Quantitative FIT tests in the Czech Republic
Past, present and future

Kocna Petr

European Colorectal Cancer Days - Brno, 26. April 2014
Laboratory of Gastroenterology of the Institute of Medical Biochemistry and Laboratory Diagnostics shows long-standing – 40 years experiences with FOBT analytics.

**1st GENERATION OF FOBT**

**GUAIAC TEST: g-FOBT**

1970 – 1980 different chemically based tests with guaiac or o-tolidine were compared for reproducibility, sensitivity and assurance.

Haemoccult, HemDetect, KryptoHaem SSW

Haemoccult exclusively has been recommended for CRC screening with highest reproducibility.

An adapted program of colorectal cancer screening. Fric P, Zavoral M, Dvoráková H et al. - Hepatogastroenterology. 1994
g-FOBT – GUAJAC TEST, HAEMOCCULT

- g-FOBT
- i-FOBT
- qi-FOBT

28.7%  56.8%  83.4%

g-FOBT WITH SENSITIVITY LESS 30% FINISHED AT END OF 2012
1990 – 2000 different immunochemically tests were compared for reproducibility, sensitivity and assurance, compared with Haemoccult, and validated by colonoscopy.

ImmoCare, HemeSelect, Hemolex, Actim FB, Hexagon OBTI

None of iFOBT test has been recommended for CRCA screening. iFOBT tests are very different in sensitivity, very high false positivity - more than 25%, and variable sample preparation.

Ferkl M, Kocna P, Fric P. - Cas Lek Cesk. 1992
Dvorak M., Kocna P. Vanickova Z. - Cas Lek Cesk. 2002
FOBT - THE PAST

20 YEARS WE USED g-FOBT
WITH LOW SENSITIVITY
BUT THE SAME RELIABILITY IN ALL REGIONS OF THE CZECH REPUBLIC
i-FOBT methods for screening in the Czech Republic in 2013

SURVEY IN GENERAL PRACTITIONERS IN 2014

2nd GENERATION OF FOBT
QUALITATIVE FIT: i-FOBT

Qualitative FIT 65% - 13 different methods

Report of Committee for colorectal cancer screening
Ministry of Health Care, Czech Republic, Meeting - March 25, 2014
HIGH RANGE of iFOBT RAPID TESTS AVAILABLE NOW IN THE CZECH REPUBLIC
i-FOBT QUALITATIVE, RAPID TESTs

- g-FOBT: 28.7%
- i-FOBT: 56.8%
- qi-FOBT: 83.4%

I-FOBT SENSITIVITY COULD BE 2x HIGHER AS HAEMOCCULT
i-FOBT QUALITATIVE, RAPID TESTs

- i-FOBT Rapid tests available in the CR from 20 producers
- i-FOBT tests varied highly in the sensitivity and accuracy
- i-FOBT tests sensitivity varied from 100 ng Hb/ml to 2000 ng Hb/ml
- Rapid i-FOBT tests use very different sampling devices
- Rapid i-FOBT tests varied in the Hb/extract buffer stability

Quantitative immunochemical fecal occult blood testing for colorectal adenoma detection: evaluation in the target population of screening and comparison with qualitative tests.

- Mayo Clinic study of 750 subjects, colonoscopy verified
- FIT qualitative - false positivity - 7.4%
- FIT quantitative - false positivity - 3.8%

Colorectal Cancer Screening Committee, DDW 2012 Workshop
Expert Working Group – Fit for Screening - prof. Stephen Halloran
Director: NHS Bowel Cancer Screening
## UNITS & CUT-OFF VALUE (ng Hb/ml / μg Hb/g stool)

<table>
<thead>
<tr>
<th>FIT test</th>
<th>Sampling</th>
<th>Conc.</th>
<th>Ratio</th>
<th>cut-off (ng/ml)</th>
<th>cut-off (μg/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ColonView</td>
<td>1mg/2ml</td>
<td>0.50</td>
<td>1</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>immo-Care-C</td>
<td>11.5 mg/2.5ml</td>
<td>4.60</td>
<td>9.2</td>
<td>50</td>
<td>11</td>
</tr>
<tr>
<td>FOB Test</td>
<td>10mg/2ml</td>
<td>5.00</td>
<td>10</td>
<td>40</td>
<td>8</td>
</tr>
<tr>
<td>OC-Light</td>
<td>10mg/2ml</td>
<td>5.00</td>
<td>10</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>EpiTuub® iFOB</td>
<td>5-10mg/1.1ml</td>
<td>4.5-9</td>
<td>9-18</td>
<td>50</td>
<td>5.5-11</td>
</tr>
<tr>
<td>Hema-screen™</td>
<td>x /1.7-1.8ml</td>
<td>1.00</td>
<td>2</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>FOB test</td>
<td>3-10mg/3ml</td>
<td>1.0-3,3</td>
<td>2-6,6</td>
<td>10</td>
<td>3.3-10</td>
</tr>
<tr>
<td>Hb FECALE</td>
<td>100-200mg/2ml</td>
<td>50-100</td>
<td>100-200</td>
<td>40</td>
<td>0.4-0.8</td>
</tr>
<tr>
<td>Actim Fecal Blood</td>
<td>10-20mg/10ml</td>
<td>1.0-2.0</td>
<td>2-4</td>
<td>50</td>
<td>25-50</td>
</tr>
<tr>
<td>Easy-Card</td>
<td></td>
<td></td>
<td></td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>SureScreen FOB</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Tests with identical cut-off in Hb ng/ml may have up to 200x times higher, or lower, cut-off in μg Hb/g stool.
FOBT - THE PAST
20 YEARS WE USED g-FOBT
WITH LOW SENSITIVITY
BUT THE SAME RELIABILITY IN ALL
REGIONS OF THE CZECH REPUBLIC

FOBT - THE PRESENT
IN 2013 WE CHANGED TO i-FOBT (FIT)
WITH 2-TIMES HIGHER SENSITIVITY
BUT DISTINCTLY INCREASING VARIABILITY
IN REGIONS OF THE CZECH REPUBLIC
QUANTITATIVE Hb ANALYSIS IN STOOL

- Qualitative, rapid tests, quantified by the scanner/software
- POCT analysers at general practitioners
- Chemical/biochemical analysers at hospital/laboratories

3rd GENERATION OF FOBT
QUANTITATIVE FIT: qi-FOBT

Started 5 years ago
qi-FOBT/FIT - QUANTITATIVE Hb ANALYSIS IN STOOL

28,7%  56,8%  83,4%

g-FOBT  i-FOBT  qi-FOBT

qi-FOBT SENSITIVITY COULD BE 3x HIGHER AS HAEMOCULT
RAPID iFOBT QUALITATIVE TEST

STANDARD PC - SCANNER

PC - NOTEBOOK

EVALUATION OF COLOURED BAND INTENSITY
COMPARING WITH DIGITAL / COLOUR STANDARD
QUANTIFICATION OF iFOBT TEST = ONLY PC'S VISUALISATION
QUANTITATIVE FIT ANALYSERS IN CZECH REPUBLIC

Map of the Czech Republic with marked locations where the quantitative analysis of Hb in stool, controlled with the SEKK external control quality, is available.
EXTERNAL CONTROL QUALITY SYSTEM in CR

SEKK EHK FOB
2011/2013
VARIABILITY of FITs

Automated analysers for qiFOBT are ready to start CRC screening with qiFOBT optimised for Czech Republic screening. EQAS control system is since January 2012 available.

National screening programme in the Czech Republic should be modified to use quantitative qiFOBT technology.

Committee for CRC screening Ministry of Health of the Czech Republic.

Quantitative determination of Hb in stool
Eiken OC-Sensor micro analyser
General Faculty Hospital Prague
15 000 analysis in 5 years (2008 - 2013)
The analytical data-mining tool I-COP
(Cancer Care Information Centre) compare
Laboratory data - FIT - Hb in stool
with National Cancer Registry output

Kocna P., Májek O., Blaha M.: Clinical and epidemiological importance of analyzing laboratory data with the data source I-COP.
Sborník Medsoft 2014 - March 25; 110-122
DETECTED COLORECTAL CANCERS

<table>
<thead>
<tr>
<th>AGE 50 – 90 YEAR ( n = 4145 )</th>
<th>AGE 50 – 90 YEAR ( n = 6561 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ng/ml</td>
<td>n</td>
</tr>
<tr>
<td>75</td>
<td>292</td>
</tr>
<tr>
<td>&gt; 1000</td>
<td>47</td>
</tr>
</tbody>
</table>

Patients of the Center for Preventive Care & GPs

Patients specialized hospital clinics outpatient and inpatients

**Detected CRC – 11/64**

CRC detection rate - 2.65/1000 FIT
Average time FIT - surgery: 5.34 months

**Detected CRC – 53/64**

CRC detection rate - 8.08/1000 FIT
Average time FIT - surgery: 2.95 months
CRC TUMOR - BOWEL LOCALISATION

- C180 - C181: 25%
- C182 - C183: 17.2%
- C184 - C186: 12.5%
- C187 - C200: 45.3%
The frequency of tumors in different localisations corresponding published papers

**CRC TUMOR - BOWEL LOCALISATION**

- **C180 - C181**: 25% (25%)
- **C182 - C183**: 17.2% (17.2%)
- **C184 - C186**: 12.5% (12.5%)
- **C187 - C200**: 45.3% (45.3%)

Johns Hopkins Colon Cancer Center
http://www.hopkinscoloncancercenter.org
Hb ng/ml values are not significantly different according to tumor localisation.

The OC-Sensor FIT could be used reliably for CRC screening in any tumor localisation.
False negativity - is 15.62% (cut-off value 75 ng/ml recommended by the CRC Commission)
The sensitivity for CRC - is 84.38%
False negativity - is 15.62% 
(cut-off value 75 ng/ml recommended by the CRC Commission)  
The sensitivity for CRC - is 84.38% 

The percentage of unrecognized cancers - 17.6%  
for one test with cut-off 75 ng/ml 

Kelley L, Swan N, Hughes DJ. - Colorectal Dis. 2013 Sep; 15(9): e512-21  
An analysis of the duplicate testing strategy of an Irish immunochemical FOBT colorectal cancer screening programme
CRC TUMOR STAGE & FIT VALUE

Hb ng/ml values are not significantly different according to tumor stages.

<table>
<thead>
<tr>
<th>CRC stage I (n=11)</th>
<th>CRC stage II (n=21)</th>
<th>CRC stage III (n=17)</th>
<th>CRC stage IV (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1656 ng/ml (421-2154)</td>
<td>960 ng/ml (453-1639)</td>
<td>848 ng/ml (37-1554)</td>
<td>720 ng/ml (175-1396)</td>
</tr>
</tbody>
</table>

Hb ng/ml values are not significantly different according to tumor stages.
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20 YEARS WE USED g-FOBT
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FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS
FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS

1. TASK
ANALYSE THE EUROPEAN EXPERIENCES
We analysed 175 scientific publications, available on web publications focusing on CRC screening by FIT.
Publications published in the last 5 years (2008-2013)
The presentation was focused only on studies of European countries.

'EVIDENCE BASED' RECOMMENDATIONS AND EXPERIENCES ARE NOW AVAILABLE.

EUROPEAN EXPERIENCES WITH FIT

Recommendations for a colorectal cancer screening programme in Ireland - 12/2008

The National Cancer Screening Service Board, Ireland

The Board’s recommendation that the immunochemical faecal occult blood test (iFOBt) which operates on an automated testing platform.

Immunochemical faecal occult blood tests - Evaluation report - November 2009
Centre for Evidence-based Purchasing of the NHS Purchasing and Supply Agency.

The OC-Sensor / DIANA analyser is well designed and is the most suitable system for the English bowel cancer screening programme.

A national colorectal cancer screening programme, November 17, 2009
The Health Council of the Netherlands

The Committee recommends iFOBT-based screening (OC-Sensor, one faecal sample) once every two years for men and women between fifty-five and seventy-five years old.

Faecal occult blood test-based screening programme. 2009 May
Lecco Colorectal Cancer Screening Group

Immunochemical faecal tests (HM-Jack, Kiowa; Japan) were processed by a single central laboratory using an automated reading technique; the positivity cut-off was 100 ng/ml.
FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS

ANALYSE THE EUROPEAN EXPERIENCES

2. TASK
HIGHLIGHT QUANTITATIVE FIT
qFIT is 3 times more sensitive and reliable than gFOBT

qFIT analysis is based on specific antibody technique

qFIT on automatic analyzer eliminates subjective evaluation

qFIT allows the quantitative analysis

qFIT could be possible to optimize selecting screening cut-off

qFIT allows comparing the values on a European scale

qFIT may be monitor by quality control system EQAS
At least 50 laboratories in the Czech Republic offers the quantitative determination of Hb in the stool, verified 2 times per year by the external quality control system, with sufficient capacity for population screening of CRC.
FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS

ANALYSE THE EUROPEAN EXPERIENCES
HIGHLIGHT QUANTITATIVE FIT

3. TASK
CLEARLY DEFINE CUT-OFF POSITIVITY
Colorectal Disease - 09/2013

9704 kits (2 tests) sent out to residents, 50-74 years return rate - 5023 (52%), positivity ≥ 100 ng/ml: 514 (10.2%) 419 FIT+ colonoscopy (81.5%) with caecal intubation 402 (96%) CRC found 17 (4.1%), Dukes I + II in 62.5%, 132 advanced adenomas (31.5%)

<table>
<thead>
<tr>
<th></th>
<th>Positivity rate (95% CI)</th>
<th>Colonoscopies number</th>
<th>CRC &amp; adv. adenomas</th>
<th>Specificity CRC &amp; AA</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIT one</td>
<td>6.9% (6.3 - 7.7%)</td>
<td>287</td>
<td>108</td>
<td>96.4% (95.7 - 96.9%)</td>
</tr>
<tr>
<td>FIT two</td>
<td>10.2% (9.4 - 11%)</td>
<td>419</td>
<td>149</td>
<td>94.5% (93.7 – 95.1%)</td>
</tr>
</tbody>
</table>

The percentage of unrecognized cancers 23.5% for one test with cut-off 100 ng/ml and 17.6% with 75 ng/ml neoplasms, including advanced adenomas - 32% (100 ng/ml) a 30% (75 ng/ml)

Kelley L, Swan N, Hughes DJ. - Colorectal Dis. 2013 Sep; 15(9): e512-21 An analysis of the duplicate testing strategy of an Irish immunochemical FOBT colorectal cancer screening programme
FIT test before colonoscopy - 815 people, two centers (VFN and FTN)

Comparison of a two-FIT tests and different cut-off values

FIT test - OC-Sensor micro

<table>
<thead>
<tr>
<th>Hb cut off - ng/ml</th>
<th>50</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity CRC - FIT 1</td>
<td>88.6%</td>
<td>85.7%</td>
<td>85.7%</td>
<td>80.0%</td>
<td>80.0%</td>
</tr>
<tr>
<td></td>
<td>(73.2 - 96.7)</td>
<td>(69.7 - 95.1)</td>
<td>(69.7 - 95.1)</td>
<td>(63.1 - 91.5)</td>
<td>(63.1 - 91.5)</td>
</tr>
<tr>
<td>Sensitivity CRC - FIT 2</td>
<td>88.6%</td>
<td>85.7%</td>
<td>85.7%</td>
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<td>85.7%</td>
</tr>
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<td></td>
<td>(73.2 - 96.7)</td>
<td>(69.7 - 95.1)</td>
<td>(69.7 - 95.1)</td>
<td>(69.7 - 95.1)</td>
<td>(69.7 - 95.1)</td>
</tr>
<tr>
<td>Specificity CRC - FIT 1</td>
<td>87.2%</td>
<td>90.1%</td>
<td>91.0%</td>
<td>93.0%</td>
<td>93.5%</td>
</tr>
<tr>
<td></td>
<td>(83.6 - 90.2)</td>
<td>(86.8 - 92.8)</td>
<td>(87.9 - 93.6)</td>
<td>(90.1 - 95.2)</td>
<td>(90.6 - 95.6)</td>
</tr>
<tr>
<td>Specificity CRC - FIT 2</td>
<td>81.4%</td>
<td>84.7%</td>
<td>86.9%</td>
<td>89.1%</td>
<td>90.1%</td>
</tr>
<tr>
<td></td>
<td>(77.3–85.0)</td>
<td>(80.9 - 88.1)</td>
<td>(83.3 - 90.0)</td>
<td>(85.7 - 91.9)</td>
<td>(86.8 - 92.8)</td>
</tr>
</tbody>
</table>

Recommendation of Czech pilot study - one FIT test with cut-off value 75 ng/ml


Biomed Pap 2012 Jun; 156(2): 143 - 150: Improvements in colorectal cancer screening programmes - quantitative immunochemical faecal occult blood testing - how to set the cut-off for a particular population.
Higher fecal immunochemical test cutoff levels: lower positivity rates but still acceptable detection rates for early-stage colorectal cancers.


Higher fecal immunochemical test cutoff levels: lower positivity rates but still acceptable detection rates for early-stage colorectal cancers.
OC-Sensor Eiken recommended cut-off value **100 ng/ml** with similar sensitivity & specificity approximately **90 %**
Optimizing cut-off for qiFOBT and indications for colonoscopy: Indicate for colonoscopy, if possible, all pathology, including 15% of healthy people? The sensitivity could be 93%.

Decrease cut-off to 50 ng/ml
Optimizing cut-off for qiFOBT and indications for colonoscopy:

Do not indicate for colonoscopy any healthy person, increase specificity to 93% but reduce the sensitivity by 15%?

Increase cut-off to 200 ng/ml
FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS

ANALYSE THE EUROPEAN EXPERIENCES
HIGHLIGHT QUANTITATIVE FIT
CLEARLY DEFINE CUT-OFF POSITIVITY

4. TASK
CHANGE THE Hb CONCENTRATION UNIT
UNITS & CUT-OFF VALUE (ng Hb/ml / μg Hb/g stool)

- **QuikRead**
- **FOB Gold**
- **HM Jack**
- **OC Sensor**
- **iT Linear**

**VARIABLE SAMPLING DEVICES FOR FIT, WITH DIFFERENT CONCENTRATION OF STOOL IN THE SAMPLING SOLUTION**

- 10mg/2ml
- 10mg/1.7ml
- 2mg/2ml
- 10mg/2ml
- 20mg/1.6ml

12.5 times higher
UNITS & CUT-OFF VALUE (ng Hb/ml / µg Hb/g stool)

Stool concentration in Sentinel sampling tool is 1.76 times higher, compare to Eiken sampling.
UNITS & CUT-OFF VALUE (ng Hb/ml / μg Hb/g stool)

Re-calculation of measured values from ng/ml to μg/g of stool

Eiken OC-Sensor
Sentinel FOBGold

μg Hb/g stool
FOBT - THE FUTURE

PREMISE - VISIONS - SIX MAIN TASKS

ANALYSE THE EUROPEAN EXPERIENCES
HIGHLIGHT QUANTITATIVE FIT
CLEARLY DEFINE CUT-OFF POSITIVITY
CHANGE THE Hb CONCENTRATION UNIT

5. TASK
MODIFY THE SCREENING RULES
Higher fecal immunochemical test cutoff levels: lower positivity rates but still acceptable detection rates for early-stage colorectal cancers.


Higher fecal immunochemical test cutoff levels: lower positivity rates but still acceptable detection rates for early-stage colorectal cancers.
Local studies with 9,800 inhabitants, 3,145 aged 50-74 years
FIT test OCF-Sensor, 100 ng/ml, performed 2001-2003-2006-2008
Participation in four cycles from 56% to 63%, 48.1% of all 4 cycles

<table>
<thead>
<tr>
<th>Cycle</th>
<th>2001</th>
<th>2003</th>
<th>2006</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invited</td>
<td>2959</td>
<td>2566</td>
<td>2056</td>
<td>1862</td>
</tr>
<tr>
<td>Participated</td>
<td>2161</td>
<td>1520</td>
<td>971</td>
<td>713</td>
</tr>
<tr>
<td>FIT positivity</td>
<td>92 (4,3%)</td>
<td>62 (4,1%)</td>
<td>33 (3,4%)</td>
<td>36 (5,1%)</td>
</tr>
<tr>
<td>CRC+AA detected</td>
<td>35</td>
<td>18</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

Local studies with 4 cycles lasting 8.5 years with the participation of 48% of the population in all cycles
Screening - quantitative FIT with cut-off of 100 ng/ml

High rate of advanced adenoma detection in 4 rounds of colorectal cancer screening with the fecal immunochemical test.
## DETECTED COLORECTAL CANCERS

### AGE 50 – 90 YEAR (n = 4145)

<table>
<thead>
<tr>
<th>ng/ml</th>
<th>n</th>
<th>FIT +</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>292</td>
<td>7.05%</td>
</tr>
<tr>
<td>&gt; 1000</td>
<td>47</td>
<td>1.13%</td>
</tr>
</tbody>
</table>

### AGE 50 – 90 YEAR (n = 6561)

<table>
<thead>
<tr>
<th>ng/ml</th>
<th>n</th>
<th>FIT +</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>1287</td>
<td>19.62%</td>
</tr>
<tr>
<td>&gt; 1000</td>
<td>311</td>
<td>4.74%</td>
</tr>
</tbody>
</table>

Patients of the Center for Preventive Care & GPs

Patients specialized hospital clinics outpatient and inpatients

Detected CRC – 11/64

Detected CRC – 53/64

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Kocna P., Májek O., Blaha M., Zima T., Dušek L.: Characteristics of colorectal cancer detected by quantitative faecal haemoglobin test in hospital opportunistic screening. WorldLab 2014, June, Istanbul
FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS

ANALYSE THE EUROPEAN EXPERIENCES
HIGHLIGHT QUANTITATIVE FIT
CLEARLY DEFINE CUT-OFF POSITIVITY
CHANGE THE Hb CONCENTRATION UNIT

5. TASK
MODIFY THE SCREENING RULES

- could we change screening age limits since 40 years?
- could we include annually FIT test even after colonoscopy?
- could we increase number of FIT tested subjects including indications
  from specialized hospital clinics - diabetology, cardiology etc?
FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS

ANALYSE THE EUROPEAN EXPERIENCES
HIGHLIGHT QUANTITATIVE FIT
CLEARLY DEFINE CUT-OFF POSITIVITY
CHANGE THE Hb CONCENTRATION UNIT
MODIFY THE SCREENING RULES

6. TASK
INCREASE EDUCATION UNIVERSALLY
False negativity - is 15.62 %
(cut-off value 75 ng/ml recommended by the CRC Commission)
The sensitivity for CRC - is 84.38 %

The percentage of unrecognized cancers - 17.6%
for one test with cut-off 75 ng/ml

Kelley L, Swan N, Hughes DJ. - Colorectal Dis. 2013 Sep; 15(9): e512-21
An analysis of the duplicate testing strategy of an Irish immunochemical FOBT colorectal cancer screening programme
### EDUCATION ON IMPORTANCE OF FIT VALUES

<table>
<thead>
<tr>
<th>Man 66 year (born 1946)</th>
<th>Two cases with FIT value 0 ng/ml and CRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.4.2009 - FIT: 0 ng/ml</td>
<td></td>
</tr>
<tr>
<td>8.8.2011 - FIT: 1355 ng/ml</td>
<td>NO reaction</td>
</tr>
<tr>
<td>11.7.2012 - FIT: 1854 ng/ml</td>
<td></td>
</tr>
<tr>
<td>14.8.2012 - colonoscopy, sigmoid CRC</td>
<td></td>
</tr>
<tr>
<td>6.9.2012 - tumour resection, stage 3</td>
<td></td>
</tr>
<tr>
<td>FIT - surgery time: <strong>12.96 months</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Man 72 year (born 1941)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13.5.2010 - FIT: 0 ng/ml</td>
<td></td>
</tr>
<tr>
<td>14.11.2012 - FIT: 741 ng/ml</td>
<td>NO reaction</td>
</tr>
<tr>
<td>5.3.2013 - FIT: 1637 ng/ml</td>
<td></td>
</tr>
<tr>
<td>10.4.2013 - colonoscopy, sigmoid CRC</td>
<td></td>
</tr>
<tr>
<td>13.5.2013 - tumour resection, stage 3</td>
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<tr>
<td>FIT - surgery time: <strong>5.92 months</strong></td>
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Kocna P., Májek O., Blaha M.: *Clinical and epidemiological importance of analyzing laboratory data with the data source I-COP.*

*Sborník Medsoft 2014 - March 25; 110-122*

EDUCATION ON IMPORTANCE OF FIT VALUES

- FIT value 0 ng/ml does not mean that there is no cancer
- Quantitative FIT with sensitivity 85% does not recognize 15% of CRC
- Repeated FIT screening, annually, are very important
- FIT value more than 1000 ng/ml being almost reliably indicates cancer and colonoscopy should be performed as soon as possible
FOBT - THE FUTURE
PREMISE - VISIONS - SIX MAIN TASKS

- Analyse the European experiences
- Highlight quantitative fit
- Clearly define cut-off positivity
- Change the Hb concentration unit
- Modify the screening rules
- Increase education universally
THANK YOU FOR YOUR ATTENTION