HEALTH QUALITY & SAFETY COMMISSION NEW ZEALAND
Kupu Taurangi Hauora o Aotearoa

Opioid implementation package

The use of a care-bundle to reduce opioid-related harm

Edition 1

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DISCLAIMER

The information in this guide is provided to assist health professionals with improving the safe use of opioids. The information was gathered from a number of sources. Their inclusion does not constitute or imply endorsement by the Health Quality & Safety Commission New Zealand (the Commission). While the Commission has taken all reasonable steps to ensure the information is accurate and from reliable and reputable sources, it accepts no liability or responsibility for any acts or omissions, done or omitted in reliance, in whole or in part, on the information. The Commission accepts no responsibility for the manner in which this information is subsequently used. Users of this information must always consider current best practice and use their clinical judgement with each patient. This information is not a substitute for the exercise of clinical judgement by individual clinicians. The statements, views and opinions expressed in this guide do not necessarily reflect those of the Commission.

Acknowledgements

This implementation package is based on the work undertaken through the Commission's national formative opioid collaborative 2014–17 and the resultant How-to Guide[1] where the final selection of interventions to reduce opioid-related harm was based on published evidence, local quality improvement data and expert opinion (through a modified-Delphi technique[1]).

The Commission acknowledges the 20 district health boards and MercyAscot Hospital for participating in the safe use of opioids national collaborative, their enthusiasm and their commitment to improving medication-related patient safety. The Commission congratulates the teams who embraced the use of quality improvement tools and methods, and reduced the extent of opioid-related harm in their pilot areas.

Special thanks go to Dr John Krueger from the Institute for Healthcare Improvement for his invaluable contribution, especially his support at the national learning events and his advice and guidance with creating the care bundles.

Finally, the Commission thanks the consumer representatives who were part of district health board teams, and the patients/consumers who shared their personal stories of opioid-related harm with the collaborative. These stories are a powerful reminder of the importance of the improvement work undertaken.

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1. At a glance: the opioid implementation package

1.1. Building on the Safe Use of Opioid Formative Collaborative – next steps

Opioid medicines (morphine, oxycodone, fentanyl, methadone, tramadol, codeine) are high-risk medicines, which are excellent at controlling pain but have a number of unintended side-effects (eg, nausea, vomiting, constipation, urinary retention). Opioids can also cause serious harm when given in high doses, or in individuals who are at higher risk (eg, opioid induced ventilatory impairment [OIVI] and arrest).

Opioid-related Adverse Drug Events (ADEs) also impose significant costs on the health care system, due to the management of adverse drug events (ADEs) and prolong hospital stays for patients who suffer harm. The recent medication-related harm study in New Zealand,[2] where opioids contributed to 30 percent of ADEs, showed that patients stayed in hospital on average four days longer than patients who did not suffer an ADE. A meta-analysis[3] found an overall increase in costs between 7.4–47 percent. Opioid-induced constipation increased costs by up to 29 percent, bowel obstruction by 50 percent, confusion by nearly 20 percent and urinary retention by 14.5 percent.

Opioids are a leading contributor of health care associated harm ranging from patients experiencing mild distress to substantial patient harm and increased costs to hospital services in New Zealand. In response to these concerns, the Health Quality & Safety Commission (the Commission) sponsored an eighteen-month formative collaborative from October 2014. The collaborative was aimed at building District Health Board (DHB)-sector and private hospital engagement and capacity to identify interventions to reduce opioid harm. Given its formative nature, DHBs were free to identify which specific opioid-harm to concentrate on, and to use interventions of their own choosing. Ten DHBs focussed on opioid-induced constipation (OIC), a further two opioid-induced ventilatory impairment (OIVI), two on nausea and vomiting, and two on uncontrolled pain.

It was envisaged that this work would contribute to the development of a best-practice care bundle approach to decreasing opioid-related harm. Three bundle elements have been produced (OIC, OIVI and uncontrolled pain) and a composite care bundle (see the How-to Guide[1]). The How-to Guide describes the four emerging care bundles designed to reduce opioid-related harm. The term ‘emerging’ is used because, although some evidence from the individual interventions indicates they are effective, no evidence yet exists to show improvement when the interventions are used together.

The collaborative was based on the Institute for Healthcare Improvement’s (IHI) breakthrough-series collaborative methodology.[4] Frontline hospital staff engaged in small-scale, rapid cycle testing of ‘change ideas’ to reduce opioid-related harm.

This collaborative has finished but there is still enthusiasm within the sector to continue to work on reducing the burden of opioid-related harm. The Commission is therefore keen to facilitate further work with DHB and private hospitals.

The purpose of this opioid implementation package is to outline the next steps and what the options are to make a significant difference in opioid-induced ADEs. The use of standardised definitions and data collection across sites will enable the use of these data at an aggregated national level.

What are we trying to accomplish? Our aim is to reduce the harm from the therapeutic use of opioids in New Zealand hospitals.

Aim: To reduce opioid-related harm (specifically OIC and OIVI) in adult surgical inpatients (eg, general surgery, orthopaedics, urology, transplant) by 25 percent in participating hospitals within 12 months.

This opioid implementation package is a subset of the suggested interventions and measures from the How-to Guide.[1]

The implementation package builds on the work of the formative collaborative to refine those elements with the most evidence, to test, implement, spread, embed, and sustain as business as usual, in the participating hospitals.

1.2. Key definitions

This opioid implementation package aims for consistency in its implementation within and between sites. To enable this, standard definitions must be used. All the operational definitions to support the measures are provided in Appendix 2. The key definitions are described below.

1. **Opioid**: All opioids, strong and weak, including but not limited to: codeine, dihydrocodeine, fentanyl, methadone, morphine, oxycodone, pethidine and tramadol. For methadone, this includes methadone used for analgesia, but excludes methadone used for opioid substitution therapy (OST). Additional exclusions are other opioids/opioid-combinations use in OST (eg, Suboxone [buprenorphine + naloxone]); and low-dose opioid combination products (eg, paracetamol + codeine, ibuprofen + codeine).
2. **Opioid-induced ventilatory impairment:** A respiratory rate < 8 breaths per minute and a sedation score ≥ 2 on the modified Macintyre sedation scale (or Pasero scale, or the equivalent score using any validated sedation scale).
3. **Uncontrolled pain**: Two or more (≥ 2) consecutive at rest pain scores, at least 60 minutes apart, of ≥ 7/10 in 24 hours confirmed on completion of a pain assessment.

1.3. Interventions

At a glance, the elements to be introduced under this opioid implementation package are provided in Table 1.3a.

Table 1.3a: The elements of the opioid implementation package

Parameter	Interventions
Outcome measure Reportable – these elements will be monitored through the national quality and safety marker	1. Opioid-induced Constipation (OIC) 2. Opioid-induced ventilatory impairment (OIVI)
Balance measure Reportable – this element will be monitored through the national quality and safety marker	3. Poorly controlled pain
Supporting balance measure Not reportable – this element will not be monitored at a national level through a quality and safety marker	4. Uncontrolled diarrhoea
Supporting interventions Not reportable – these elements will not be monitored at a national level through a quality and safety marker	5. Patient/whānau education/engagement 6. Staff education

1.4. **Measures for opioid-induced harm** (see Appendix 1 for the detailed measures)

The scope of the audit sample is adult surgical inpatients prescribed and administered opioids (Table 1.4a). It therefore excludes day cases, mental health, patients admitted to the medical wards, and children. The rationale is to allow a focus on an area where opioid use is high. The national formative collaborative focused predominantly on a surgical and orthopaedic patient population. Most private hospitals also focus on surgical and orthopaedic cases, so this would allow private hospitals to participate. Interventions apply to all patients where clinically appropriate, but the measurement will need to occur with a focused sample of patients able to answer questions accurately.

Table 1.4a: Inclusion and exclusion criteria

Inclusion criteria
1. Patients aged 18 years and older (≥ 18 years) 2. Inpatients on a surgical ward (eg, general surgery, orthopaedic, urology, transplant) – including patients admitted under surgical services who do not receive a surgical intervention (eg, admitted for observation or pain control) 3. Patients must to be on an opioid (administered regular or PRN)
Exclusion criteria
1. All inpatients admitted to a non-surgical ward

Four national measures (quality and safety markers, or QSMs) will be used to monitor the implementation and success of the elements under this implementation package (Table 1.4b).

Table 1.4b: National quality and safety markers (QSMs)

Quality and safety markers (QSMs)		
1.	Process 1:	Percentage of patients with documented sedation scores
2.	Process 2:	Percentage of patients with documented bowel function monitored
3.	Balance:	Percentage of patients with uncontrolled pain
4.	Outcome:	Percentage of patients with opioid-related adverse drug events

The **process** and **balance** measures will require manual data collection (as with most other QSMs). We propose collecting the opioid-use process and balance measures data using a standardised monitoring chart (see Appendix 4). It is suggested the data are captured post-discharge, possibly at the same time as the data capture for the deteriorating patient programme, so that a single review of the health records will enable both data sets to be captured.

A number of DHBs are developing electronic data collection (eg, through their eVitals or PatientTrack systems. It is anticipated that ultimately electronic data capture will be universal.

There is one balance measure – uncontrolled pain. A balance measure is a metric that must be tracked to ensure an improvement in one area does not impact negatively on another area. With pain, it could be that the focus on opioid-related harm leads to a decrease in the use of opioids, with the unintended consequence of poorly controlled pain. Therefore, uncontrolled pain will be measured and reported.

Uncontrolled pain is defined as two or more (≥ 2) consecutive at rest pain scores, at least 60 minutes apart, of ≥ 7/10 in 24 hours confirmed on completion of a pain assessment. However, it is important that opioids are not used inappropriately to control pain. Patients with uncontrolled pain

must receive an assessment (Appendix 5) rather than simply receiving additional opioid. Additional opioid should not always be the default treatment; non-opioid and non-pharmacological interventions must also be considered in the treatment plan.

A robust assessment of acute pain is imperative for the development of an effective pain management plan. Pain is individualised and subjective. A pain assessment should be undertaken regularly and frequently. Routine assessment of self-reported pain intensity is a better measure than pain assessed by a nurse or doctor.[5] Pain intensity scores are valid and reliable measures of pain intensity, are quick and easy to use, and provide rapid feedback about the effectiveness of an intervention (Appendix 5).[5,6]

Pain that is not responding to the prescribed analgesia/treatment should be discussed with the local pain team/nurse practitioner pain management/pain specialist.

The **outcome** measure will be captured by the Commission using the National Minimum Data Set (NMDS)[i] codes (Y450 codes and sub-codes) using DHB hospital coded data. While these data have variation across DHBs, that may not support national aggregation, we are confident that there is merit in reporting outcomes at an **individual DHB level** for increased transparency and uptake of improvement efforts related to the safe use of opioids.

For the national QSMs only a subset of all the measures (Table 1.4c) is required to be reported on. However, to support an overall reduction in opioid-related harm the full range of interventions and measures are likely to be needed. Interventions should be introduced using improvement methodology including plan-do-study-act (PDSA)[ii] activity.

[i] The National Minimum Dataset (NMDS) is a national collection of public and private hospital discharge information, including coded clinical data for inpatients and day patients. See http://www.health.govt.nz/nz-health-statistics/national-collections-and-surveys/collections/national-minimum-dataset-hospital-events.

[ii] IHI uses the Model for Improvement as the framework to guide improvement work. http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx.

Table 1.4c: Summary of the measures for opioid-related harm

Note: The measures in **bold** are the reportable national quality and safety markers (QSMs).

Element	Process measures	Balancing measures	Outcome measures
Overall		**Percentage of patients prescribed an opioid that have uncontrolled pain**	1. Percentage of patients administered an opioid with bowels not open for >72 hours 2. Number of days between two consecutive episodes of OIVI in patients where an opioid was administered 3. Count of episodes of OIVI in patients where an opioid was administered
Opioid-induced constipation (OIC)	1. Percentage of patients who were prescribed laxatives within 24 hours of an opioid being prescribed, and the laxative administered consistent with a local guideline 2. Percentage of patients provided with a dietary intervention to prevent or treat constipation **3. Percentage of patients who have had bowel function activity recorded (using the Bristol Stool Chart) in relevant documentation**	Percentage of patients with diarrhoea who had laxatives administered and/or used dietary measure(s)	
Opioid-induced ventilatory impairment (OIVI)	1. Percentage of patients who are identified as being at risk for OIVI using the STOP-Bang[7,8] risk assessment tool 2. Percentage of patients with a management plan that has considered opioid-sparing options 3. Percentage of patients whose respiratory rates are monitored and documented following local guidelines **4. Percentage of patients whose sedation levels are monitored and documented following local guidelines** 5. Percentage of patients who have an episode of OIVI and receive treatment or other related intervention, consistent with standard protocols		
Patient education	Percentage of patients/consumers and families/whānau provided with information		
Staff education	Percentage of staff who had assessment and education completed annually		

1.5. Interventions to prevent opioid-related adverse drug reactions

Parameter	Interventions
Overall	1. Patients/whānau who receive education/engagement 2. Staff who receive education/engagement
Opioid-induced Constipation (OIC)	1. Co-prescribing of laxative 2. Improve fibre in hospital diets including kiwifruit or similar 3. Bowel function measurement (Bristol Stool Chart)
Opioid-induced ventilatory impairment (OIVI)	1. Risk assessment to identify patients at most risk (STOP-Bang)[7,8] 2. Measure sedation using standardised sedation score 3. Measure respiratory depression using respiratory rate 4. Standard protocol (OIVI rescue)
Balancing measures 1. Uncontrolled diarrhoea 2. Uncontrolled pain	1. Bowel function measurement (Bristol stool chart) 2. Patients with two or more (≥ 2) consecutive at rest pain scores, at least 60 minutes apart, of ≥ 7/10 in 24 hours confirmed on completion of a pain assessment

1.6. Reporting requirements

A summary of the interventions and the reporting requirements is given in Table 1.6a. A suggested opioid monitoring form is provided in Appendix 3, and a suggested audit tool/data collection form is provided in Appendix 4.

The minimum data size: 10 patients each week.

The QSM asks for a sample of 10 patients per week, per hospital. More patients can be sampled if wanted.

This will be a challenge in some hospitals where there are (for example) small patient numbers on opioids, or where surgical enhanced recovery after surgery (ERAS) programmes are used to encourage discharge early on day three.

If 10 patients are not available for audit, then the maximum possible number should be reported. It will take the hospital longer to demonstrate any change in outcomes from interventions. Whatever the sample size, the Commission requires the numerator and the denominators for data sets.

When to audit
It is suggested the data are captured post-discharge, possibly at the same time as the data capture for the deteriorating patient programme, so that a single review of the health records will enable both data sets to be captured.

Opioid monitoring form
A suggested opioid monitoring form is provided in Appendix 3. This form does not replicate parameters applicable to the monitoring of opioids that are contained in the Adult Vital Signs Chart (eg, respiratory rate).

Alternatively, inclusion of the process and balance measure monitoring parameters in the early warning score charts (adult vital signs chart from the deteriorating patient programme) is an option. Each hospital has ownership of the customisable section at the bottom of the Adult Vital Signs Chart and can configure this section to meet their specific needs. You will need to liaise with your local Deteriorating Patient Team.

The Adult Vital Signs Chart is designed for all non-pregnant adult in-patients and the opioid programme is focussed on surgical in-patients. As such, it is preferred the opioid observation chart is used on surgical patients receiving opioids rather than modify the whole hospital chart for just surgical patients.

Table 1.6a. Summary of activities and measures
Note: The measures in **bold** are the reportable national quality and safety markers (QSMs).

Element	Intervention	Measurement
All	Patient/whānau education/engagement	Annual audit – local reporting
	Staff education/engagement	Annual audit – local reporting
Opioid-induced Constipation (OIC)	Co-prescribing of laxative	Convenience sampling audit – local reporting
	Improve fibre in hospital diets (including kiwifruit or similar)	Not specifically measured
	Bowel function measurement (Bristol stool chart)	**Audit – 10 patients per week**
Opioid-induced ventilatory impairment (OIVI)	Risk assessment to identify patients at most risk (STOP-Bang)[7,8]	Convenience sampling audit – local reporting
	Measure sedation using standardised sedation score	**Audit – 10 patients per week**
	Measure depression using respiratory rate	Convenience sampling audit – local reporting
	Standard protocol (OIVI rescue)	Convenience sampling audit – local reporting
Balancing Measures		
Uncontrolled pain	**Pain scores**	**Audit – 10 patients per week**
	Staff education on importance of pain scoring	Annual audit – local reporting
Uncontrolled diarrhoea	Bowel function measurement (Bristol Stool Chart)	Convenience sampling audit – local reporting

Audit tool/data collection form

A suggested audit tool/data collection form is provided in Appendix 4. The outcome measure (percentage of patients with opioid-related adverse drug events) will be captured by the Commission using the National Minimum Data Set (NMDS)[iii] derived from DHB hospital clinical coding data.

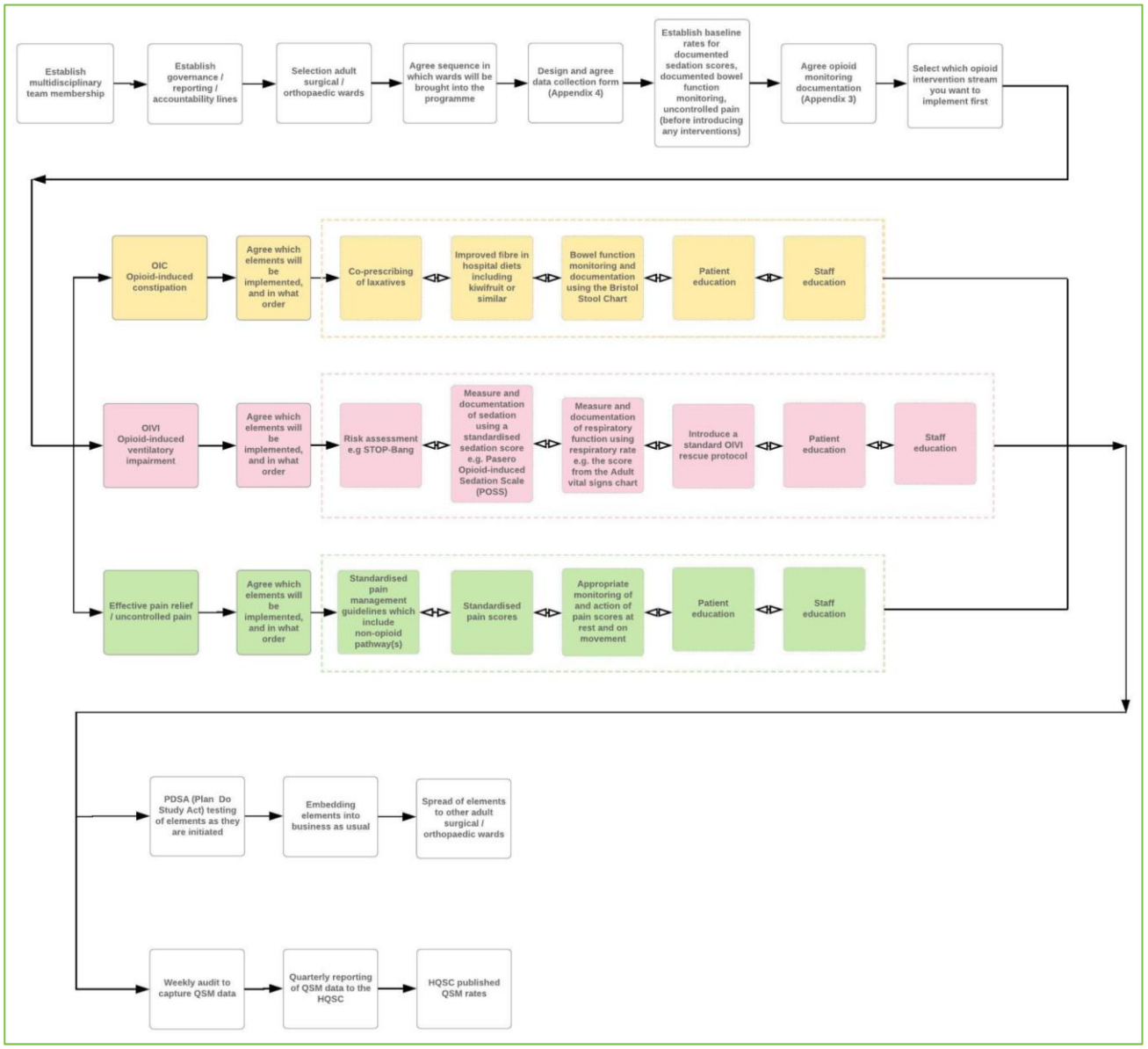
[iii] The National Minimum Dataset (NMDS) is a national collection of public and private hospital discharge information, including coded clinical data for inpatients and day patients. See http://www.health.govt.nz/nz-health-statistics/national-collections-and-surveys/collections/national-minimum-dataset-hospital-events.

1.7. Indicative process map

Figure 1.7 gives a suggested process sequence for introducing the elements of the opioid bundle.

Figure 1.7: Indicative process map for introducing the opioid bundle elements

Note: This is an indicative process map only. The order in which elements are addressed will depend on which elements, if any, are in place already. Some elements may be iterative (eg, the establishment of the multidisciplinary team may not be able to be finalised until the participating ward(s) have been agreed).



2. Opioid-induced constipation (OIC) element

2.1. Background

Opioids are effective in the treatment of pain, but their use is associated with constipation and other gastrointestinal effects that are often difficult to manage. In patients with pain, opioid-induced constipation (OIC) can add to their discomfort and may result in patients decreasing or stopping their opioid therapy to relieve or avoid constipation.[9] When a balance between pain relief and development of constipation cannot be achieved, it impairs a patient's quality of life and compromises effective pain management.[10]

2.2. Care elements

The elements in this care bundle seek to reduce OIC in patients who are prescribed and administered opioids (Table 2.2a). Table 2.2b describes the outcome measure for use with the OIC element. Assessing OIC early and using prophylactic treatment with laxatives may decrease the burden of constipation in patients on opioid treatment.[11]

Table 2.2a: Opioid-induced constipation element

	Element description
a.	When prescribing and administering opioids, co-prescribe laxatives and administer accordingly (unless contraindicated)
b.	When prescribing and administering opioids, include non-pharmacological interventions in the care plan (for example, dietary measures and/or fluid prescription

Table 2.2b: Opioid-induced constipation measures *(see Appendix 2 for definitions)*

Measure	Numerator	Denominator	Exclusions	Population
Outcome measure Percentage of patients administered an opioid with bowels not open for > 72 hours	Total number of patients where bowels not open for > 72 hours	Total number of patients to whom an opioid was administered	Nil	Surgical patients aged 18 years and over, admitted to a hospital inpatient area
Process measure 1 Percentage of patients to whom laxatives were prescribed within 24 hours of an opioid being prescribed, and the laxative administered consistent with a local guideline	Total number of patients who were prescribed a laxative within 24 hours of an opioid being prescribed, and the laxative administered consistent with a local guideline	Total number of patients to whom an opioid was administered	Any contraindications	Surgical patients aged 18 years and over, admitted to a hospital inpatient area

Measure	Numerator	Denominator	Exclusions	Population
Process measure 2 Percentage of patients provided with a dietary intervention to prevent or treat constipation	Total number of patients provided with a dietary intervention to prevent or treat constipation	Total number of patients who have had an opioid prescribed	Any contraindications or cautions	Surgical patients aged 18 years and over, admitted to a hospital inpatient area
Process measure 3 Percentage of patients who have had bowel function activity recorded in relevant documentation	Total number of patients who have had bowel function recorded at least twice a day, morning (am) and afternoon (pm), for the 24 hour audit period	Total number of patients who were administered an opioid	Nil	Surgical patients aged 18 years and over, admitted to a hospital inpatient area

2.3. Implementing interventions

2.3.a Co-prescribe and administer laxatives

When prescribing and administering opioids, co-prescribe laxatives and administer accordingly (unless contraindicated)

In an effort to reduce OIC and improve the patient experience, teams involved in the safe use of opioids national collaborative focused on co-prescribing and administering laxatives (Table 2.3a).

Table 2.3a: Purpose, change ideas and lessons learned in relation to co-prescribing and administering laxatives

What	How	Lessons learned

Co-prescribe and administer laxatives	• Introduce a laxative step-wise guide for clinical staff on managing OIC.
	• The guide should include preventive non-pharmacological approaches, laxative ladder and the importance of documentation.
	• Using the completed guide:
	  ○ display it on the wards
	  ○ display it in A3 size in clinical areas
	  ○ use it at education sessions and handover meetings
	  ○ use it as an education resource at orientation sessions for resident medical officers
	  ○ display it in doctors' areas of the wards for reference
		• The guide needs to have simple graphics and be easy to use.
		• Simplicity encourages staff to use the guide.
		• The guide was useful for increasing awareness.
		• The rate of appropriate prescribing and administration increased.
		• A patient's bowel status has become a discussion point at ward handover and huddle sessions.
		• Staff attitude to constipation has changed from seeing it as an accepted complication to seeing it as an unacceptable harm.
		• It is necessary to reinforce the key messages at each

What	How	Lessons learned
	and reinforcement	medical staff run change. • It is necessary to talk with clinicians about the resource and the rationale behind it.
Resources	1. Counties Manukau Laxative Step-wise Guide 2. Counties Manukau DHB Laxsol® Prescribing Sticker 3. MidCentral DHB Guideline for Management and Prevention of Opioid Related Constipation	
Use stickers	• Develop stickers to remind staff to co-prescribe laxatives. • Print a 'Regular Opioid – Regular Laxative' sticker and attach it to the top of computer screens as a prompt.	• Stickers are low cost and easy to implement. • Stickers are enduring and are still on the computer screens. • This approach may have been too subtle.
Tips	✓ Introducing a laxative alert for automated dispensing cabinets when accessing an opioid is a good reminder for the nursing staff. ✓ Electronic prescribing and administration systems – prompt prescribers to add a laxative when prescribing an opioid.	

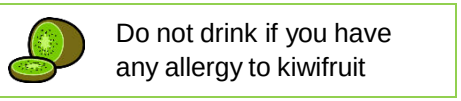
2.3b: Provided with a dietary intervention to prevent or treat constipation

When prescribing and administering opioids, include non-pharmacological interventions in the care plan (for example, dietary measures and/or fluid prescription).

Conventional management of constipation includes non-pharmacological management, for example, drinking more fluids, increasing physical activity and increasing fibre content in the diet. These measures may be effective in some patients with mild to moderate OIC.[12]

In an effort to reduce OIC and improve the patient experience, teams involved in the safe use of opioids national collaborative focused on providing a natural laxative that patients readily accepted (Table 2.3b).

Table 2.3b: Purpose, change ideas and lessons learned in relation to providing a natural, well-accepted laxative

What	How	Lessons learned
Provide natural laxatives to patients	• Organise with kitchen staff to routinely provide products that contain kiwifruit (eg, Kiwi Crush™,[iv] Phloe™,[v]) and prunes to patients as breakfast options, subject to special dietary requirements. • One option is to purchase dry prunes and steam them before serving to make them more palatable. • Another option is to make Kiwi Crush in bulk and decant it into cups with caution labels (about allergy – see resource below) immediately before serving. • Promote the use of Kiwi Crush or Phloe and prunes to staff and patients. • Discuss use of Kiwi Crush or Phloe and prunes at ward handover meetings and education sessions.	• These change ideas are easy to implement. • Patients responded positively to Kiwi Crush and prunes and liked having a natural alternative. • Supplies are easy to procure. • Placing Kiwi Crush and prunes on the breakfast tray removed an element of choice so uptake was very high. • The label worked well for those patients whose allergy had not been disclosed. A picture on the label bypassed language barriers. • Kitchen staff had to be educated on how to mix Kiwi Crush to provide a consistent mixture for all patients.
Resources	1. Kiwi Crush caution label:  (Kiwi Crush Label – Lakes DHB)	
Tips	✓ Mobilising patients, as appropriate, is recommended as a useful adjuvant for preventing and managing constipation. ✓ Assess patients for pre-existing allergies to dietary measures, before using those measures. ✓ Products containing kiwifruit may also contain high levels of potassium and sugar. Check the ingredients first. Use with caution in patients with diabetes/glucose intolerance, hyperkalaemia or pre-existing renal impairment.	

[iv] Kiwi Crush (website).ULR: https://www.kiwicrush.co.nz/. (Accessed 20 August 2017).

[v] Phloe (website). URL: http://www.phloe.co.nz/. (Accessed 20 August 2017).

2.3c Improving bowel monitoring

Monitor and document bowel movements (at least twice a day, morning (am) and afternoon (pm), for the 24-hour audit period daily), and effectiveness of any actions taken, using evidence-based guidelines and methods.

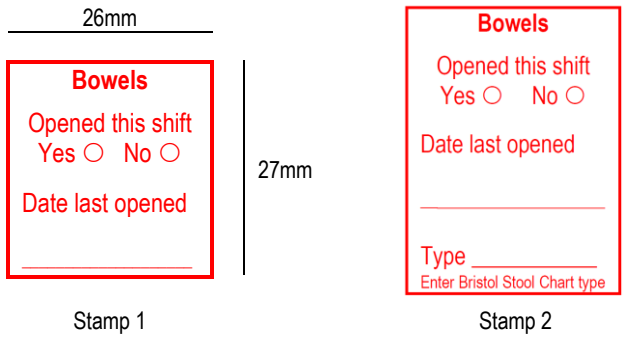
The presence of OIC can significantly impact a patient's quality of life and can lead them to reduce their dose or even stop opioid pain therapy.[9] Health care providers may not always be aware that patients are experiencing significant OIC.[10] Nurses should monitor patient bowel habits as well as the quantity and quality of stools. Diagnosis of OIC should begin with a detailed patient history that includes frequency of bowel movements, the consistency of stool, and the presence of straining, pain, nausea and vomiting.[13]

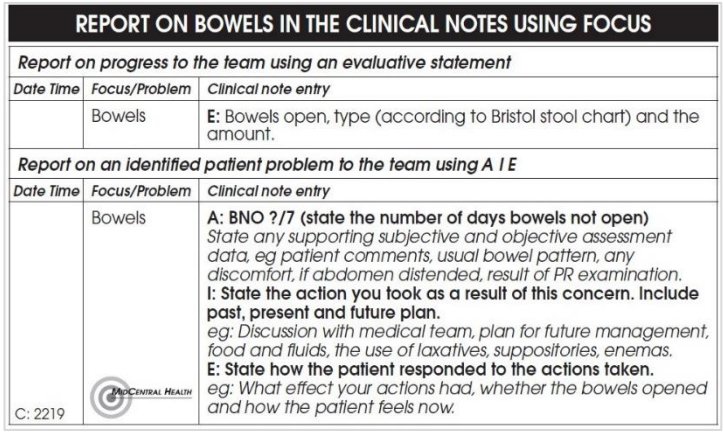
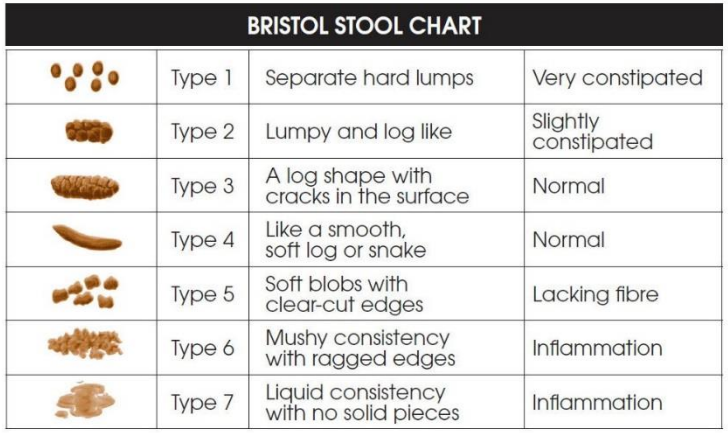
In an effort to reduce OIC and improve patient experience, teams involved in the safe use of opioids national collaborative focused on improving bowel monitoring of patients (Table 2.3c).

Table 2.3c: Purpose, change ideas and lessons learned in relation to improving monitoring and documentation of bowel activity

What	How	Lessons learned

Improve monitoring and documentation of bowel activity	• Ensure staff complete the bowel monitoring section on a patient's care plan.
	• Educate staff on the importance of monitoring and documentation.
	• Undertake regular audits and make the results visible to staff.
	• Create a bowel stamp for use in the health record that contains specific fields to improve documentation.
	• Introduce the stamp at ward handover and staff meetings.
	• Provide multiple stamps on the ward so they are readily available.
	• Give feedback to staff on audit results.
		• Measures contributing to successful implementation included education of staff, regular auditing and making results visible.
		• The stamp is a useful reminder to document bowel activity.
		• This change idea is easy to implement when staff are engaged.
		• The stamp effectively communicates patient bowel status to the multidisciplinary team.
		• The stamp facilitates audit as entries on bowel activity are clearly visible.
		• Use of the stamp has increased awareness of patient bowel status and has led to early intervention where indicated.
		• Challenges included that:
		  ○ Some staff did not use stamp regularly
		  ○ Some staff only completed part of the stamp
		  ○ Staff did not always use the stamp on night shift if patients had not moved their bowels.

What	How	Lessons learned
Resources	1. Counties Manukau DHB bowel stamp 2. Hawke's Bay DHB bowel stamp 	• The staff did not document type of bowel motion, so the stamp was amended to include 'type number' as described on the Bristol Stool Chart (Hawke's Bay's example Stamp 2).[14] • Other clinical areas spontaneously adopted the stamp.
Improving the accuracy of nursing documentation of bowel activity	• Introduce a new format for nursing documentation for elimination as part of 'focus charting': ○ ensure staff document 'days since bowels last opened' in the health record ○ divide elimination into the categories of bladder and bowel ○ for bowel, every nursing shift writes if bowels opened and type from Bristol Stool Chart. • Hold a project kick-off meeting with nursing staff to discuss OIC and new nursing documentation. • Use a patient story to demonstrate the issue to staff. • Introduce a nursing cue card to prompt nursing staff (nursing-led design of cue card).	• Staff were involved in developing the cue card. • Multiple communication methods are needed to educate all staff and make them aware of changes.

What	How	Lessons learned
Resources	1. MidCentral DHB's Bristol Stool Chart Card  2. The Bristol Stool Chart 	
Tips	✓ Bowel movement assessment is encouraged using a recognised tool (eg, the Bristol Stool Chart). The details may include: consistency, colour and volume of stool; presence or absence of blood and/or mucus; ease of defaecation; complete or incomplete evacuation; frequency; and if pain occurs during defaecation. ✓ Local application of lignocaine gel for haemorrhoids may provide relief from painful defecation. ✓ Identify how and where to store stamps on each ward.	

REPORT ON BOWELS IN THE CLINICAL NOTES USING FOCUS

Report on progress to the team using an evaluative statement

Date Time	*Focus/Problem*	*Clinical note entry*
	Bowels	**E:** Bowels open, type (according to Bristol stool chart) and the amount.

Report on an identified patient problem to the team using A I E

Date Time	*Focus/Problem*	*Clinical note entry*
C: 2219	Bowels	**A: BNO ?/7 (state the number of days bowels not open)** *State any supporting subjective and objective assessment data, eg patient comments, usual bowel pattern, any discomfort, if abdomen distended, result of PR examination.* **I: State the action you took as a result of this concern. Include past, present and future plan.** *eg: Discussion with medical team, plan for future management, food and fluids, the use of laxatives, suppositories, enemas.* **E: State how the patient responded to the actions taken.** *eg: What effect your actions had, whether the bowels opened and how the patient feels now.*

MidCentral Health

BRISTOL STOOL CHART

	Type 1	Separate hard lumps	Very constipated
	Type 2	Lumpy and log like	Slightly constipated
	Type 3	A log shape with cracks in the surface	Normal
	Type 4	Like a smooth, soft log or snake	Normal
	Type 5	Soft blobs with clear-cut edges	Lacking fibre
	Type 6	Mushy consistency with ragged edges	Inflammation
	Type 7	Liquid consistency with no solid pieces	Inflammation

3. Opioid-induced ventilatory impairment (OIVI) element

3.1. Background

Opioids continue to be the main way of managing moderate to severe acute pain; however, concerns remain about their potential adverse effects on ventilation.[15] Opioid-induced ventilatory impairment (OIVI) is considered to be a more appropriate term than respiratory depression to describe the effects of opioids on patient ventilation. OIVI encompasses not only respiratory depression and elevated partial pressure of carbon dioxide in arterial blood, but also the depressed consciousness and subsequent upper airway obstruction resulting from excessive opioid use.[16]

3.2. Care elements

The elements in this care bundle seek to reduce OIVI in patients who are prescribed and administered opioids (Table 3.2a). Table 3.2b describes the outcome measure for use with the OIVI element.

Table 3.2a: Opioid-induced ventilatory impairment element

	Element description
a.	Identify patients with an increased risk of OIVI, using standardised risk assessment tools and methods
b.	When prescribing and administering opioids, consider opioid-sparing analgesics and techniques
c.	Monitor and document sedation level and respiratory rate, and response to therapeutic interventions, using evidence-based guidelines and methods
d.	Manage OIVI episodes using standard protocols (for example, rational use of naloxone)

Table 3.2b: Opioid-induced ventilatory impairment measures *(see Appendix 2 for definitions)*

Measure	Formula	Exclusions	Population
Outcome measure 1 Number of days between two consecutive episodes of OIVI in adult surgical patients where an opioid was administered	Days = Day x - Day y	Nil	Surgical patients aged 18 years and over, admitted to a hospital inpatient area
Outcome measure 2 Count of episodes of OIVI in adult surgical patients where an opioid was administered	Number of episodes compiled on a prospective basis	Nil	Surgical patients aged 18 years and over, admitted to a hospital inpatient area

Measure	Numerator	Denominator	Exclusions	Population
Process measure 1 Percentage of patients who are identified using the locally agreed risk assessment tools (eg, STOP-bang[7,8]) and methods	Total number of patients who were assessed, using a risk assessment tool consistent with the hospital guideline, before they are prescribed an opioid	Total number of patients who have had an opioid prescribed	Where risk assessment is not feasible or prudent because of, for example, acuity or level of consciousness	Surgical patients aged 18 years and over, admitted to a hospital inpatient area
Process measure 2 Percentage of patients with a management plan that has considered opioid-sparing options	Total number of patients with a completed pain management plan that contains opioid-sparing options	Total number of patients with a painful condition	Patients receiving palliative care, patients with a terminal condition where death is considered imminent or likely to occur within the next 30 days	Surgical patients aged 18 years and over, admitted to a hospital inpatient area
Process measure 3 Percentage of patients whose respiratory rates are monitored and documented following local guidelines	Total number of patients with respiratory rate consistent with local guidelines	Total number of patients who were administered an opioid	Nil	Surgical patients aged 18 years and over, admitted to a hospital inpatient area
Process measure 4 Percentage of patients whose sedation levels are monitored and documented following local guidelines	Total number of patients with documented sedation level rate consistent with local guidelines	Total number of patients who were administered an opioid	Nil	Surgical patients aged 18 years and over, admitted to a hospital inpatient area
Process measure 5 Percentage of patients who have an episode of OIVI and receive treatment or other related intervention, consistent with standard protocols	Total number of patients who have an OIVI episode and receive active management consistent with the local policy	Total number of patients who had an OIVI episode	Intubated and mechanically ventilated patient Patients for whom standard protocols do not apply, as agreed on an individualised basis by the patient's care team, and documented as such in the patient's medical record	Surgical patients aged 18 years and over, admitted to a hospital inpatient area

3.3. Implementing interventions

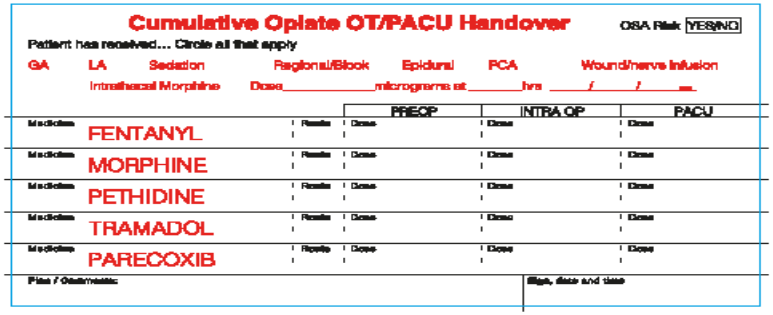
3.3a Identify patients with an increased risk of OIVI

Identify patients with an increased risk of OIVI, using standardised risk assessment tools and methods.

Risk assessment tools can effectively identify high-risk patients, which enables interventions aimed at reducing patient harm, improving postsurgical experiences for the intended subsets of high-risk patients, and decreasing hospital costs.[17] In an effort to reduce the risk of OIVI and improve patient experience, teams involved in the safe use of opioids national collaborative focused on identifying patients at risk of OIVI (Table 3.3a).

Table 3.3a: Purpose, change ideas and lessons learned in relation to identifying patients at risk of OIVI

What	How	Lessons learned
Screen patients for risk of OIVI	• Screen new patients attending surgical pre-assessment clinic. • Use an appropriate evidence-based assessment tool as part of the formal assessment process for patients attending clinic. • The recommended tool is the STOP-Bang obstructive sleep apnoea (OSA) screening tool.[7,8] However, any validated tool may be used.	• One DHB team included STOP-Bang as part of the formal assessment process. • Integrating the assessment tool into the pre-operative assessment process improved the reliability of the intervention. • A different process for screening should be used for patients who have not attended a pre-assessment clinic. • One of the higher-risk groups of patients (found to have more frequent events) was not a group routinely assessed in pre-assessment clinic.
Refer high-risk patients	• After referral, a pharmacist takes an accurate medication history. • Involve the pain team early and on an ongoing basis.	• The prescriber does not always review medication history. • Many opioid prescriptions were based on prescriber preference. • Staff varied in their level of understanding of patient harm.
Track cumulative opioid doses	• Use cumulative dose stickers to highlight the cumulative opioid doses patients are given.	• Documenting this information and discussing it at staff handover gave staff critical information to use as part of their assessment of patient needs.

What	How	Lessons learned
	1. Example cumulative dose opioid sticker:  **Cumulative Opiate OT/PACU Handover** OSA Risk YES/NO Patient has received… Circle all that apply GA LA Sedation Regional/Block Epidural PCA Wound/nerve infusion Intrathecal Morphine Dose_____micrograms at _____hrs ____/____/____ am PREOP INTRA OP PACU Medicine FENTANYL Route Dose Dose Dose Medicine MORPHINE Route Dose Dose Dose Medicine PETHIDINE Route Dose Dose Dose Medicine TRAMADOL Route Dose Dose Dose Medicine PARECOXIB Route Dose Dose Dose Pain / Observations Sign, date and time	• The National Medication Chart was the most reliable place to capture this information. • This change idea has prompted a modified protocol for sending patients from the Post-Anaesthetic Care Unit to the ward. Patients who either recently received opioids or received higher doses of opioids have longer monitoring times. • Challenges were: ○ ensuring staff discussed this information at staff handover ○ the level of staff awareness of risks for patients who have received high doses of opioids ○ inconsistencies in whether staff completed the sticker.
Tips	✓ Not all patients requiring opioids will receive a risk assessment at their pre-assessment clinic. ✓ Monitor sedation level and respiratory rate to detect OIVI in a timely way.	

3.3b Consider opioid-sparing analgesics and techniques

When prescribing and administering opioids, consider opioid-sparing analgesics and techniques.

The reason for using non-opioid analgesics and techniques combined with opioids is to minimise the adverse effects of opioid analgesic medication. Termed 'balanced' analgesia, this approach involves using:

1. smaller doses of opioids in combination with non-opioid analgesic drugs (for example, paracetamol, nonsteroidal anti-inflammatory drugs – NSAIDs)
2. adjuvant analgesics (for example, local anaesthetics, anticonvulsants, antidepressants)
3. techniques (for example, cognitive behavioural therapy, feedback, reassurance, motivational interviewing, resiliency training, acupuncture, massage, bio-feedback, transcutaneous electrical nerve stimulation, physical therapy, ice, heat, vibration, nerve blocks), activities (for example, yoga, Pilates, music therapy, art therapy, stretching, group and individual pain education, therapeutic exercise)
4. opioid total dose minimising techniques (for example, the use of sustained action opioids in tolerant patients, use of effective opioid extending techniques, use of lower potency opioids as first opioid option, and optional or mandatory washout periods).

Opioid analgesic overdose is a life-threatening condition. The unpredictable clinical course of intoxication demands empirical management of this potentially lethal condition.[18]

DHBs identified this element as an important one to include in the emerging care bundle. Though no DHBs explicitly tested this element, the safe use of opioids national collaborative Delphi Panels and expert faculty have endorsed its inclusion.

3.3c Monitor and document sedation level and respiratory rate

Monitor and document sedation level and respiratory rate, and response to therapeutic interventions, using evidence-based guidelines and methods.

All patients must be monitored appropriately for OIVI, so it can be detected at an early stage and appropriate interventions triggered. The risk of OIVI can be reduced by undertaking appropriate and regular monitoring. If OIVI related to opioid administration is detected and treated at an early stage, it will increase the chance of avoiding significant and permanent harm to the patient.[15]

In an effort to reduce the risk of OIVI and improve the patient experience, teams involved in the safe use of opioids national collaborative focused on improving patient monitoring (Table 3.3c).

Table 3.3c: Purpose, change ideas and lessons learned in relation to improving patient monitoring

What	How	Lessons learned
Improve sedation score monitoring	• Format the opioid observation chart (see Appendix 3 for an example chart) to include the sedation score and pain score on the same page as the rest of the observations. • Develop a guideline on monitoring patients on opioids according to route, with summary table on the observation chart. • Provide guidelines in one place for all routes of administration of opioids, which staff can refer to. • Introduce a standardised sedation scoring system using a suitable validated scale that is appropriate to the patient group in which it is being used (eg, the modified Macintyre sedation score, see *Safe Use of Opioids Frequently Asked Questions*, Table 5). Any validated, standardised sedation score can be used that is appropriate to the patient in which it is used. However, a hospital/DHB may choose to use an alternative scoring system.	• Documentation of these parameters increased as the observations required became more visible to nurses; observations on the back of documentation forms get missed. • Even though the place for recording the scores was visible, some nurses still left these parameters blank despite filling in the other observations because they did not recognise the importance of monitoring or did not know the reason for it. • Many health professionals do not understand the need to monitor sedation in relation to opioids. • It was great to have, for easy reference, the summary table (for monitoring according to route) on the adult observation chart. • Nurses gave positive feedback on the addition of the 'when to monitor' table to the adult observation chart. • Having a sensitive sedation score helped to identify patients starting to decline, particularly when combined with more frequent monitoring. • Running small-group education sessions when a change is made would increase staff knowledge.
Resources	1. Modified Macintyre sedation score: see the *Safe Use of Opioids Frequently Asked Questions*, Table 5). 2. MercyAscot sedation scores (adult)	
Tip	✓ Adding the sedation scales to the New Zealand early warning score (NZEWS) will facilitate the capture and documentation of early deterioration of patients on opioids.	

3.3d Manage OIVI episodes using standard protocols

Manage OIVI episodes using standard protocols (for example, rational use of naloxone).

Opioid analgesic overdose is a life-threatening condition. The unpredictable clinical course of intoxication demands empirical management of this potentially lethal condition.[18]

DHBs identified this element as an important one to include in the emerging care bundle. Though no DHBs explicitly tested this element, the safe use of opioids national collaborative Delphi Panels and expert faculty have endorsed its inclusion (Table 3.3d).

Table 3.3d: Purpose and change ideas in relation to using standard protocols to manage OIVI

What	How	Lessons learned
Use a standard protocol for managing OIVI	• Ensure DHB OIVI Management Protocol is appropriate for the DHB. • It is recommended that an OIVI Management Protocol contains, at a minimum, the following information: ○ naloxone available on all wards where opioids are used ○ flowchart detailing respiration rate and sedation score and then necessary response ○ when to call rapid response team ○ dose of naloxone and how to administer ○ ongoing monitoring requirements ○ second and additional doses to be given, as needed, tailored to the patient's clinical needs ○ ongoing monitoring and IV infusion dosing ○ documentation of naloxone use for OIVI in the health record.	• Change idea not tested during collaborative so no lessons learned.
Resources	1. MercyAscot OIVI Management Protocol	

4. Patient education element

4.1. Background

Chronic pain management and treatment side effects, present complex challenges for patients and their health professionals.[10] For example, constipation and problems with defecation can be taboo subjects and some health care professionals can neglect the issue.[19]

Patients report they are often not given adequate information about pain control measures despite wanting to be informed.[20] Generally, patient-focused interventions that engage patients actively in their care can have a beneficial effect on patient experience and health status; this includes the use of written materials to improve health literacy.[21] Data on the effectiveness of patient education in pain management is limited. However, given that research shows patient attitudes and beliefs modify their pain perceptions and analgesic requirements, patient and carer education can positively influence the outcome of acute pain management.[22]

Patients/consumers and families/whānau should be provided with information about the assessment of pain, risks and adverse effects of opioid treatment. Patient participation is required if each patient is to get the best treatment.[16]

4.2. Care element

DHBs identified this element as an important one to include in the emerging care bundle. Although no DHBs explicitly tested this element, the safe use of opioids national collaborative Delphi Panels and expert faculty have endorsed its inclusion.

Information needs to be tailored to the patient to optimise the patient's understanding. Information should be provided to patients in a format that suits their level of literacy and preference, such as patient leaflet, one-on-one discussion or video.

This element seeks to provide patients with information about their prescribed opioids and the associated risk of harm (Table 4.2a). Table 4.2b describes the outcome measure for use with this patient education element.

Table 4.2a: Opioid patient education element

	Element description
a.	Provide patients/consumers and families/whānau with information about opioid use for optimum pain management, the assessment of pain, bowel health, and the risk of adverse effects (OIC and OIVI), in formats appropriate to their needs.

Table 4.2b: Patient education measures *(see Appendix 2 for definitions)*

Measure	Numerator	Denominator	Exclusions	Population
Process measure Percentage of patients/consumers and families/whānau provided with information	Total number of patients/consumers and families/whānau who received information.	Total number of patients who have had an opioid prescribed	The patient is not in a state to receive or understand the information and the family/whānau is unavailable.	Surgical patients aged 18 years and over admitted to a hospital inpatient area, or their support person.

4.3. Implementing the intervention

Provide patients/consumers and families/whānau with information about opioid use for optimum pain management, the assessment of pain, bowel health, and the risk of adverse effects (OIC and OIVI in particular), in formats appropriate to their needs.

In an effort to reduce uncontrolled pain and improve patient experience, teams involved in the safe use of opioids national collaborative focused on improving health literacy and supporting patient self-management. Although not explicitly testing the change idea in relation to OIVI, DHBs tested similar change ideas for other harm areas. Table 4.3a summarises their experience to provide some guidance and information to other DHBs when developing patient education resources on opioid use and their risks.

Table 4.3a: Purpose, change ideas and lessons learned in relation to providing patients with information about opioid use and harm

What	How	Lessons learned

Provide patient-centric education using standardised information for consistent messaging	• Provide information in a simple, visually appealing, easy-to-read format.
	• Discuss with patients their current knowledge.
	• Ask patients to help with developing a patient information leaflet. That is, use a patient co-design approach.
	• Provide information about:
	  ○ what an opioid is
	  ○ pain relief
	  ○ managing pain – ‘what you can do’
	  ○ constipation
	  ○ signs of OIVI.
	• Identify a nurse to be responsible for sustaining the
		• Following co-design principles when developing resources (where patients/consumer advocates partnered with the clinical staff-interdisciplinary team) resulted in more useful resources.
		• Patients were interested in how laxatives work – but staff had assumed patients would not want to know how laxatives work.
		• Challenges were the time required to roll out the information and ensuring the sustainability of the process.
		• A dedicated staff member is needed to sustain the change

What	How	Lessons learned
	change idea(s) on the ward. • Use a process for staff to routinely talk with patients about their pain and use of opioids.	idea on the ward. • Patients did not always receive the information. • Patients remember more information if a staff member goes through it with them.
Consider equity and cultural appropriateness of all educational materials 	• Work with patients to identify appropriate language for the educational material. • Work with local kaumātua to ensure the material is culturally appropriate (cultural review).	• It is necessary to work with cultural advisors to ensure the posters use appropriate language.
Leaflets	• Develop a guidance resource for clinical staff on the correct use of the patient information leaflet and educate clinical staff on how to use the patient information leaflet. • Introduce the leaflet and display them in the wards. • Encourage the use of leaflets at education sessions and handover meetings. • Routinely include leaflets in patient pre-admission packs and give them to patients at pre-admission clinics, at Early Recovery After Surgery (ERAS) boot camps and on admission to the ward.	• How staff used the patient information leaflet varied, which prompted the development of a guidance resource on how to use the leaflet. • Patients accepted the patient information leaflet as a tool for partnership. • The information leaflet was included in the ward admission pack for the nurse to discuss with the patient. • Challenges were to: ○ present sometimes technically complex language in a simple-to-understand format ○ distribute the completed resource ○ make staff conversations part of routine care ○ measure improvement in patient experience.
Posters: Improve patient awareness	• Develop a patient information poster. • Display patient information posters in every bathroom. • Encourage patients to discuss their bowel movement habits with nursing staff.	• It is necessary to engage with the patient population to develop suitable and appropriate educational materials.
In-flight card	• Give patients easy access to information – information at the bedside. • Develop a patient information card (in-flight card). • Place this at the patient's bedside within reach of the patient (as patient can be immobile). • Laminate the card, make it easy-to-read.	• A hook was needed to hang the in-flight card on the bedside locker.

What	How	Lessons learned
Empower patients to 'speak up' when in pain or if experiencing adverse drug events to help with timely management of pain and adverse drug events	• Use a message to give patients 'permission' to ask for help (eg, 'Please let staff know if you are in pain. No matter how busy we seem, you are important to us.').	• Barriers that patients reported included: ○ not wanting to bother busy staff ○ fear of opioid addiction ○ expectation that negative experiences are a natural part of disease and recovery processes ○ poor understanding of the benefit of or need for analgesics.
Resources	1. Waitemata DHB Patient Information Leaflet 2. Counties Manukau Health Patient Information Leaflet 3. Counties Manukau Health Staff Guide on Using Patient Information Leaflet 4. MidCentral DHB Patient Information Leaflet 5. Capital and Coast DHB Patient Information Leaflet 6. MidCentral DHB Patient Information Poster	
Tips	✓ When providing patients with information, document in the clinical record: who received it, who gave it, what was given and when. ✓ Provide patient-centric education using standardised information for consistent messaging. ✓ When developing patient information, please refer to the Ministry of Health's guide to developing health information resources: *Rauemi Atawhai – A guide to developing health education resources in New Zealand*. URL: www.health.govt.nz/publication/rauemi-atawhai-guide-developing-health-education-resources-new-zealand ✓ Develop a reliable process for providing information to patients/consumers and families/whānau. ✓ It is important for staff to talk with patients about any posters, written or visual information provided.	

5. Staff education element

5.1. Background

Opioid analgesia is one of the main pharmacological interventions for managing pain in hospitalised patients. OIC is a common opioid-related adverse event, and OIVI is a serious opioid-related adverse event. Multiple factors, including opioid dosage, route of administration, duration of therapy, patient-specific factors and desired goals of therapy, can influence the occurrence of these adverse events.[23]

Effective management of acute pain depends on close liaison with, and education and training of, all staff.[22] Clinical staff education and coordination of care by health care professionals may help to meet the critical need to appreciate and proactively improve pain management and address the burden of opioid adverse events, particularly OIC and OIVI.[10] Staff education may take several forms; the evidence for any benefit or the best educational technique is inconsistent.[16]

5.2. Care element

The staff education element seeks to reduce opioid side effects (OIC and OIVI), improve pain management and enhance the patient experience in patients who are prescribed and administered opioids (Table 5.2a). Table 5.2b describes the outcome measure for use with this staff education element.

Table 5.2a: Staff education element

	Element description
a.	Regularly educate staff about pain management, opioid use, OIC and OIVI, and risk reduction strategies. Education includes an assessment of knowledge and skills, educational intervention(s) and reassessment.

Table 5.2b: Staff education measures *(see Appendix 2 for definitions)*

Measure	Numerator	Denominator	Exclusions	Population
Process measure: Percentage of staff who had assessment and education completed annually	Total number of staff on a ward(s) assessed, provided with an educational intervention, & reassessed annually on opioid use, opioid-induced side effects (OIC and OIVI) and pain management	Total number of permanent staff, and non-permanent staff employed more than 30 days on a ward(s)	Non-permanent staff employed 30 days or less	Permanent staff, and non-permanent staff employed more than 30 days

5.3. Implementing the intervention

Regularly educate staff about pain management, opioid use, OIC and OIVI, and risk reduction strategies. Education includes an assessment of knowledge and skills, educational intervention(s) and reassessment.

In an effort to reduce uncontrolled pain, opioid-induced side effects (OIC and OIVI) and to improve the patient experience, teams involved in the safe use of opioids national collaborative focused on providing education to clinical staff to increase nurses' and prescribers' knowledge of opioid use (Table 5.3a).

Table 5.3a: Purpose, change ideas and lessons learned in relation to providing regular staff education about opioid use and harm

What	How	Lessons learned

OIC prevention:
Educate house officers to improve co-prescribing
	• Promote prescribing 'like for like' – that is, prescribing:
	  ○ PRN laxatives if PRN opioids have been prescribed
	  ○ regular laxatives if regular opioid analgesia has been prescribed.	

OIVI prevention	• Run a poster-based educational campaign outlining:
	  ○ naloxone use across the hospital
	  ○ how to balance pain and sedation
	  ○ sedation scores
	  ○ guidelines about oral opioid monitoring
	  ○ patient pain expectations
	  ○ equivalent opioid doses.
	• Written education should include:
	  ○ addition to the adult observation chart of the summary table on the frequency of observations
	  ○ the policy on opioid clinical management
	  ○ the policy on the management of sedation
	  ○ communications through internal staff newsletter.
		• Staff in general gave positive feedback on the posters (with reservations noted below):
		  ○ ward staff were having conversations about opioid use, particularly with the pain team
		  ○ there were too many posters
		  ○ whether staff read the posters was uncertain
		  ○ it was hard to educate about complex issues via posters.
		• Eye-catching graphics are important in developing posters that get your message across.

	• Identify patients who had received naloxone through duty manager reports. • Audit these patients to establish the events that led to naloxone administration and identify any trends. • Conduct an anaesthetic review of cases of naloxone use	• This change idea provided insight into events and a focus for an education poster campaign. • Health professionals differ in their approach to auditing and in the level of importance they assign to harms. • Audit with multi-professional review may have identified

What	How	Lessons learned
	and notify anaesthetic advisory group (or similar body).	more trends. • Staff had varying levels of understanding of patient harm.
Generic guidance	• Invite a house officer to be part of the project team. Ask them to spend time with the other house officers to explain the rationale for prescribing laxatives with opioids. • Include the subject in the Post Graduate Year One (PGY1) orientation programme and medication safety. • Provide multiple approaches to target staff education. These can include: ○ introducing guidelines on preventing and managing OIC and OIVI ○ using case studies, real examples or patient stories to help inform staff ○ speaking at the Grand Round sessions.	• Initial education was successful but not sustainable due to house officer rotations. Therefore, education was included in orientation. • House officers were receptive to and genuinely interested in this work. • Medical staff responded positively to Grand Round session. • Most medical staff indicated they would prescribe ondansetron despite its constipating side effects. • Prescribers began to write better parameters and guidance. • Methadone prescribing on the ward reduced.
	• Formal staff education sessions can be held to explain: ○ the 'safe use of opioids' project ○ how the project developed ○ the methodology (process, balance and outcome measures) ○ interventions ○ future work. • Prescriber education could include written guidance, in the internal anaesthetic specialist newsletter, from a pain specialist on safe and appropriate prescribing of opioids.	• It was difficult to provide education to all staff due to staff schedules. • Not all staff were able to be released from clinical areas to attend education sessions. • The sessions needed to be repeated several times, which was labour intensive. • Most nurses did not recognise tramadol as an opioid. • Changes to the adult observation chart increased monitoring. • Education increased awareness among staff.
	• Conduct small-group teaching and organisation-wide teaching that includes: ○ opioid education at the annual update organisation day ○ a pain study day.	• Small-group teaching proved effective. Participants improved from pre- to post-education quizzes.

What	How	Lessons learned
	• Design a survey using SurveyMonkey[vi] to identify gaps in staff knowledge.	• People needed significant prompting before they completed the survey. • Staff understanding of naloxone use was poorer than expected. Other DHBs conducting the same survey had very similar results, suggesting this finding is likely to be the same for many DHBs in New Zealand.
	• Provide short education sessions (15 minutes) at handover. Sessions can take the form of 'myth busters' with multi-choice questions to review commonly or easily misunderstood concepts. Discuss the answers with the group. • Provide staff with education, guidance resources and documentation standards for pain management. • Provide ward education on pain monitoring and life-threatening complications related to the use of intravenous patient-controlled analgesia or patient-controlled epidural analgesia.	• Staff were discussing analgesia more often on the ward. • Staff often learn from experience and from other staff. • Most staff stated they would like more education. • The education sessions spurred staff to learn more about general pain management. Subsequently, more staff enrolled in the pre-existing pain management education programmes and online eLearning – pain management platform. • Staff responded positively to short, targeted messages. • The sessions generated great discussions. • Student nurses on the wards also attended. • The education sessions were fun and interactive and clearly demonstrate the need for an integrated health system where different knowledge and skills come together to make improvements. • Through the process of developing the educational and guidance resource, clinicians from various disciplines had to critically reflect on existing practice and best practice and to recommend pragmatic guidelines (eg, time, resource, value added of suggested monitoring parameters). • The completed resource was particularly useful because, for the first time, the DHB had a single formal guidance resource that provided clear, standardised and practical

[vi] SurveyMonkey (website). (Accessed 20 August 2017). URL: https://www.surveymonkey.com/.

What	How	Lessons learned
		instructions on pain management. • Developing the resource was complex and resource intensive. • Distributing the completed resource was a challenge. It was published online and printed copies were available. A communication and dissemination plan plus a structured educational programme would have made the resource more visible and led to its wider distribution among staff. • Comparing current knowledge among staff with what ward educators thought they knew provided insight into existing knowledge gaps. • Providing education on routine pain assessment and documentation helped to address and draw attention to what is expected. • Evidence showed that routine pain monitoring and documentation practices improved significantly.
Develop nursing leadership in the ward	• Develop nurse champions. • Buddy experienced nursing staff with a nurse specialist to share learnings about effective pain management, promote the changes tested, raise the profile of pain management and provide support.	• Nursing staff were very receptive to peer buddying. • This change idea to increase individuals' knowledge and understanding was time consuming.
	• The clinical nurse manager spends time educating nurses on the ward. • Give reminders at staff meeting about the need to monitor patients' bowel movements and administer laxatives proactively.	• The rate of patients receiving laxatives increased. • Improvement in practice was not universal across all staff. • To sustain the change idea, repeated reminders may be required.
Resources	1. MidCentral DHB Opioid Quiz 2. MidCentral DHB PowerPoint Presentation 3. MercyAscot Example of Written Communication to Nursing Staff 4. MercyAscot Introduction to Campaign Poster 5. MercyAscot Education Poster on Equivalent Opioid Doses 6. MercyAscot Education Poster Balance Pain Management /	

What	How	Lessons learned
	Sedation 7. MercyAscot Education Poster New Guideline Oral Opioids 8. MercyAscot Education Poster Patient Expectations - Pain Goals 9. MercyAscot Education Poster Sedation - Escalation Guide 10. MercyAscot Elderly High Risk Poster 11. Waitemata DHB Agenda for Pain Study Day 12. Waitemata DHB Pain Study Day Objectives 13. Waitemata DHB e-Learning Module Introduction 14. National Prescribing Service Pain Management Module 15. Waitemata DHB Staff Education Booklet 16. Canterbury DHB Nurse Survey	
Tip	✓ Repeat education sessions regularly for maximum staff attendance and coverage, and to sustain results. ✓ Provide annual updates to give an opportunity to refresh knowledge.	

6. Balance measure – diarrhoea

6.1. Background

Balance measures are necessary to ensure the system improvements we have introduced do not have unintended consequences or other factors influencing the outcome. Balance measures look at a system from different directions/dimensions and asks ‘what happened to the system as we improve the outcome and process measures?’ For example, by increasing the use of laxatives do we ‘over provide’ with diarrhoea as a result?

6.2. Care element

This care element seeks to detect any diarrhoea that results from the over-use of laxatives or dietary interventions in patients receiving opioids (Table 6.2a). Table 6.2b describes the outcome measure for use with this staff education element. These data will be captured through the documentation of bowel activity against the Bristol Stool Chart (see section 2: Opioid-induced constipation (OIC) element).

Table 6.2a: Balance measure - diarrhoea

	Element description
a.	To regularly monitor patient receiving opioids and laxatives, or dietary interventions, for diarrhoea

Table 6.2b: Diarrhoea balancing measure *(see Appendix 2 for definitions)*

Measure	Numerator	Denominator	Exclusions	Population
Balance measure: Percentage of patients with diarrhoea who had laxatives administered and/or used dietary measure(s)	Total number of patients with a documented episode of diarrhoea	Total number of patients on an opioid where a laxative was administered or dietary measure(s) used	Nil	Surgical patients aged 18 years and over admitted to a hospital inpatient area

7. Balance measure – uncontrolled pain

7.1 Background

Patients in acute settings frequently report uncontrolled pain.[24] Such pain can negatively affect a patient's health care experience and lead to poor clinical outcomes.[25] Additional efforts are needed to address uncontrolled pain.[26]

7.2 Care element

The uncontrolled pain balancing measure (Table 7.2a) seeks to ensure any reduction in opioid-related adverse events is not at the expense of an inappropriate reduction in opioid usage resulting in uncontrolled pain for patients. Table 7.2b describes the outcome measure to capture the level of uncontrolled pain.

Table 7.2a: Balance measure – uncontrolled pain

	Element description
a.	To monitor and document pain behaviours/indicators, and effectiveness of any actions taken, using evidence-based guidelines and methods

Table 7.2b: Uncontrolled pain measures *(see Appendix 2 for definitions)*

Measure	Numerator	Denominator	Exclusions	Population
Balance measure: Percentage of patients prescribed an opioid that have uncontrolled pain	Total number of patients prescribed an opioid that have uncontrolled pain	Total number of patients who have an opioid prescribed	Nil	Surgical patients aged 18 years and over admitted to a hospital inpatient area

8. Appendix 1. At a glance: The elements of this opioid implementation package

Area	Elements	Measures	Numerator	Denominator
Opioid-induced constipation (OIC)	When prescribing and administering opioids, co-prescribe laxatives and administer accordingly (unless contraindicated)	**Outcome measure:** Percentage of patients administered an opioid with bowels not open for > 72 hours	**Numerator:** Total number of patients where bowels not open for > 72 hours	**Denominator:** Total to whom an opioid was administered
	When prescribing and administering opioids, include non-pharmacological interventions in the care plan (for example, dietary measures and/or fluid prescription)	**Process measure 1:** Percentage of patients to whom laxatives were prescribed within 24 hours of an opioid being prescribed, and the laxative administered consistent with a local guideline	**Numerator:** Total number of patients to whom a laxative was prescribed within 24 hours of an opioid being prescribed, and the laxative administered consistent with a local guideline	**Denominator:** Total number of patients to whom an opioid was administered
		Process measure 2: Percentage of patients provided with a dietary intervention to prevent or treat constipation	**Numerator:** Total number of patients provided with a dietary intervention to prevent or treat constipation	**Denominator:** Total number of patients who have had an opioid prescribed
		Process measure 3: Percentage of patients who have had bowel function activity recorded in relevant documentation	**Numerator:** Total number of patients who have had bowel function recorded daily (or consistent with local guideline)	**Denominator:** Total number of patients who were administered an opioid
Opioid-induced ventilatory impairment (OIVI)	Identify patients with an increased risk of OIVI, using standardised risk assessment tools and methods	**Outcome measure 1:** Number of days between two consecutive episodes of OIVI in patients where an opioid was administered	Days = Day x – Day y	
	When prescribing and administering opioids, consider opioid-sparing analgesics and techniques	**Outcome measure 2:** Count of episodes of OIVI in patients where an opioid was administered	Number of episodes compiled on a prospective basis	
	Monitor and document sedation level and respiratory rate, and response to therapeutic interventions, using evidence-based guidelines and methods	**Process measure 1:** Percentage of patients who are identified using the locally agreed risk assessment tools and methods	**Numerator:** Total number of patients who were assessed, using a risk assessment tool consistent with the hospital guideline, before they are prescribed an opioid	**Denominator:** Total number of patients who have had an opioid prescribed
	Manage OIVI episodes using standard protocols (for example, rational use of naloxone)	**Process measure 2:** Percentage of patients with a management plan that has considered opioid-sparing options	**Numerator:** Total number of patients with a completed pain management plan that contains opioid-sparing options	**Denominator:** Total number of patients with a painful condition
		Process measure 3: Percentage of patients whose respiratory rates are monitored and documented following local guidelines	**Numerator:** Total number of patients with documented respiratory rate consistent with local guidelines	**Denominator:** Total number of patients who were administered an opioid
		Process measure 4: Percentage of patients whose sedation levels are monitored and documented following	**Numerator:** Total number of patients with documented sedation level consistent with local guidelines	**Denominator:** Total number of patients who were administered an opioid

Area	Elements	Measures	Numerator	Denominator
		local guidelines		
		Process measure 5: Percentage of patients who have an episode of OIVI and receive treatment or other related intervention, consistent with standard protocols	**Numerator:** Total number of patients who have an OIVI episode and receive active management consistent with the local policy	**Denominator:** Total number of patients who have had an OIVI episode
Patient education	Provide patients/consumers and families/whānau with information about opioid use for optimum pain management, the assessment of pain, bowel health, and the risk of adverse effects (OIC and OIVI), in formats appropriate to their needs.	**Process measure:** Percentage of patients/consumers and families/whānau provided with information	**Numerator:** Total number of patients/consumers and families/whānau who received information	**Denominator:** Total number of patients who have had an opioid prescribed
Staff education	Regularly educate staff about pain management, opioid use, OIC and OIVI, and risk reduction strategies. Education includes an assessment of knowledge and skills, educational intervention(s) and reassessment	**Process measure:** Percentage of staff who had assessment and education completed annually	**Numerator:** Total number of staff on a ward(s) assessed, provided with an educational intervention, and reassessed annually on opioid use, opioid-induced side effects (OIC and OIVI) and pain management	**Denominator:** Total number of permanent staff, and non-permanent staff employed more than 30 days on a ward(s)
Balance measure – diarrhoea	To regularly monitor patient receiving opioids and laxatives, or dietary interventions, for diarrhoea.	**Balance measure:** Percentage of patients with diarrhoea who had laxatives administered and/or used dietary measure(s)	**Numerator:** Total number of patients with a documented episode of diarrhoea	**Denominator:** Total number of patients on an opioid where a laxative was administered or dietary measure(s) used
Balance measure – uncontrolled pain	When prescribing and administering opioids, use pain medication dosing guidelines to determine the appropriate route of administration and to optimise pain management	**Balance measure:** Percentage of patients prescribed an opioid that have uncontrolled pain	**Numerator:** Total number of patients prescribed an opioid who have uncontrolled pain	**Denominator:** Total number of patients who have an opioid prescribed

9. Appendix 2. Measure operational definitions

	Measure operational definition
1.	**Adult**: 18 year of age and older (≥ 18)
2.	**Bowel movements**: Include any passage of stool from the rectum or stoma, as assessed using the Bristol Stool Chart, or other recognised tool
3.	**Constipation**: Bowels not open for > 72 hours (where day 1 is the day when an opioid was first administered)
4.	**Contraindications** (to laxative use): Including but not limited to: diarrhoea, allergy to a specific laxative products, faecal impaction (note: macrogol containing laxatives are not contraindicated in faecal impaction), ileus, bowel obstruction, gastrointestinal surgeries where laxatives are contraindicated, gastrointestinal bleeding, patient intolerant to bowel stimulation, toxic megacolon, neurogenic bowel conditions where laxatives are contraindicated, small bowel bacterial overgrowth syndrome cases
5.	**Co-prescribe laxatives**: Prescribe laxatives within 24 hours of the opioid being prescribed and administered
6.	**Diarrhoea**: Type 6 or 7 bowel movement on the Bristol Stool Chart, or as measured on another recognised stool assessment tool
7.	**Dietary measures**: Examples include prunes and Kiwi Crush (or other kiwifruit extract product); serving sizes decided by dietitian or based on hospital policy
8.	**Document(ed)**: Complete(d) relevant documentation, which may include the patient's health record, opioid observation chart, or any other patient-related documentation. This may vary by clinical area. Bowel movement assessment using a recognised tool (eg, Bristol Stool Chart) is encouraged
9.	**Fluid prescription**: Use of fluids to prevent or treat dehydration, a known risk factor for constipation
10.	**Laxatives agreed list**: Lactulose, macrogol containing laxatives, bisacodyl, sennoside B with or without docusate sodium, glycerol (rectal), paraffin liquid (rectal), sodium citrate (rectal), or according to local guidelines
11.	**Laxative frequency**: Prescribed regular and/or PRN laxative, following local guideline (taking into account the frequency the opioid has been prescribed – ie, regular or PRN)
12.	**Opioid**: codeine, dihydrocodeine, fentanyl, methadone, morphine, oxycodone, pethidine and tramadol. For methadone, this includes methadone used for analgesia, but excludes methadone used for the opioid substitution therapy (OST). Other exclusions are other opioids/opioid-combinations use in OST (eg, Suboxone [buprenorphine + naloxone]); and low-dose opioid combination products (eg, paracetamol + codeine, ibuprofen + codeine)
13.	**Opioid-induced ventilatory impairment**: A respiratory rate < 8 breaths per minute and a sedation score ≥ 2 on the modified Macintyre sedation scale (or Pasero scale, or the equivalent score using any validated sedation scale)
14.	**Standard protocols**: Any locally approved policy, guideline or protocol. This may include: safe, accurate and appropriate administration of naloxone, transfer to high dependency unit, escalation of care, increased level of clinical monitoring, or equivalent
15.	**Uncontrolled pain**: Two or more (≥ 2) consecutive at rest pain scores, at least 60 minutes apart, of ≥ 7/10 in 24 hours confirmed on completion of a pain assessment

10. Appendix 3. Suggested opioid observation chart

A. Opioid observation chart

This example observation chart captures the parameters required to monitor a patient on an opioid that are not included on the Adult Vital Signs Chart.

Opioid observation chart

Insert organisational logo or identifier here

Family Name: _____

Given Name: _____ Gender: _____

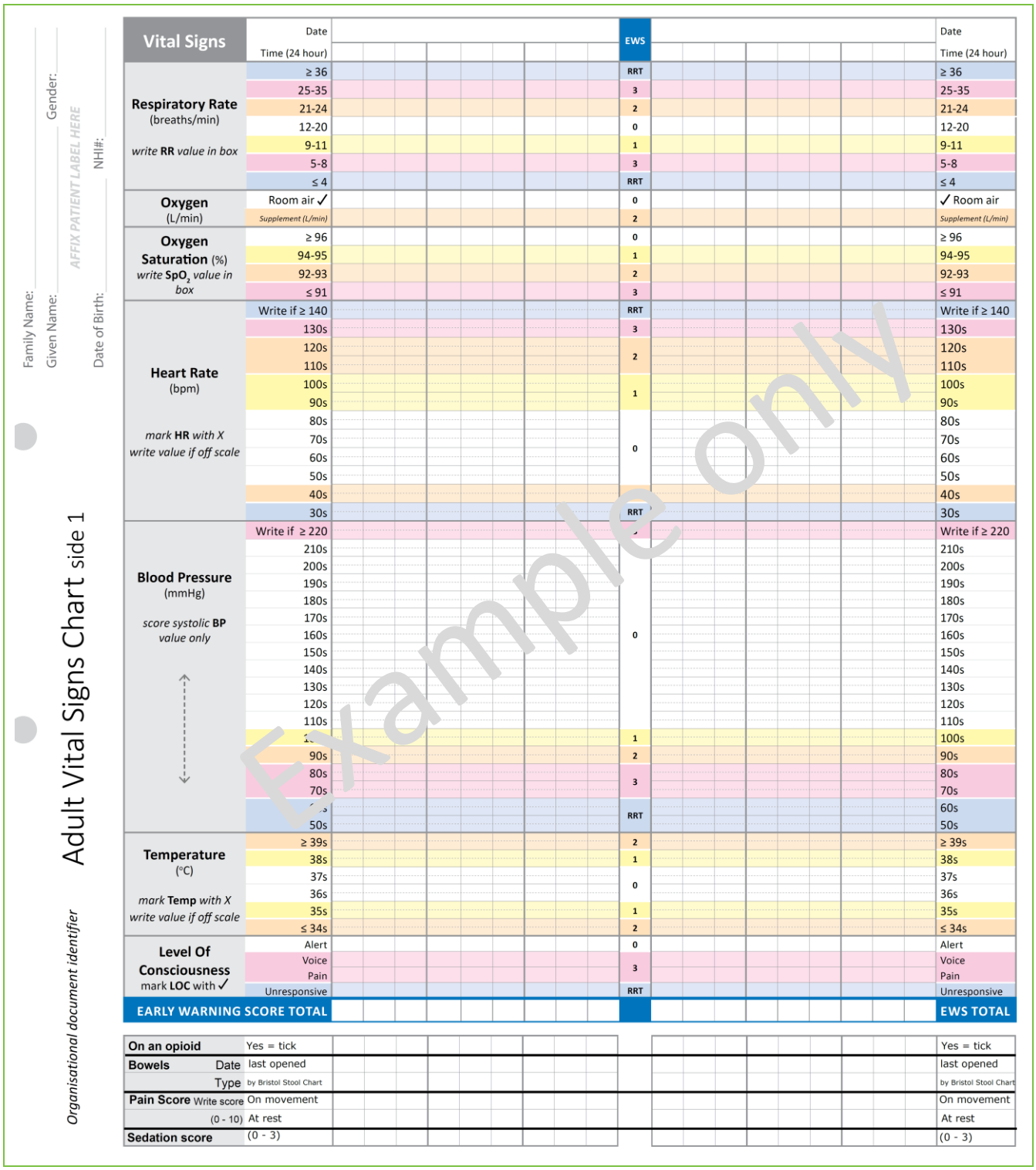
AFFIX PATIENT LABEL HERE

Date of Birth: _____ NHI#: _____

Date																				
Last dose opioid administered (pm or regular)																				
Enter the time (24 hour)																				
Respiratory rate Record the respiratory rate on the Adult Vital Signs Chart																				
Sedation Mark sedation level with a ×. Assessment to be recorded graphically																				
Difficult to rouse This is severe respiratory depression	3																			3
Moderate sedation Easy to rouse, unable to remain awake (or difficult staying awake)	2																			2
Mild sedation Easy to rouse	1																			1
Awake and alert	0																			0
Pain Scores - at rest Mark Pain Scores with an × Assessment to be recorded graphically	10																			10
	9																			9
	8																			8
	7																			7
	6																			6
	5																			5
	4																			4
	3																			3
	2																			2
	1																			1
	0																			0
Pain Scores - on movement e.g. on deep breathing and coughing Mark Pain Scores with an × Assessment to be recorded graphically	10																			10
	9																			9
	8																			8
	7																			7
	6																			6
	5																			5
	4																			4
	3																			3
	2																			2
	1																			1
	0																			0
Bowel Activity Days since bowels last opened																				-
Bowel Type According to the Bristol Stool Chart. Record a minimum of once per shift																				
6-7 Diarrhoea	7																			7
	6																			6
3-5 Normal / optimal	5																			5
	4																			4
	3																			3
1-2 Constipation	2																			2
	1																			1
Identification / initials	Init																			Init

B. Adapting the Adult Vital Signs Chart to accommodate the opioid monitoring parameters

In this example the foot section of the Adult Vital Signs Chart has been configured to include the opioid monitoring parameters 'On an opioid', bowels, pain scores and sedation scores.



The editable PDF of the Adult Vital Signs Chart is available on the Health Quality & Safety Commission's website.

11. Appendix 4. Opioid audit tool/data collection form

Safe use of opioids QSM data collection

Jump to latest week

DHB **Start date of audits (Monday)**

		Demographics					Sedation scores documentation Process 1 (y/n)	Bowel function documentation Process 2 (y/n)	Presence of uncontrolled pain Balance (y/n)
Week starting	Case number (10 per week)	Gender	Age (years)	Ethnicity MPAEO	Age group	Ethnic group			
0 Jan 00	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								

12. Appendix 5: Pain assessment and management plan

The QSM suite includes a balance measure of uncontrolled pain. Uncontrolled pain is defined as two or more (≥ 2) consecutive at rest pain scores, at least 60 minutes apart, of ≥ 7/10 in 24 hours confirmed on completion of a pain assessment. However, it is important opioids are not used inappropriately to control pain. Patients with uncontrolled pain must receive an assessment rather than automatically receiving additional opioid. Additional opioid should not be the default treatment. Non-opioid and non-pharmacological interventions must also be considered in the treatment plan.

Pain that is not responding to the prescribed analgesia/treatment should be discussed with the local pain team/nurse practitioner pain management/pain specialist.

A robust assessment of acute pain is imperative for the development of an effective pain management plan. A pain assessment should be undertaken regularly and frequently. Pain is individualised and subjective. Therefore, the patient's own self-reported pain intensity is the most reliable indicator of the pain they are experiencing.

Pain assessment

A pain assessment should include:[27,28,29]

Assessment	Rationale
Assess pain characteristics: • quality (eg, burning, sharp, shooting, spasms, pressure, cramping, deep aching) • severity (eg, using a pain intensity scale – see text below) • location (anatomical description, well or poorly localised, generalised pain) • onset (gradual or sudden) • duration (how long; intermittent or continuous) • precipitating or relieving factors (provocative or palliative symptoms; what makes the pain better or worse).	Assessment of pain experience is the first step in planning pain management strategies. The most reliable source of information about the pain is the patient. Descriptive pain intensity scales such as a visual analogue can be utilised to distinguish the degree of pain (see below). The assessment of pain intensity should be undertaken at rest and on movement.[31] At rest is important for making the patient comfortable, and on movement (during mobilisation, deep breathing and coughing) is important for early mobilisation, the reduction of postoperative complications (eg, cardiopulmonary and thromboembolic events), and may improve long-term outcome after surgery.
Assess for signs and symptoms relating to pain.	Some people deny the existence of pain. Attention to associated signs may help the nurse in evaluating pain. An increase in blood pressure, heart rate, and temperature, shallow respiration, restlessness, facial grimacing, guarding behaviour, diaphoresis, pallor and pupil dilation may be present in a patient with acute pain.
Assess to what degree cultural, environmental, intrapersonal, and intrapsychic factors may contribute to pain or pain relief.	Such variables play a big role in modifying the patient's expression of pain. Some cultures simply express feelings, whereas others hold such expression. Nevertheless, health care providers should not prejudge any patient response but rather evaluate the unique response of each individual.
Assess the patient's anticipation for pain relief.	Some patients may be satisfied when pain is no longer massive; others will demand complete elimination of pain. This influences the perceptions of the effectiveness of the treatment of the treatment modality and patients' eagerness to engage in further treatments.
Assess the patient's willingness or ability	Patients may overlook the effectiveness of non-

Assessment	Rationale
to explore a range of techniques aimed at controlling pain.	pharmacological methods of pain relief, and may be willing to try them, either with or instead of traditional analgesic medications. Often a combination of therapies (eg, mild analgesics with distraction or heat) may be more effective. Some patients will feel uncomfortable exploring alternative methods of pain relief. However, patients need to be informed that there are other approaches to manage pain.
Assess the suitability of the patient as a patient controlled analgesia (PCA) candidate.	PCA allows the patient to manage the administration of opioid analgesic within prescribed limits. The criteria for implementing PCA include (refer to your local guidelines for your local criteria): • no allergy to opioid analgesics • no history of substance abuse • no history of renal, hepatic, or respiratory disease • no history of major psychiatric disorder • clear sensorium • cooperative and motivated about use • manual dexterity.
If the patient is on PCA, assess the following:	
Weigh the amount of pain medication the patient is using to his or her reports of pain.	If requests for medication are quite frequent, the patient's dosage may need to be increased to promote pain relief. If requests are very low, the patient may require further guidance to correctly use PCA.
Potential PCA complications such as excessive sedation; respiratory distress; urinary retention; nausea and vomiting; constipation; and IV site pain or swelling.	Early assessment of complication is required to prevent serious adverse reactions to opioid analgesics.
If the patient is receiving epidural analgesia, assess the following:	
Tingling in the extremities, numbness, a metallic taste in the mouth.	These symptoms may be indicators of an allergic response to the anaesthetic agent or of incorrect catheter placement.
Potential epidural analgesia complications such as extreme sedation (relate this to the patient's sedation score), respiratory distress, urinary retention, or catheter migration.	Respiratory depression and intravascular infusion of anaesthesia (resulting from catheter migration) can be potentially life threatening.
Evaluate the patient's response to pain and management strategies.	It is essential to assist patients express as factually as possible (ie, without the effect of mood, emotion, or anxiety) the effect of pain relief measures. Inconsistencies between behaviour or appearance and what the patient says about pain relief (or lack of it) may be more a reflection of other methods the patient is using to cope with the pain rather than pain relief itself.
Evaluate what the pain suggests to the patient.	The meaning of pain will directly determine the patient's response. Some patients, especially the dying, may consider that the 'act of suffering' meets a spiritual need.

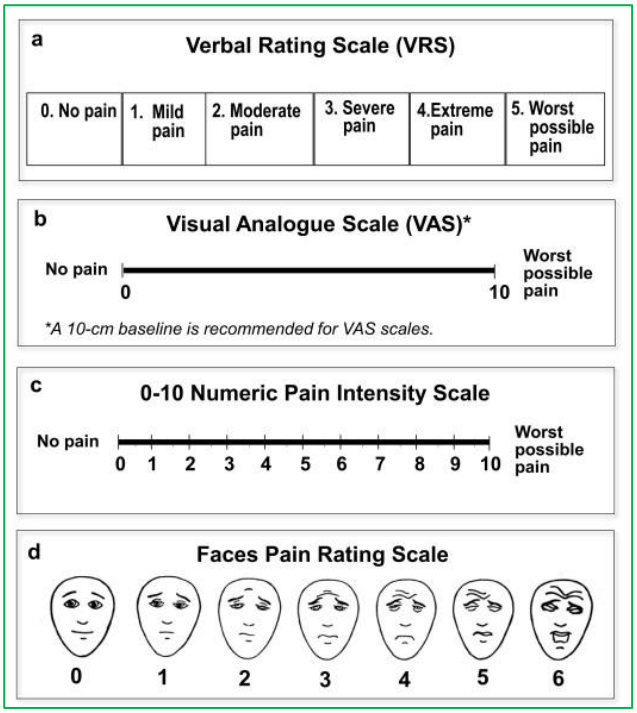
Pain intensity scales

Routine assessment of self-reported pain intensity is a better measure than pain assessed by a nurse or doctor.[5] They are valid and reliable measures of pain intensity, are quick and easy to use, and provide rapid feedback about the effectiveness of an intervention.[27,28] However, pain intensity scales measure the intensity of pain only. They are not a substitute for a pain assessment.

Commonly used pain intensity scores include[27,28] (Figure 12; note that there are other scales available and variants of the scales described here):

- verbal rating scale (VRS)
- visual analogue scale (VAS)
- numeric pain intensity scale (NPI)
- face pain rating scale.

Figure 12. Commonly used one-dimensional pain intensity scales[30]



1. **Verbal rating scale (VRS)**[27,29]
   The verbal rating scale (also known as the verbal descriptor scale) uses the verbal descriptors 'no pain', 'mild pain', 'moderate pain', 'severe pain', 'extreme pain', and 'worst pain possible'. This scale can be administered verbally or visually, and the patient is instructed to pick the words that best describe his or her current pain intensity.

2. **Visual analogue scale (VAS)** [27,29]
   The visual analogue scale is a 100 mm line scale from 0 (no pain) to 10 (worst pain imaginable). The patient is asked to place a mark that corresponds with his or her current pain intensity on the line. The line is then measured from the beginning to the patient's mark, and this distance is translated into a pain intensity score ranging from 0 to 10.

3. **Numeric pain intensity scale (NPI)**
   The numeric pain intensity scale (also known as the numeric rating scale, NRS) is an 11-point scale from 0 (no pain) to 10 (worst possible pain). Patients are asked to rate the intensity of their pain on this scale. This can be administered graphically or verbally. This scale is suitable for patients aged nine and older who are able to use numbers to rate their pain intensity.[31] The

NPI can be used by patients with mild to moderate cognitive impairment to self-report their pain intensity.[27]

4. **Face pain rating scale**[5,27,32,33]
   This pictorial scale (happy and unhappy faces) uses seven faces (0-6) ranging from a neutral face (no pain) to a grimace (worst pain). The patient is asked to select the picture that represents the pain that they are feeling. This tool is suitable for patients aged three and older.

   Visual analogue scale (VAS) and the numeric pain intensity scale (NPI) correlate well, giving almost identical scores in the same patient at various times after surgery, and are equally sensitive in assessing acute pain intensity after surgery.[31] They work best for an assessment of a patient's current (present) subjective feeling of pain intensity.

Multimodal analgesia

Multimodal analgesia could be considered and part of the pain treatment plan:[5,25,28]

Intervention	Example
Non-pharmacological considerations	• Providing information • Attention techniques • Distraction • Cognitive behavioural interventions • Meditation / mindfulness • Relaxation • Decreasing environmental stimuli (eg, temperature, sound, lighting) • Aromatherapy • Music therapy • Repositioning • Immobilisation • Heat and cold • Manual and massage therapies • Acupuncture • Transcutaneous electrical nerve stimulation (TENS)
Non-opioid considerations	• Paracetamol • Non-steroidal anti-inflammatory drugs (NSAIDs: eg, ibuprofen, naproxen, diclofenac, celecoxib, ketorolac, etoricoxib) • Muscle relaxants (eg, diazepam) • Anxiolytics (eg, a benzodiazepine) • Local anaesthetic nerve block • Anticonvulsants (eg, gabapentin) • Ketamine • Clonidine • Nitrous oxide
Opioid	• Consider alternative routes of delivery

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