Update Management of Rectal Cancer

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• I have no disclosures

Outline

• Pre-operative staging
• Who needs neoadjuvant therapy?
• What is the appropriate operation?
• What is the Alberta experience?
Staging

“… if it would be possible to decide the category of the case before operating, this would be very useful information.”

Cuthbert Dukes, 1932

What do we want to know?

Tumour related factors:
1. Location of tumour
2. Depth of penetration of tumour through intestinal wall
3. Presence of regional lymph node metastasis
4. Presence of distant metastasis

Why do we want to know it?

Stage dictates THERAPY!
   Should we consider local excision?
   Should this patient have Neoadjuvant therapy?

Stage dictates PROGNOSIS
CT Scan chest, abdomen pelvis

- Provides an image of the relationship between the tumour and surrounding structures (local regional involvement)
- Provides an assessment of internal organs for distant metastases (liver, lung)

Local regional staging TRUS

- Most useful when considering local excision
- Does not see mesorectal envelope well
- T-stage
  - Accuracy 85% +
  - But operator dependent
- Problem areas:
  - T2 vs. T3
  - edema vs. tumor post radiation
  - Overstaging (11-18%) and understaging (5-13%)

uT1
MRI

- The Gold Standard
- Technology evolving rapidly!
  - Intramural staging improving (T1, T2)
  - Best for evaluation of the integrity of the mesorectal envelope
  - Proximity of tumour to the surgical margin
  - Vascular invasion

Cancer of Mesorectum

Distal Mesorectum with Tumor Deposits
MRI
Prediction of involved CRM

Beets-Tan 2004

MRI and Mesorectal Margin

<table>
<thead>
<tr>
<th>Histopathologic Examination</th>
<th>Clear</th>
<th>Involved</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI Prediction:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear</td>
<td>215</td>
<td>15</td>
<td>230</td>
</tr>
<tr>
<td>Involved</td>
<td>4</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>219</td>
<td>26</td>
<td>245</td>
</tr>
</tbody>
</table>

Accuracy = 92% (226/245)
Sensitivity = 42% (11/26)
PPV = 73% (11/15)
Specificity = 98% (215/219)
NPV = 93% (215/230)

MERCURY Study Group. BMJ. 2006;333:779-784

Local Recurrence vs. Radial Margin in Rectal Cancer

Adam, 1994 - 190 pt, 141 curative surgery

<table>
<thead>
<tr>
<th></th>
<th>Local Recurrence</th>
<th>Local Recurrence Hazard ratio</th>
<th>Survival Hazard ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>78 %</td>
<td>12.2</td>
<td>3.2 (CI (4.4-34.6))</td>
</tr>
<tr>
<td></td>
<td>Cl (62-94)</td>
<td></td>
<td>Cl (1.6-6.5)</td>
</tr>
<tr>
<td>Negative</td>
<td>10 %</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Cl (4-16)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PET scans**

- Higher sensitivity and specificity for detecting recurrent rectal cancer than both CT and MRI
- Spatial resolution is not very accurate. A companion study such as an MRI or a CT scan is required to define the precise location of the tumour (CT/PET); increasing accuracy from 78% to 89%
- Limited use in assessing response to neoadjuvant therapy

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**Who needs neoadjuvant therapy?**

- **Neoadjuvant (preoperative)**
  - Short course radiotherapy
    - 5 days 500 Gray/d surgery within 10 days
  - Long course chemoradiotherapy
    - 5040 over 6 weeks with concomitant chemotherapy
    - Surgery 8-10 weeks following end of radiation

- **Adjuvant (postoperative)**

---

**What is it?**

- **Neoadjuvant (preoperative)**
  - Short course radiotherapy
    - 5 days 500 Gray/d surgery within 10 days
  - Long course chemoradiotherapy
    - 5040 over 6 weeks with concomitant chemotherapy
    - Surgery 8-10 weeks following end of radiation

- **Adjuvant (postoperative)**
Pre-op Radiation Decreases Local Regional Recurrence

<table>
<thead>
<tr>
<th>Study</th>
<th>Number</th>
<th>Radiation Gy/Frac</th>
<th>Surgery alone Local Rec (%)</th>
<th>Surgery/XRT Local Rec (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Marks 1994</td>
<td>468</td>
<td>15 / 3</td>
<td>21</td>
<td>19*</td>
</tr>
<tr>
<td>Bergen, Norway, 1990</td>
<td>359</td>
<td>31.5 / 18</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Manchester, 1994</td>
<td>264</td>
<td>20 / 4</td>
<td>37</td>
<td>19*</td>
</tr>
<tr>
<td>EORTC, 1988</td>
<td>466</td>
<td>34.5 / 15</td>
<td>30</td>
<td>19*</td>
</tr>
<tr>
<td>MRC-2, 1996</td>
<td>275</td>
<td>40 / 20</td>
<td>46</td>
<td>36</td>
</tr>
<tr>
<td>Stockholm, 1995</td>
<td>849</td>
<td>25 / 5</td>
<td>28</td>
<td>19*</td>
</tr>
<tr>
<td>Swedish Rectal Ca Trial, 1997</td>
<td>1168</td>
<td>25 / 5</td>
<td>27</td>
<td>11*</td>
</tr>
<tr>
<td>Dutch TME Trial, 2002</td>
<td>1981</td>
<td>20 / 5</td>
<td>11.4</td>
<td>19*</td>
</tr>
</tbody>
</table>

* Denotes results that are statistically significant.

Pre-op radiation does not improve survival

<table>
<thead>
<tr>
<th>Study</th>
<th>Overall Survival</th>
<th>Curative Resection/ Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Surgery Sx / XRT</td>
<td>Surgery Sx / XRT</td>
</tr>
<tr>
<td>St. Marks, 1984</td>
<td>-</td>
<td>51</td>
</tr>
<tr>
<td>Bergen, 1984</td>
<td>55</td>
<td>59</td>
</tr>
<tr>
<td>Manchester, 1994</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>EORTC, 1996</td>
<td>49</td>
<td>52</td>
</tr>
<tr>
<td>MRC-2, 1996</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Stockholm, 1995</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>Swedish Rectal Ca Trial, 1997</td>
<td>48</td>
<td>58</td>
</tr>
<tr>
<td>Dutch TME Trial, 2005</td>
<td>63.5</td>
<td>64.3</td>
</tr>
</tbody>
</table>

Pre-op RT is more effective at decreasing local recurrence

<table>
<thead>
<tr>
<th>Study</th>
<th>Number</th>
<th>Rads</th>
<th>5 yr LR</th>
<th>5 yr OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uppsala (SCRT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-op</td>
<td>235</td>
<td>25 Gy (1 wk)</td>
<td>13%</td>
<td>47%</td>
</tr>
<tr>
<td>Post-op</td>
<td>235</td>
<td>60 Gy (8 wk)</td>
<td>22%*</td>
<td>(p=0.02) 40%</td>
</tr>
<tr>
<td>NSABP – R03 (CRT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-op</td>
<td>130</td>
<td>50.4 Gy</td>
<td></td>
<td>74%</td>
</tr>
<tr>
<td>Post-op</td>
<td>137</td>
<td>50.4 Gy</td>
<td></td>
<td>66%</td>
</tr>
<tr>
<td>German Trial (LCRT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-op</td>
<td>406</td>
<td>50.4 Gy</td>
<td>6%</td>
<td>76%</td>
</tr>
<tr>
<td>Post-op</td>
<td>394</td>
<td>55.8 Gy</td>
<td>13%*</td>
<td>(p=0.006) 74%</td>
</tr>
</tbody>
</table>

Note: Complete response in 90% of pre-op vs 50% of post-op
Frykholm et al. DCR 1993; 36: 564-572
Tagliabue et al. DCR 1997; 40: 131-139
Clinical Factors
When does my Patient Need It?

Neoadjuvant LCCRT is useful for:
- Fixed / tethered tumours (improve mobility)
- Bulky lesions (decrease tumour size)
- Borderline resectable due to relative tumour size
  - Larger tumours with small pelvis
  - Male or obese
  - Tumour regression may permit reanastomosis by improving technical issues (Sphincter sparing)
- We do not rely on neoadjuvant chemoradiation to sterilize the distal intramural margin

How is MRI used to determine neoadjuvant therapy?

- Predicted CRM negative
  - T1, T2
  - Early T3 < 5mm depth, N0 or N1;

- Predicted CRM negative but
  - T3 > 5mm depth invasion
  - T4, N2;

- Predicted CRM positive (≤ 1mm)
  - includes all T2,T3,T4 below levators

Consider primary surgery

neoadjuvant short course RT or long course CRT

neoadjuvant long course CRT

What is the Cost?
Long term function following adjuvant radiotherapy

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Uppsala (Mean F/U 6.7 yrs)</th>
<th>Stockholm I &amp; II (mean F/U 15 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sx (%)</td>
<td>Sx/XRT (%)</td>
</tr>
<tr>
<td>Frequency (&gt;8/d)</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Loose liquid stool</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Fecal urgency</td>
<td>12</td>
<td>41</td>
</tr>
<tr>
<td>Fecal incontinence</td>
<td>5</td>
<td>49</td>
</tr>
<tr>
<td>Use of pads</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>Diarrhoea, stool/gas</td>
<td>95</td>
<td>77</td>
</tr>
<tr>
<td>Social impact</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>Antidiarrheal use</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>Tenesmus</td>
<td>3</td>
<td>13</td>
</tr>
</tbody>
</table>

Dahlberg et al. DCR. 1998; 41: 543-549
What is the most appropriate operation?

- Should we consider local excision?
- Should I tackle this case, or refer?
- Should this patient have a low anterior resection or an APR?

Transanal Excision

- Suitable in 3-5% of pts.
- Criteria not well defined, but ideally:
  - Distal 1/3 of rectum (except with TEM)
  - Mobile (generally T1)
  - < 1/3 circumference
  - Polypoid > ulcerated
  - Well / moderately well differentiated
  - < 4cm in size
  - No lymphovascular invasion
  - No evidence of nodal metastases

RECTAL CANCER LOCAL EXCISION (trans anal excision)

**pro**
- low morbidity/mortality
- avoids sexual/urinary/bowel dysfunction
- avoids colostomy

**con**
- nodal status not pathologically assessed
- involved nodes not excised
- ? equivalent oncologic results to radical excision

TMN - Total mesorectal neglect

R Madoff
Transanal Excision
Local Recurrence

<table>
<thead>
<tr>
<th>Study / year</th>
<th>No. of patients</th>
<th>T1 Local Rec.</th>
<th>T2 Local Rec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stipa et al. 2004</td>
<td>47</td>
<td>16%</td>
<td>20%</td>
</tr>
<tr>
<td>Maeda et al. 2004</td>
<td>91</td>
<td>2%</td>
<td>15%</td>
</tr>
<tr>
<td>Gopal et al. 2004</td>
<td>64</td>
<td>13%</td>
<td>24%</td>
</tr>
<tr>
<td>Gao et al. 2003</td>
<td>47</td>
<td>11%</td>
<td>27%</td>
</tr>
<tr>
<td>Patty et al. 2002</td>
<td>94</td>
<td>14%</td>
<td>28%</td>
</tr>
<tr>
<td>Garcia-Aguilar 2006</td>
<td>82</td>
<td>18%</td>
<td>37%</td>
</tr>
<tr>
<td>Mellgren et al. 2002</td>
<td>108</td>
<td>18%</td>
<td>47%</td>
</tr>
<tr>
<td>Chakravarti 1999</td>
<td>52</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Skirve et al. 1998</td>
<td>71</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Baron et al. 1996</td>
<td>76</td>
<td>19%</td>
<td>21%</td>
</tr>
<tr>
<td>Total</td>
<td>732</td>
<td>12%</td>
<td>28%</td>
</tr>
</tbody>
</table>

Compare to Dutch Rectal Cancer Trial - <1% in stage 1 pts.

Comparison of Transanal to Radical Excision

<table>
<thead>
<tr>
<th>5-year local recurrence</th>
<th>Local Excision (n=108)</th>
<th>5-year local recurrence</th>
<th>Radical Excision (n=153)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>21%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>47%</td>
<td>6%</td>
<td></td>
</tr>
</tbody>
</table>


Total mesorectal neglect
Risk of lymph node metastases

• *Increased by:*
  – Lower 1/3 of rectum
  – Poor differentiation*
  – Lymphovascular invasion*
  – Sm level 3 T1 sub staging (Azou et al. Endoscopy. 1990;25:450-453)
T1 Sub-staging

Sm Level and LNM

- Sm1 = 0%, Sm2 = 10%, Sm3 = 25%
  - Kikuchi et al. DCR. 1995;38:1286-1295
- Sm1 = 3%, Sm2 = 11%, Sm3 = 34%
  - Odds ratio Sm3 vs. Sm1 = 5
    - Nascimbeni et al. 2002;45:200-206

Transanal Excision
Bottom Line

- Think this out carefully!
- Discuss with patient ahead of time!
- Use very selectively!
Advantages of TEM
TransEndoscopic Microsurgery

• Improved visibility
• Larger lesions can be taken out intact (not piecemeal)
• Access to mid and upper rectal lesions
• Potential sampling of lymph nodes

• Very good for large villous tumours
• Good for select T1 cancers with low risk of lymph node metastases
• Possibility for mesorectal excision ??

Radical excision
1. Rectal cancer surgery is **technically driven**
2. The surgical procedure (surgeon) may be the most significant intervention in resectable rectal cancer
3. The principles of rectal cancer surgery can be learned but …. it requires practice / practise

### Outcome by Surgeon Volume

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>751</td>
<td>819</td>
<td>665</td>
</tr>
<tr>
<td>5 yr Overall survival</td>
<td>57.3%</td>
<td>47.1%</td>
<td>53.1%</td>
</tr>
<tr>
<td>5 yr cancer specific survival colon</td>
<td>70.2%</td>
<td>62.0%</td>
<td>65.9%</td>
</tr>
<tr>
<td>5 yr cancer specific survival Rectum</td>
<td>70.5%</td>
<td>63.7%</td>
<td>68.6%</td>
</tr>
</tbody>
</table>


### Outcome by Specialization Rectal subset

<table>
<thead>
<tr>
<th></th>
<th>Specialist</th>
<th>Non-specialist</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>531</td>
<td>1655</td>
<td></td>
</tr>
<tr>
<td>5 yr overall Survival Rectum</td>
<td>58.6%</td>
<td>47.0%</td>
<td>0.009</td>
</tr>
<tr>
<td>5 yr cancer specific survival Rectum</td>
<td>72.0%</td>
<td>60.6%</td>
<td>0.047</td>
</tr>
</tbody>
</table>

Outcomes by Training and Volume

<table>
<thead>
<tr>
<th></th>
<th>&gt;21 resections</th>
<th>&lt;21 resections</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Recurrence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal trained</td>
<td>10.4%</td>
<td>21.1%</td>
</tr>
<tr>
<td>non-colorectal trained</td>
<td>27.8%</td>
<td>44.6%</td>
</tr>
<tr>
<td><strong>Disease-specific survival</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal trained</td>
<td>67.3%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Non-colorectal trained</td>
<td>49.0%</td>
<td>39.2%</td>
</tr>
</tbody>
</table>


Know your surgeon!

Total Mesorectal Excision

- the rectum and its mesentery are a single fascia-enveloped unit, anatomically separate from surrounding pelvic structures
- surgical violation of this anatomic package leads to a positive circumferential margin
Circumferential resection margin (CRM)

Why is it so important?

- A positive CRM is an independent predictor of local recurrence and survival (Quirke, Adam)

- Risk for positive CRM increases with more advanced T and N stage (Nategaal/Quirke)

- Risk for positive CRM increases with violation of the mesorectum (Quirke)

Plane of Surgery Dictates local recurrence rates!

<table>
<thead>
<tr>
<th>Plane of Surgery</th>
<th>Local Recurrence (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesorectal</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Intramesorectal</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Muscularis Propria</td>
<td>13</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Quirke 2009
Can Adjuvant Radiation Compensate for Surgical Technique?

**NO!!**

- Radiation can decrease local recurrence by 50% from base line levels Pahlman. 1997
- Thus surgical technique is the most important variable!!

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**Surgical Technique**

- Mesorectal Excision
  - Total mesorectal excision refers to removal of the rectum and mesorectum down to the pelvic floor and the levator hiatus
  - appropriate for tumors of the mid and lower rectum
  - Tumour specific mesorectal excision refers to the removal of the rectum and mesorectum for a distance of 5 cm below the tumour (no coning)
  - appropriate for tumors of the upper rectum (> 10 cm)
Abdominoperineal resection and TME

• **Indications for APR**
  – Invasion of the levator ani or sphincter complex
  – Inability to obtain proper distal margin without resecting sphincter
  – Preoperative incontinence

• **Issues with APR**
  – Significantly more positive CRMs
  – Significantly more perforations
  – Generally use more chemoradiation
Alberta Rectal Cancer Initiative (ARCI)

Rectal Cancer and Surgeon Volume

Surgery is performed at 22 hospitals across Alberta
- 8 hospitals perform a mean of ≤ 3 cases per year

Surgeon Volume
- top quintile = High volume (HV) Surgeons
  ≥ 9 surgeries/year
  (range 9-31 cases/yr)

What needs to be done?

- Increase the number of high volume surgeons and provide them with the tools to do quality work.

- HV surgeons:
  - completed 68% of rectal cancer surgeries in Alberta in 2011, up from 32% in 1997, we need to do better!

Why?
- higher rates of grade 3 TME specimens
- lower rates of CRM positivity
- higher sphincter preservation rates
- lower 5-year local recurrence
- higher 5-year disease-specific survival
How? Education

Surgeons want to do the right thing

Rectal Cancer School:
- Proper operative (TME) techniques
- Appropriate staging and interpretation of MRI
- Use of Multidisciplinary Tumour Boards
- Appropriate use of neo adjuvant therapy
- Centralization of rectal cancer surgery to high-volume surgeons
  - May be at the local level
  - Central referral of difficult cases

Introduction of TME
Regional Multi-Surgeon Studies

Arbman, 1996
- 211 controls 1984-86 vs. 230 TME 1990-92
- Local recurrence decreased from 14% to 6%

Havenga, 1999
- 691 TME vs. 720 conventional stage 2 and 3 cancers by two groups of surgeons
- Local recurrence range; TME 4-9% vs. non TME 32-35%

Kockerling, 1998
- TME introduced over 1985-1991
- 1581 pt
- Local recurrence decrease from 39.4 to 9.8%, 5 yr survival increased from 50-71%

Is it just the Surgeons?

Radiologists
- Goal
  - Dedicated high resolution imaging (MRI) for all patients undergoing curative surgery for rectal cancer in a timely manner using a synoptic report
- MRI performed according to the Mercury protocol for T2 and T3 tumours
- Correlation of test results and management plan
- Ensure access within accepted timelines
Medical and Radiation Oncologists

Neoadjuvant therapy
- **Goal** - All patients with locally advanced operable rectal cancer have the opportunity to be discussed at a multidisciplinary conference (MDC) and offered Neoadjuvant therapy when appropriate
  - Care plan based on preoperative staging
  - Current guidelines in Alberta include neoadjuvant long course chemoradiation or short course radiation
  - Only 50% of Alberta patients with stage II and 66% of stage III rectal cancer received neoadjuvant therapy (2011)

Pathologists

Continuous Quality Improvement
- **Goal**
  - Complete TME evaluation of every rectal cancer specimen based on Quirke methodology
  - 22% of cases were not graded for TME
  - CRM positivity reported 78% of the time
  - Lymph node harvest mean 17 nodes
  - Lymph node status not reported in 4%

Proposed Rectal Cancer Pathway (Stage II/III)

1. Dedicated High-Resolution Rectal MRI performed according to mercury protocol
2. Transrectal Ultrasound
   - Unresectable
3. Preoperative Staging
   - T1, T2
   - T3, T4
   - Serosal perforation
   - Spleen perforation
4. TME as part of a low anterior or abdominoperineal resection
5. Tumour specific mesorectal excision with a margin of at least 5 cm
6. All patients should receive a referral to an oncologist to determine adjuvant therapy
7. Majority should receive adjuvant therapy
Proposed Rectal Cancer Measures (Stage II/III)

**Process Measures:**
- Percentage of pre-operative MRIs performed to accurately stage disease.
- MRI's are appropriately performed according to standard practice.
- New patients are managed according to a comprehensive workup.

**Outcome Measures:**
- tumour and lymph nodes.
- TME is performed with satisfactory margins and negative lymph nodes.

**Process Measures:**
- Number of patients with stage II/III disease treated with neoadjuvant therapy.
- Type of neoadjuvant therapy used (radiation or chemotherapy).

**Outcome Measures:**
- Quality of life (e.g., bladder, bowel incontinence, sexual dysfunction).
- Survival rates.
- Post-treatment hospital utilization rates.

Pathway is based on accepted standards of care

**Practice Parameters for the Management of Rectal Cancer (Revised)**

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J. F. Baffa, M.D. Preformed by the Standards Practice Task Force of the American Society of Colon and Rectal Surgeons

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What can we expect?

- Better more efficient care
- Major impact on immediate and long-term patient outcomes
- Impact on survival rates
- Decreased local recurrence rates
- Potential reduction in repeat surgeries
How will we accomplish this?

- Design and implement a knowledge translation strategy to promote uptake of a rectal cancer clinical pathway that can be tailored to each local practice environment

- Evidence-based strategies for improving rectal cancer outcomes:
  - Physician education initiatives
  - Outcomes reporting
  - Centralized Care

Project Overview

<table>
<thead>
<tr>
<th>Evidence-based strategies for improving rectal cancer outcomes</th>
<th>Timeline</th>
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</thead>
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<td>Educational initiatives:</td>
<td>2014</td>
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<td>Outcomes reporting:</td>
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<td>Increased case volumes:</td>
<td>2016</td>
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<th>Strategies to tailor interventions to each local practice environment</th>
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</tbody>
</table>

Overall Goal

Optimal safe effective patient centered care for every rectal cancer patient in Alberta
Summary

• Rectal cancer surgery has undergone a technical evolution
  - Anatomic basis for resection
  - Cross sectional imaging
  - Concentration of surgical care
  - Extension of transanal methods
• Integration of multidisciplinary care
  - Standardized Care Pathways
  - Appropriate use of neoadjuvant therapy

Future
  - Chemoradiation, transanal excision of residual tumour followed by observation

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Questions