What is the Impact of a Bowel Management Protocol in Cardiac Intensive Care?

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## Introduction

### Constipation

**Incidence:** 83% \((\text{Mostafa et al. 2003})\)

**ICU Risk Factors**

- Opioid use
- Immobility \((\text{Van der Spoel et al. 2006})\)
- Severity of illness \((\text{Van der Spoel et al. 2007})\)

**Implications**

- Difficulty weaning from MV
- Increased length of ICU stay \((\text{Mostafa et al. 2003})\)
- NHS Costs

**Bowel Management Protocols:** standardising and improving incidence of constipation and diarrhoea \((\text{Dorman et al. 2004; McPeake et al. 2011})\).

### Diarrhoea

**Incidence:** 78% \((\text{Jack et al. 2010})\)

**ICU Risk Factors**

- NG feed
- Antibiotics \((\text{Thibault et al. 2013})\)
- Infection \((\text{Salva et al. 2013})\)

**Implications**

- Impaired skin integrity
- Fluid & electrolyte loss \((\text{Pittman et al. 2012})\)
- NHS costs
Bowel Management on Cardiac Intensive Care (PHNT)

- Haphazard bowel management
- Lack of guidance
- Needed standardisation
- Bowel management protocol developed based on research and protocols in the literature
- Implemented on CICU

Southwest Cardiothoracic Centre
- 12 bedded ICU capacity
- 6 HDU
- Elective and emergency cardiac surgery, e.g. CABG, valve repairs, aortic dissection repairs.
- Rise in comorbidities - longer ICU stay
Bowel Management Protocol for Adults in Cardiac Intensive Care
(excludes patients with spinal cord injury and chronic liver disease)

See enteral feeding protocol

Commence enteral feeding as per protocol

Absorbing? Yes

Commence Senna 10mls (ON) on day of established feeding

Stool 6-7 on BSC

Perform PR - is it overflow?

Yes

Senna 20mls (ON) + Lactulose 15mls (BD)

BO within 24 hours?

Yes

1 x 4g Glycerin Suppository

BNO in 2 hours?

Yes

Stool Soft

1 x 10mg Bisacodyl Suppository

BNO in 2 hours?

Yes

1 x Microlax Enema

BNO in 2 hours?

Yes

Consider neostigmine infusion if not contraindicated

If BNO by day 5 & rectum empty, inform consultant. Consider abdominal xray

If persists for a further 24 hours, consider flexi-seal or loperamide (if infection excluded)

Continue laxatives and perform PR daily and treat as per protocol

Perform PR examination and treat according to protocol

Senna 20mls (ON) + Lactulose 15mls (BD)

BO within 24 hours?

Yes

Perform PR examination as per trust policy

Rectum Empty

Rectum Full

If persists beyond 2 episodes then send specimen for C. Diff & MC&S to exclude infection, commence Trust Diarrhoea care plan, inform IPC Team and isolate patient as per Trust policy

Consider cause for diarrhoea. Review Drug chart and NG feed.

If no result, inform consultant

If persists for an additional 24 hours, consider neostigmine infusion if not contraindicated

Consider phosphate enema

If persists beyond 2 episodes then send specimen for C. Diff & MC&S to exclude infection, commence Trust Diarrhoea care plan, inform IPC Team and isolate patient as per Trust policy

Perform PR as per trust policy and treat according to protocol

Consider alternative

If no result, inform consultant

If no result, inform consultant

If no result, inform consultant

If no result, inform consultant

If no result, inform consultant
Impact of a BMP in ICU

- What does the research say?
  - Mixed results
- Is compliance the issue?
  - Only 34% compliance rate to a BMP in ICU (Knowles et al. 2014)
- **Snapshot**: day one of admission only.
- **Implementation research**: to improve compliance need to identify barriers to using BMP in health care (Graham et al. 2006; Grimshaw, 2012).
Aims and Objectives

- Ascertain the impact of the implementation of a BMP on cardiac intensive care patients & to identify the factors to implementation success using the following objectives:

1. Detect the impact that the implementation of the BMP had on the incidence of constipation and diarrhoea.
2. Identify the level of compliance to the BMP
3. Explore the barriers and enablers of the BMP after its implementation to help future refinements of the BMP
**Methods**

**Implementation of BMP:** 03/07/15 – 18/10/15

**Phase One:**
Quasi-Experimental Uncontrolled Pre-test Post-test

**Data Collection**
Retrospective notes review:
- 28/02/15 – 30/06/15 (Pre-implementation)
- 20/10/15– 15/04/16 (Post-Implementation)

**Sample**
Adults, admitted > 72 hours, NG fed.
Exclusion criteria applied

**Outcome Measures:**
Demographics, Constipation, Diarrhoea
Compliance to the BMP

**Data Analysis:**
Descriptive stats, Chi-square & Mann-Whitney U

**Phase Two:**
Focus Groups exploring barriers & enablers 6 months after the BMP implementation

**Data Collection:**
- Semi-structured questions
- Audio recording devices

**Sample**
Staff using BMP in CICU
Recruited via emails, Facebook, posters.

**Data Analysis:**
Manually transcribed verbatim
Thematic analysis
Member Checking offered
Results: Phase One

Pre-implementation

37 Patients’ retrieved from initial database search
- ICU admission > 72 hours
- Enteral feed
- Not on TPN

3 excluded due to past medical history contraindicating with exclusion criteria.

4 excluded due to patients’ condition falling within the exclusion criteria.

Unable to obtain notes for 0 patients.

30 patients included for case review

Post-implementation

33 Patients’ retrieved from initial database search
- ICU admission > 72 hours
- Enteral feed
- Not on TPN

1 excluded due to past medical history contraindicating with exclusion criteria.

7 excluded due to patients’ condition falling within the exclusion criteria.

Unable to obtain notes for 4 patients.

21 patients included for case review
### Demographics and clinical characteristics

<table>
<thead>
<tr>
<th></th>
<th>Pre-implementation n (%)</th>
<th>Post-implementation n (%)</th>
<th>Test Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender: Male</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>21 (70)</td>
<td>15 (71.4)</td>
<td>$\chi^2 = .028$, df = 1, p = .87</td>
</tr>
<tr>
<td><strong>Operation: CABG</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve repair/replacement</td>
<td>8 (26.7)</td>
<td>3 (14.3)</td>
<td></td>
</tr>
<tr>
<td>CABG + valve repair/replacement</td>
<td>5 (16.7)</td>
<td>5 (23.8)</td>
<td></td>
</tr>
<tr>
<td>Multiple valve repair/replacement</td>
<td>3 (10)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Type A dissection repair</td>
<td>4 (13.3)</td>
<td>3 (14.3)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3 (9.9)</td>
<td>1 (4.8)</td>
<td>**</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>73 (65.50 – 76.75)</td>
<td>69 (60 – 77.5)</td>
<td>U = 285.50, z = -.565, p = .572</td>
</tr>
<tr>
<td><strong>ICU LOS (days)</strong></td>
<td>7.67 (5.89 – 15.09)</td>
<td>6.98 (5.10 – 15.38)</td>
<td>U = 286.50, z = -.545, p = .585</td>
</tr>
<tr>
<td><strong>Hours of MV</strong></td>
<td>88.64 (22.86 – 159.50)</td>
<td>64 (44.37 – 289.09)</td>
<td>U = 299, z = -.306, p = .759</td>
</tr>
<tr>
<td><strong>EuroSCORE II</strong></td>
<td>3.66 (2.23 – 14.04)</td>
<td>3.31 (1.99 – 9.42)</td>
<td>U = 308, z = -.134, p = .893</td>
</tr>
<tr>
<td><strong>Total IV fentanyl intake (mcg)</strong></td>
<td>350.00 (0 – 7639.79)</td>
<td>2300.00 (0 – 8562.20)</td>
<td>U = 294, z = -.422, p = .673</td>
</tr>
<tr>
<td><strong>Total IV remifentanil intake (mg)</strong></td>
<td>1.77 (0 – 9.5)</td>
<td>7.20 (0 – 26.85)</td>
<td>U = 263, z = -.761, p = .446</td>
</tr>
<tr>
<td><strong>Total IV propofol intake (mg)</strong></td>
<td>13625.00 (2775.00 – 21878.75)</td>
<td>9400.00 (4603.34 – 19316.25)</td>
<td>U = 312.50, z = -.048, p = .962</td>
</tr>
<tr>
<td><strong>Total enteral feed intake (ml)</strong></td>
<td>7107.29 (2695.50 – 10349.06)</td>
<td>2565.00 (1150.00 – 14501.79)</td>
<td>U = 253, z = -1.187, p = .235</td>
</tr>
<tr>
<td><strong>Course of antibiotics</strong></td>
<td>3 (2-3)</td>
<td>3 (2-3)</td>
<td>U = 288, z = -.556, p = .578</td>
</tr>
<tr>
<td><strong>Number of inotropes</strong></td>
<td>2 (1-3)</td>
<td>2 (1.5 – 2)</td>
<td>U = 269.50, z = -.909, p = .363</td>
</tr>
</tbody>
</table>

## Constipation

<table>
<thead>
<tr>
<th></th>
<th>Pre-implementation</th>
<th>Post-implementation</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours until first bowel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>movement</td>
<td>96.52 (72.59-128.10)</td>
<td>108 (97.98 – 119.23)</td>
<td>( U = 266, z = -.938, p = .348. )</td>
</tr>
<tr>
<td>( Md \text{ (IQR)} )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Episodes (%) of constipation</td>
<td>14.29 (6.67 – 20)</td>
<td>14.29 (5.5 – 20)</td>
<td>( U = 282.50, z = -.626, p = .531 )</td>
</tr>
<tr>
<td>( Md \text{ (IQR)} )</td>
<td>14.29 (6.67 – 20)</td>
<td>14.29 (5.5 – 20)</td>
<td></td>
</tr>
<tr>
<td>Constipated within first</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96 hours: ( n ) (%)</td>
<td>15 (50)</td>
<td>17 (81)</td>
<td>( \chi^2 = 3.8, df = 1, p = .05 )</td>
</tr>
<tr>
<td>No</td>
<td>15 (50)</td>
<td>4 (19)</td>
<td></td>
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</tbody>
</table>
# Diarrhoea

<table>
<thead>
<tr>
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<th>Pre-implementation</th>
<th>Post-implementation</th>
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</tr>
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<tbody>
<tr>
<td>Number (%) diarrhoea days Md (IQR)</td>
<td>2.17 (0-20)</td>
<td>0 (0 – 16.07)</td>
<td>$U = 283, z = -.644, \ p = .507$</td>
</tr>
<tr>
<td>Patients who developed diarrhoea: n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (50)</td>
<td>9 (42.9)</td>
<td>$\chi^2 = .048, \ df = 1, \ p = .827$</td>
</tr>
<tr>
<td>No</td>
<td>15 (50)</td>
<td>12 (57.1)</td>
<td></td>
</tr>
<tr>
<td>Flexi-seal? n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7 (23.3)</td>
<td>0 (0)</td>
<td>$p = .03$</td>
</tr>
<tr>
<td>No</td>
<td>23 (76.7)</td>
<td>21 (100)</td>
<td></td>
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</tbody>
</table>
Results: phase one - Compliance

Overall compliance

<table>
<thead>
<tr>
<th>2.4%</th>
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<tbody>
<tr>
<td>(IQR = 0-39%, n = 12).</td>
</tr>
</tbody>
</table>

• Performing PR assessments
• Escalating laxatives

Versus

Nurse Documented Compliance

<table>
<thead>
<tr>
<th>86%</th>
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</thead>
<tbody>
<tr>
<td>(IQR = 44.4 – 98.9%, n = 12).</td>
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</tbody>
</table>
Evidence of Behaviour Change

Days from NG feed starting to laxatives first administered

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Pre-Implementation</th>
<th>Post-Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20</td>
<td>9.5</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>9.5</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>6.7</td>
</tr>
<tr>
<td>3</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3.3</td>
<td>0</td>
</tr>
</tbody>
</table>

Percentages represent the number of days from NG feed starting to laxatives first administered for both Pre- and Post-Implementation periods.
Evidence of Behaviour Change

Type of laxatives administered to patients

<table>
<thead>
<tr>
<th>Type of Laxatives Administered</th>
<th>Pre-Implementation</th>
<th>Post-Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senna/Lactulose</td>
<td>60</td>
<td>66.7</td>
</tr>
<tr>
<td>Other Aperients</td>
<td>23.3</td>
<td>0</td>
</tr>
<tr>
<td>No Aperients</td>
<td>16.7</td>
<td>33.3</td>
</tr>
</tbody>
</table>
Results: Phase Two – Focus Groups

2 x Focus Groups (April 2016)

5 Nurses in each focus group

All female from CICU and CHDU

20 minutes each

Preceptor to management role
Themes extracted from focus groups

- Nurse as a Barrier
- Increased Workload
- Raised Awareness
- Outcomes of the BMP
- Barriers & Enablers of BMP Characteristics
- Barriers & Enablers of Dissemination
- Medical Involvement
- Improved Patient Care
- Barriers to Bowel Assessment
<table>
<thead>
<tr>
<th>Barrier</th>
<th>Action Plan</th>
</tr>
</thead>
</table>
| • BMP appearance overwhelming  
• Statements on BMP not clear. | Simplify the BMP  
Ensure its elements are clearly stated. |
| • Inconsistent methods of dissemination to staff.  
• Misinterpretation of the BMP.  
• Reluctance to change previous practices. | Additional one-to-one interactions and teaching sessions for staff to explain the elements of the BMP and the implications of its use in practice. |

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Action Plan</th>
</tr>
</thead>
</table>
| Lack of a multidisciplinary approach of bowel management. | Inform anaesthetic lead consultant of findings.  
Ward round templates to include ‘bowel’ element for doctors to complete. |
| • Lack of nurse confidence in performing a PR assessment.  
• Poor documentation of patients’ nutritional intake and bowel function. | Provide guidelines to nurses on performing PR assessments.  
Set up reminders about the importance of documentation |
Discussion

• Little impact was established on incidence of constipation and diarrhoea following BMP implementation.
• Tendency for higher incidence of constipation and lower incidence of diarrhoea.
• Less laxatives were given after the implementation – misinterpretation of protocol.
• Compliance was low.
• Barriers identified can explain low compliance.
• Discrepancies between actual compliance and nurse documented compliance highlights educational requirements.
• There was evidence of practice change through less varied bowel care.
References


Thank you for your attention

Any Questions?

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