

Improving Cancer Outcomes Project

Colorectal Cancer Audit

FINAL Data Analysis Report

2014-15

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Purpose: To present the tabular and diagrammatic format for data analyses arising from the colorectal cancer
record audit (CCRA) 2014-15

References: Data Analysis Plan for the Improving Cancer Outcomes Project 2014-15 Version 5.1 – Mar 2015

This document is to be read in conjunction with the "ICOP Methodology Report" and related attachments

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Introduction: Improving Cancer Outcomes Project (ICOP) – Grampians region

The Improving Cancer Outcomes Project (ICOP) was initiated and funded by the Victorian Department of Health and Human Services (DHHS) to: examine pathways of treatment for people with cancer in the Grampians region; and to establish whether these pathways and treatment aligned well with best practice.

Colorectal cancer (CRC) was chosen as the first tumour stream to be investigated. This tumour stream was selected due to the:

- Apparent poorer outcomes for cancer in Grampians
- Possible over-utilisation of chemotherapy for colorectal cancer
- Possible under-utilisation of radiotherapy for colorectal cancer
- Other factors which might contribute to poor outcomes

This report is a presentation of the available data. This report is broken into two components:

- Component one, high level overview of the data findings and recommendations
- Component two, the complete data analysis set with commentary

Inclusion Criteria:

1. Newly diagnosed invasive colorectal cancer
2. 2012-13 financial year
3. Grampians residents treated at least partially in-region

Data Sources:

- Colorectal Cancer Record Audit (CCRA) manual audit of patient records at 6 participating health service sites which treat patients with CRC
- VAED (Vic Admitted Episode Dataset)
- Vic Cancer Registry (Diagnosis and Death dates)
- Statewide radiotherapy data from the Victorian Radiotherapy Minimum Data Set (VRMDS) & local treatment data from Ballarat Austin Radiation Oncology Centre (BAROC)
- Multidisciplinary meeting (MDM) data (from GICS MDMone database)
- Supportive care screening (from GICS MDMone database)

The audit tool and data map are separate appendices to this document. ("CCRA_Audit_Tool_FINAL_20141024.xlsx" and "CCRA Data Map.xlsx" respectively)

Aim:

To investigate the following 5 hypotheses for colorectal cancer:

- Delays, whether patient initiated or as a result of service limitations, impact the timeliness of cancer care in the Grampians region (GR) of Victoria
- Access to services is different for people who reside in different geographical locations within the GR
- People with cancer in the GR have high stage disease at diagnosis for colorectal cancer
- Chemotherapy services are over-utilised for colorectal cancer in the GR when compared with the state Victorian average
- Radiotherapy services are under-utilised for colorectal cancer in the GR when compared with the state Victorian average

The initial aims were to benchmark against UK [Nice guidelines](#), Christie UK National Bowel Cancer Audit and Grampians region clinician-led tumour stream guidelines. Subsequently it was possible to benchmark against the new Optimal Care Pathway for Colorectal Cancer and this work aligns with the GICS Strategic Plan for 2014-16 to "Optimise systemic capability and performance".

Methods:

Each of six Grampians health services participated and supplied resources in the form of Interns (3 at 1 site) or Health Information Managers (5 at 5 sites) to conduct the Colorectal Cancer Record Audit (CCRA). The DHHS provided assistance with cohort selection and randomisation to each audit site. The data was later collated and analysed by the Centre for Informatics and Applied Optimisation at Federation University, Ballarat. As illustrated in Figure 1, it was difficult to correctly identify patients who met the audit criteria. Unfortunately, some patients were identified from health service sites which did not provide the major treatment for those patients. (e.g. some patients were audited at a health service where they had only chemotherapy or colonoscopy – the surgical data and associated pathology report were not accessible at the audit site. For those who had their surgery in Ballarat, records were later accessed for these patients at either the public or private health service where they had their surgery (available via the VAED dataset) to capture this data)

Where staging data was missing or incomplete, local pathology and radiology reports were consulted to ensure that staging for the 95 patients was as complete as possible. Clinicians were engaged to review medical records to ascertain treatment intent where this was not captured.

Pathway development: The Victorian Admitted Episode Dataset (VAED) was used as a basis for the pathways, with local radiotherapy and multi-disciplinary meeting (MDM) dates and supportive care (SC) screening dates overlaid. Work is ongoing to develop visual representation of patient pathways from this project by Federation University, Ballarat.

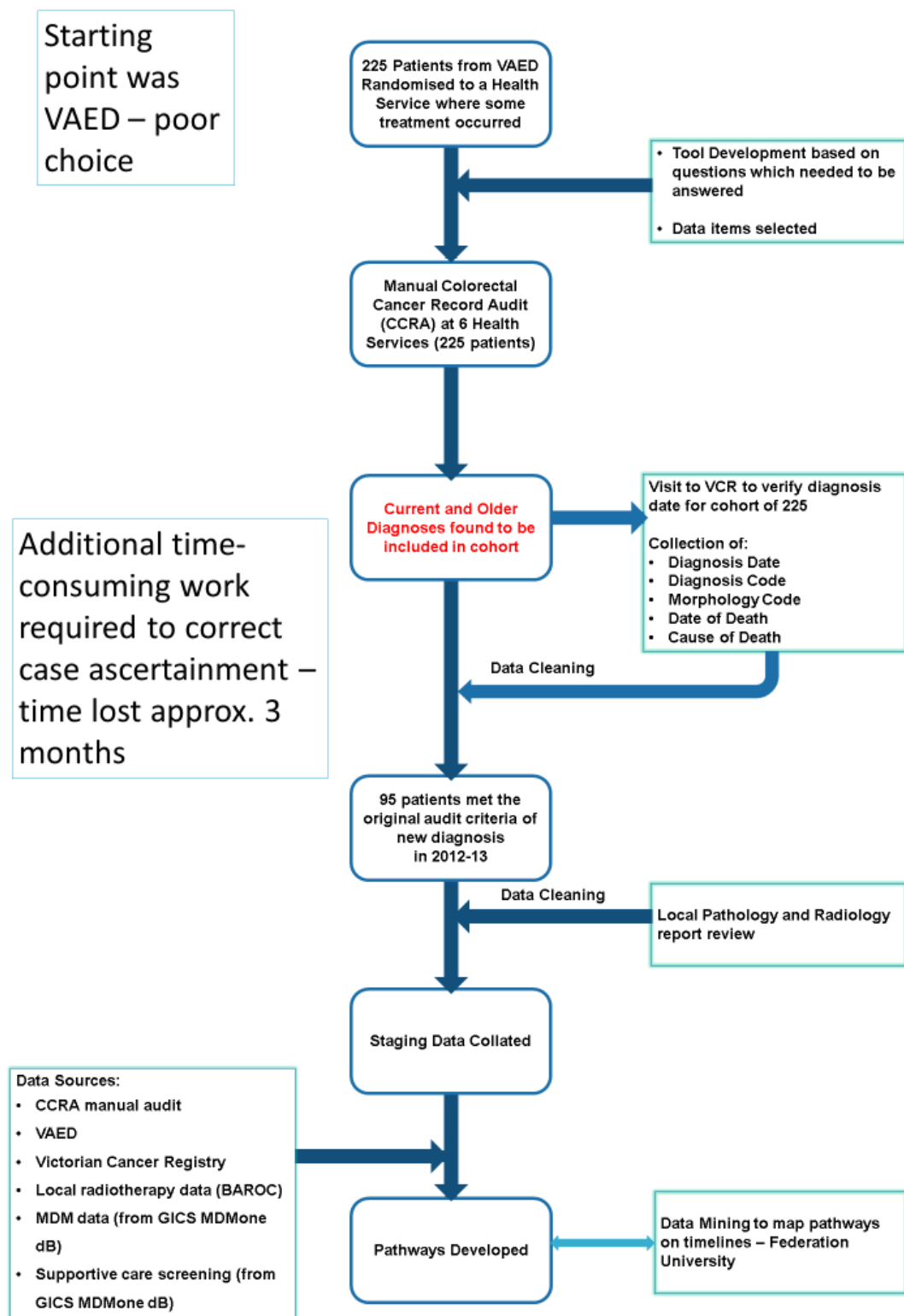
Major Issues:

Cohort selection – Diagnosis date range, diagnosis codes (some non-invasive polyp disease were included unintentionally – for the purposes of the data analysis, these patients have been removed to help to minimise missing data rates)

Postcode was used to define place of residence, however, LGA would have ensured that each patient in the cohort resided in the Grampians. Postcode cross-over between LGAs means that 17 members of the cohort actually lived in neighbouring Integrated Cancer Service regions. To prevent significant loss of data, these patients have been included in the final cohort.

Audit site selection – patients were audited at sites where minimal treatment and non-surgical treatment occurred. This was due to randomisation processes which did not take into account where the most complete data for each patient would be located.

Figure 1. Project process



Results:

The GICS' Lead Clinicians, GP Reference and Data Working Groups agreed 9 questions to be answered by the data gathering and analysis process. These were:

1. Did delays occur in diagnosis or treatment? And if so, reasons. (e.g. patient choice, excessive time on waiting list)
2. Did access to treatment impact choices? (e.g. transport issues, health literacy, social disadvantage)
3. Diagnosis and stage at diagnosis
4. Was there an MDM treatment plan and did this align with guidelines or existing evidence?
5. Did treatment received match the plan?
6. Did supportive care screening occur at 3 points of care? (Diagnosis, during active treatment and during the follow-up phase of care)
7. Did the patient receive supportive care interventions required?
8. Did the patient receive appropriate follow-up care in a timely way?
9. Did the patient experience recurrence and, if so, when?

Some of the questions were unable to be answered due to a lack of data. For the sake of transparency, the tables and missing data rate have been left in the second component of this report.

Recommendations:

The following are the key recommendations from the ICOP CRC audit:

- Dissemination of the Optimal Care Pathways to all relevant service providers and health services in the region to increase awareness of Victorian benchmarks and ensure they are embedded into clinical practice
- Increase clinical involvement in future audit activities at initiation – involvement of Heads of tumour streams is strongly recommended in future projects (with buy-in from other relevant clinicians)
- Engage in prospective data collection activities (e.g. GICS' MDMone database)
- Utilise TNM staging which is more reflective of current recommendations in addition to the ACP staging system
- Consider that variance of treatment opinions exists internationally as well as locally
- Establishment of a community education program regarding early signs of possible colorectal cancer to reduce delay between symptom onset and initial GP presentation.
- GICS work with health services to improve access to colonoscopy services and comply with the Colorectal Cancer Optimal Care Pathway timeframes.
- GICS establish a set of key performance indicators aligned to the Colorectal Cancer Optimal Care Pathway benchmarks and monitor health service compliance on a six monthly basis.
- Improvement in pathology reporting to include circumferential resection margin (CRM) for all rectal cancer specimens
- Future audits to examine:
 - The 24 rectal cancer patients in this cohort to deepen the understanding of treatment pathways received
 - treatment pathway variation by location of residence in general.
 - differences in pathway based on stage of cancer and treatment intent at diagnosis.
 - treatment variation from MDM plan. Retrospective clinical audit reviewed by clinical peers may validate where documented or identify reasons for variations in treatment from MDM plans.
- Prospective multidisciplinary discussion to occur for ALL newly diagnosed Rectal cancer patients.
- Multidisciplinary treatment plans to include reasons for variation in treatment outside of the Colorectal Cancer Optimal Care Pathway.
- A minimum of 80% of newly diagnosed Colon cancer patients to be presented prospectively for multidisciplinary discussion.
- GICS to work with health services to ensure MDM treatment plans are communicated to all health services involved in delivery of care to the patient.
- Health services to ensure that oncology multidisciplinary treatment plans are filed in the medical record to enable access by the whole treating team.
- GICS to work with health services to improve supportive care screening rates and comply with screening points throughout the patient journey.
- GICS establish key performance indicators aligned to the Colorectal Cancer Optimal Care Pathway benchmarks regarding supportive care screening points and monitor health service compliance on a six monthly basis.

- Improved access to alternative data points (eg, private clinician records, general practice records) to increase capture of relevant data
- Request for access to MBS test codes which in the past have not been accessible but will lead to more complete assessment of follow-up
- Development of an improved strategy for capturing information on recurrence of disease (e.g. utilisation of data from the Victorian Cancer Registry)
- Resource provision for longitudinal patient record audits (e.g. tracking individual patients over a five year time period)

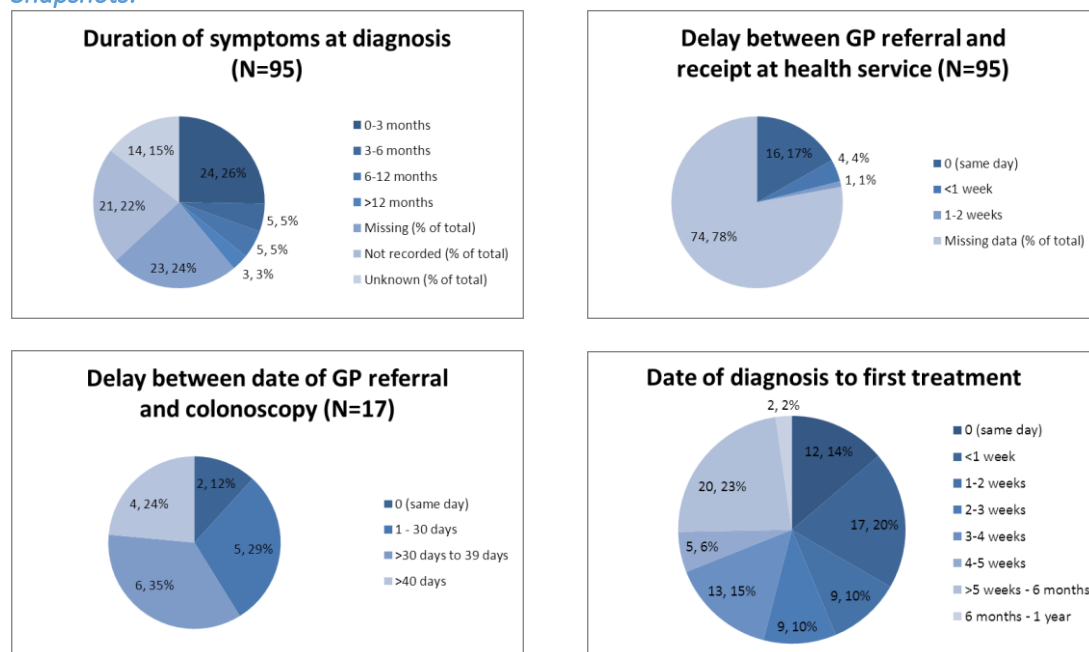
Component one: High level data findings

Question 1.

Did delays occur? And if so, reasons. (e.g. patient choice, excessive time on waiting list)

The Grampians Cancer Data Framework was modified to align with the new Optimal Care Pathway for colorectal cancer in order to enable comparison with best practice and ensure timeliness of care. This particularly relates to delays in the patient treatment pathway (see 'Optimal_cancer_care_for_people_with_colorectal_cancer.pdf').

Snapshots:



('Missing' = data item not completed by the auditor; 'Not recorded' = Data not found in history; 'Unknown' = recorded as Unknown in the history)

Discussion:

41 percent of patient records with a GP referral letter in the history met the Optimal Care Pathway prescribed timeframe to colonoscopy of four weeks

From the available data, 35% of patients who presented to a GP and were referred had symptom duration of more than 3 months. This could have been due to patient delay in presenting to or following up with a GP, or GP delay in referring patients with symptoms. GP referrals were often received on the day they were written. There was no trend identified showing that location of residence impacted duration of symptoms at diagnosis. Anecdotally, stoic farmers in remote areas are reluctant to present to a GP, however, this was not borne out in the data.

Seven people (10%) were known to have waited more than four weeks for their diagnostic procedure from their first appointment in a specialist setting.

For 21 patients with known GP referral date, 17 went on to have a colonoscopy. 59% of those patients who had a colonoscopy following GP referral waited more than 30 days to undergo this procedure. 90% of patients underwent some form of treatment for their colorectal cancer after diagnosis. Of these, 1 patient waited more than 6 months to receive post diagnostic treatment for their cancer. (Note: 11 patients were diagnosed at excisional surgery)

Recommendations:

- Establish a community education program regarding early signs of possible colorectal cancer to reduce delay between symptom duration and initial GP presentation.
- GICS work with health services to improve access to colonoscopy services and comply with the Colorectal Cancer Optimal Care Pathway timeframes.

- GICS establish a set of key performance indicators aligned to the Colorectal Cancer Optimal Care Pathway benchmarks and monitor health service compliance on a six monthly basis.

Question 2.

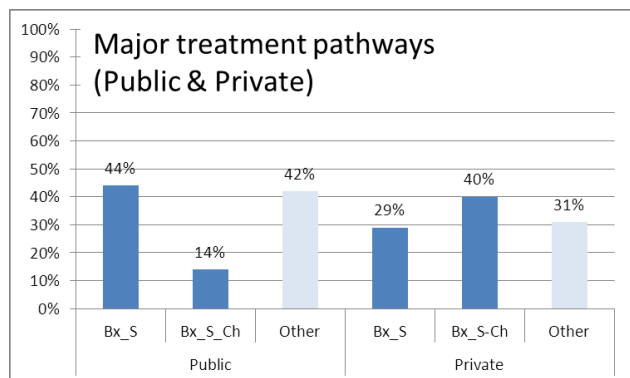
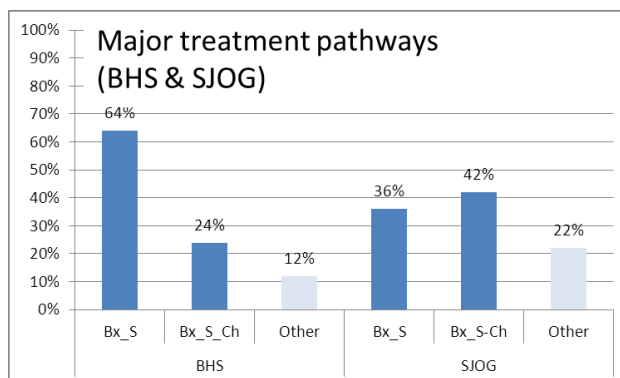
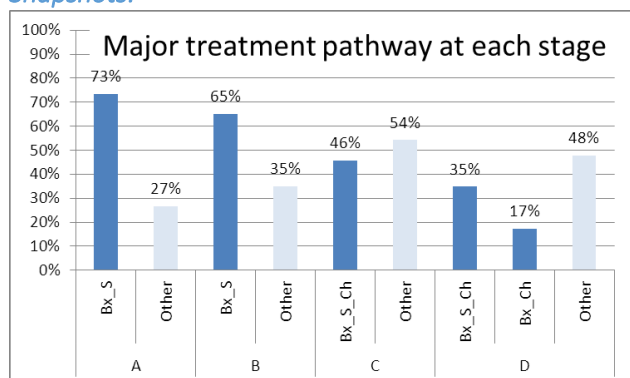
Did access to treatment impact choices? (e.g. transport issues, health literacy, social disadvantage)

Unfortunately, there was no evidence to support or refute the theory that health literacy or social disadvantage impacted access to treatment. Patients either had treatment or did not, and reasons for particular patterns of care were not well documented. However, location of services did seem to play a role in whether patients received investigations and radiotherapy in particular.

Only 2 patients of the 95 were documented to have refused treatment. The reasons given were: 'patient did not want surgery due to age'; and 'Patient stopped chemo because of side effects'.

Not all institutions have the full complement of radiology services available. Wimmera Health Care Group made MRI available in December of 2013, so lack of local access to this investigation during the audit timeframe may have contributed to the lack of MRI seen in this audit.

Snapshots:



Pathway Legend:

Pathways are set out in chronological order of treatment received:

- Bx Biopsy
- S surgery (major excisional)
- Ch chemotherapy
- R radiotherapy
- CCR concurrent chemo-radiotherapy

Discussion:

Of interest are the referral pathways into health services and treatment pathways by stage of disease at diagnosis: 11 of 15 patients (73%) and 13 of 20 (65%) who had stage A or B colorectal cancer respectively underwent a pathway of biopsy followed by surgery. This appeared to be irrespective of where they lived. By contrast, approximately 46% of those with stage C colorectal cancer underwent adjuvant chemotherapy, but there was more diversity of pathway in this group. The most diversity occurred for people with stage D colorectal cancer, with 35% of this group undergoing biopsy and excisional surgery followed by chemotherapy, and 4 of 23 (17%) who had only biopsy and chemotherapy without major surgery for their cancer.

It appears that patients treated publicly are more likely to undergo biopsy followed by surgery (without chemotherapy) (44%), than those treated as private patients (29%) irrespective of which type of health service provides the surgical care.

Access to radiotherapy: As radiotherapy is only available in Ballarat (within the Grampians), and treatment usually involves five days per week for up to six weeks, anecdotal evidence suggests that lack of radiotherapy for patients in this cohort may be due to travel and accommodation issues, although this information was not documented in the patient records.

Recommendations:

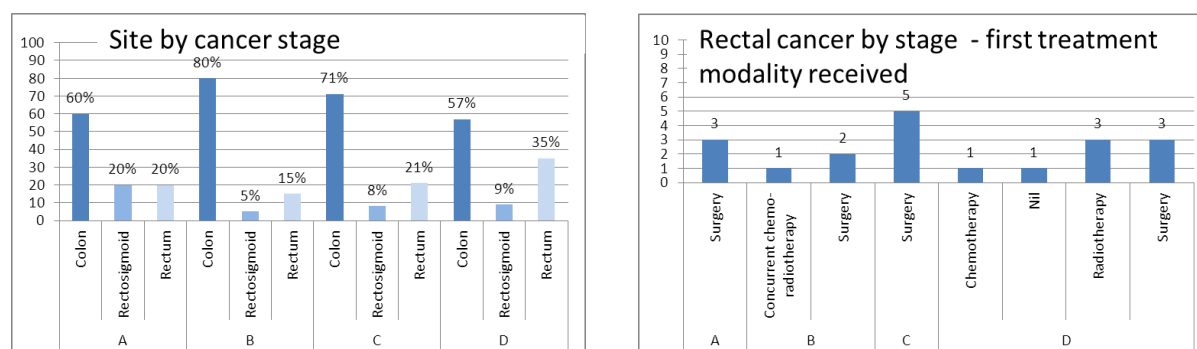
- Future audits to examine:
 - treatment pathway variation by location of residence
 - if there are real differences in pathway based on stage of cancer and treatment intent at diagnosis.

Question 3.

Diagnosis and stage at diagnosis:

The majority of cancers in the cohort were adenocarcinomas (almost 96%), and situated in the colon (N=60), rectosigmoid (N=11) or rectum (N=24). Staging by the Australian Clinico-pathological Staging system ratios for those for whom staging data was available were: A (18.3%), B (24.4%), C (29.3%) and D (28%). Staging by TNM is available in the Data Analysis Report (see page 7). This shows a 10% higher rate of metastatic disease at diagnosis for this cohort than the statewide average (18%) reported at the Victorian Colorectal Cancer Summit in September 2014.

Snapshots:



Rectal cancer snapshot:

- 24 patients had rectal cancer - (12 curative, 8 palliative, 4 unknown)
- 12 of 24 (50%) had an MDM discussion, 2 were pre-operative MDM discussions
- 20 had major excisional surgery
- 8 had radiotherapy (4 pre-operatively), 2 of which had pre-operative concurrent chemo-radiotherapy (CCR)

Discussion:

For the 60 patients with cancer of the colon, surgery was the first treatment modality in 88% of cases. For 11 rectosigmoid cancers, 8 (73%) were treated with surgery as a starting modality.

In contrast to best practice guidelines, including the Optimal Care Pathway for Colorectal Cancer, which recommend radiotherapy as first line treatment for rectal cancer, 13 of 24 (54%) patients in the ICOP cohort received surgery prior to any other modality of treatment.

The high proportion of patients presenting with Stage D (metastatic disease) could account for poor outcomes in this region.

Recommendations:

- Prospective multidisciplinary discussion to occur for all newly diagnosed Rectal cancer patients.
- Multidisciplinary treatment plans to include reasons for variation in treatment outside of the Colorectal Cancer Optimal Care Pathway.

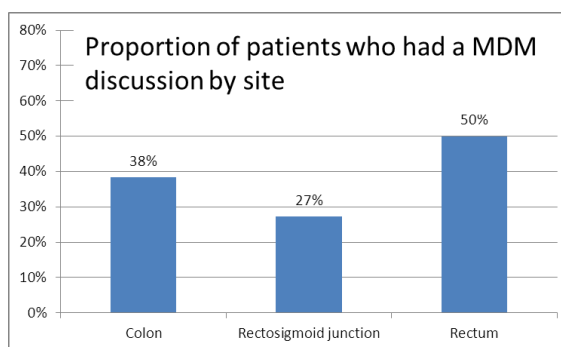
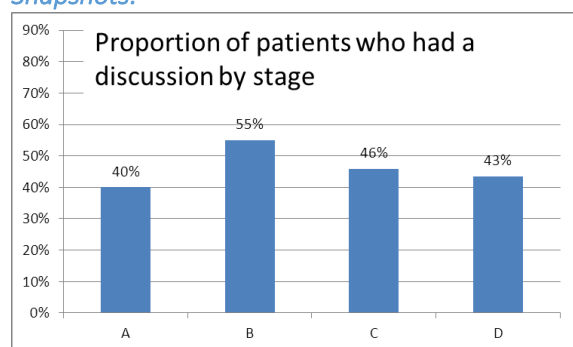
Question 4.

Was there a multidisciplinary treatment (MDM) plan?:

38 of 95 patients with invasive colorectal cancer had an MDM discussion as recorded in the GICS MDM database (40%). (Note: all colorectal oncology multi-disciplinary meeting recommendations for the region are captured in this database). For the 38 patients who were known to have been discussed at a multidisciplinary meeting anywhere in the Grampians, only 22 (56%) had the treatment plan in the medical record at the audit site.

The Colorectal Cancer Optimal Care Pathway states that:
All newly diagnosed patients should be discussed at an MDM, rectal cancers pre-operatively

Snapshots:



Discussion:

Please see section 4.5 in the Data Analysis Report for detail of treatment plan recommendations. Further clinical and pre-discussion treatment data is needed to determine if each recommendation aligned with best practice guidelines.

Only 40% of the cohort benefited from multidisciplinary care through an MDM treatment plan. Only 50% of rectal cases had a MDM discussion. The target rate for discussion is 80% for colorectal cancer in Victoria.

Recommendations:

- GICS to work with health services to ensure MDM treatment plans are communicated to all health services involved in delivery of care to the patient.
- Health services to ensure that oncology multidisciplinary treatment plans are filed in the medical record to enable access by the whole treating team

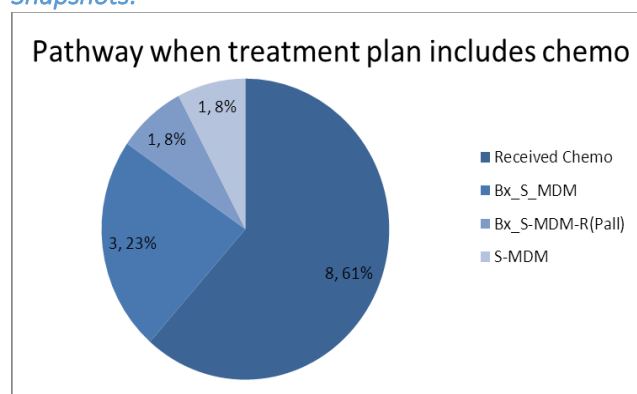
Question 5.

Did treatment received match the plan?:

For 24 of the 38 patients with an MDM treatment plan, the treatment received matched the plan. However, for 12 of 38, treatment received varied from the plan. For an additional one patient who was discussed, their colorectal cancer was deemed to be “insignificant in their overall picture” and the patient died within 40 days of their diagnosis. A further single patient had a recommendation of an octreotide scan, and it is unclear from the collected data whether this occurred.

The Colorectal Cancer Optimal Care Pathway target:
Radiotherapy is recommended for high risk rectal cancers pre-operatively (or less commonly post-operatively)

Snapshots:



Pathway Legend:

Pathways are set out in chronological order of treatment received:

- Bx Biopsy
- S surgery (major excisional)
- Ch chemotherapy
- R radiotherapy
- CCR concurrent chemo-radiotherapy

Chemotherapy	TOTAL 13
Bx_CCR_S_MDM_Ch	1
Bx_MDM_S_Ch	1
Bx_S_MDM	3
Bx_S_MDM_Ch	6
Bx_S_MDM-R(Pall)	1
S_MDM	1

Rectal cancer snapshot:

Only 8 patients received radiotherapy.

Site of cancer	ACPS stage	Treatment Intent	Pathway (N=9)
Rectum	A	Curative	Bx_S--R(2 years later)
	B	Curative	Bx_CCR_S_Ch
	C	Curative	Bx_S_CCR(Long)
	C	Curative	Bx_S-R(Pall)
	D	Palliative	Bx_R
	D	Curative	Bx_R_S_Ch
	D	Palliative	Bx_R_S_Ch
	Data not available (treated elsewhere)	Not available	Bx_CCR_S_Ch

Discussion:

Reasons for variation to recommended treatment plan were, in the main, not collected. Comments documented by auditors indicated in a small number of cases that the patient had died, or was otherwise unable to undergo the recommended treatment.

Recommendations:

- Future audits to examine:
 - treatment variation from MDM plan. Retrospective clinical audit reviewed by clinical peers may validate where documented or identify reasons for variations in treatment from MDM plans.

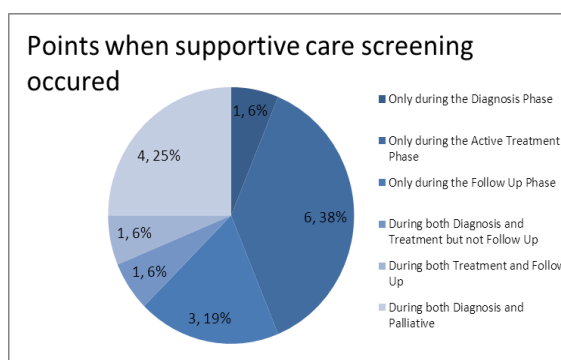
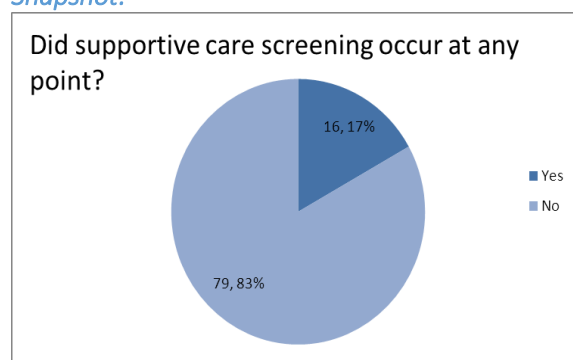
Question 6.

Did supportive care screening occur at three points of care? (Diagnosis, during active treatment and during the follow up phase of care):

Definitions:
A) Diagnosis Phase (Defined by period between Date of Diagnosis and First Treatment Date)
B) Active Treatment Phase (Defined by period between First treatment and final treatment of initial cancer – not treatment of recurrence)
C) Follow-up Phase (Defined by period after final treatment date of initial cancer)

Supportive care screening is associated with improved outcomes for people with cancer. ([NICE 2004](#))

Snapshot:



The six most self-identified supportive care issues from supportive care screening.

Issue identified	Domain	Number N=328	%
Fatigue	Physical	188	57

Worry	Emotional	155	47
Sleep	Physical	152	46
Memory/concentr	Physical	114	38
Pain	Physical	108	33
Fears	Emotional	96	29
Grampians region supportive care screens completed over a 12 month period (Oct 2013 – Sept 2014) 299 individuals completed the screen (Source: GICS MDMOne Database)			

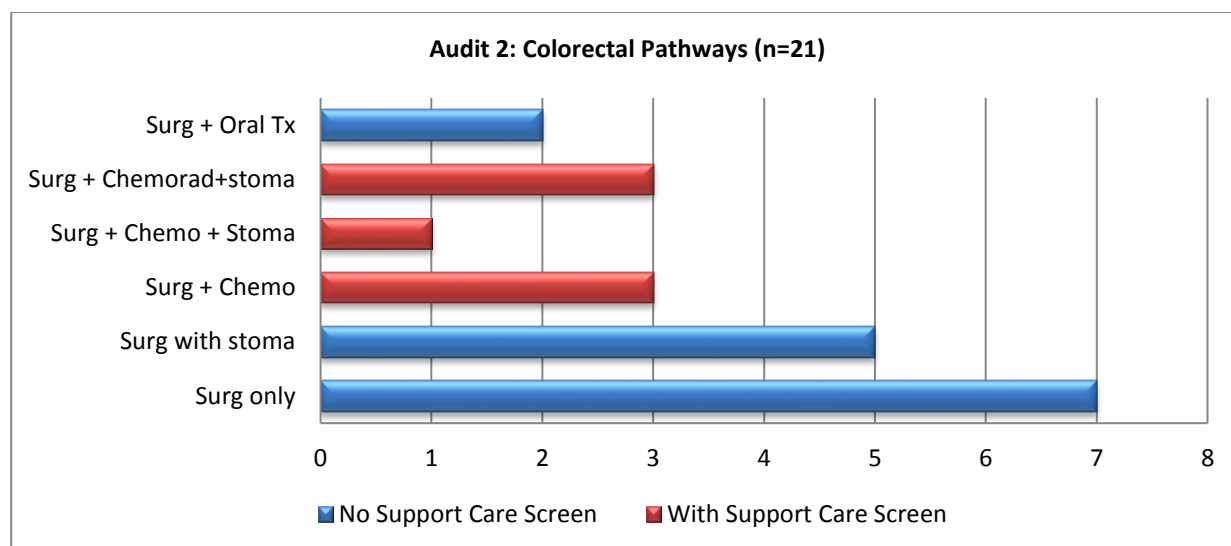


Chart 3: Provisional Grampians data analysis from statewide Audit Round 2 2014-15.

Points to note from Audit 2, chart 3:

- There was evidence of supportive care screening in 33% of cases (7 of 21)
- All of these were treated in chemotherapy day unit

Discussion:

There was an overall lack of supportive care screening of patients in the audited colorectal cancer patient cohort, with only 16 of the 95 patients (17%) with invasive colorectal cancer recorded as having a supportive care screen. This is consistent with the DHHS Cancer Service Performance Indicator audit findings which show sub-optimal levels of supportive care screening in the region as demonstrated in Audit 2 results in chart 3.

Recommendations:

- GICS to work with health services to improve supportive care screening rates and comply with screening points throughout the patient journey.
- GICS establish key performance indicators aligned to the Colorectal Cancer Optimal Care Pathway benchmarks regarding supportive care screening points and monitor health service compliance on a six monthly basis.

Question 7.

Did the patient receive supportive care interventions required?

Unfortunately, within the project, analysis of supportive care interventions was not able to be determined.

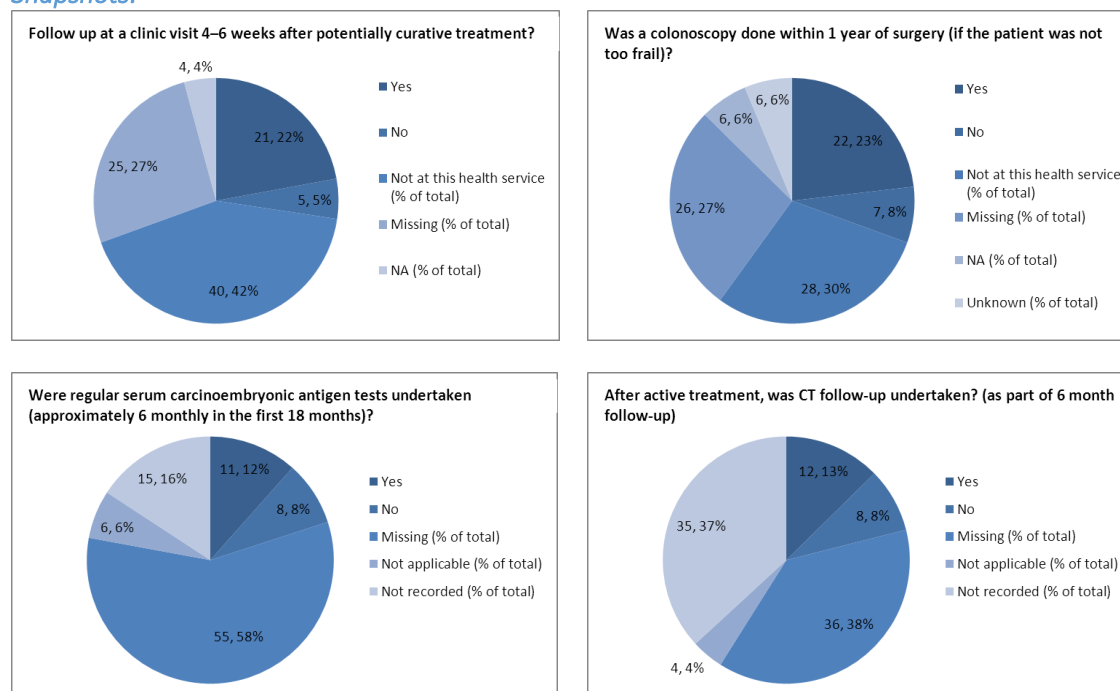
Question 8.

Did the patient receive appropriate follow-up care in a timely way?

Unfortunately it was not possible to answer this question with any degree of accuracy. Due to the fact that patients are seen in various settings for their follow-up care (and not necessarily in the original treating health service), access to the data was not within the scope of this project.

21 of 95 patients were known to have had a clinic appointment within six months of treatment for their cancer. Missing data means that no conclusions can be made regarding extent or quality of follow-up care.

Snapshots:



(‘Missing’ = data item not completed by the auditor; ‘Not recorded’ = Data not found in history; ‘Unknown’ = recorded as Unknown in the history)

Discussion:

It appears that the high rate of incomplete data emphasises the fragmentation of care/follow-up in the Grampians region. However, appropriate follow-up care may have occurred at an alternative health service to the audit site, or within the private clinical setting.

Recommendations:

- Improved access to alternative data points (e.g. private clinician records, general practice records) to increase capture of relevant data
- Request for access to MBS test codes which in the past have not been accessible but will lead to more complete assessment of follow-up

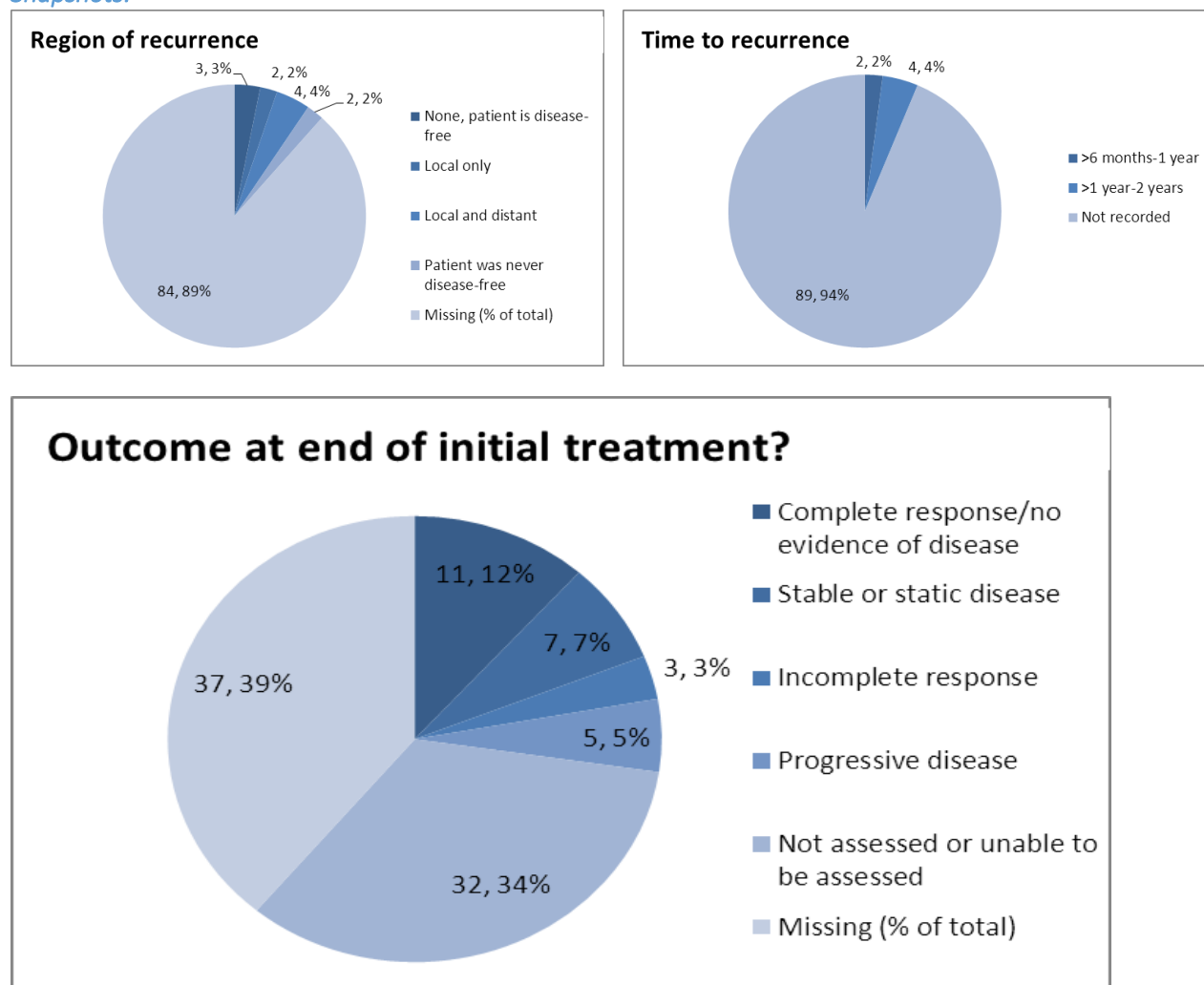
Question 9.

Did the patient experience recurrence and, if so, when?

Recurrence was rarely documented, and it was impossible to tell within the health service sites audited whether this was because it did not occur, or whether it was diagnosed elsewhere.

69 of 95 patients (73%) had no documentation pertaining to the outcome at the end of their active treatment phase of care. In addition, patients who experienced recurrence may have been followed up at a different health service to where the audit was undertaken for that patient. Therefore no conclusions can be made in relation to rates of recurrence for this cohort.

Snapshots:



('Missing' = data item not completed by the auditor; 'Not recorded' = Data not found in history; 'Unknown' = recorded as Unknown in the history)

Discussion:

In the relatively short follow-up time associated with the project, only six of the original 95 patients were documented to have had recurrence. Documentation in the audit site record is unlikely to be comprehensive, so confidence in this rate is not high.

'The reported incidence of recurrent disease after a primary curative resection ranges from 20-30%. Eighty percent of recurrences occur within the first 2 years, with a median interval of 16 to 22 months from the index resection.'¹

Recommendations:

- Development of an improved strategy for capturing information on recurrence of disease (e.g. utilisation of data from the Victorian Cancer Registry)
- Resource provision for longitudinal patient record audits (e.g. tracking individual patients over a five year time period)

¹ Hellinger MD, Santiago CA. Reoperation for Recurrent Colorectal Cancer, Clinics in Colon and Rectal Surgery. 2006; 19 (4):228-236. Doi: 10.1055/s-2006-956445.