Using QCancer® -2014 in a clinical setting

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Revision History

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1 Purpose of document

- This document illustrates the use of the QCancer for assessment of current risk of cancer in patients in primary care.
- It is intended for use by clinicians interested to use the public www.qcancer.org website and also system suppliers who wish to integrate QCancer into their clinical computer systems.

2 Background

There are two main ways QCancer can be used in primary care.

2.1 Use within a doctor patient consultation

- QCancer can be used by primary care clinicians during a consultation with patients to calculate the absolute risk of a patient having a current as yet undiagnosed cancer with separate risks for each type of cancer
- It is important to note that QCancer gives a risk of cancer not a diagnosis of cancer
- This can be done by entering all the data required directly into www.qcancer.org or by using QCancer integrated into a clinical computer system.
- The advantage of integration is that many of the variables needed for the calculations are already recorded in the patient's underlying electronic medical record whilst others can then be entered during the consultation.
- The results of the calculation can then be shared with the patient and used to inform the decision to undertake further investigation or referral.
- The results can then be saved into the medical record or included on a referral letter or request for investigation.

2.2 Batch processing mode

- QCancer can also be used in 'batch processing mode' where the calculations are performed automatically using data already recorded in the electronic medical record. This will result in a risk profile being generated for each patient, which can be stored in the medical record or an ancillary table.
- The resulting profile can then be used to sort patients according to their overall cancer risk or risk of an individual type of cancer.

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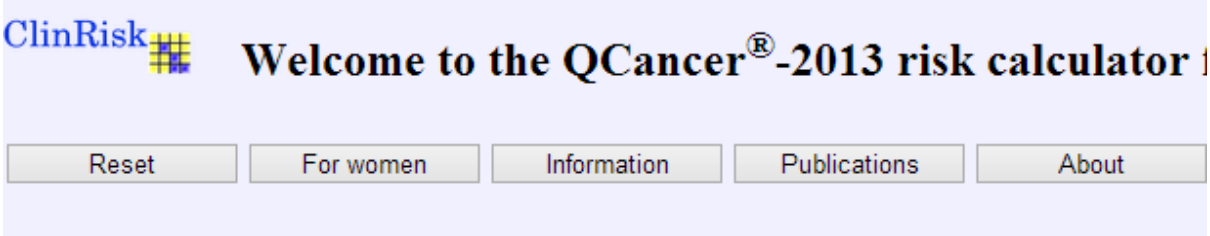
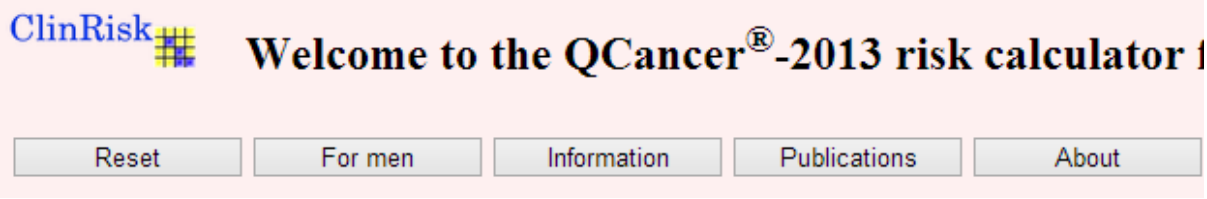
3 Use within a clinical consultation

- There are two calculators – one for women and one for men. This is because the types of cancers, risk factors and symptoms differ between men and women.
- On the www.qcancer.org website it is possible to toggle between the two calculators using the second button on the top tool bar.
- When using the calculator for men, then you can switch to the calculator for women by clicking on the button 'for women' below

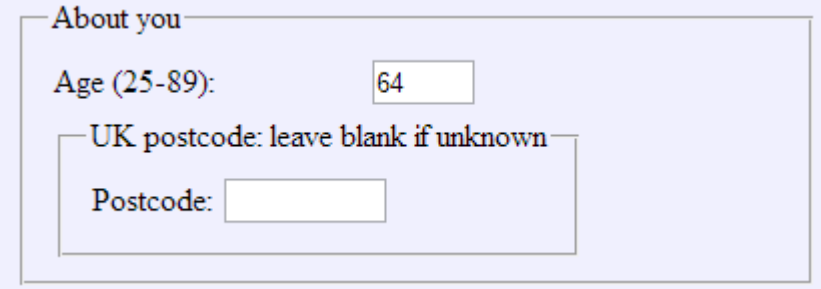


- Similarly when using the calculator for women, you can toggle to the calculator for men by selecting the For Men button.



3.1 Demographic information

- A Patient's risk of having cancer increases with increasing age and deprivation. The QCancer calculator therefore requires information on both age (years) and deprivation score.
- The postcode is entered in order to derive the Townsend deprivation score which is then used in the calculation. When QCancer is integrated into a clinical computer system, then this information should be pre-populated from the clinical record.



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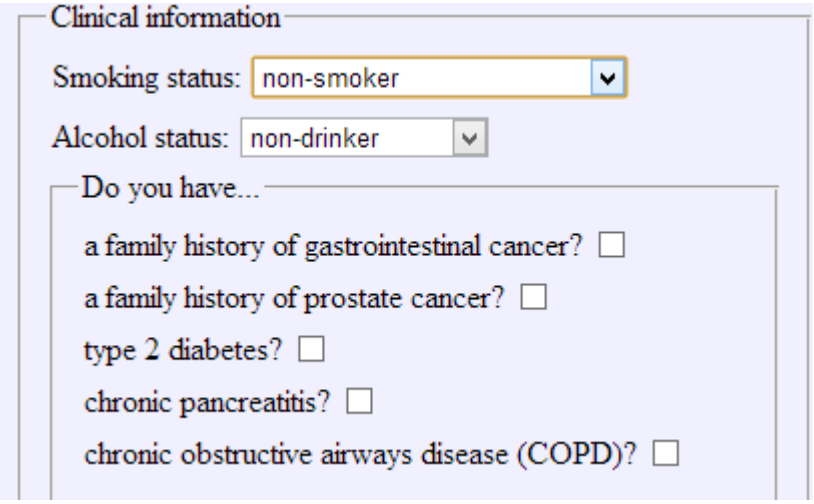
3.2 Clinical information for baseline risk assessment

Past medical history, smoking and alcohol also affect a patient's baseline risk of cancer and these variables are needed for the calculation. When QCancer is integrated into a clinical computer system, then this information should be pre-populated from the clinical record.

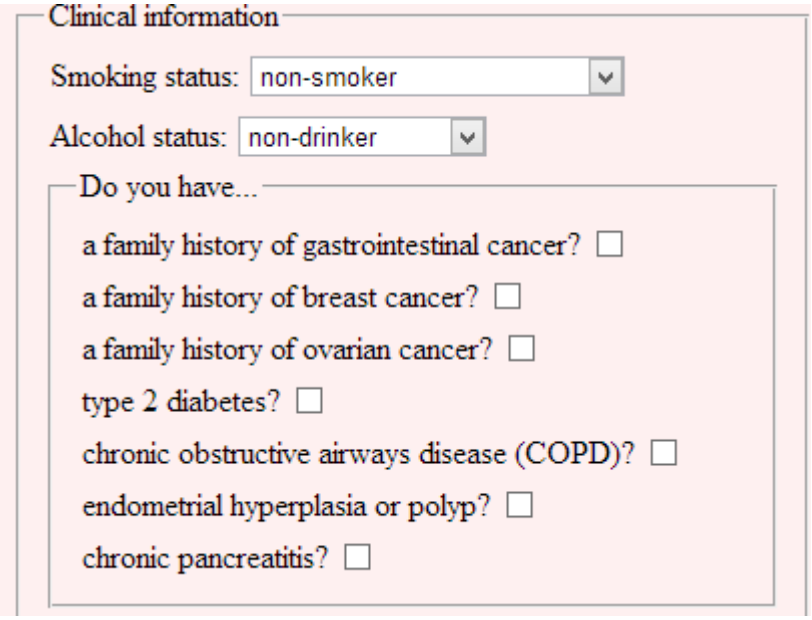
For men, then family history of prostate cancer and family history of gastrointestinal cancer are both important and are therefore included in the calculator for men.

Clinical information for baseline cancer risk in men



In women, family history of gastrointestinal cancer, family history of breast cancer and family history of ovarian cancer are all important so are included in the calculator for women

Clinical information for baseline cancer risk in women



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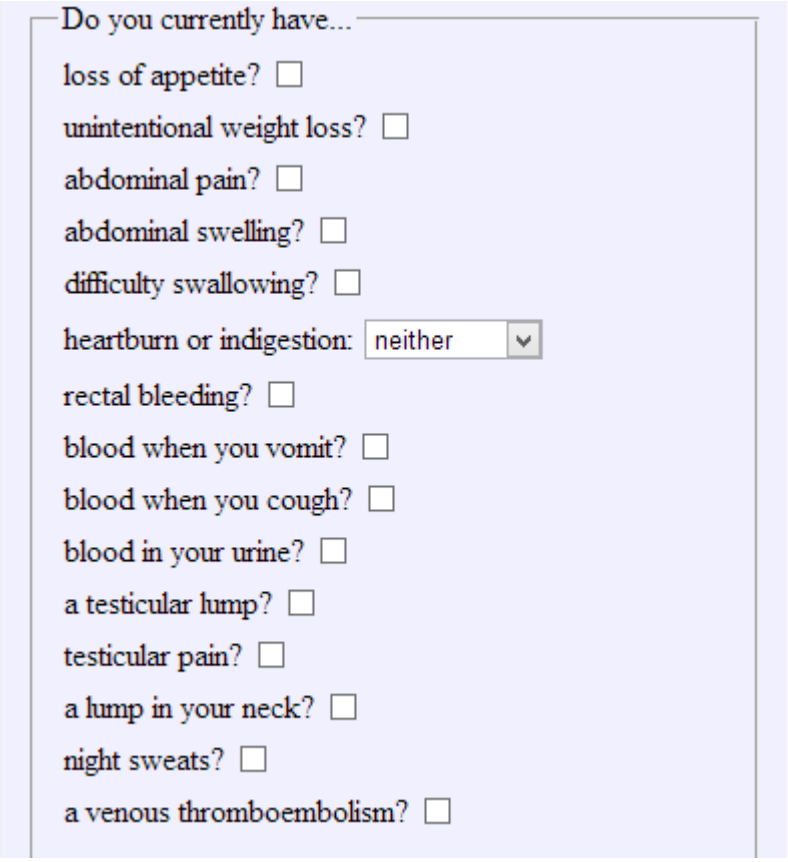
3.3 Current symptoms in men

Risk of cancer increases in the presence of particular symptoms and these vary between men and women. We have grouped the questions into two groups:

a. **Current 'alarm' type symptoms** – this includes 'alarm' type symptoms which the patient currently has or has had within the last month. It is anticipated that this information will be entered during the consultation.
b. **Recent symptoms** – this includes more common symptoms which the patient might have experienced at any time within the last year and have consulted their GP. It is anticipated that many of these symptoms will already be recorded into the medical record.

The questions for men are ordered to reflect how doctors might take a history - so the gastrointestinal questions are grouped together. After that are comes symptoms which involve abnormal bleeding. This is followed by two questions on testicular symptoms (pain and lump) and then two more systemic factors – night sweats and recent thromboembolism (which covers pulmonary embolus and deep vein thrombosis).



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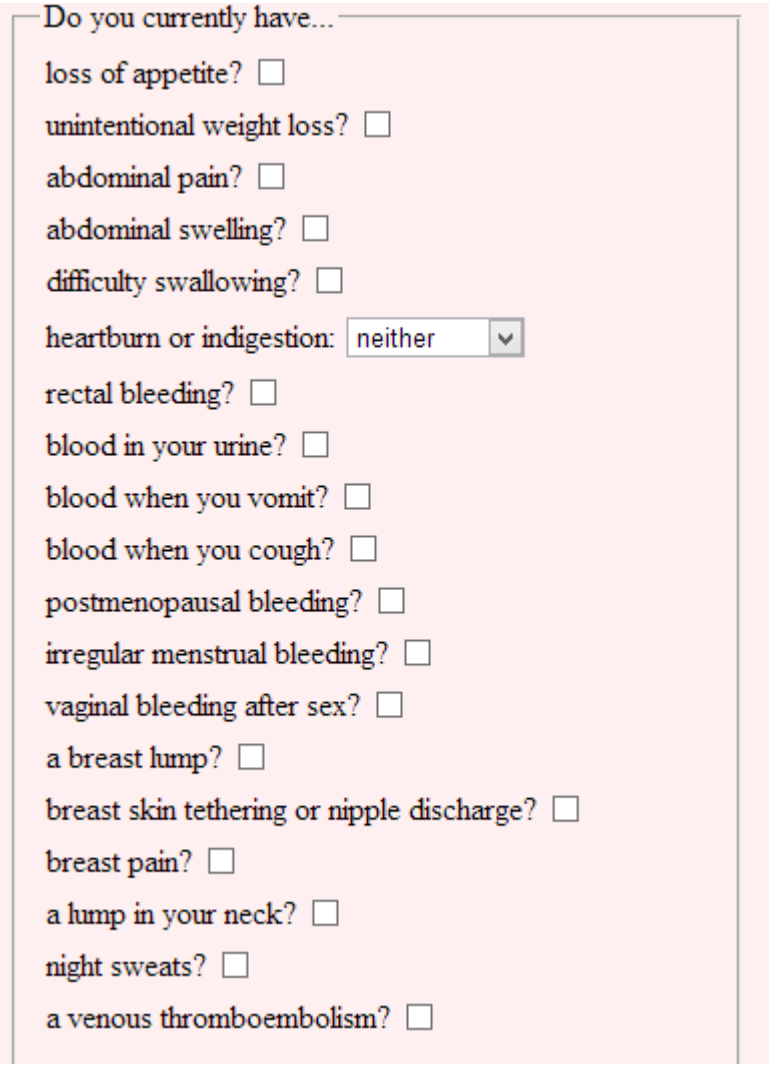
3.4 Current symptoms in women

The first 10 questions for women are the same as for men. These questions are then followed by

a. three which related to gynecological symptoms: (post-menopausal bleeding, irregular menstrual bleeding and vaginal bleeding after sex) and
b. three relating to breast symptoms (breast lump, breast pain, breast skin tethering of nipple discharge)
c. three other questions (lump in your next, night seats and venous thromboembolism) which are the same for men and women.

Current symptoms in women



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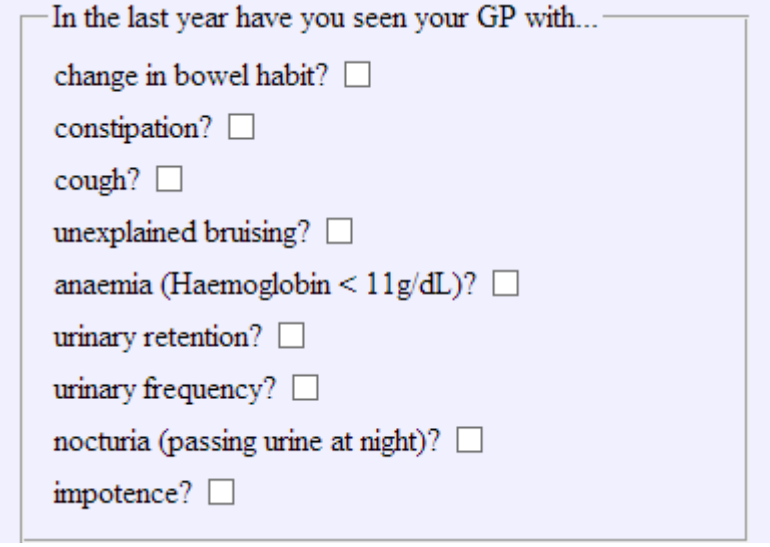
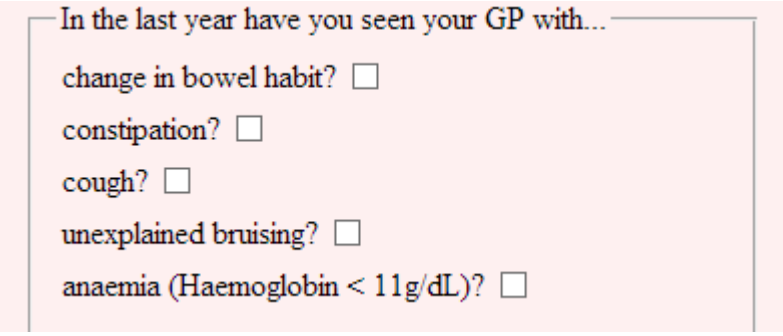
3.5 Symptoms for men in the last year

There are nine questions for men which relate to symptoms or factors which have been experienced anytime in the last 12 months and recorded into the GP records. These include



3.6 Symptoms for women in the last year

The following questions are relevant for women



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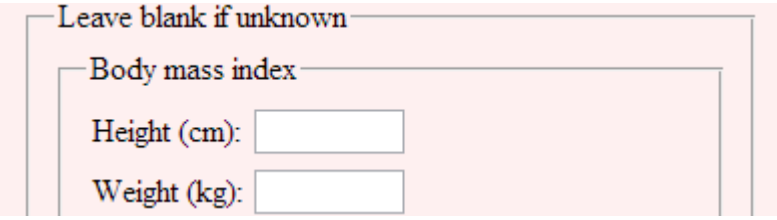
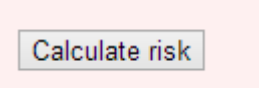
3.7 Body mass index

Finally, height and weight are entered to calculate body mass index. If this information is unknown it can be left blank and an estimated value based on the patient's age, sex, smoking status and diabetes status is used for the calculations



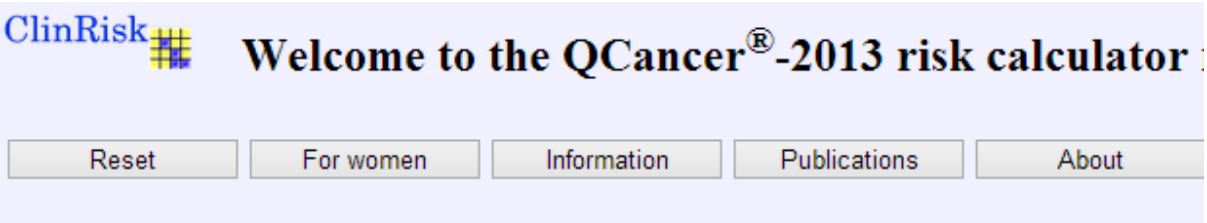
3.8 Calculate risk

Once all the information has been assembled, then use the calculate risk button to calculate the risk score. There are two buttons and either can be used.. One button is at the top of the screen and one at the bottom.



3.9 Reset button

The reset button will clear the check boxes and value boxes ready for the next calculation



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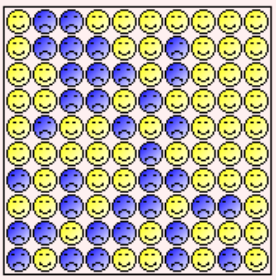
3.10 Understanding the results - women

- An asymptomatic 64 year older women who is a heavy smoker, who had a history of chronic obstructive airway disease and a family history of gastrointestinal cancer has a baseline risk of cancer of 3.36%.
- If the same woman also has abdominal pain, rectal bleeding and weight loss, then her absolute risk of a cancer as yet undiagnosed 36% as shown by the smiley chart.
- In other words, of a hundred similar patients, then 36 are likely to have a diagnosis of cancer and 64 will be clear of cancer.
- Note the calculator does not give a diagnosis of cancer.

In other words, in a crowd of 100 people with the same risk factors as you, 36 are likely to have a cancer as yet undiagnosed and 64 will not, as shown by the chart below.



Risk of a cancer as yet undiagnosed

Your score has been calculated using estimated data, as some information was left blank.

A typical person like you without any symptoms, prior illness or family history has a 1.25% risk of having a cancer as yet undiagnosed.

- There is also a table which gives the persons risk compared with the risk for a 64 year old women, who is a non-smoker, with no symptoms, prior illnesses, family history – this is 1.25%.
- The relative risk is 28.5, which is calculated by taking the woman's absolute risk (i.e. 35.65%) and dividing it by the risk of a 64 year old woman with no symptoms, prior illnesses, family history (1.25%).
- In other words, this woman, given her symptoms and risk factors, is 28 times more likely than another woman of her age to have a cancer as yet undiagnosed.

Your score

Your QCancer® score	35.65%
The score of a typical person with the same age and sex*	1.25%
Relative risk**	28.5

* This is derived from all people of your age and sex without any symptoms, prior illness or family history.

** Your relative risk is your risk divided by the typical person's risk.

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- The table also shows the absolute risk of cancer broken down by type. The results are rank ordered with the most likely cancer appearing at the top. In this example, of the 35 patients with cancer, 26 are likely to have colorectal cancer, 3 will have lung cancer and just under two will have pancreatic cancer.

Cancer	Type	Risk
No cancer		64.35%
Any cancer		35.65%
	colorectal	26.17%
	lung	3.45%
	other	2.28%
	pancreatic	1.64%
	gastro-oesophageal	0.67%
	ovarian	0.53%
	blood	0.29%
	breast	0.28%
	renal tract	0.24%
	uterine	0.05%
	cervical	0.04%

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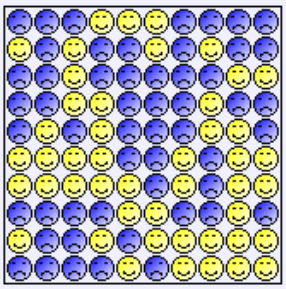
3.11 Understanding the results – men

- An asymptomatic 64 year old man who is a heavy smoker, who had a history of chronic obstructive airway disease and a family history of gastrointestinal cancer has a baseline risk of cancer of 4.2%.
- If the same man also has abdominal pain, rectal bleeding and weight loss, then his absolute risk of a cancer as yet undiagnosed 52.7% as shown by the smiley chart below.
- In other words, of a hundred patients, then 53 are likely to have a diagnosis of cancer and 47 will be clear of cancer. This is approximately equal to a one in two chance of having cancer.

You have a 52.69% risk of having a cancer as yet undiagnosed, and correspondingly, a 47.31% chance that you are clear.

In other words, in a crowd of 100 people with the same risk factors as you, 53 are likely to have a cancer as yet undiagnosed and 47 will not, as shown by the chart below.



Risk of a cancer as yet undiagnosed

- There is also a table which gives the man's risk compared with the risk for a 64 year old man, who is a non-smoker, with no symptoms, prior illnesses, family history – this is 1.75%.
- The relative risk is 30.1, which is calculated by taking the man's absolute risk (i.e. 52.69%) and dividing it by the risk of a 64 year old man with no symptoms, prior illnesses, family history (1.75%).
- In other words, this man, given his symptoms and risk factors, is 30 times more likely than another man of his age to have a cancer as yet undiagnosed.

Your score

Your QCancer® score	52.69%
The score of a typical person with the same age and sex*	1.75%
Relative risk**	30.1

* This is derived from all people of your age and sex without any symptoms, prior illness or family history.

** Your relative risk is your risk divided by the typical person's risk.

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- The table also shows the absolute risk of cancer broken down by type. The results are rank ordered with the most likely cancer appearing at the top. In this example, of the 53 patients with cancer, 38 are likely to have colorectal cancer, 5 will have lung cancer and 3 will have pancreatic cancer.

Cancer	Type	Risk
No cancer		47.31%
Any cancer		52.69%
	colorectal	38.45%
	lung	5.36%
	pancreatic	2.97%
	other	2.28%
	prostate	1.41%
	gastro-oesophageal	1.3%
	blood	0.51%
	renal tract	0.41%
	testicular	0%

4 Batch processing a practice population

- QCancer can also be used in 'batch processing mode' where the calculations are performed automatically using data already recorded in the electronic medical record.
- The QCancer batch processor is available as a standalone tool which can work on a standard comma separated file as specified in the associated document "QCancer-2013-Search_definition"
- Suppliers can also integrate a batch processing utility which can run against a GP practice population.
- This will result in risk calculations being generated for each patient, which can be stored in the medical record or an ancillary 'risk results' table.
- The resulting risk results can then be used to sort patients according by their overall cancer risk or risk of an individual type of cancer.
- The clinician can then start at the top of the list with the patient most at risk and undertake a structured case review
- For example, using the example above: A 64 year old man is a heavy smoker, who has a history of chronic obstructive airway disease and a family history of gastrointestinal cancer. He has new onset of abdominal pain, rectal bleeding and weight loss. His absolute risk of a cancer as yet undiagnosed 52.7% with the breakdown shown below.).

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Cancer	Type	Risk
No cancer		47.31%
Any cancer		52.69%
	colorectal	38.45%
	lung	5.36%
	pancreatic	2.97%
	other	2.28%
	prostate	1.41%
	gastro-oesophageal	1.3%
	blood	0.51%
	renal tract	0.41%
	testicular	0%

- In an integrated solution, then the clinician could be presented structured information on which diagnostic tests and referrals have been done with the dates and results.
- For example, if the patient is at high risk of colorectal cancer, then has the patient had a colonscopy, barium enema or been referred to a lower GI surgeon.
- If the patient is at high risk of lung cancer, then has he had a chest xray or CT chest?
- If the example patient has had colorectal and lung cancer excluded but remains symptomatic, then does he need further assessment to rule out pancreatic cancer (eg endoscopic ultrasound)

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