Rapid cancer diagnosis for patients with vague symptoms

Welsh Health Economics Support Service and Swansea Bay University Health Board supporting value-based health care

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A collaborative project

→ Wales Cancer Network provided funds to establish two pilot rapid diagnosis centres (RDC) for people with vague symptoms suspicious of cancer.

→ WHESS researchers, based at Swansea University, gave initial advice (funded by HCRW) and undertook a health economic evaluation of the RDC at Swansea Bay University Health Board.

→ The evaluation was funded by Cancer Research UK.
The RDC...

- Pilot evaluations for a ‘one-stop’ clinic based on a Danish model of care coordinated via the Wales Cancer Network
- The RDC model in SBUHB is based at NPT hospital within selected GP clusters
  - Rapid access via GP referral for vague symptoms suspicious of cancer not meeting criteria for urgent referral
  - MDT service including access to CT
  - Patients receive diagnosis, refer back to GP or specialist onwards referral on ‘same day’
The aim of the economic evaluation

To estimate the costs and consequences of the Rapid Diagnosis Centre in improving outcomes compared to usual care for people with vague/non-specific symptoms that could be due to cancer (but do not fit USC referral pathway)
Methods – Overview

→ Build a discrete event simulation model to estimate the **costs, waiting times and impact on patient quality of life** of the RDC in the diagnosis of patients with non-specific symptom suspicious of cancer **between referral and diagnosis**.

→ Identify a suitable and **relevant comparator** together with the RDC team.

→ Undertake a patient flow analysis to estimate the **impact of changes to the service on patient waiting time** during their RDC appointment.
Working Together to Deliver

→ This was the **first of its kind** evaluation.

→ The challenges of getting real-world data required **extensive collaboration between researchers and the RDC team**.

→ Working in partnership enabled the researchers to design and deliver a **research-led, analysis-driven evaluation** for a local service.

→ Our shared learning was fed back through a range of events across Wales and the UK with **joint presentations** given.
Methods – Input parameters

→ Routine data from all RDC NPT patients up to May 2018 (n = 189):
  • RDC attendance, tests, outcome, further investigations, follow up
  • Cost of running RDC on a monthly basis

→ Comparator data (n = 85):
  • Healthcare resource use and costs of all investigations between referral and diagnosis (hospital data hand-searched)

→ Patient quality of life (from published literature)
The results of the economic evaluation

The RDC addresses an unmet need and provides excellent value for money.
Results – Time spent at RDC

- Patients spend just over 3 hours at RDC clinic (if they have a suspicion of cancer diagnosis)
- **Just under 2 ¾ hours** if they either have a different diagnosis, the doctors need to investigate further or if they are discharged to the GP.
- Queuing times are between **0.28 minutes and 37 minutes** (95% CI: 15.20 to 15.53) depending on number of patients seen per clinic.
- Patients diagnosed with cancer wait on average **15.29 minutes (95% CI: 14.50 to 16.08)** for the CNS appointment post cancer diagnosis.
## Results – Time to diagnosis

<table>
<thead>
<tr>
<th>Time to diagnosis (SD)</th>
<th>Derived from:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean time to RDC diagnosis (days)</td>
<td>5.90 (3.44)</td>
</tr>
<tr>
<td></td>
<td>RDC routine data (up to May 2018)</td>
</tr>
<tr>
<td>Mean time to diagnosis RDC + further investigations (days)</td>
<td>40.76* (27.96)</td>
</tr>
<tr>
<td></td>
<td>RDC routine data (up to May 2018)</td>
</tr>
<tr>
<td>Mean time to diagnosis comparator arm (days)</td>
<td>84.22 (65.27)</td>
</tr>
<tr>
<td></td>
<td>NPT hospital records</td>
</tr>
</tbody>
</table>

*If 4 outliers are removed, this decreases to 33.85 days. SD=standard deviation
**Results – Implementation costs**

Including total staff costs per half-day clinic, CT scan, any additional tests (including blood, urine and faecal tests, echocardiograms, electrocardiograms and MRIs)

<table>
<thead>
<tr>
<th>Number of patients per clinic</th>
<th>RDC cost per patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 patient</td>
<td>£2,758.05</td>
</tr>
<tr>
<td>2 patients</td>
<td>£1,438.13</td>
</tr>
<tr>
<td>3 patients</td>
<td>£998.16</td>
</tr>
<tr>
<td>4 patients</td>
<td>£778.17</td>
</tr>
<tr>
<td>5 patients</td>
<td>£646.18</td>
</tr>
</tbody>
</table>
Healthcare cost between referral and diagnosis

<table>
<thead>
<tr>
<th>Outcome category</th>
<th>Mean cost per RDC patient (SD) n=189</th>
<th>Cost per comparator patient (SD) n=85</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on 5 patients per clinic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer diagnosis</td>
<td>£646.18</td>
<td>£2,396.99 (£2,106.96)</td>
<td>-£1,750.81</td>
</tr>
<tr>
<td>Other diagnosis</td>
<td>£646.18</td>
<td>£871.43 (687.69)</td>
<td>-£225.25</td>
</tr>
<tr>
<td>No serious pathology found</td>
<td>£646.18</td>
<td>£515.01 (£138.94)</td>
<td>£131.17</td>
</tr>
<tr>
<td>Further investigations</td>
<td>£1,036.28 (£214.27)</td>
<td>£953.07 (£381.42)</td>
<td>£83.20</td>
</tr>
</tbody>
</table>
Cost-effectiveness of the RDC

RDC is less costly and more effective compared to usual care (referral to USC pathway followed by downgrade).
Summary: The RDC...

- Addresses an unmet need and provides excellent value for money.
- Is less costly and more effective than usual care when run at (or near) full capacity.
- Reduces mean time until diagnosis by 78 days for patients diagnosed during RDC and 43 days for patients requiring further investigations after their RDC appointment.
The Benefits of This Work

→ The RDC was **established as a permanent service** within SBUHB - with our evidence key to the business case made.

→ Patients and GPs now have access to a new service which can help to **improve outcomes for people with cancer** within the local region.

→ Demonstrates how **health economics can support our NHS colleagues** in informing the value of new innovations.
Thanks!

Any questions?