Improving Early Diagnosis of Cancer using QCancer in EMIS Web

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Disclosures

Director QResearch (non-profit venture with EMIS Health,)
Founder & shareholder ClinRisk Ltd (software company)
1. The QResearch Database

2. QCancer – early diagnosis research

3. QCancer - Implementation in EMIS Web
Primary care data collection in the UK

Proportions of general practices in the UK using different computer systems
QResearch founded in 2003
- Collaboration with EMIS Health
- Anonymised data > 1500 practices
- Individual data > 30 million patients
- Historical Data > 25 years
- World beating resource for innovative medical research
- Moved to Oxford 2019
- Strong governance controls with patient & practice representation
**GP Data**
- Demographics
- Prescriptions
- Diagnoses
- Lab investigations
- Clinical values
- Consultations
- Symptoms
- referrals

**HES Data**
- Admissions
- A&E episode
- Outpatients
- Critical Care
- Maternity
- Operations (OPCS)
- Some diagnostics
GP Data
- Demographics
- Prescriptions
- Diagnoses
- Lab investigations
- Clinical values
- Consultations
- Symptoms
- Referrals

HES Data
- Admissions
- A&E episode
- Outpatients
- Critical Care
- Maternity
- Operations (OPCS)
- Some diagnostics

Cancer registry
- Date diagnosis
- Type cancer
- Morphology
- Grade
- Stage
- Route to diagnosis
- Treatment
- Size
<table>
<thead>
<tr>
<th>GP Data</th>
<th>HES Data</th>
<th>Cancer registry</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>Admissions</td>
<td>Date diagnosis</td>
<td>Date of death</td>
</tr>
<tr>
<td>Prescriptions</td>
<td>A&amp;E episode</td>
<td>Type cancer</td>
<td>Up to 15 causes death</td>
</tr>
<tr>
<td>Diagnoses</td>
<td>Outpatients</td>
<td>Morphology</td>
<td>ICD10 codes</td>
</tr>
<tr>
<td>Lab investigations</td>
<td>Critical Care</td>
<td>Grade</td>
<td></td>
</tr>
<tr>
<td>Clinical values</td>
<td>Maternity</td>
<td>Stage</td>
<td></td>
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<td>Consultations</td>
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<td>Symptoms</td>
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<td></td>
</tr>
<tr>
<td>referrals</td>
<td></td>
<td>Size</td>
<td></td>
</tr>
</tbody>
</table>
EMIS Web QResearch data sharing agreement

Use this training handout to help you activate the QResearch data sharing agreement, to ensure your practice is contributing to the QResearch database.

Access Data Sharing Manager

Note: To access and use Data Sharing Manager, you must have Role Based Access Control (RBAC) activity B0109 Local Restricted System Administration in your role profile. If you need to update your role profile to add this activity, follow the instructions in the Users section of UG148 EMIS Web Organisation configuration.

To access Data Sharing Manager, do one of the following:

- Click point to Configuration, and then click Data Sharing Manager.
- If you have customised the quick access toolbar, click .
- If you are already in the Configuration module, click the Data Sharing Manager tab.
- From anywhere else in the system, press ALT, press E, press Z, and then press S.
- On the EMIS Web homepage, click the link, if configured.

Note: The Data Sharing Manager option is not available if you do not have any agreements in place.

Activate the QResearch sharing agreement

1. Access Data Sharing Manager.
2. If required, on the Data Sharing Manager ribbon, click My Agreements.
3. At the bottom of the navigation pane, click the tab for the appropriate agreement type (Data Distribution).

Existing agreements are listed in the navigation pane, with a green tick beside active agreements and a red cross beside agreements that have been created, but not yet activated.

- Currently all practices in Oxfordshire EMIS
- 50% contribute to QResearch
- Keen to expand so every practice contributes
- Opportunity to do more localized research
- Help improve care pathways in Oxford
Risk Prediction Tools: research since 2007

- Developed, validated and implemented suite of widely used novel risk prediction tools
  - Prognostic - Risk of future cancer
  - Diagnostic - Risk of current cancer
  - Outcomes - Prognosis following cancer diagnosis

- Enables informed consent - improved risk communication
- Enables risk stratification – target resources to highest risk most likely to benefit from interventions
Early diagnosis of cancer: The problem

• 300,000 new cancers each year
• UK has relatively poor track record
• Partly due to late diagnosis with estimated 7,500+ lives lost annually
• Later diagnosis due to mixture of
  – Late presentation by patient (lack awareness)
  – Late recognition
  – Delays in secondary care
• Earlier diagnosis cancer improves chances of survival
What’s the problem in General Practice?

• Many patients present with symptoms
• Most people with symptoms won’t have cancer
• Need to decide which patients to investigate
QCancer – what it needs to do

1. Accurately predict individual risk of multiple cancers using on multiple risk & symptoms
2. Discriminate between patients
4. Educational tool for sharing information with patient.
• Representative cohort from QResearch 2.5 million men & women aged 25-89 years
• Cancer outcome - all new diagnoses on GP record or linked record in 2 years
• Identify key risk factors
• Identify key symptoms
• Established methods to develop risk prediction algorithm
• Measure of absolute risk of any cancer + type
Q Cancer - overall risk & risk 12 types cancers

- Lung
- Pancreas
- Renal
- Ovary
- Colorectal
- Gastro
- Testis
- Cervix
- Breast
- Prostate
- Blood
- Uterus

- These accounts for 85% cancers
- Plan to extend to rarer cancers when sufficient data
Key Risk Factors in QCancer

Demographics
- Age
- Sex
- Smoking status
- Alcohol use
- Deprivation score
- Family history of cancer

Co-morbidities
- COPD
- Endometrial hyperplasia/polyp
- Chronic pancreatitis
- Type 2 diabetes
- Anaemia (HB < 11g/DL)
- Venous thromboembolism
Key Symptoms in Model

- Loss of appetite
- Unintentional weight loss
- Indigestion +/- heart burn
- Dysphagia
- Abdominal pain or swelling
- Constipation
- Night sweats
- Cough
- Neck lump

- Haemoptysis
- Haematemesis
- Haematuria
- Rectal bleeding
- Haematuria
- Unexplained bruising

- Vaginal Bleeding
- Breast lump
- Breast pain
- Nipple changes

- Genito-Urinary symptoms (men)
  - Retention
  - Nocturia
  - Frequency
  - Impotence
  - Testicular lump

- General
- Bleeding
- Women
- Men
Validation of QCancer

- Essential to demonstrate the tools work and identify right people in an efficient manner

- Tested performance
  - ✓ separate sample of QResearch practices
  - ✓ external dataset (Vision practices)

- Good at identifying those who do and don’t have cancer

- Good at estimating level of risk

- Real world testing with 500+ GP practices by Macmillan and CRUK

www.qcancer.org
Using QCancer in EMIS Web

What is available in EMIS Web?

link

1. QCancer Alert Protocol released *inactive*.
2. Complete QCancer Diary Entry protocol released *inactive*.
3. QCancer Symptom Checklist template released *active*.
4. QCancer component calculation for use in templates.
5. The option to batch add the QCancer calculation.
6. A suite of searches and reports for safety netting, follow up and outcomes.

www.qcancer.org
Complete Diary entry protocol

- **Name:** Complete QCancer Diary entry
  - **Description:** Clears down diary entry - required with new patient.
  - **Type:** Protocol

- **Name:** QCancer Alert Protocol
  - **Description:** Includes outcome and follow up alerts.
  - **Type:** Protocol Alert

- **Name:** QCancer Symptoms and Follow Up
  - **Description:** Updated with Outcome/Follow Up page.
  - **Type:** Template
The Alert Protocol

You'll find the QCancer alert protocol in the EMIS Library folders:
EMIS Library > EMIS Protocols > QCancer & Morphology

Once the protocols are active, if you are a clinical practitioner i.e. GP or Nurse Practitioner, any QCancer risk score alerts are displayed in the alert box in the lower right corner of the screen as follows:

An alert featuring the QCancer risk score is displayed if a patient has any site specific score of 2% or greater.
If the QCancer score has increased by 0.1% or more since the last time the score was recorded, the alert will change accordingly.

Double click on the alert to launch the QCancer Symptom Checklist template to record any symptoms. You can also run the template from the ribbon.
The QCancer Symptoms and Follow Up template

1st page of template has 5 sections to record symptoms and calculate the score.

Click Calculate to display the QCancer risk score. Add further symptoms using the template, and then click Calculate to recalculate.
You have a 8.79% risk of having a cancer as yet undiagnosed.

Data used to calculate the QCancer Score:
- Townsend score: 0 (substitute value)
- Smoking status: Heavy Smoker
- BMI: 25.3 kg/m² (substitute value)
- Alcohol category: Three or more units per day
- Heartburn or indigestion: No
- Family History of Gastrointestinal Cancer?: Yes
- Family History of Breast Cancer?: No
- Family History of Ovarian Cancer?: No
- Endometrial hyperplasia or Polyps?: No
- Postmenopausal bleeding?: No
- Irregular Menstrual Bleeding?: No
- Vaginal bleeding after sex?: No
- Breast lump?: No
- Breast skin tethering or nipple discharge?: No
- Breast pain?: No
- Chronic Pancreatitis?: No
- Type 2 Diabetes?: No
- Chronic obstructive Airways Disease (COPD)?: No
- Loss of appetite?: No
- Unintentional weight loss?: No
- Abdominal pain?: No
- Abdominal swelling?: No
- Difficulty swallowing?: No
- Rectal bleeding?: No
- Blood in your urine?: No
- Blood when you vomit?: No
- Blood when you cough?: No
- Lump in your neck?: No
- Night sweats?: No
- Venous Thromboembolism?: No
- Change in bowel habit?: Yes
- Constipation?: Yes
- Cough?: No
- Unexplained weight loss?: No
- Anaemia?: No

Individual cancer risk scores:
- No Cancer: 91.21%
- Any Cancer: 0.79%
- Colorectal: 2.03%
- Lung: 1.70%
- Other: 1.45%
- Bladder: 1.31%
- Breast: 0.83%
- Pancreatic: 0.56%
- Gastro-Oesophageal: 0.37%
- Ovarian: 0.22%
- Renal Tract: 0.20%
- Uterine: 0.08%
- Cervical: 0.03%

© Cancer Research UK 2004
## QCancer follow up template

### Referral

<table>
<thead>
<tr>
<th>Option</th>
<th>Text</th>
<th>No previous entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 week rule referral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine referral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No referral - reassurance only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Further Investigation

- Blood test requested: Text
- Plain X-ray requested: Text
- Ultrasound scan requested: Text
- CAT scan requested: Text
- Refer for MRI: Text
- Referral for endoscopy: Text
- Referral for other investigation: Text

### Follow up

<table>
<thead>
<tr>
<th>Option</th>
<th>Follow Up</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>QCancer risk assessment follow-up</td>
<td>04-Feb-2016</td>
<td>21-Jan-2016</td>
</tr>
<tr>
<td>Complete QCancer follow up diary entry</td>
<td></td>
<td>14-Jan-2016</td>
</tr>
</tbody>
</table>
The following suite of searches and reports has been added to the EMIS Library to support follow up care. These profile investigation and follow up of patients with the coded QCancer risk score.

The searches also identify patients without the recorded referral, reassurance or follow up:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with a recorded QCancer Score in past 6 months</td>
<td></td>
</tr>
<tr>
<td>Patients with a QCancer risk assessment follow up set</td>
<td></td>
</tr>
<tr>
<td>QCancer Risk Assessment Follow up Due in next week</td>
<td></td>
</tr>
<tr>
<td>QCancer Risk Assessment Follow up Overdue</td>
<td></td>
</tr>
<tr>
<td>QCancer individual score above 2% in past 6 months</td>
<td></td>
</tr>
<tr>
<td>NO recorded investigation at time of QCancer Score greater than...</td>
<td></td>
</tr>
<tr>
<td>NO recorded referral or reassurance at time of QCancer Score m...</td>
<td></td>
</tr>
<tr>
<td>QCancer Score further investigated at time of QCancer Score</td>
<td></td>
</tr>
<tr>
<td>Investigation arranged due to QCancer Score</td>
<td></td>
</tr>
<tr>
<td>QCancer Score referred or reassured at time of QCancer Score</td>
<td></td>
</tr>
<tr>
<td>Referral/reassurance as a result of QCancer Score</td>
<td></td>
</tr>
<tr>
<td>Subsequent diagnoses of Cancer following coded QCancer Score</td>
<td></td>
</tr>
<tr>
<td>QCancer Score prior to Cancer diagnosis</td>
<td></td>
</tr>
</tbody>
</table>
## Investigation arranged due to QCancer Score

<table>
<thead>
<tr>
<th>Patient Details</th>
<th>Latest QCancer Score</th>
<th>Blood Test Requested</th>
<th>Plain x-ray requested</th>
<th>USS Requested</th>
<th>CAT Scan Requested</th>
<th>Refer for MRI</th>
<th>Refer for Endoscopy</th>
<th>Refer for other investigation</th>
<th>Due Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAKER, Keith (Mr)</td>
<td>01-Jan-2016</td>
<td>5.97</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>20-Jan-2016</td>
</tr>
<tr>
<td>SMITH, Robert (Mr)</td>
<td>29-Oct-2015</td>
<td>3.53</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

## QCancer Score prior to Cancer diagnosis

<table>
<thead>
<tr>
<th>Patient Details</th>
<th>QCancer Score prior to diagnosis</th>
<th>Cancer Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOOTH, Rachel (Ms)</td>
<td>07-Nov-2012</td>
<td>0.14</td>
</tr>
<tr>
<td>BAKER, Keith (Mr)</td>
<td>01-Jan-2016</td>
<td>5.97</td>
</tr>
</tbody>
</table>

## Referral/reassurance at time of QCancer Score

<table>
<thead>
<tr>
<th>Patient Details</th>
<th>Latest QCancer Score</th>
<th>2 Week Referral</th>
<th>Referral</th>
<th>Reassurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAKER, Keith (Mr)</td>
<td>01-Jan-2016</td>
<td>5.97</td>
<td>20-Oct-2015</td>
<td>2 week rule referral - colorectal</td>
</tr>
<tr>
<td>GREENWOOD, Stuart (Mr)</td>
<td>29-Oct-2015</td>
<td>0.47</td>
<td>29-Oct-2015</td>
<td>Yes</td>
</tr>
<tr>
<td>ALEXANDER, Sheila (Ms)</td>
<td>04-Feb-2016</td>
<td>28.29</td>
<td>04-Feb-2016</td>
<td>Yes</td>
</tr>
<tr>
<td>SMITH, Robert (Mr)</td>
<td>29-Oct-2015</td>
<td>3.53</td>
<td>29-Oct-2015</td>
<td>Yes</td>
</tr>
</tbody>
</table>
QCaner Batch Add

- Similar to QRISK2 which is in 95% of GP practices—automatic calculation of risk for all patients in practice based on existing data.
- Safety netting - Identify patients with symptoms/adverse risk profile without follow up/diagnosis
- Enables systematic recall or further investigation
- Systematic approach - prioritise by level of risk

www.qcancer.org
• Professors Coupland, Collins and Altman
• University of Nottingham
• GP practices
• EMIS Health
• ClinRisk Ltd (software)
• Macmillan Cancer Research
• CRUK
Thank you for listening & any questions