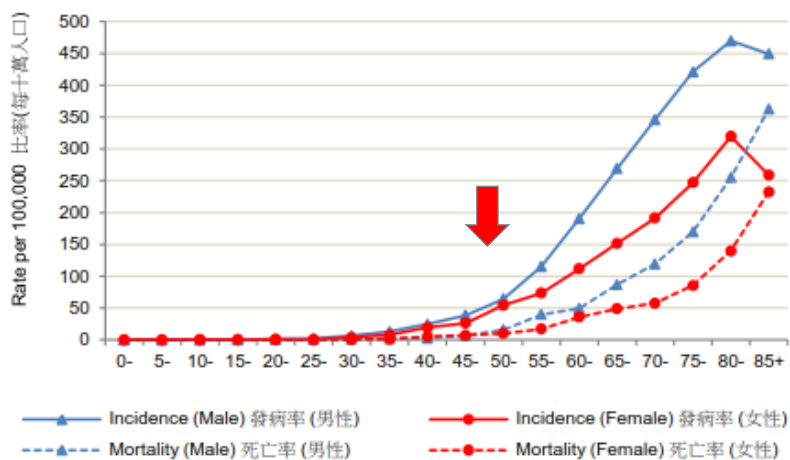
K-ras mutation
SMAD 2/4

p53 mutation
Loss of 18q

AGE OF CRC IN HONG KONG

香港大腸癌患者的年齡分佈

Age-specific Incidence and Mortality Rates for Colorectal Cancer in 2016
2016年按年齡組別分佈的大腸癌發病及死亡率



WHOM TO SCREEN? 何人需接受篩查？

- **High risk 高風險**
 - Familial colorectal cancer syndrome 家族性大腸癌徵狀 (FAP, HNPCC)
 - Family history of CRC/adenoma 有大腸癌家族病史 (2-3x risk)
- **Individual risk 個人風險**
 - History of colorectal polyps/cancer 大腸息肉或癌症的病史
 - Inflammatory bowel disease 炎症性腸病
- **Average risk 平均風險**
 - Age > 50



AMERICAN CANCER SOCIETY 2018 美國癌症協會

- People at average risk* of colorectal cancer **start regular screening at age 45.**
大腸癌平均風險人士需於**45歲**開始進行定期篩查
- People who are in good health and with a life expectancy of more than 10 years should continue regular colorectal cancer screening through the **age of 75.**
健康及預期壽命有10年或以上的人士，於**75歲時**仍需進行定期篩查
- **Ages 76 through 85**, the decision to be screened should be based on a person's preferences, life expectancy, overall health, and prior screening history.
76至85歲人士，可視乎個人意願、預期壽命、健康狀況及過往的篩查歷史去決定是否繼續進行篩查
- **People over 85** should no longer get colorectal cancer screening.
85歲以上人士無需繼續接受大腸癌篩查

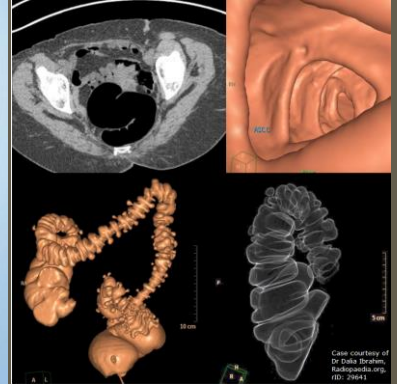
HOW TO SCREEN? 如何篩查？



FIT



Colonoscopy



CT colonography

Table 1. US Guidelines for Colorectal Cancer Screening in Average-Risk Individuals

	Fecal Occult Blood	Flexible Sigmoidoscopy	Colonoscopy	Multitarget FIT-DNA	Computed Tomographic Colonography
USPSTF¹³					
Recommendation	Yes with highly sensitive gFOBT or FIT	Yes	Yes	Yes	Yes
Interval	Annual	Every 5 years alone Every 10 years with annual FIT	Every 10 years	Every 1 year Every 3 years	Every 5 years
ACS/ACR/MSTF-CRC (2008)¹⁵					
Recommendation	Yes with highly sensitive test (FIT)	Yes	Yes	Yes	Yes
Interval	Annual	Every 5 years	Every 10 years	Uncertain	Every 5 years
ACP Guidance Statement (2012)¹⁶					
Recommendation	Yes with gFOBT or FIT	Yes	Yes	Yes	Yes
Interval	Annual	Every 5 years	Every 10 years	Uncertain	Every 5 years

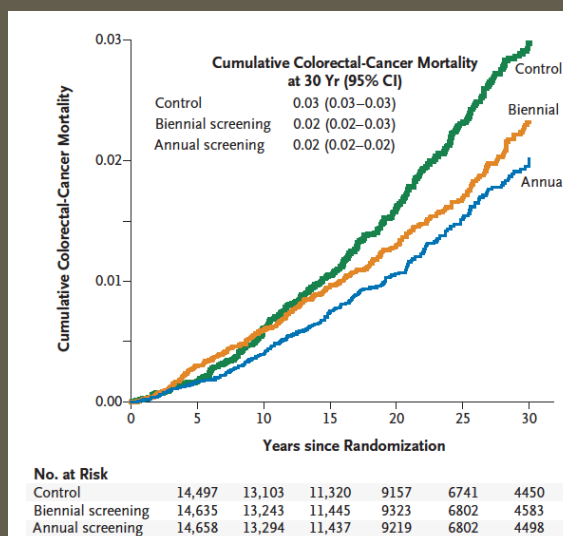
Abbreviations: A of Physicians; AC of Radiology; ACS Society; FIT, fecal test; gFOBT, guai testing; MSTF-CRC Task Force on Co USPSTF, US Prev Task Force.

FECAL OCCULT BLOOD 大便隱血測試

- Guaiac-based tests (FOBT)
愈創木脂測試
 - Peroxidase activity 過氧化物酶活性
 - 2-3 samples collected at home
- Fecal Immunochemical Test (FIT)
免疫化學測試
 - Detect human globin 檢測人體珠蛋白



FOBT AND CUMULATIVE CRC MORTALITY 大便隱血測試和大腸癌累計死亡率



Shaukat A, et al. NEJM 2013

FIT FOR CRC SCREENING: META-ANALYSIS

大腸癌篩查的免疫化學測試：統合分析

- Pooled sensitivity for CRC 匯集靈敏度: **0.79** (95% CI, 0.69 – 0.96)
- Specificity 特異性: **0.94** (0.92 – 0.95)
- Overall diagnostic accuracy 總體診斷準確率: **95%** (93 - 97%)

- Sensitivity improved with lower cutoff values
靈敏度隨著邊界值的降低而提高

- Single-sample FIT had similar sensitivity and specificity as several samples
單樣本的免疫化學測試具有與幾個樣本相似的靈敏度和特異性

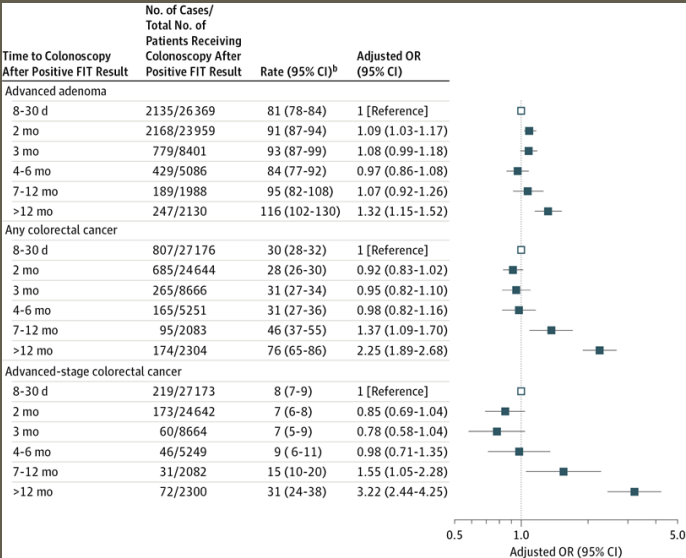
Lee JK, et al. Ann Intern Med 2014

FOBT VS FIT

	gFOBT	FIT
Evidence	RCTs	Cohort studies
One-time sensitivity for CRC	20-50%	79%
Sensitivity for polyps >=10mm	11-20%	20-50%
CRC mortality reduction	15-30%	?
CRC incidence reduction	20%: annual 17%: biennial	?

WAITING TIME BETWEEN POSITIVE FIT AND COLONOSCOPY

免疫化學測試陽性結果與進行大腸鏡檢查之間的等候時間



Corley DA, et al. JAMA 2017

COLONOSCOPY SCREENING

大腸鏡檢查篩查



COLONOSCOPY AND POLYPECTOMY

大腸鏡檢查和切除瘻肉

ENDOSCOPIC MUCOSAL RESECTION

內鏡下黏膜切除術

Submucosal injection

Removal by snare

ENDOSCOPIC SUBMUCOSAL DISSECTION 内鏡黏膜下剥離術

WL

NBI

Chromo

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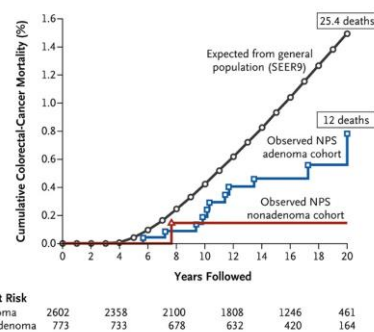
Colonoscopic Polypectomy and Long-Term Prevention of Colorectal-Cancer Deaths

Ann G. Zauber, Ph.D., Sidney J. Winawer, M.D., Michael J. O'Brien, M.D., M.P.H., Iris Lansdorp-Vogelaar, Ph.D.,
Marjolein van Ballegooijen, M.D., Ph.D., Benjamin F. Hankey, Sc.D., Weiwei Shi, M.S., John H. Bond, M.D.,
Melvin Schapiro, M.D., Joel F. Panish, M.D., Edward T. Stewart, M.D., and Jerome D. Waye, M.D.

Table 3. Deaths from Colorectal Cancer in the Adenoma Cohort, as Compared with Incidence-Based Mortality from Colorectal Cancer in the General Population.*

Follow-up Time	Adenoma Cohort			General Population			
	No.	Person-Years at Risk	Observed Deaths <i>no.</i>	Expected Deaths <i>no.</i>	SMR (95% CI)	Reduction %	P Value
All	2602	37,073	12	25.4	0.47 (0.26–0.80)	53	0.008
<10 yr	2602	22,903	4	9.1	0.44 (0.14–1.06)	56	0.09
≥10 yr	2031	14,170	8	16.3	0.49 (0.23–0.93)	51	0.04

* Data on the general population are from the Surveillance, Epidemiology, and End Results registries of nine areas (SEER9). The standardized mortality ratio (SMR) and percent reduction in mortality are for the adenoma cohort as compared with the general population.



FIT VS COLONOSCOPY: RCT DATA

免疫化學測試 VS 大腸鏡檢查：隨機對照試驗數據

Table 1. Diagnostic Yield of Colonoscopy and Fecal Immunochemical Testing (FIT), According to the Intention-to-Screen Analysis.*

Colorectal Lesion	Colonoscopy (N=26,703)		FIT (N=26,599)		Odds Ratio (95% CI)†	P Value
	Subjects	Rate	Subjects	Rate		
	no.	%	no.	%		
Cancer	30	0.1	33	0.1	0.99 (0.61–1.64)	0.99
Advanced adenoma‡	514	1.9	231	0.9	2.30 (1.97–2.69)	<0.001
Advanced neoplasia§	544	2.0	264	1.0	2.14 (1.85–2.49)	<0.001
Nonadvanced adenoma	1109	4.2	119	0.4	9.80 (8.10–11.85)	<0.001
Any neoplasia	1653	6.2	383	1.4	4.67 (4.17–5.24)	<0.001

Participation rate: 24.6 vs 34.2% (P< 0.001)

Quintero E et al. NEJM 2012

OUTCOME AFTER NEGATIVE COLONOSCOPY

大腸鏡檢查陰性結果的後續

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Five-Year Risk of Colorectal Neoplasia after Negative Screening Colonoscopy

Thomas F. Imperiale, M.D., Elizabeth A. Glowinski, R.N., Ching Lin-Cooper, B.S.,
Gregory N. Larkin, M.D., James D. Rogge, M.D., and David F. Ransohoff, M.D.

Number of Persons with Normal Findings on Baseline Screening Colonoscopy Who Would Need to Be Rescreened at 5 Years to Detect One Advanced Adenoma

大腸鏡檢查篩查結果正常，五年後再檢查以檢測會否有晚期腺瘤的人數

Table 5. Number of Persons with Normal Findings on Baseline Screening Colonoscopy Who Would Need to Be Rescreened at 5 Years to Detect One Advanced Adenoma.

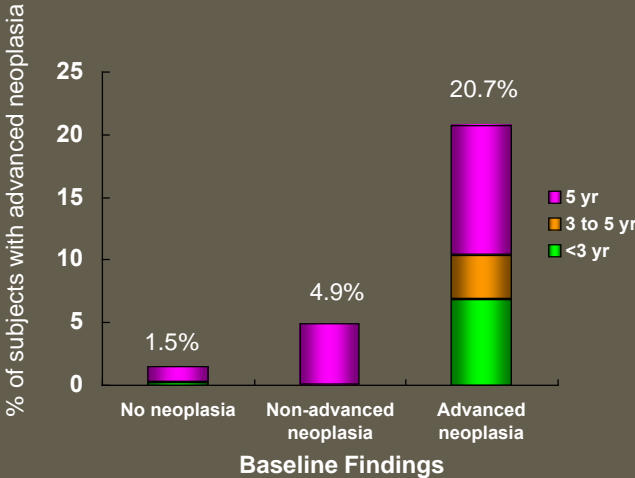
Group	No. of Subjects	Subjects with Advanced Adenoma	No. Needed to Screen (95% CI)*
		%	
Overall	1256	1.3	79 (49–137)
Men	712	1.8	55 (32–102)
Women	544	0.6	182 (63–909)
Subjects with hyperplastic polyps at baseline	199	2.0	50 (20–182)
Subjects with no polyps at baseline	1057	1.1	88 (51–169)

* The number needed to screen is the inverse of the percent with advanced adenoma.

Imperiale TF et al. N Engl J Med 2008;359:1218–1224

CUMULATIVE PERCENTAGE AND TIMING OF SUBJECTS WITH ADVANCED NEOPLASIA ACCORDING TO BASELINE FINDINGS

根據基線發現，患有晚期腫瘤的患者的累積百分比和時間



Leung WK, et al. Am J Gastroenterol 2009

HK COLORECTAL CANCER SCREENING PROGRAM 大腸癌篩查計劃



HONG KONG CRC SCREENING PROGRAM 大腸癌篩查計劃

- 先導計劃於2016年9月推行
- 於2018年8月正式全面推行
- 分三階段資助50至75歲沒有大腸癌徵狀的香港居民接受篩查
- 第一階段覆蓋61至75歲人士，成為計劃的首批參加者
- 而第三階段會進一步擴展至50至75歲人士
- FIT+ follows by colonoscopy 免疫化學測試+大腸鏡檢查

參加者應約見已參與計劃的基層醫療醫生，安排進行大便免疫化學測試

大便免疫化學測試呈陽性的人士需要進行內大腸鏡檢查

大便免疫化學測試呈陽性的人士需要每兩年進行覆檢直至年齡超越75歲

FIRST PHASE (SEP 2016 - DEC 2018) 第一階段 (2016年9月 - 2018年12月)

現時已有722名基層醫療醫生參與計劃
176名大腸鏡醫生亦已加入計劃

115,000 participants

12,117 (13%) positive FIT

6,689 adenoma

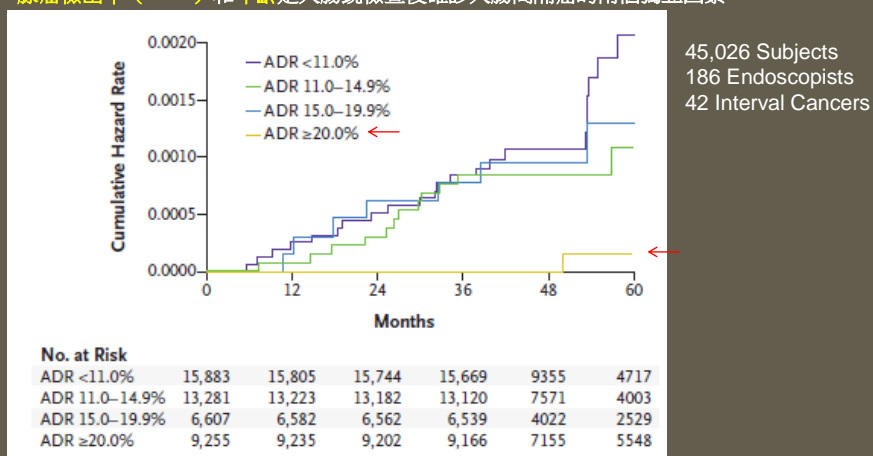
643 (6.6%) cancer
60% early cancer

IS COLONOSCOPY THE BEST? 大腸鏡檢查是最好選擇？

QUALITY INDICATORS FOR COLONOSCOPY 大腸鏡檢查的質量指標

Adenoma detection rate (ADR) and age are the two independent factors for interval colorectal cancer after screening colonoscopy

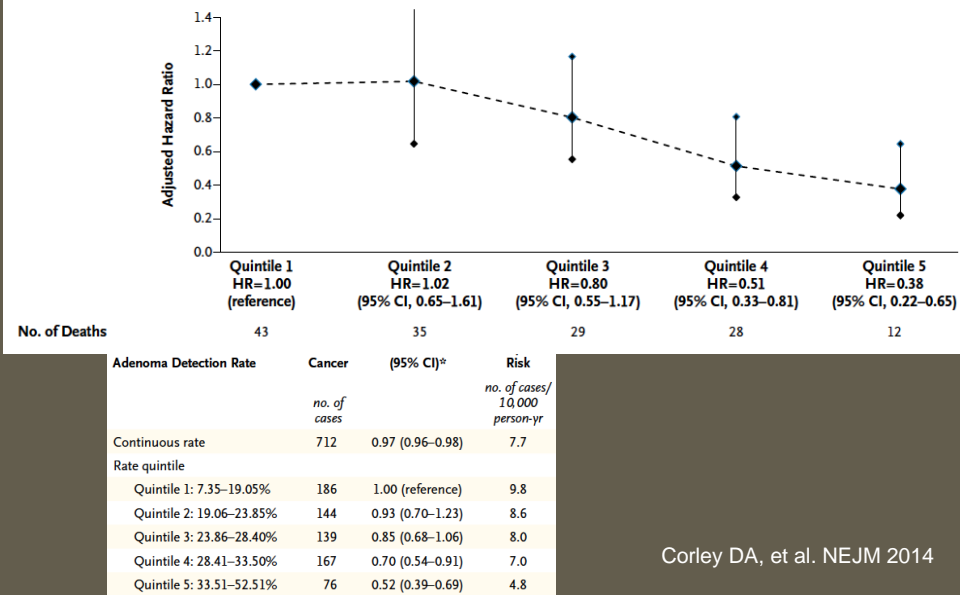
腺瘤檢出率 (ADR) 和年齡是大腸鏡檢查後確診大腸間隔癌的兩個獨立因素



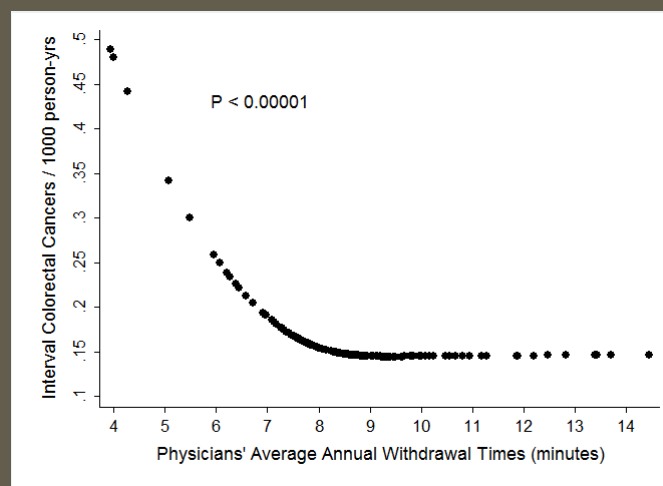
Kaminski MF, et al. NEJM 2010

INTERVAL CANCER MORTALITY AND ADENOMA DETECTION RATE 間隔癌死亡率と腺瘤検出率

C Risk of Fatal CRC



COLONOSCOPY WITHDRAWAL TIME AND INTERVAL CANCER 大腸鏡検査取出時間と間隔癌症



Shaikat A, et al. Gastroenterology 2015

TO IMPROVE ADENOMA DETECTION 提高腺瘤檢出率的策略



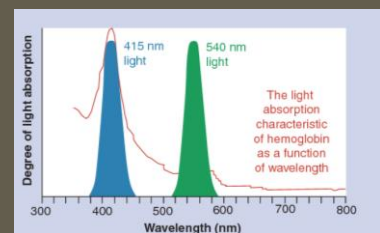
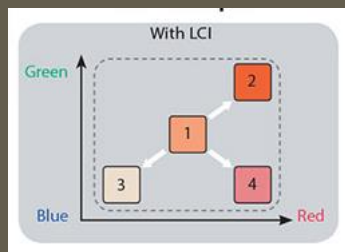
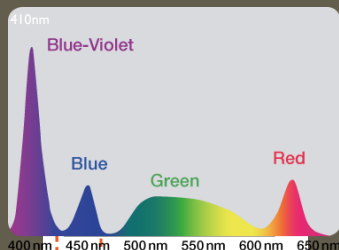
- Optical Method: Image enhanced endoscopy (IEE) 圖像增強內鏡
- Add-on devices 輔助工具
- Wide angle view colonoscopy 增加內鏡視野的結腸鏡
- Water-assisted/water exchange colonoscopy 水輔助/水交換結腸鏡
- Tandem Colonoscopy 串聯結腸鏡

OPTICAL METHODS (IEE) TO IMPROVE ADR 光學技術提高ADR

BLI

LCI

NBI



窄帶成像（NBI）

NBI International Colorectal Endoscopic (NICE) Classification

窄帶成像國際結直腸內鏡分型

MECHANICAL DEVICES TO IMPROVE ADR
輔助工具提高ADR



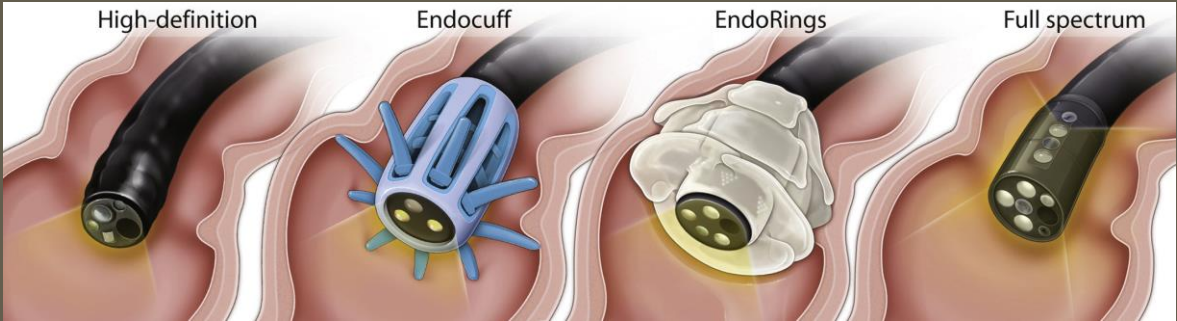
Cap



EndoRings



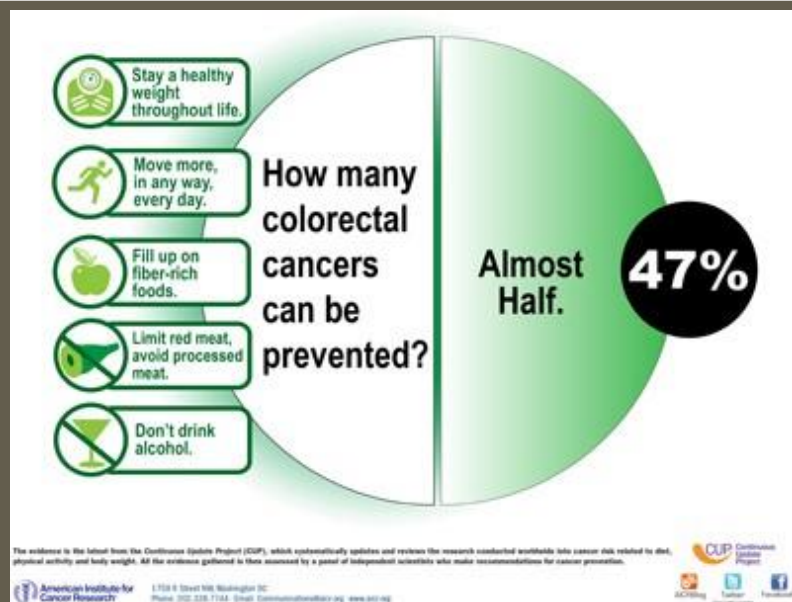
EndoCuff



WIDE ANGLE VIEW COLONOSCOPE 增加內鏡視野的結腸鏡



PREVENT COLORECTAL CANCER 預防大腸癌





大腸癌篩查計劃

56至75歲

(1943至1963年出生)



THANK YOU !
謝謝！





粉色週末淺談

乳癌防治

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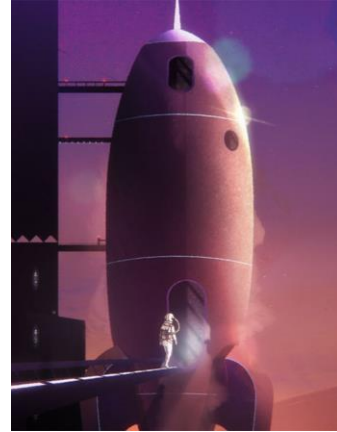
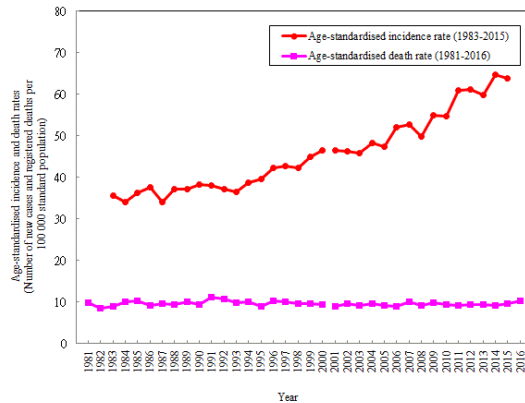


Breast cancer incidence

乳癌發病率

- Breast cancer incidence is higher in Western countries
西方國家的發病率較亞洲高
- But incidence in Asia is increasing substantially
亞洲的發病率正在上升
- Risk increases among Asian women who immigrate to the U.S.
 - ? Environmental factor
亞裔美國人的發病率較亞洲高 (? 環境因素)

Situation in Hong Kong 香港的情況



Source: Department of Health Hong Kong

Prevention of Breast Cancer 預防乳癌

Understand the risk factors

(Live a healthy lifestyle)

了解風險成因

Detect it early

(Understand the symptoms and Screening)

及早發現



1. Understanding risk factors

一覽風險成因


- Familial risk factors
 - Family history 家族史
- Lifestyle risk factors
 - Reproductive factors 生殖因素
 - Central obesity 中央肥胖
 - Westernized diet
 - Lack of physical activity
- Other **postulated** risk factors
 - Shift duties 輪班工作



Familial risk factors

- Family history of breast cancer 家族史
 - 1 first-degree family member
 - Risk doubled 風險加倍
 - > 1 first degree family member
 - 5-fold increased risk 五倍風險
- Family history \neq Hereditary breast cancer
家族史 遺傳

	U.S. Preventive Services Task Force ¹ 2016	American Cancer Society ² 2015	American College of Obstetricians and Gynecologists ³ 2011	International Agency for Research on Cancer ⁴ 2015	American College of Radiology ⁵ 2010	American College of Physicians ⁶	American Academy of Family Physicians ⁷ 2016
Women at higher than average risk	Women with a parent, sibling, or child with breast cancer are at higher risk for breast cancer and thus may benefit more than average-risk women from beginning screening in their 40s.	Women who are at high risk for breast cancer based on certain factors (such as having a parent, sibling, or child with a BRCA1 or BRCA2 gene mutation) should get an MRI and a mammogram every year.	For women who test positive for BRCA1 or BRCA2 mutations or have a lifetime risk of 20% or greater, screening should include twice-yearly clinical breast exams, annual mammography, annual breast MRI, and breast self-exams. For women who received thoracic irradiation between ages 10 and 30 years, screening should include annual mammography, annual MRI, and screening clinical breast exams every 6 to 12 months beginning 8 to 10 years after radiation treatment or at age 25 years.	Evidence suggests that screening (mammography and MRI) at an earlier age may be beneficial.	For BRCA1 or BRCA2 mutation carriers, untested family members of BRCA1 or BRCA2 mutation carriers, and women with a lifetime risk of 20% or greater (based on family history), screening should include annual mammography and annual MRI starting by age 30 years but not before age 25 years. For women with a history of chest irradiation between the ages of 10 and 30 years, annual mammography and annual MRI starting 8 years after treatment (mammography not recommended before age 25).	Not addressed.	Not addressed.

 Centers for Disease Control and Prevention
CDC 2475 Saving Lives. Protecting People™

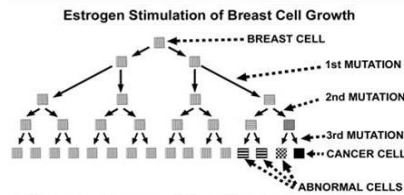
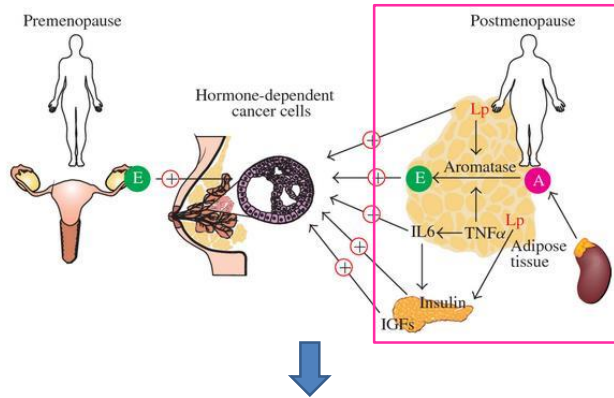
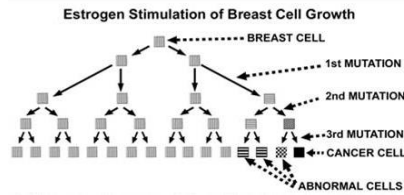
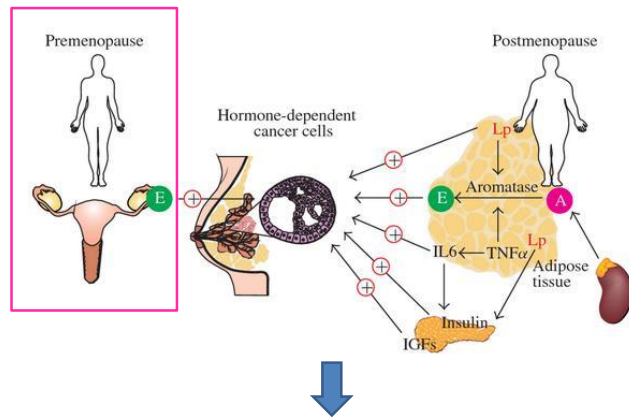
Reproductive factors

生殖因素

- Early menarche 早月經初潮
- Late menopause 遲更年期
- Nulliparity 未產
- Use of contraceptive pills 服食避孕藥
- Use of hormone replacement therapy 荷爾蒙替代療法

Increased exposure to

female hormone 女性荷爾蒙



Central obesity

中央肥胖

- High saturated fat / Low fiber diet
- Lack of exercise

Exogenous Estrogens from Food intake

病從口入

Alcohol 酒精

- > 100 studies have found association between alcohol and breast cancer
 - 2-3 drinks / day = 20% higher risk
每天葡萄酒2至3杯增加20%風險
 - Most are observational studies
 - Direct causal relationship cannot be confirmed

Hamajima N, Hirose K, Tajima K, et al. Br J Cancer. 87(11):1234-45, 2002.

Alcohol 酒精

- Postulated rationales
 - Weight gain with alcohol intake
 - Increase level of estrogens
- 肥胖 + 女性荷爾蒙



Cigarette smoking 吸煙

- Canadian Expert Panel on Tobacco Smoke and Breast Cancer Risk
 - Proven causality
已證明因果關係
- Review in 2014
 - Tobacco smoke is carcinogenic in breast cancers
導致乳腺癌

Tob Control. 2011 Jan; 20(1):e2
Lancet Oncol. 2009 Nov; 10(11):1033-4.

Angelica sinensis (Dong Quai) 當歸

Estrogenic effect
雌激素效應

Effect on breast cancer

Stimulates proliferation of MCF-7 cells,
a human breast cancer cell line



Amato P, Christophe S, Mellon PL. Estrogenic activity of herbs commonly used as remedies for menopausal symptoms. Menopause. 2002;9:145-50.

Hasma (Oviductus Ranae) 雪蛤膏

Fatty tissue around fallopian tube of a frog

Estrogen effect

雌激素效應



L. Kang. Estrogen-like effects of oviductus ranae.
Modern Food Science and Technology 31(8):25-30 and 24 · August 2015

Chinese like soy... 華人社會喜歡黃豆製品

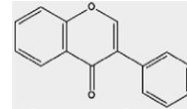


- **Phytoestrogens 植物雌激素**
 - Natural estrogen receptor modulators

Isoflavonoids Isoflavones

Biochanin A, Glycitein,
Daidzein,
Formononetin, Genistein

Soy beans, and other
legumes



Effects of Phytoestrogens 植物雌激素的影響

- ? Increase the risk of carcinogenesis
增加致癌風險
- Canadian study 加拿大研究 2001年
 - Phytoestrogen stimulate existing breast tumor growth

Mário L de Lemo. Effects of Soy Phytoestrogens Genistein and Daidzein on Breast Cancer Growth. Annals of Pharmacotherapy. Vol 35, Issue 9, 2001

- Meta-analysis in 2006 (Caucasian)
 - 18 studies published between 1978 and 2004
 - Protective effect of soy in pre-menopausal Caucasian women 降低致癌風險
- Meta-analysis in 2008 (Asian)
 - Risk of developing breast cancer drops as soy intake rises
 - As little as 10 mg of soy per day was sufficient to decrease breast cancer risk by 12% 降低致癌風險

Wu AH, Yu MC, Tseng CC, Pike MC. Epidemiology of soy exposures and breast cancer risk. Br. J. Cancer. 2008; 98:9–14.

Trock BJ, Hilakivi-Clarke L, Clarke R. Meta-analysis of soy intake and breast cancer risk. J. Natl. Cancer Inst. 2006; 98:459–471

Adding soy foods to an already healthy diet

- Bone health (osteoporosis) 骨骼健康
- Cardiovascular health 心血管健康

Possibly safe in 相對安全

- Women without serious risk factors
- Women without family history of breast cancer

Food product	Genistein (mg/100g)	Daidzein (mg/100g)	Total isoflavones (mg/100 g)
Soy Infant Formula (powder)	13.5	6.32	26.3
Edamame (raw green soybeans)	22.6	20.3	48.9
Miso	23.2	16.4	41.5
Silken tofu	8.4	9.2	18.0
Raw tofu, regular	13	9	23
Textured soy flour	89.4	67.7	172.6
Soy protein isolate	57	31	91
Soy-based sliced cheese	6.5	5.1	14.5
Soy-based bacon bits	45.8	64.4	118.5
Soy-based burgers	5.0	2.4	6.4
Red clover	10	11	21
Multigrain bread	0.2	0.2	0.4
KASHI Go Lean cereal	7.7	8.4	17.4
Green tea, Japanese	0.02	0.01	0.02
Flaxseeds	0.04	0.02	0.07
Raw broccoli	0.00	0.04	0.25

大豆補充片劑不等於天然大豆

- Natural soy \neq soy tablets
- Some laboratory studies of cells have shown that soy protein isolates may increase cancer growth.
- Soy supplements are NOT recommended

Duffy C, Perez K, Partridge A. Implications of phytoestrogen intake for breast cancer. CA Cancer J Clin. 57(5):260-77, 2007.

Artificial substances (Antibiotics & hormones) 食品添加劑 (抗生素和激素)

- Hormonal disturbances may increase breast cancer risk in human
- No direct evidence 直接證據不足
 - Nachman e. al. valuated breast cancer risk with hormone use in food production
 - Risk cannot be quantified due to limited technology, past evidence and surveillance programs

Nachman, K.E. and T.J. Smith, Hormone Use in Food Animal Production: Assessing Potential Dietary Exposures and Breast Cancer Risk. Curr Environ Health Rep, 2015. 2(1): p. 1-14

Other factors e.g. Shift works 睡眠不足

Shift work

- Disciplined services
- Doctors and nurses
- Flight attendants
- Security guards, etc



- Recent report suggested increased risk of breast cancers among flight attendants
- 空姐患乳腺癌的風險較高
- Implications 涵義
 - Frequent travelers
 - 旅行常客

McNeely E, et al. Cancer prevalence among flight attendants compared to the general population. Environmental Health 2018 17:49



Reasons

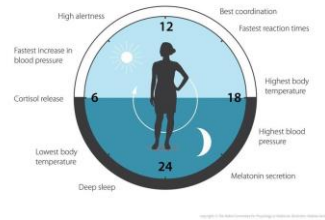
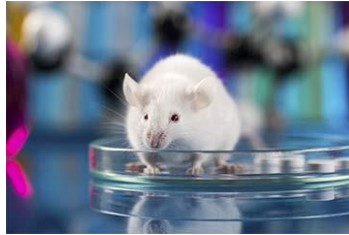
- Shift work 輪班工作
- Disruption of circadian rhythm 晝夜節律紊亂
- Cosmic irradiation 宇宙輻射

McNeely E, Mordukhovich I, Staffa S, Tideman S, Gale S, Coull B. Cancer prevalence among flight attendants compared to the general population. Environmental Health 201817:49

Santi SA, Meigs ML, Zhao Y, Bewick MA, Lafrenie RM, Conlon MS. A case-control study of breast cancer risk in nurses from Northeastern Ontario, Canada. Cancer Causes Control. 2015 Oct;26(10):1421-8

Disruption of circadian rhythm 晝夜節律

- Simulated chronic jet lag that disrupts circadian rhythm has shown to accelerate tumor growth in mice
- 實驗中時差增加小鼠的腫瘤生長



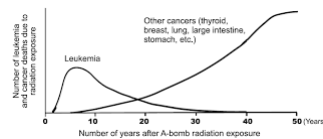
Filipski E, Levi F. Circadian disruption in experimental cancer processes. *Integr Cancer Ther* 2009; 8: 298–302.

Cosmic irradiation 宇宙輻射

Radiation exposure is a known risk factor of breast cancer

輻射是乳腺癌的風險因素

Example: Atomic bomb survivors in Japan



Cosmic radiation exposure increases with

- Increased altitudes
- Increased latitudes (Polar areas)
- 高度+緯度



Is flying that dangerous?

飛行真的那麼危險嗎？

Author / Year	Study Design	Sample size	Results (%)	Conclusion	Region
Studies on breast cancer rates					
McNeely (2018)	Case-control	5366	195 (3.6%)	Higher rate of breast cancer	US
Pinkerton (2012)	Cohort	11311	79 (0.7%)	No increased incidence	US
Kojo (2005)	Case-control	1041	27 (2.6%)	Inconclusive But not related to occupational factors	Finland
Linnersjö (2003)	Case-control	2324	33 (1.4%)	Statistically insignificant	Sweden
Lyng E (1996)	Letter (cohort)	915	14 (1.5%)	Increased incidence	Danmark
Reynolds (2002)	Case-control	6895	60 (0.9%)	Increased incidence	US
Rafnsson (2001)	Population-based	1532	26 (1.7%)	Increased incidence	Iceland
Pukkala (1995)	Cohort	1577	20 (1.3%)	Increased incidence	Finland
Pukkala (2012)	Cohort	8057	263 (3.3%)	Increased incidence	4 Nordic nations
Schubauer-Berigan (2015)	Cohort	6093	344 (5.6%)	Increased incidence	US
Studies on breast cancer mortality rates					
Zeeb (2003)	Cohort	33063	59 (0.2%) Mortality	Statistically insignificant	8 European nations
Paridou (2003)	Cohort	1835	2 (0.1%) Mortality	Statistically insignificant	Greece

Co M, et al. Global Breast Cancer Conference 2019

	Observed prevalence	Expected prevalence *	Standardized prevalence ratio
Overall breast cancer rate	1061 / 45111 (2.35%)	348,124 / 1,574,000 (2.17%)	1.08 (90% CI 0.30 – 2.58)

Conclusion:

Breast cancer risks NOT increased despite theoretical risks

儘管存在理論風險，但**乳腺癌風險並未增加**

Co M, Kwong A. Global Breast Cancer Conference 2019

1. Understanding risk factors

一覽風險成因

- Familial risk factors
 - Family history 家族史
- Lifestyle risk factors identified in Asian
 - Reproductive factors 生殖因素
 - Central obesity 中央肥胖
 - Westernized diet
 - Lack of physical activity

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2. Detect it early

- Self breast examination 自我乳房檢查
 - Every month
- Clinical breast examination 臨床乳房檢查
 - Every year
- Mammogram / Ultrasound 乳房X光照片/超聲波檢查
 - Every year

- Monthly self-examination
每月自我檢查乳房
- Annual clinical breast examination
每年醫生檢查
- Mammogram / Ultrasound screening
按醫生建議定期接受乳房X光或超聲波檢查

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Breast self-examination BSE 自我乳房檢查

- Advantages 優點
 - Simple and no cost 簡單而且沒有成本
 - Detect abnormality early (1) 及早發現異常
- Evidence
 - No evidence to suggest that BSE improves breast cancer survival (2)
 - 沒有提高生存率的證據

1. International Agency for Research on Cancer (IARC) Handbook of Cancer Prevention
2. Hackshaw AK, et al. Br J Cancer. 2003 Apr 7;88(7):1047-53.
3. Thomas DB, et al. [J Natl Cancer Inst](#). 2002 Oct 2;94(19):1445-57.

Self-breast examination

自我乳房檢查

Monthly (> 20 years old) 超過20歲 - 每月

Step 1: Observation 先觀察

- Observe for deformity
in upright position,
arms pressing on the
hips

站於鏡前，雙手叉腰，仔細地觀察

- Observed for deformity
with arms placed over
the back of the head

高舉雙手放在頭後，再從
不同角度觀察乳房

Look for **skin changes** 皮膚變化

and **Lumps** 硬塊

Step 2: Palpation 後觸摸

- Gently palpate right breast with left hands

用左手三隻手指墊放在右側乳房

- Gentle palpation over breast, nipple and axilla

作小圓圈按摩動作，範圍包括乳房、乳頭及腋下

- Repeat on left breast

以相同方法，用右手檢查左乳房、左乳頭及左腋下部位

- Monthly self-examination

每月自我檢查乳房

- Annual clinical breast examination

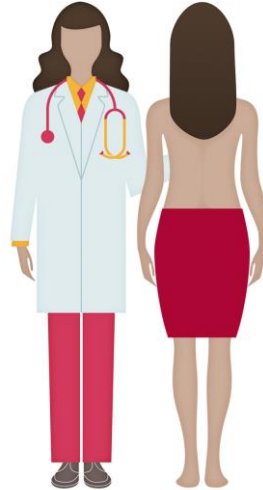
每年醫生檢查

- Mammogram / Ultrasound screening

按醫生建議定期接受乳房X光或超聲波檢查

Clinical breast exam 定期醫生檢查

- 54% Sensitivity
- 94% Specificity
- Role remains controversial
- 證據不充分

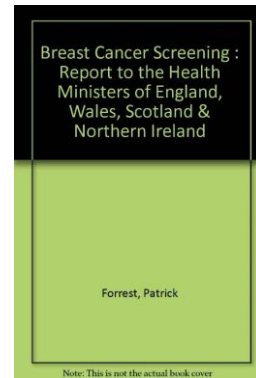


- Monthly self-examination
每月自我檢查乳房
- Annual clinical breast examination
每年醫生檢查
- Mammogram / Ultrasound screening
按醫生建議定期接受乳房X光或超聲波檢查

Mammographic (MMG) screening

THE HISTORY 歷史由來

- Professor Sir Patrick Forrest reviewed MMG screening in reducing breast cancer mortality in UK
- Breast Cancer Screening Report (Forrest Report), published in 1986
 - Mammographic screening had the potential to reduce breast cancer mortality in women aged > 50
- 1986年 Patrick Forrest 爵士報告
 - 乳房X光檢查有可能降低年齡> 50歲女性的乳腺癌死亡率



Pitfalls of screening MMG

- False negativity 假陰性
 - False reassurance
- False positivity 假陽性
 - Over-diagnosis 過度診斷
 - Over-treatment 過度治療

30 years of MMG screening in UK

Return to an Address of the Honourable
the House of Commons
dated 13 December 2018 for

30年英國乳腺篩查獨立回顧

The Independent Breast
Screening Review 2018



Ordered by the House of Commons to be printed on 13 December 2018

Chapter 5: Impact on women

Recommendation

5.39 Women who were contacted through the Patient Notification Exercise and have been diagnosed with breast cancer will be assessed to try to determine whether they were caused harm by errors within the breast screening programme. Public Health England should work quickly and sensitively with these women, their families and their healthcare professionals to try and provide clarity over this and ensure the women have the support they need.

The American Guidelines 美國建議

	U.S. Preventive Services Task Force ¹ 2016	American Cancer Society ² 2015	American College of Obstetricians and Gynecologists ³ 2011	International Agency for Research on Cancer ⁴ 2015	American College of Radiology ⁵ 2010	American College of Physicians ⁶	American Academy of Family Physicians ⁷ 2016
Women aged 40 to 49 with average risk	The decision to start screening mammography in women prior to age 50 years should be an individual one. Women who place a higher value on the potential benefit than the potential harms may choose to begin biennial screening between the ages of 40 and 49 years.	<i>Women aged 40 to 44 years</i> should have the choice to start annual breast cancer screening with mammograms if they wish to do so. The risks of screening as well as the potential benefits should be considered. <i>Women aged 45 to 49 years</i> should get mammograms every year.	Screening with mammography and clinical breast exams annually.	Insufficient evidence to recommend for or against screening.	Screening with mammography annually.	Discuss benefits and harms with women in good health and order screening with mammography every two years if a woman requests it.	The decision to start screening mammography should be an individual one. Women who place a higher value on the potential benefit than the potential harms may choose to begin screening.
Women aged 50 to 74 with average risk	Biennial screening mammography is recommended.	<i>Women aged 50 to 54 years</i> should get mammograms every year. <i>Women aged 55 years and older</i> should switch to mammograms every 2 years, or have the choice to continue yearly screening.	Screening with mammography and clinical breast exam annually.	<i>For women aged 50 to 69 years</i> , screening with mammography is recommended. <i>For women aged 70 to 74 years</i> , evidence suggests that screening with mammography substantially reduces the risk of death from breast cancer, but it is not currently recommended.	Screening with mammography annually.	Physicians should encourage mammography screening every two years in average-risk women.	Biennial screening with mammography.



Centers for Disease Control and Prevention
CDC 2017. Saving Lives. Protecting People™

The Hong Kong Recommendations

7 Should I screen for breast cancer if I do not have any symptom?

For women in general

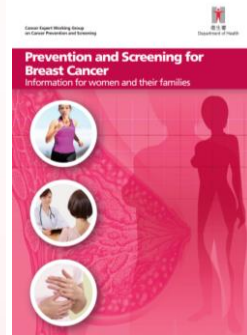
At present, it is still not clear whether population-based breast cancer screening² will bring more benefit than harm to general women population. The Hong Kong SAR Government's **Cancer Expert Working Group on Cancer Prevention and Screening (CEWG)**, based on a systematic review of scientific evidence, concludes that:



There is insufficient evidence to recommend *for or against* population-based mammography screening for general female in Hong Kong.

More research and data are needed before introducing population-based breast cancer screening among local women without symptoms.

² Population-based breast cancer screening refers to breast cancer screening which is offered systematically to all individuals without symptom in a defined target group (e.g. certain age groups).



證據不足以支持在香港進行乳房X光檢查

Biopsy techniques 活檢技術

Summary

Understand the risk factors

Live a healthy lifestyle

健康生活

Detect it early

Understand the symptoms and Screening

定期篩查

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