

## RESEARCH COMMUNICATION

# Colonoscopy with and without Occult Blood Test Pre-Screening: Which is more Cost Effective for Implementation for Screening for Colon Cancer?

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### Abstract

Colon cancer is an important gastrointestinal cancer that has increasing prevalence in the present day. Screening for colon cancer is accepted as a method for colon cancer prevention. There are many methods for screening for colon cancer. However, the best method is colonoscopy. Nevertheless, the simple classical method as occult blood test is still widely used in clinical practice. Here, the author appraises on colonoscopy with and without occult blood test pre-screening. The aim is to compare the cost effectiveness and cost utility between these two approaches. Based on the present appraisal, the colonoscopy without pre-screening occult blood test provides more cost effectiveness than colonoscopy with such pre-screening.

**Keywords:** Colonoscopy - occult blood test - screening - colon - cancer

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### Introduction

Colon cancer is an important problematic malignancy at present with a million cases detectable around the world yearly (Labianca et al., 2010). For cancer prevention, screening for colon cancer is accepted as a good method (Lieberman, 2010). At present, there are many investigative methods for screening for colon cancer. However, the best is generally considered to be colonoscopy (Hewett and Kahi, 2010). Nevertheless, the simple classical method as occult blood test is still widely used in clinical practice (Simon, 1998). Here, the author appraises colonoscopy with and without stool occult blood test pre-screening. The aim is to compare the cost effectiveness and cost utility between these two approaches.

### Materials and Methods

This study is a descriptive study with a medical economics approach is used. The setting in this work is assigned as Thailand, a country in Southeast Asia. First, the cost for each test, stool occult blood test and colonoscopy, is defined as price from a referencing tertiary hospital. The unit of the cost in this work is US dollar (30 local Thai baht=1 US dollar). The effectiveness in this study is defined as the rate of case (both premalignancy and malignancy lesions) detection and presented in %. The utility in this study is defined as the rate of final correct diagnosis of case (detection rate - false negative rate-dropout rate) and presented in %. The data on the effectiveness and utility are derived from the previous

local study on the colon cancer screening in Thailand (Paungchompoo, 2010). The two tested alternatives in this work are a) colonoscopy for all screenees and b) colonoscopy in case with positive pre-screening stool occult blood test. The cost, effectiveness and utility of each alternative are determined. Then cost effectiveness (cost per unit effectiveness) and cost utility (cost per unit utility) of each alternative were determined.

### Results

The cost of stool occult blood test is equal to 1.5 US dollar and the cost of colonoscopy is equal to 100 US dollar. The cost, effectiveness and utility of each alternative are presented in Table 1. Then cost effectiveness and cost utility of each alternative are presented in Table 2.

**Table 1. The Cost, Effectiveness and Utility of Each Alternative**

Alternative*	Cost (US dollar)**	Effectiveness (%)	Utility (%)***
A	10,000	18.84	18.84
B	734	1.29	- 0.73****

\*Alternative A=colonoscopy without pre-screening occult blood test, Alternative B=colonoscopy with pre-screening stool occult blood test; \*\* The cost for each alternative is validated at the primary assumption of 100 subjects based on the data from previous local study in Thailand (Paungchompoo, 2010); \*\*\* It is primary assumed that colonoscopy is a gold standard and has no false negative while the false negative rate for stool occult blood test is quoted from the referencing paper (Jaffe et al., 1975); \*\*\*\* The value below 0 means no utility

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**Table 2. The Cost Effectiveness and Cost Utility of Each Alternative**

Alternative	cost effectiveness (US dollar)	cost utility (US dollar)
A	543.48	543.48
B	568.99	N/A**

\*Alternative A=colonoscopy without pre-screening stool occult blood test, Alternative B=colonoscopy with pre-screening stool occult blood test; \*\* N/A=not available (due to no utility)

## Discussion

Stool occult blood test is a simple test that can be easily performed in any hospital setting. This test help identify the blood within the stool that can be a clue for many gastrointestinal disorder including to colon cancer so that it has been used as a screening tool for a long time (Jaffe et al., 197). Although it is an inexpensive investigation the problem of false positive and false negative cannot support this test as single tool for screening for colon cancer at present (Jaffe et al., 1975). The more accurate test of colonoscopy is recommended.

Colonoscopy is an endoscopic approach that needs hospitalization for investigation. It is classified as an invasive test and requires expert in endoscopy for practice (Hewett et al., 2010). Since it is a visualization technique, it is accepted as the best tool for detection of mass lesion (that can be a precancerous lesion) within the colon. This can be helpful in screening for colon cancer. The new concept of using colonoscopy as screening tool for colon cancer is proposed. However, the cost for screening is high and the technique is considerable invasive. Hence, there is an idea to combine the classical stool occult blood test as pre-screening investigation. In case with positive stool occult blood, colonoscopy is performed.

Here, the author tries to appraise on the cost effectiveness and cost utility of the two approaches, colonoscopy with and without pre-screening stool occult blood test. It can be seen that the use of colonoscopy without any pre-screening test provide higher effectiveness, detection of the case, at a lower cost. Nevertheless, there is no utility if the pre-screening stool occult blood test is used. This is due to the very high dropout rate of positive case for further colonoscopy and high false negative of stool occult blood test. The nature of stool occult blood test is easily to result in false negative in the setting where the citrus fruits are routinely ingested (including to Thailand) (Jaffe et al., 1975). Also, the stool testing seems to be a rude thing that is not accepted by some local people in developing countries (Wiwanitkit, 2010). It implies that the attempt to use pre-screening stool occult blood test is useless when compared to the alternative that does not use this approach.

In conclusion, based on the present appraisal, the colonoscopy without pre-screening occult blood test provides more cost effectiveness than colonoscopy with pre-screening occult blood test. Also, the colonoscopy with pre-screening occult blood test provides no utility due to high dropout rate and false negative.

## References

- Hewett DG, Kahi CJ, Rex DK (2010). Does colonoscopy work. *J Natl Compr Canc Netw*, **8**, 67-76.
- Jaffe RM, Kasten B, Young DS, et al (1975). False-negative stool occult blood tests caused by ingestion of ascorbic acid (vitamin C). *Ann Intern Med*, **83**, 824-6.
- Labianca R, Beretta GD, Kildani B, et al (2010). Colon cancer. *Crit Rev Oncol Hematol*, **74**, 106-33.
- Lieberman D (2010). Progress and challenges in colorectal cancer screening and surveillance. *Gastroenterology*, **138**, 2115-26.
- Paungchompoo P (2010). Colon cancer is not a disease of people living in the city, Kom Chad Leuk. 2010 June 18 (in Thai). Available online at [www.komchadleuk.net/2010061/63315](http://www.komchadleuk.net/2010061/63315).
- Simon JB (1998). Fecal occult blood testing: clinical value and limitations. *Gastroenterologist*, **6**, 66-78.
- Wiwanitkit V (2010). Screening for colorectal cancer: perception of the population, an important concern. E letter in *bmj.com*.