
Mr Brian Hodgkins

Please note: Some changes have been made for the purpose of publication
Colorectal Cancer Summit working party

Chairs:
Geoff Chong
Brian Hodgkins

Members:
Andrew Bui       Paul McMurrick
David Deutscher  Paul Mitchell
Ian Faragher     Heinrich Schwalb
Marcus Foo       Jeremy Shapiro
Peter Gibbs      Bruce Stewart
Neil Jayasuriya  Neil Strugnell
Mathew Leong     Zee Wan Wong

Data analysis:
CCV / DHHS
• Dr Luc te Marveld
• Ella Stuart

Victorian Tumour
Summits project team:
• Mirela Matthews
• Rebecca Miller
• Amy Sutherland
• Claire Porter

Aim:
• Discuss variations in care
• Victorian population perspective
• Variations in local approach
Unwarranted variations

Identify State-wide summit

Measure Local & state-wide

Investigate Local variations

Change Clinical teams / MDMs
Colorectal cancer optimal care pathway (OCP)

Prevention and early detection

Presentation, initial investigations and referral

Diagnosis, staging and treatment planning

Treatment

Care after initial treatment and recovery

Managing recurrent and residual disease

End-of-life care
DHHS linked cancer data

- Victorian Cancer Registry (VCR) 2011 – 2015
- Hospital in-patient data (VAED) July 2006 – March 2017
- Radiotherapy data (VRMDS) July 2010 – 2016

Data Linkage Performed By Victoria Data Linkage
Features of linked cancer dataset

• State wide data - reliable linkage program

• Population level outcomes - offers general indicative patterns

• Limitations
  • Does not identify community care
  • Currently lacks specific disease features (e.g. staging, ECOG)
  • Relies on hospital coding
  • Some assumptions / use of proxy data (metastatic / non metastatic)
  • Interstate treatment not included (mainly affects Hume RICS)
Registry derived summary stage


- Based on T-N-M from pathology reports (according to AJCC)

- For rectal cancer - pre neo-adjuvant treatment staging is not-available for most patients

- For colon cancer – 92% of summary stage available

- Registry derived summary stage is updated to stage IV if metastatic disease codes are present in the admissions data within 4 months of diagnosis
Integrated cancer services (ICS) & cancer centres

Regional

- Loddon Mallee ICS
- Grampians ICS
- Barwon South Western ICS
- Ballarat Regional Cancer Centre
- Andrew Love Barwon Regional Cancer Centre
- Hume ICS
- Gippsland ICS

Metropolitan

- Western Central MICS
- North Eastern MICS
- Southern MICS
- Western ICS
- Hume ICS
- Gippsland ICS
- Victorian Comprehensive Cancer Centre
- Monash Comprehensive Cancer Consortium
- Olivia Newton John Cancer Wellness & Research Centre
Incidence, Demographics, & Survival
Colorectal cancer age standardised incidence rates by year

Data source: VCR; Bowel cancer C18, C19 & C20
Colorectal cancer age standardised incidence rates by ICS of residence

Data source: VCR and ABS, 2011-2015; C18-C20
## Colorectal cancer patient demographics for Victoria

<table>
<thead>
<tr>
<th>ICS of residence</th>
<th>N</th>
<th>Age (median)</th>
<th>Male (%)</th>
<th>SES, most disadvantaged quintile (%)</th>
<th>VAED derived Charlson’s Comorbidity Index of zero (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEMICS</td>
<td>4413</td>
<td>72</td>
<td>54</td>
<td>10</td>
<td>73</td>
</tr>
<tr>
<td>SMICS</td>
<td>4703</td>
<td>72</td>
<td>52</td>
<td>18</td>
<td>72</td>
</tr>
<tr>
<td>WCMICS</td>
<td>3229</td>
<td>69</td>
<td>56</td>
<td>31</td>
<td>71</td>
</tr>
<tr>
<td>BSWRICS</td>
<td>1553</td>
<td>73</td>
<td>52</td>
<td>27</td>
<td>71</td>
</tr>
<tr>
<td>GRICS</td>
<td>1135</td>
<td>71</td>
<td>56</td>
<td>31</td>
<td>76</td>
</tr>
<tr>
<td>HRICS</td>
<td>1202</td>
<td>70</td>
<td>54</td>
<td>34</td>
<td>74</td>
</tr>
<tr>
<td>LMICS</td>
<td>1379</td>
<td>72</td>
<td>54</td>
<td>38</td>
<td>74</td>
</tr>
<tr>
<td>GICS</td>
<td>1007</td>
<td>72</td>
<td>54</td>
<td>36</td>
<td>71</td>
</tr>
<tr>
<td>Victoria</td>
<td>18621</td>
<td>71</td>
<td>54</td>
<td>24</td>
<td>73</td>
</tr>
</tbody>
</table>

Data source: VCR, VAED and ABS, 2011-2015; C18-C20
Socio-economic status of colorectal cancer patients by ICS of residence

Data source: VCR, 2011-2015

Difference between ICS: P-value <0.001
Stage at diagnosis of colorectal cancer patients by ICS of residence

Data source: VCR & VAED, 2011-2015
Victorian colorectal cancer 5-year relative survival

Data source: VCR and ABS, 1986-2011; C18-C20
Overall survival of colorectal cancer patients by ICS of residence

Cox proportional hazard model risk-adjusted for age, sex, socio-economic status, stage, year of diagnosis and VAED derived Charlson’s Comorbidity Index; Data source: VCR and VAED 2011-2015
Overall survival of colon cancer patients by stage and ICS of residence

Cox proportional hazard model risk-adjusted for age, sex, socio-economic status, year of diagnosis and VAED derived Charlson Comorbidity Index;
Data source: VCR and VAED 2011-2015
Presentation
Colorectal cancer surgery performed in an emergency admission over time

Data source: VCR and VAED, 2011-2015
- First CRC surgery admission type ‘C’ or ‘O’ (emergency)

Trend over time: P-value <0.001
Colorectal cancer surgery performed in an emergency admission by ICS of residence

Source: VCR and VAED, 2011-2015

- CRC surgery admission type ‘C’ or ‘O’ (emergency)

Difference between ICS: P-value

0.058
Treatment Planning
Percentage of newly diagnosed colorectal cancer cases with documented MDM recommendations 2015 (n = 487)

DHHS Target: 80%

State-wide average = 79%

Difference between ICS: P-value <0.001

Data source: DHHS Cancer Services Performance Indicator (CSPI) Audit 2015
Timing of MDM treatment planning for rectal cancer

Rectal cancer audit
100% of patients diagnosed in second half of 2015 were included

Data source: DHHS Cancer Services Performance Indicator (CSPI) audit 2015, *HUME data limitation
Treatment
Variation in treatment modality utilisation

Colon cancer (stage I, II, III)

Rectal cancer (stage I, II, III)

(L & R) Models risk-adjusted for age and VAED derived Charlson Comorbidity Index

* Hume data limitation; Data source: VCR, VAED & VRMDS, 2011-2015
Rectal cancer treatment (stage I, II, III) by ICS of surgery

<table>
<thead>
<tr>
<th>Area</th>
<th>Neo-adj RT*</th>
<th>Neo-adj chemo***</th>
<th>Surgery</th>
<th>Adj RT*</th>
<th>Adj chemo***</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEMICS (n=724)</td>
<td>39.9%</td>
<td>33.4%</td>
<td>1.2%</td>
<td>43.9%</td>
<td></td>
</tr>
<tr>
<td>SMICS (n=932)</td>
<td>39.7%</td>
<td>29.4%</td>
<td>1.1%</td>
<td>40.9%</td>
<td></td>
</tr>
<tr>
<td>WCMICS (n=786)</td>
<td>44.3%</td>
<td>43.6%</td>
<td>2.7%</td>
<td>53.6%</td>
<td></td>
</tr>
<tr>
<td>BSWRICS (n=230)</td>
<td>33.0%</td>
<td>13.9%</td>
<td>4.8%</td>
<td>29.1%</td>
<td></td>
</tr>
<tr>
<td>GRICS (n=70)</td>
<td>40.0%</td>
<td>25.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HRICS** (n=62)</td>
<td>3.9%</td>
<td>24.2%</td>
<td>4.8%</td>
<td>35.5%</td>
<td></td>
</tr>
<tr>
<td>LMICS (n=127)</td>
<td>51.2%</td>
<td>33.9%</td>
<td>3.1%</td>
<td>41.7%</td>
<td></td>
</tr>
<tr>
<td>GICS (n=141)</td>
<td>15.6%</td>
<td>8.5%</td>
<td>4.3%</td>
<td>37.6%</td>
<td></td>
</tr>
<tr>
<td>Victoria</td>
<td>39.7%</td>
<td>31.9%</td>
<td>2.3%</td>
<td>43.9%</td>
<td></td>
</tr>
</tbody>
</table>

Restricted to patients who had a major resection

* Restricted to curative intent
** Hume data limitation
*** Excludes oral chemotherapy
Treatment restricted to within first year following VCR diagnosis date

Data source: VCR, VAED & VRMDS, 2011-2015
Colon patients with less than 12 nodes examined have a 14% increased risk of death (in our linked data set)*

* Cox proportional hazard model risk adjusted for age, sex, emergency status, comorbidities, ASA, stage and year of diagnosis

Data source: VCR, VAED & VRMDS, 2008-2015
Lymph node resection by ICS of surgery
Colon cancer (C18, C19); stage II & III

Data source: VCR & VAED, 2015
Lymph node resection by campus of surgery
Colon cancer (C18, C19); stage II & III

Each dot represents a campus
No risk-adjustment

Data source: VCR & VAED, 2015
Adjuvant intravenous chemotherapy by campus of surgery
Colon cancer (C18, C19); stage III

Utilisation

Note: the outlier pattern holds even when adjusted for oral chemotherapy (unpublished PBS data)

Data source: VCR & VAED, 2011-2015
Timeliness of adjuvant intravenous chemotherapy by ICS of surgery
Colon cancer, stage III

72% of patients stage III colon cancer patients started their intravenous chemotherapy within 56 days of surgery (public 64%, private 81%)

Variation between ICS of surgery exists

Source: VCR & VAED, 2011-2015
Treatment utilisation stage IV colon cancer patients

Survival of stage IV colon cancer (C18, C19)

(Lef) Model risk-adjusted for age, sex, socio-economic status, year of diagnosis and VAED derived Charlson Comorbidity Index;
(Right) Model risk-adjusted for age and VAED derived Charlson’s Comorbidity Index

Data source: VCR and VAED 2011-2015
Variations for noting

• CRC survival is increasing overall. **Incidence** is higher in regional ICS compared to metropolitan ICS (38-42 vs. 34-35 per 100k population).

• There is a higher proportion of stage IV CRC at diagnosis for patients residing at GICS.

• The proportion of patients whose first surgery was during an **emergency admission increased** slightly between 2011 (13%) and 2015 (15%) for CRC patients.

• There is significant variation in the overall **utilisation of chemotherapy** in colon and rectal cancer patients.
Variations for discussion

1. The proportion of CRC patients having an MDM discussion varies between ICS (range 56% to 93%).

2. 38% of MDM discussions for rectal cancer patients occurred after treatment had started. This proportion varies between ICS.

3. Utilisation of neoadjuvant radiotherapy in rectal cancer patients varies by ICS of treatment (range 15.6% - 51.2%).
4. Number of lymph nodes examined for colon cancer patients varies between ICS and campus of surgery (range 72% - 92% with 12+ nodes examined).

5. Utilisation of adjuvant chemotherapy for stage III colon cancer patients varies between ICS of treatment (range 82% – 95%).

6. Timeliness of adjuvant chemotherapy for stage III colon cancer patients varies by ICS of treatment and campus of surgery (range 53% - 80% within 8 weeks of surgery in a public campus).