

Improving identification of Familial Breast & Colorectal Cancer & *how do we implement in General Practice?*

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The University of
Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

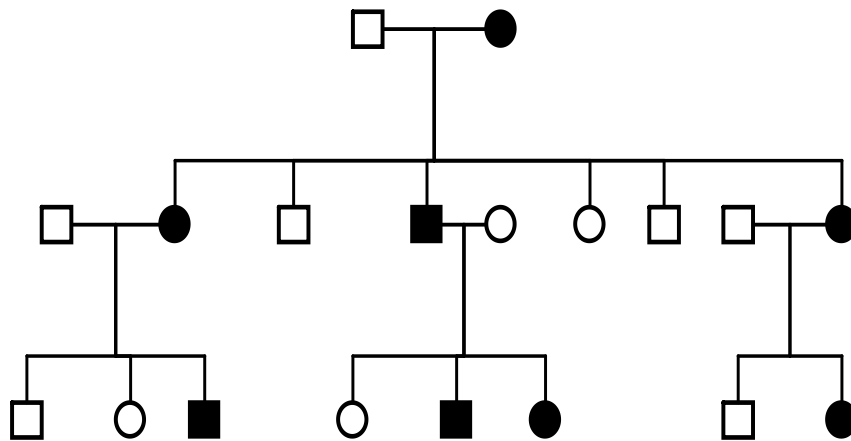
Familial breast cancer

The classification and care of women at risk of familial breast cancer in primary, secondary and tertiary care

How big an issue?

- **Breast cancer:** lifetime risk 8-10
- 1 in 5 cases have a **family history**
- Up to 3% breast cancers in **women** due to BRCA1 & BRCA2 mutation
- Up to 15% breast cancers in **men** due to BRCA1 & BRCA2 mutation (& prostate cancer)
- BRCA1 mutation: 60-90% lifetime breast cancer risk; 40-65% ovarian cancer risk

Dominant inheritance



- **Pattern**
 - Affected people in each generation
 - Males and females affected in approx. equal numbers
 - All forms of transmission seen, including male to male transmission
- **Dominant:** Needs only one copy of a gene pair to be altered to cause the disease

Rationale for management: *risk stratification*

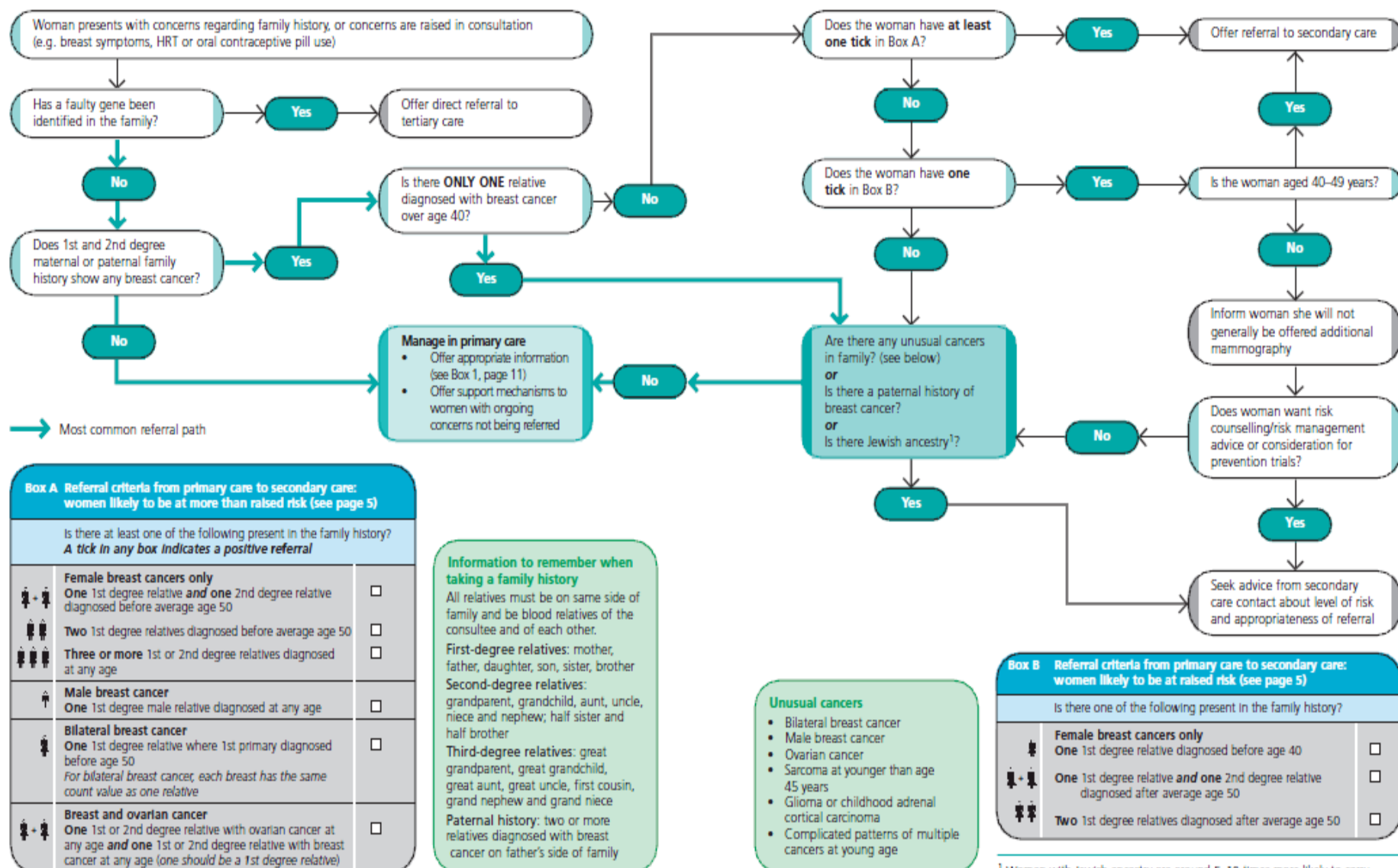
Breast cancer risk category	Definition of category		Probability of a breast cancer genetic mutation (BRCA1, BRCA2 or TP53 mutation)
	Lifetime breast cancer risk from aged 20	Breast cancer risk between age 40 and 50 years	
Near population risk	less than 17% (equivalent to less than 1 in 6)	less than 3%	Very low
Moderate risk	17% or a greater but less than 30% (equivalent to greater than 1 in 4)	a risk of 3–8%	Less than 10%
High risk	30% or greater (equivalent to greater or equal to 1 in 3)	a risk of greater than 8%	a 10% or greater chance of a faulty gene in the family

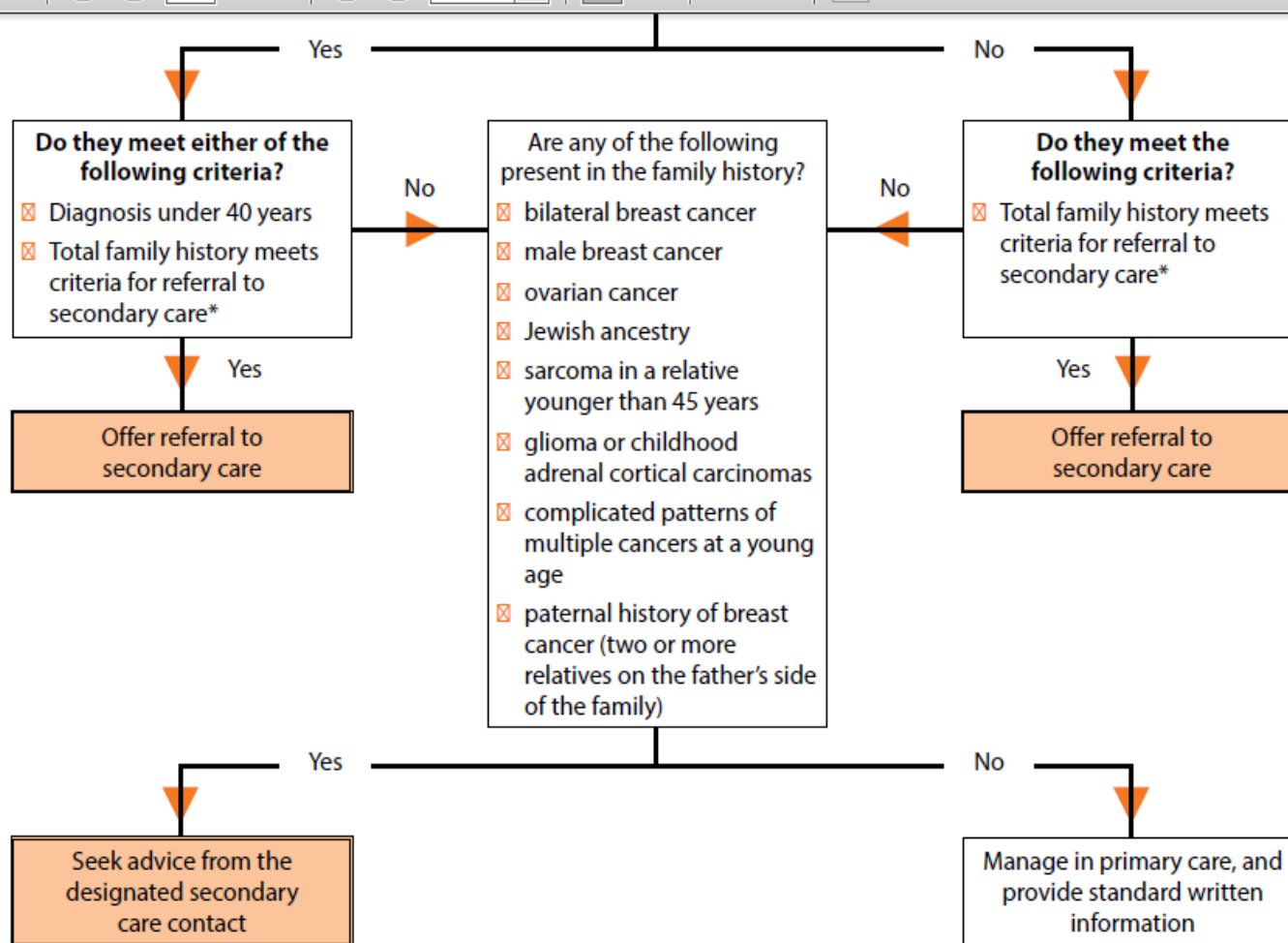
FH recommendations

- Detailed family history (FHx):
 - women with concerns about breast cancer risk
 - clinically relevant e.g. HRT, *?on registration*
- What information to collect:
 - Age at which diagnosed
 - Relationship to affected (paternal; maternal)
 - Ethnicity
 - Nature of cancer
 - *Gene mutation in family*

How collect & interpret family history information?
- discuss later

Primary care management





***Referral criteria to secondary care:**

- ☒ one first-degree female relative diagnosed with breast cancer at younger than age 40 years **or**
- ☒ one first-degree male relative with breast cancer at any age **or**
- ☒ one first-degree relative with bilateral breast cancer where the first primary was diagnosed at younger than age 50 years **or**
- ☒ two first-degree relatives, or one first-degree relative and one second-degree relative, diagnosed with breast cancer at any age **or**
- ☒ one first-degree or second-degree relative diagnosed with breast cancer at any age and one first-degree or second-degree relative diagnosed with ovarian cancer at any age (one of these should be a first-degree relative) **or**
- ☒ three first-degree or second-degree relatives diagnosed with breast cancer at any age

Improving FHx collection

- Self-administered questionnaire

THE ROYAL COLLEGE OF GENERAL PRACTITIONERS

NEW PATIENT REGISTRATION

Name _____
Forename _____
Date of Birth _____ Religion _____
Country of Birth _____ Tel No. _____
Single _____ Married _____ Divorced _____ Separated _____ Widowed _____

FAMILY HISTORY

Alive: Date of Birth - Any Serious Illness (If dead - age at death and cause)

Father _____

Mother _____

Brothers:

1 _____

2 _____

3 _____

Sisters:

1 _____

2 _____

3 _____

Husband/Wife/Partner _____

Children:

1 _____

2 _____

3 _____

4 _____

5 _____

Have any relations had any of the following:- (Tick as appropriate)

Tuberculosis ☐ Diabetes ☐ High Blood Pressure ☐ Heart Attack ☐

Stroke ☐ Asthma ☐ Hay Fever ☐ Migraine ☐

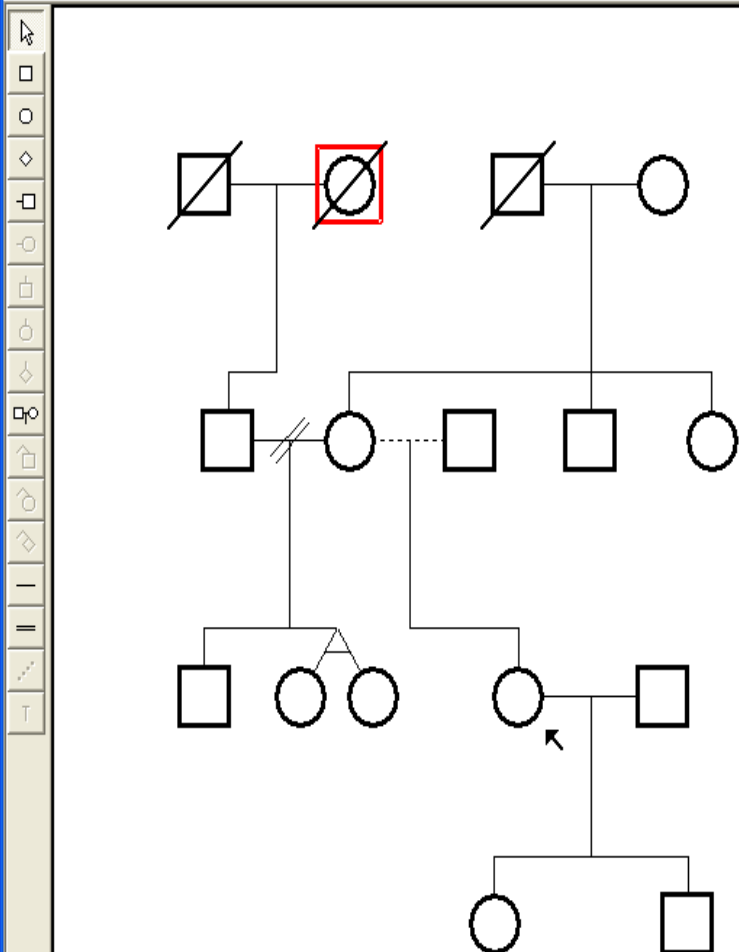
Depression ☐ Cancer ☐ Epilepsy ☐

If so, please give details below: _____

Interpreting Family History

- Decision support



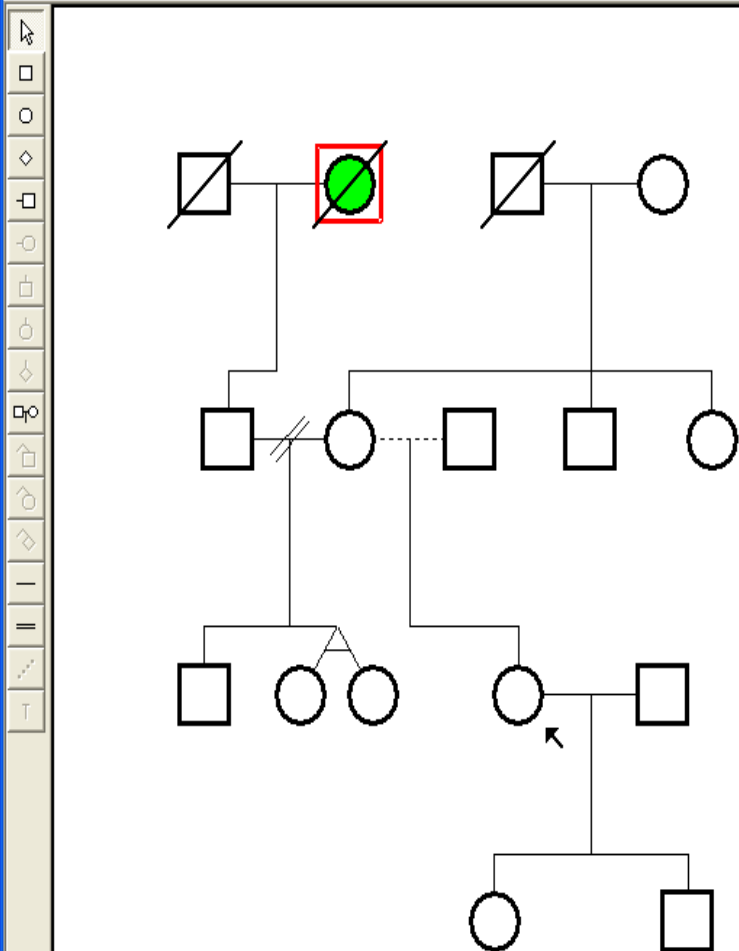


Family Member Details

General Disease Breast Ca Risk Factors

Disease	Genetics	Affected	Confirmed
Breast Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Colorectal Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Gynaecological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Haematological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Head & Neck Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Hodgkins Disease	<input type="checkbox"/>	No	<input type="checkbox"/>
Lung Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Myeloma	<input type="checkbox"/>	No	<input type="checkbox"/>
Other Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Ovarian Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Pancreatic Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Prostate Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Skin Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Unknown Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Upper GI Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Urological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>

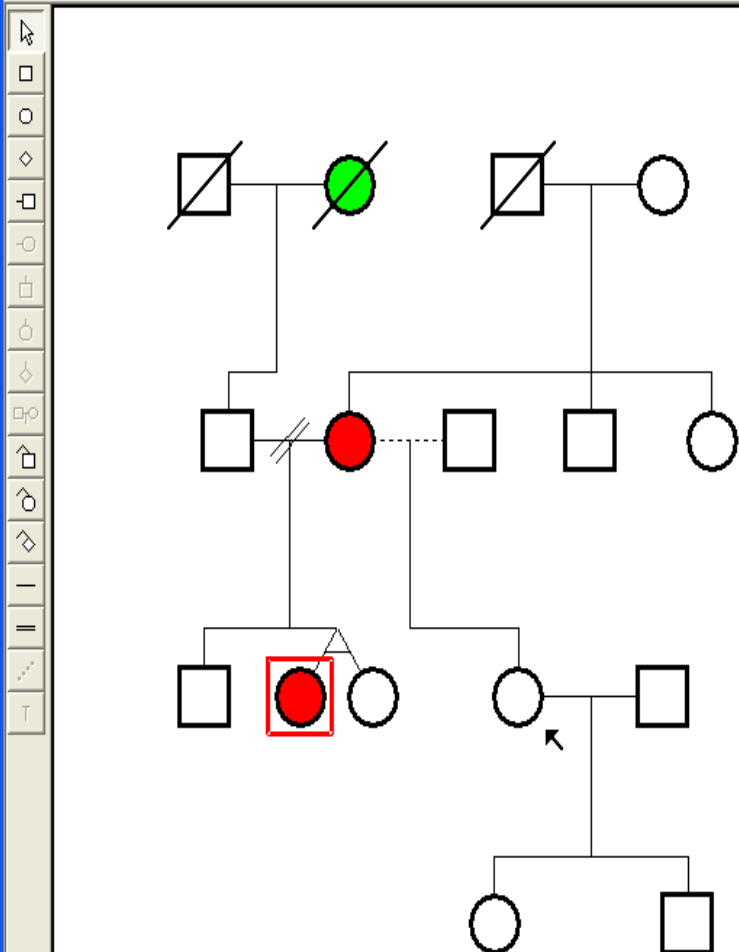
Add Diseases Affecting Family
Members



Family Member Details

General Disease Breast Ca Risk Factors Affected by Ovarian Ca

Disease	Genetics	Affected	Confirmed
Breast Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Colorectal Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Gynaecological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Haematological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Head & Neck Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
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Lung Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Myeloma	<input type="checkbox"/>	No	<input type="checkbox"/>
Other Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Ovarian Cancer	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Pancreatic Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Prostate Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Skin Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Unknown Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Upper GI Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Urological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>

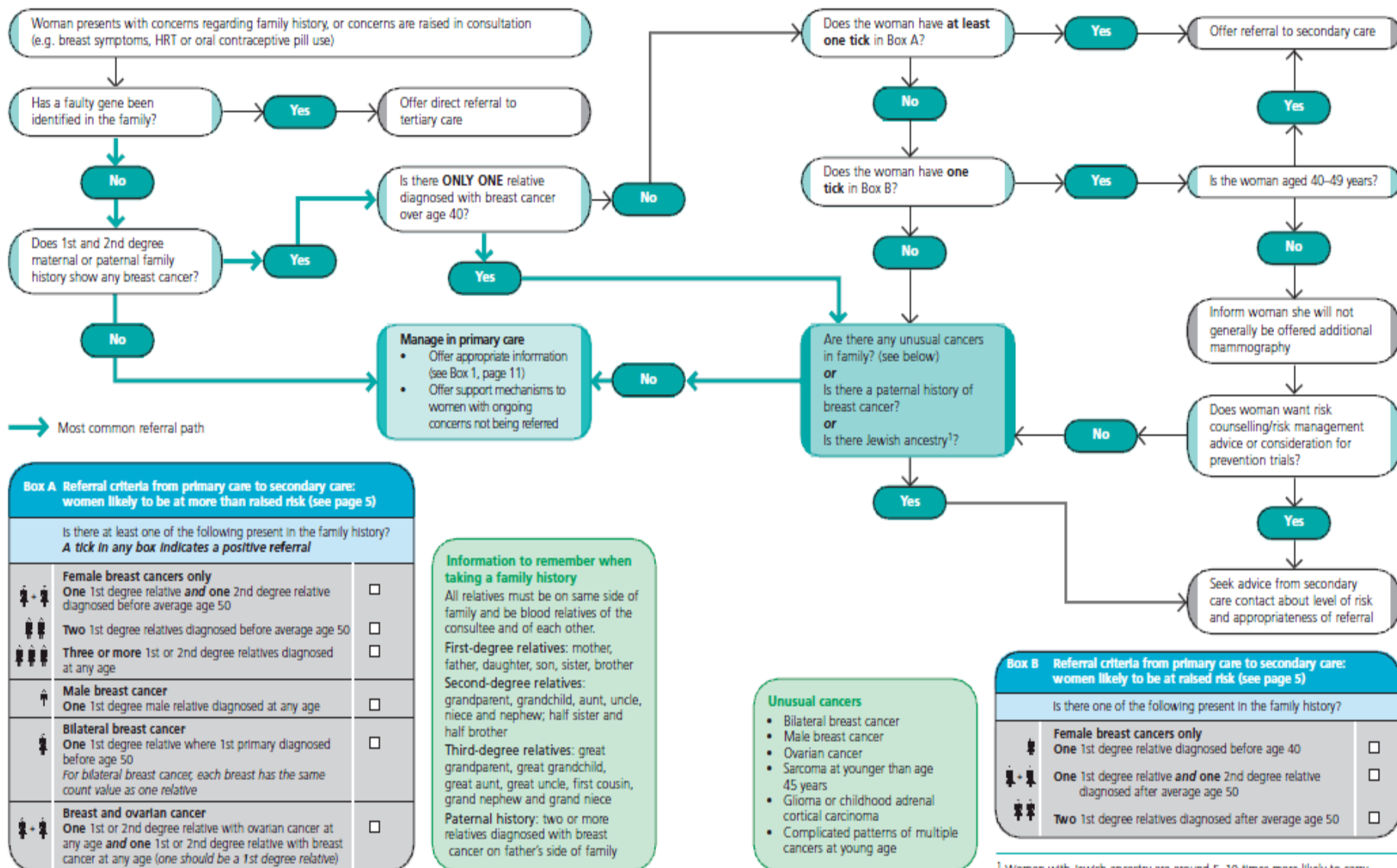


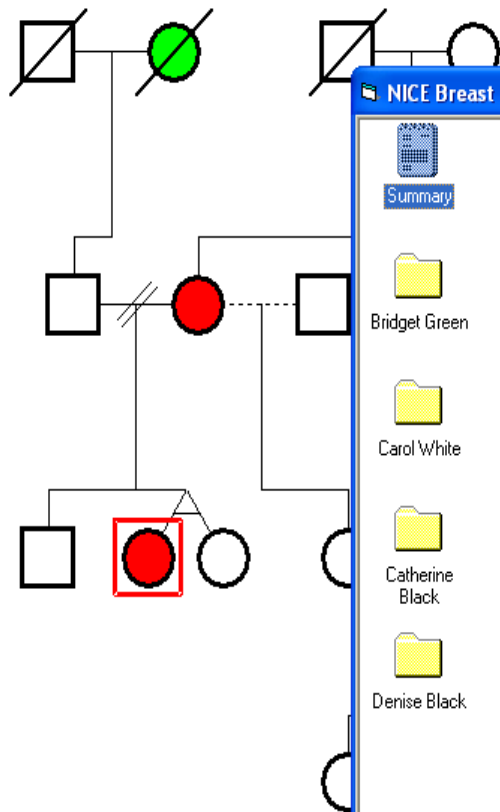
Family Member Details

General Disease Breast Ca Risk Factors Affected by Breast Ca

Disease	Genetics	Affected	Confirmed
Breast Cancer	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Colorectal Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Gynaecological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Haematological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Head & Neck Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Hodgkins Disease	<input type="checkbox"/>	No	<input type="checkbox"/>
Lung Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Myeloma	<input type="checkbox"/>	No	<input type="checkbox"/>
Other Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Ovarian Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Pancreatic Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Prostate Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Skin Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Unknown Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Upper GI Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Urological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>

Primary care management





NICE Breast Cancer Evaluation for Primary Care



Summary

Bridget Green

Carol White

Catherine Black

Denise Black

Example Family

Name	DOB	Action
Bridget Green	02-Jul-1946	Offer referral to secondary care
Carol White	17-Oct-1963	Offer referral to secondary care
→ Catherine Black	20-Feb-1970	Offer referral to secondary care
Denise Black	23-Nov-1990	Seek advice from secondary care contact

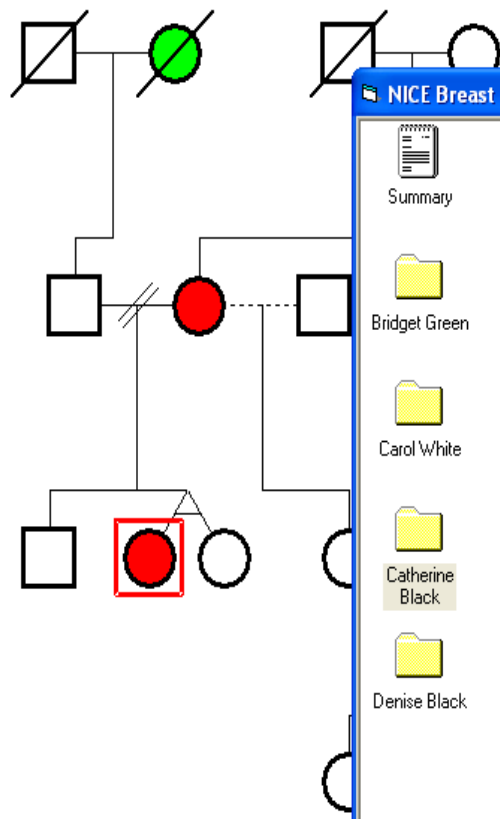
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Close

General Disease Breast Ca Risk Factors Affected by Breast Ca

Age at diagnosis 30

Bilateral



NICE Breast Cancer Evaluation for Primary Care

Catherine Black (20-Feb-1970)



Summary



Bridget Green



Carol White



Catherine Black



Denise Black

Summary

Offer referral to secondary care.

Box A Criteria (women likely to be at more than moderate risk)

Has one female 1st degree relative and one female 2nd degree relative diagnosed with breast cancer before average age 50.

Has three or more female 1st or 2nd degree relatives diagnosed with breast cancer at any age.

Box B Criteria (women likely to be at moderate risk)

Has two female 1st degree relatives diagnosed with breast cancer after average age 50.

Additional Criteria

1st and 2nd degree maternal or paternal family history shows breast cancer.

Has unusual cancers in the family.

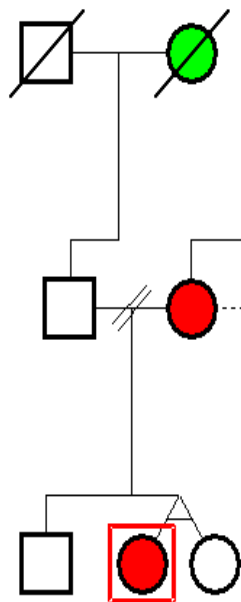
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General Disease Breast Ca Risk Factors Affected by Breast Ca

Age at diagnosis 30

Bilateral



Summary

Brenda White

Bridget Green

Carol White

Catherine Black

Claire White

IBIS Breast Cancer Risk Analysis

Example Family

Name	DOB	10 yr risk	Rel 10 yr risk
Brenda White (affected)	12-Jan-1940	11.91%	3.99
Bridget Green	02-Jul-1946	7.91%	2.87
Carol White	17-Oct-1963	7.08%	3.30
→ Catherine Black	20-Feb-1970	2.88%	2.34
Claire White (affected)	17-Oct-1963	19.08%	8.90
Denise Black	23-Nov-1990	0.04%	1.83

Print

Close

General Disease Breast Ca Risk Factors Affected by Breast Ca

Age at diagnosis 30

Bilateral

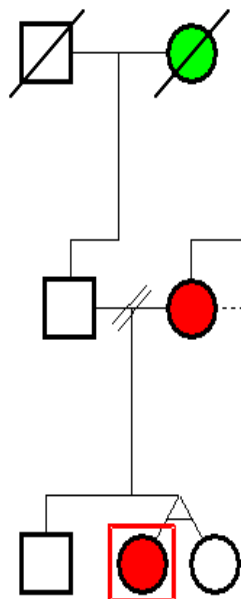
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IBIS Breast Cancer Risk Analysis

Catherine Black (20-Feb-1970)

Risk of carrying a genetic mutation

Genetic Mutation	Personal Risk	Population Risk	Relative Risk
No Mutation	92.46%	99.77%	0.93
BRCA1	1.21%	0.11%	11.03

Risk of developing breast cancer

By Age	Personal Risk	Population Risk	Relative Risk
37	0.00%	0.00%	n/a
38	0.18%	0.06%	2.90

Legend: ■ Individual Risk, ■ Population Risk

Print Close

General
 Disease
 Breast Ca Risk Factors
 Affected by Breast Ca

Age at diagnosis: 30

Bilateral: ☐

Prophylactic mastectomy: ☐

Prophylactic oophorectomy: ☐

Prophylactic salpingo-oophorectomy: ☐

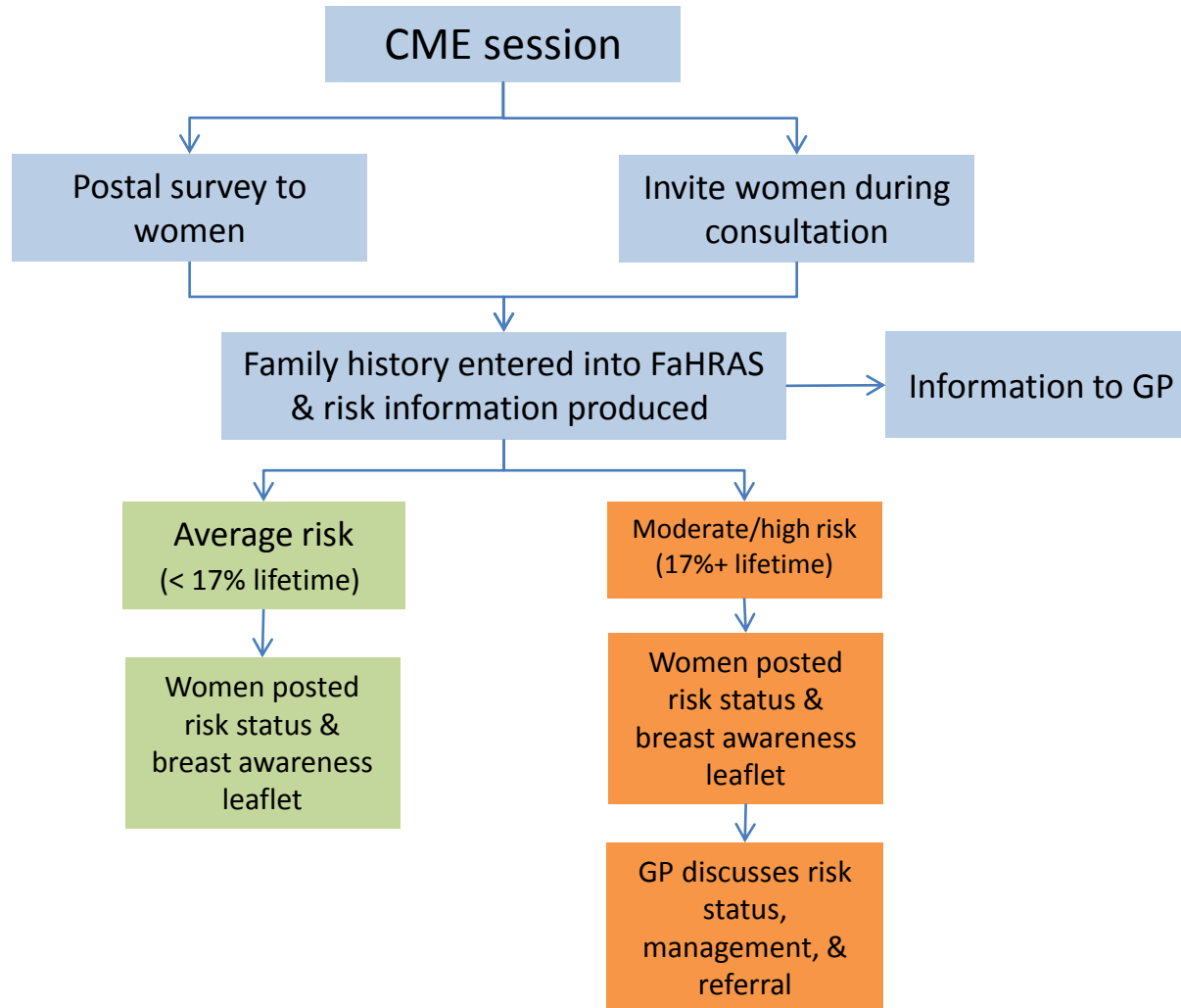
Prophylactic hysterectomy: ☐

Prophylactic bilateral mastectomy: ☐

Prophylactic bilateral mastectomy with oophorectomy: ☐

Prophylactic bilateral mastectomy with oophorectomy and hysterectomy: ☐

Process in feasibility study



Participant number (for research purposes)

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GENETIC RISK OF BREAST CANCER STUDY: FAMILY HEALTH QUESTIONNAIRE

This section asks about your IMMEDIATE RELATIVES				Do <u>not</u> give information about family members who are not your blood relatives e.g. step- or foster- brothers or sisters or children/ relatives by marriage		
Relationship to you	First name (optional)	Approximate age, or year of birth	Did relative have breast cancer, ovarian cancer or prostate cancer. Please state which cancer.	Age when cancer developed	If this person died, what was their age?	What was the cause of death?
Your mother						
Your father						
Your grandparents						
Your mother's mother						
Your mother's father						
Your father's mother						
Your father's father						

Online Family History Questionnaire


FaHRAS Risk Assessment x

www.fahras.co.uk/Questionnaire/Authenticated/User/Questionnaire/Questionnaire.aspx

FaHRAS for Primary Healthcare

[Familial Breast Cancer Risk Assessment]

- New Assessment
- Settings
- Change Password
- Users
- Event Log



1: Patient

2: Patient's Health

3: Relatives

4: Relative's Health

5: Any Other Information

Patient Details

Please enter the patient's details below.

Participant number:	<input type="text"/>
GP Name:	<input type="text"/>
Date Of Birth:	<input type="text"/> <input type="text"/> <input type="text"/>
Are they adopted:	<input type="text"/>
Are they a twin:	<input type="text"/>

Next >>

Dear GP

{Patient name} {Date of birth} {Patient Address}

Breast Cancer Risk Assessment: Moderate/high risk of familial breast cancer

Action: Offer secondary care referral

Family History

The patient has been found to be at moderate risk of familial breast cancer by the Familial History Risk Assessment Software (FaHRAS).

Reason for recommendation: has two first-degree relatives, or one first-degree and one second-degree relative, diagnosed with breast cancer at any age.

Recommendation

It is recommended that the patient be referred to the Breast Cancer Specialist Services for a further consultation. The patient has been posted a letter regarding her breast cancer risk status and has been asked to contact you to discuss her result

Participant Feedback

“...since completing this form I have just been diagnosed with breast cancer and I am due to have a mastectomy on the 16th April. If it wasn't for your survey this would probably remained undetected. I cannot thank you enough for originally contacting me.”

- 46 years, high risk

“... it's been identified that instead of starting mammograms at the age of 50, I'm starting them now at the age of 40 and it's only through participating ... that that's happened. And actually that might be a lifesaver.”

- 38 years, high risk



Further potential of FAHRAS

Case Scenarios from Colorectal Patients

Patient 1

Strong FH on maternal side;

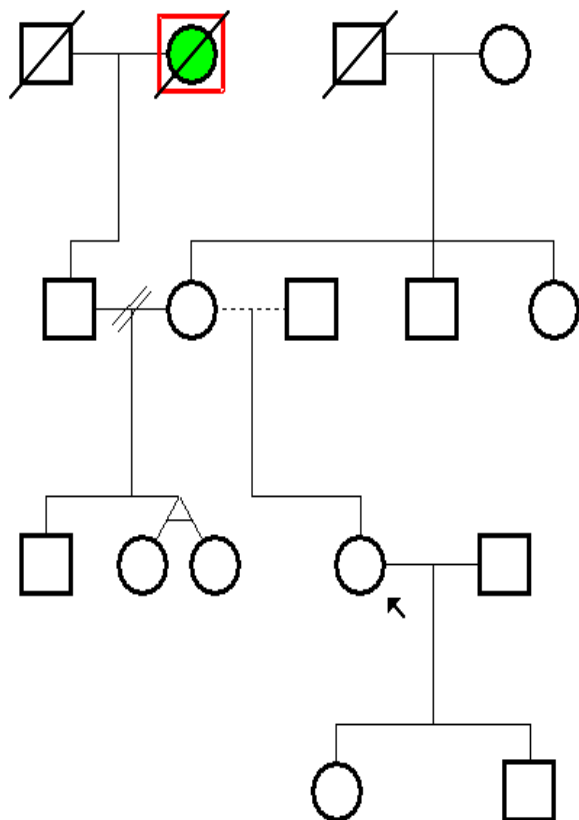
- *Maternal uncle bowel dx: 50, d: 50ish*
- *Maternal Aunt bowel dx: 80ish, died*
- *Maternal Aunt breast dx: 60ish d: 60ish,*
- *Maternal cousin bowel dx: 30, d: 30*
- *Maternal cousin bowel dx: 50 d: 50ish*
- *Another uncle died bowel not sure which side*

Patient 2

Strong FH on maternal side;

- *Mother breast cancer, dx: 62 d: 64*
- *Brother colon cancer, dx & d: 58*
- *Proband removal of polyps*





Family Member Details

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Colorectal Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Gynaecological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Haematological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Head & Neck Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Hodgkins Disease	<input type="checkbox"/>	No	<input type="checkbox"/>
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Unknown Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Upper GI Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>
Urological Cancer	<input type="checkbox"/>	No	<input type="checkbox"/>

What to do if a patient has a family history of bowel and related cancers.



Key

Green is low risk

Orange is moderate risk

Pink is moderate to high risk

Red is high risk

Number of close relatives with bowel cancer	Age of cancer diagnosis	Refer to FH clinic
1 (1 st degree)	= 45	✓
	>45	
1 (1 st degree)	Separate or multiple tumours at any age	✓
1 (1 st degree-polyps only)	More than one significant (>10mm) polyp under 50yrs	✓
2 (same side <u>or</u> both parents)	Average age = 70	✓
	>70	
2 (same side)*	Average age <50	✓
3 or more (same side)*	Any age	✓
Polyposis Coli	Positive family history	✓

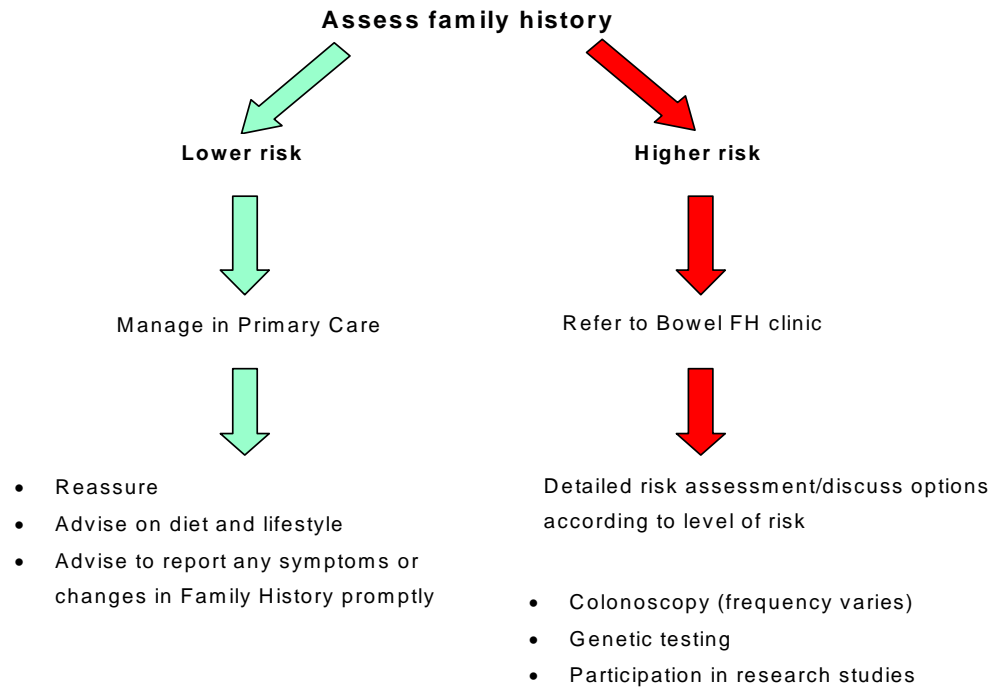
*Related cancers: When there is, in addition to at least one bowel cancer, a history of endometrial, ovarian, gastric, biliary, renal, small bowel or brain cancer in other close relatives.

- A close relative is any first or second degree relative (parent, brother, sister, child, aunt, uncle, grandparent).
- The family history should be of affected **blood relatives** through **either** the **maternal or paternal side** of the family.
- For **enquiries** about a patient's family history, or if there is a history of unusual cancers, please contact the Clinical Genetics Service on : **0115 9627728**.

Family History of Bowel and related Cancers

Management Summary

Patient presents with a Family History of Bowel or related cancers



In Nottingham, referrals should be made to the Family History Clinic, Department of Surgery, E Floor, West Block, QMC.

Online Family History Questionnaire


FaHRAS Risk Assessment x

www.fahras.co.uk/Questionnaire/Authenticated/User/Questionnaire/Questionnaire.aspx

FaHRAS for Primary Healthcare

[Familial Breast Cancer Risk Assessment]

- New Assessment
- Settings
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1: Patient

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Patient Details

Please enter the patient's details below.

Participant number:	<input type="text"/>
GP Name:	<input type="text"/>
Date Of Birth:	<input type="text"/> <input type="text"/> <input type="text"/>
Are they adopted:	<input type="text"/>
Are they a twin:	<input type="text"/>

Next >>

74 Colorectal risk evaluator, version 0.2beta

Age: 50 ☐ Male ☐ Female

Height (m): ?

Weight (kg): ?

Exercise (METS per week): ?

Alcohol (units per week): ?

Pack years: ?

☐ Ever smoked? ?

Asprin years: ?

☐ Low-dose aspirin (>3yr)? 0

Age diagnosed: ?

☐ Inflammatory-bowel disease? ?

☐ Type 2 diabetes?

Family history of bowel cancer

Relatives to add	Included
Parent	
Sibling or Child	
2-d rel	

Age affected: ?

