The Perioperative Care Chain is Only as Strong as its weakest link

Associate Professor Kerin Fielding
The University of Notre Dame, Australia
School of Medicine, Sydney
Outline

• The perioperative chain
• Possible opportunities to strengthen the links
  – Link by link
• Summary of key areas to strengthen the chain
  – Better patient outcomes
  – Reduced cancellations
  – Evidence based
The Perioperative Chain

- Operation
- Post op Care
- Preop Assess
- Waiting List
- Surgeon
- GP
Strengthening the Links – GP to Surgeon

- GP to Surgeon
  - Assessment – role of triage tool
  - Data sharing
  - Patient expectations
    - Eg high Oxford knee score will not benefit as much from arthroplasty
The Perioperative Chain

- Post op Care
- Operation
- Preop Assess
- Waiting List
- GP
- Surgeon
Strengthening the Links – Surgeon to Hospital

• Referral for admission
  – Ordering tests
  – Past history
  – Consent – done 12 months ahead
The Perioperative Chain

- Preop Assess
- Operation
- Waiting List
- Post op Care
- GP
- Surgeon
Strengthening the Links: “On the Waiting List”

• Between referral for admission and preoperative assessment

• Hospital to Preoperative Clinic
  – May be 11 months or longer

• Trial of an intervention program to better prepare orthopaedic joint replacement patients for surgery – Osteoarthritis Chronic Care Program (OACCP)
Osteoarthritis chronic care program

• NSW Agency for Clinical Innovation (ACI) musculoskeletal network and Murrumbidgee LHD and PHNs and Notre Dame university

• Pilot of multidisciplinary care program for waiting list patients - Total Knee or Hip Replacement (TKR or THR)

• Coordinator arranged referral
  – physiotherapy
  – dietitian
  – hydrotherapy
  – mental health
  – GP
Osteoarthritis chronic care program

140 left program because they did not attend. All others were operated on or decided not to have surgery.
Osteoarthritis chronic care program

• 422 patients
  – Mean age 67 (45-91); 60.3% female
  – Current smoker – 9.5%
  – Obese (BMI > 30) – 59.8%
  – Falls last 12 months – 32.7%

• Patients were assessed with hip, knee, mobility, quality of life and function scores as well as comorbidities
## Comorbidities (%)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Hip</th>
<th>Knee</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteoarthritis</td>
<td>92.9</td>
<td>94.3</td>
<td>94.0</td>
</tr>
<tr>
<td>Back Pain</td>
<td>75.5</td>
<td>65.6</td>
<td>68.4</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>61.2</td>
<td>66.4</td>
<td>64.9</td>
</tr>
<tr>
<td>Depression or other mental health problem</td>
<td>21.4</td>
<td>28.9</td>
<td>26.8</td>
</tr>
<tr>
<td>Diabetes type 2</td>
<td>12.2</td>
<td>17.8</td>
<td>16.4</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>11.3</td>
<td>15.8</td>
<td>14.4</td>
</tr>
<tr>
<td>Lung disease</td>
<td>10.2</td>
<td>15.4</td>
<td>13.8</td>
</tr>
<tr>
<td>Ulcer or stomach disease</td>
<td>15.3</td>
<td>10.9</td>
<td>12.4</td>
</tr>
<tr>
<td>Heart Disease: AMI, unstable angina pectoris</td>
<td>14.4</td>
<td>10.2</td>
<td>11.3</td>
</tr>
<tr>
<td>Sleep Apnoea</td>
<td>8.2</td>
<td>12.6</td>
<td>11.2</td>
</tr>
<tr>
<td>Rheumatoid Arthritis</td>
<td>14.3</td>
<td>9.3</td>
<td>10.7</td>
</tr>
</tbody>
</table>
# BMI: scores and initial referrals

<table>
<thead>
<tr>
<th></th>
<th>BMI category (n=365)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>normal (n=55)</td>
</tr>
<tr>
<td>Age (mean years)</td>
<td>72.1</td>
</tr>
<tr>
<td>DAS depression (mean score)</td>
<td>3.6</td>
</tr>
<tr>
<td>Joint being assessed (%)</td>
<td></td>
</tr>
<tr>
<td>Hip</td>
<td>23.6</td>
</tr>
<tr>
<td>Knee</td>
<td>8.6</td>
</tr>
<tr>
<td>HOOS (mean score)</td>
<td></td>
</tr>
<tr>
<td>pain/discomfort</td>
<td>50.5</td>
</tr>
<tr>
<td>symptoms</td>
<td>53.0</td>
</tr>
<tr>
<td>KOOS (mean score)</td>
<td></td>
</tr>
<tr>
<td>pain/discomfort</td>
<td>49.7</td>
</tr>
<tr>
<td>symptoms</td>
<td>51.4</td>
</tr>
<tr>
<td>At initial assessment, referred to other programs</td>
<td></td>
</tr>
<tr>
<td>GP</td>
<td>27.3</td>
</tr>
<tr>
<td>Stepping On</td>
<td>5.5</td>
</tr>
<tr>
<td>physiotherapist</td>
<td>18.2</td>
</tr>
<tr>
<td>dietitian</td>
<td>0.0</td>
</tr>
<tr>
<td>home exercise program</td>
<td>49.0</td>
</tr>
</tbody>
</table>

*results are for all hip and knee patients, with the exception of HOOS and KOOS scores*
Summary OACCP

- Patients who removed themselves – 11 (2.6%)
  - Arguably a saving of approx. $250K but no historical comparison and in any case the “saving” does not show up on the profit and loss statement

- Patients escalated surgery - 4

- Reduction in length of stay for hip surgery when compared to historical controls of 5.6 to 4.0 days ($p>0.001$)

- Discharge to home improved by 7% (78 to 85%) compared with historical controls (not significant)
Issues

• Data sharing between providers was problematic

• Remuneration required for sustainability
  – Work following up patients

• Waiting list team operated separately from the trial team – patients brought forward for surgery and dates allocated without reference to the OACCP
Elsewhere

• Victoria
  – Multi – Attribute Arthritis Prioritization Tool (MAAPT)

• Western Australia
  – MAAPT

• United Kingdom
  – National Institute of Clinical Excellence (NICE)
The Perioperative Chain

- Operation
- Preop Assess
- Waiting List
- Post op Care
- GP
- Surgeon

Flow from Preop Assess to Post op Care.
Strengthening the links -
Preoperative assessment clinic

Yes

- Staph aureus
  - “Preoperative screening and decolonization of S. aureus in orthopaedic patients is a cost-effective means to reduce SSIs” (Chen, Wessel and Rao, 2013)
- FBC
  - Anaemia 16% of patients
  - Important to allow time to treat and investigate (Goodnough et al, 2011)
- ECG
  - >65, ASA >1

No

- Coagulation studies
  - Unless chronic liver disease or on anticoagulants (NICE, 2016)
- UTI screening if asymptomatic (Sendi et al, 2017)
- Lung function, ABGs
Is the patient anaemic?
Hb <130 g/L (male) or
Hb <120 g/L (female)

Preoperative tests
- Full blood count
- Iron studies including ferritin
- CRP and renal function

Is the patient anaemic?
Hb <130 g/L (male) or
Hb <120 g/L (female)

Preoperative haemoglobin assessment and optimisation template

This template is for patients undergoing procedures in which substantial blood loss is anticipated such as cardiac surgery, major orthopaedic, vascular and general surgery. Specific details, including reference ranges and therapies, may need adaptation for local needs, expertise or patient groups.

No anaemia: ferritin <100 mcg/L
- Consider iron therapy if anticipated postoperative Hb decrease is ≥30 g/L
- Determine cause and need for GI investigations if ferritin is suggestive of iron deficiency <30 mcg/L

Iron deficiency anaemia
- Evaluate possible causes based on clinical findings
- Discuss with gastroenterologist regarding GI investigations and their timing in relation to surgery
- Commence iron therapy

Possible iron deficiency
- Consider clinical context
- Consider haematology advice or, in the presence of chronic kidney disease, renal advice
- Discuss with gastroenterologist regarding GI investigations and their timing in relation to surgery
- Commence iron therapy

Possible anaemia of chronic disease or inflammation, or other cause
- Consider clinical context
- Review renal function, MCV/MCH and blood film
- Check B12/folate levels and reticulocyte count
- Check liver and thyroid function
- Seek haematology advice or, in the presence of chronic kidney disease, renal advice
Preoperative planning

- Spinal table
- VTE and antibiotics protocols
- Positioning
- Approach to postoperative analgesia/blocks
  - Critical to early mobilisation
  - Prevent pneumonia
  - Tailored for each patient
  - Team approach with anaesthesiologists
The Perioperative Chain

1. Operation
2. Preop Assess
3. Waiting List
4. Surgeon
5. GP
6. Post op Care

Flow: Operation → Post op Care → GP → Surgeon → Waiting List → Preop Assess → Operation
Strengthening the Links: Postoperative

• Improved with pathways
  – But multiple pathways create issues for nursing and allied health staff

• Identify post operative complications
  – VTE
  – Pneumonia
  – Infection
  – Wound care

• Treat promptly – to prevent delayed recovery

• Role of rehabilitation
  – Probably not merited (Schilling et al, 2018)
Strengthening the links
Physicians and Geriatricians
Post-operative Care

• Multidisciplinary team approach
  – Anaesthetic lead pain management

• Post-operative fever is an expected event following orthopaedic surgery.
  – Any kind of workup in the absence of localizing symptoms in the third post-operative day or before is unwarranted and is an inappropriate use of hospital resources. (Ashley, Speigel et al, 2017)
The Perioperative Chain

- Preop Assess
- Operation
- Waiting List
- Post op Care
- GP
- Surgeon
Strengthening the links
- Discharge to GP

- Timely summaries
- Data sharing
- Distance means that GPs will often be the first point of contact for a postoperative issue
  - Super-specialistion
  - International workforce
Strengthening the chain
Physicians and Geriatricians
Summary Key Issues

• Data sharing and EMR
• Time on the waiting list could be better used
  – Earlier triage and assessment
  – Patient education
  – Focus on improving comorbidities
• Focus on the evidence for perioperative assessment
• Communication and teamwork
  – Locally agreed consensus protocols across multiple surgeons and anaesthesiologists
References
