Title: Clinicians' perceptions of medication errors with opioids in cancer and palliative care services: a priority setting report.

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Abstract

This paper reports the findings of a priority setting process, undertaken with cancer and palliative care clinicians, to better understand the characteristics of medication errors with opioids within their services. Participants representing six public hospitals in one Australian state, took part in a series of priority setting workshops, and, drawing on actual incidents occurring in their services, sought to identify where in the opioid medication process errors were most frequently occurring. Opioid error types and perceived contributing factors were explored, and strategies to reduce/prevent opioid errors were proposed. The priority setting process provided valuable insights into the types of opioid errors that occur in cancer and palliative care services, and the complexity of addressing opioid errors from the clinician's perspective. The findings from this priority setting process will inform future targeted quality improvement initiatives to support safe opioid medication practices in cancer and palliative care services.

Background

Opioids are a high-risk medicine [1], widely used in cancer and palliative care services as the primary pharmacological treatment for cancer pain [2-4]. Adult cancer and palliative care patients are at increased risk of medication errors and resultant harm due to their age [5], co-morbidities which may alter medication pharmacodynamics [6,7], and polypharmacy [8,9]. However, little is known about the incidence and characteristics of opioid errors in cancer and palliative care services [10].

Context: As part of a larger study [11], cancer and palliative care clinicians ('clinicians') from one Australian cancer research network ('CRN') identified opioid errors as a quality improvement priority. Clinicians were subsequently invited to attend a series of priority setting workshops ('workshop') to explore the scope of opioid errors within their services [12]. This process was undertaken as part of the planning phase for a future quality improvement project across the network.

Aim: The aim of the priority setting process was to explore the perceived scope and contributing factors to opioid errors, in the context of the cancer and palliative care clinical setting.

Methods: Two workshops were conducted at two hospital sites on separate days, each running for approximately two hours. Workshops were attended by nine clinicians from both inpatient and community services (medical oncologists (n=2); oncology clinical nurse educator (n=1); palliative care consultant (n=1); palliative care nurse unit manager (n=1); palliative care clinical nurse consultants (n=2); pharmacists (n=2), hospital and community). Workshops were facilitated by an independent clinical academic (JLP), nominated and funded through a larger CRN project [11].

Clinicians were asked to consider the following questions in the context of the cancer and palliative care clinical setting: i) Why are opioid errors problematic? ii) What are the perceived characteristics and frequency of opioid errors?; iii) What are the perceived opioid error contributing factors?; and v) What are the opportunities to reduce opioid errors in the clinical setting?

Key discussion points were captured and recorded onto flipcharts by a scribe (NH, CA) throughout each workshop. At the conclusion of each workshop, discussion points were transcribed verbatim into a word document. The transcribed discussion points were circulated to respective workshop participants for comments and consensus prior to thematic analysis[13] being undertaken by three authors (NH, JP, CA).

Clinicians' perceptions

As a starting point, clinicians reflected on recent opioid errors in their services. Clinicians perceived opioid errors were a regular occurrence but this was not always reflected in incident reports, primarily because some were perceived to be 'safe errors', such as errors that did not reach the patient. Clinicians acknowledged that opioid errors that resulted in patient harm in all services were due to both opioid overdose and under-dose.

Opioid error types

Transcription, conversion, prescribing and administration errors, were the primary opioid error types identified by clinicians as being problematic (Table 1). Transcription errors were most prominent when patients were admitted to the inpatient service from the community. Patients' unable to accurately recall their medications, underpinned by a lack of robust assessment on admission, were the main perceived contributors to transcription errors.

Opioid conversion errors, particularly when converting between different routes of administration, or between long acting and short acting opioids, were considered the most prevalent error type. While each service provided opioid conversion charts, and all clinicians had access to an online opioid calculator [14], clinicians questioned how confident medical and nursing professionals were using these tools, and whether the conversion charts were always adequate given the complexity of effective opioid dosing in cancer pain.

Prescribing errors were perceived to result from: failing to recognise existing or previous opioid use; not considering the impact of co-morbidities on opioid metabolism, (e.g., renal/hepatic disease); and lack of knowledge of opioid dosing principles.

Wrong drug and wrong route errors were the predominant administration errors identified. Clinicians stressed the importance of staying up to date with the continually increasing opioid formulations available, and recognising the potential for error with similar sounding drug names, such as Oxycontin/MS Contin. Unclear opioid orders were considered a key factor leading to wrong route errors, as was failing to double check the opioid order prior to administration.

Human factors

Clinicians acknowledged the classification of opioids as high risk medicines and the additional steps required to ensure patient safety throughout the opioid medication process. Human factors, such as interruptions during the opioid administration process were perceived as a major contributing factor to opioid error. Gaps in clinicians' opioid delivery knowledge and skills, and the assumption that clinicians are confident with core clinical skills,

such as undertaking basic opioid calculations/conversions, and titration, were seen as contributing factors to all opioid error types.

Proposed strategies

Having identified perceived factors contributing to opioid errors, clinicians proposed three priority areas for future quality improvement initiatives: i) targeting commonly occurring opioid error types; ii) reducing human error; and iii) identifying and addressing gaps in clinicians' knowledge and skills (Table 1).

Multiple strategies to reduce opioid error were proposed (Table 1), including: using standardised tools for opioid calculations/conversions; promoting clinician adherence to medication management policy; identifying gaps in skills and knowledge; and supporting clinicians to strengthen opioid delivery competencies. However, development of implementation strategies was beyond the scope of the workshops.

[Insert Table 1]

Table 1: Clinicians' perceptions of priority quality improvement areas pertaining to safe opioid delivery in cancer and palliative care services

Implications for future research

This priority setting exercise highlighted the need for further exploration of opioid errors in cancer and palliative care services, at both a state-wide and local level. Undertaking a jurisdictional level review of clinical incident reports involving opioids in cancer and palliative care services will provide additional insights into opioid error incidence, characteristics, patient impact, and potential contributing factors. In-depth exploration of cancer and palliative care clinicians' perceptions of barriers and facilitators to safe opioid delivery, from both an individual and systems perspective, is also essential to better understanding the burden and context of opioid errors in this clinical setting. These data will guide the development of tailored strategies to support safe opioid delivery in cancer and palliative care services.

Ethical approval

This project was assessed by the relevant Research Support Office as a quality improvement activity not requiring independent ethics review.

Conflicts of interest

There are no conflicts of interest to declare.

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Table 1: Clinicians' perceptions of priority quality improvement areas pertaining to safe opioid delivery in cancer and palliative care services

Priority area	Perceived causes/contributing factors	Proposed strategies to reduce error
1. Addressing key opioid error types		
Transcription errors	• high risk of error on admission from community to inpatient service • opioids not documented on admission • patient can't articulate ("I take the blue one") • 'as required/PRN' opioids not included • no full assessment on admission	• comprehensive assessment and accurate documentation on admission • routinely confirm opioid and dose • awareness of and ready access to resources to identify current/previous opioid (pharmacist) • encourage family to bring opioids to unit where possible
Opioid conversion errors	• difficulty with calculations e.g., volume vs mg, decimal points • clinicians not confident checking/doing calculations • unclear requirements/policy around checking calculations • polypharmacy compounds error risk • human error e.g., interruptions • team culture/interactions – punitive vs. collegial • not utilising evidence • steep learning curve for junior clinicians	• using standardised tools to calculate/convert opioids • awareness and application of conversion policy • building knowledge to access and apply relevant resources, e.g. opioid conversion charts • being confident/comfortable checking calculations and conversions • making checking routine for every dose • identifying wrong conversions and taking action
Prescribing errors	• lack of knowledge of opioid dosing principles • not recognising previous/existing opioid usage • lack of awareness of metabolic processes • attitudinal - side effects not important if patient comfortable; conversely, pain not seen as an issue • opioid altered without appropriate consultation	• robust patient history and pain assessment • rule out underlying physiological conditions • recognising previous/existing opioid usage • consequences of inappropriate alteration of opioid • under-prescribing as harmful to patient as over-prescribing • recognising opioid toxicity • seek specialist advice, e.g., methadone prescribing
Administration errors - wrong drug	• similar sounding drug names, e.g., Oxycontin/MS Contin; morphine/hydromorphone • using trade names vs generic when charting opioids, e.g., Endone/Oxynorm vs. oxycodone	• recognise potential for errors with similar sounding drug names • awareness and application of local policies re drug checking
Administration errors - wrong route	• incomplete/unclear prescription e.g., *'per oral/subcut'* • not checking order e.g., per oral ordered but given subcutaneously • transdermal patch not routinely checked/ removed	• awareness and application of local policies re drug administration • routine checking and ongoing pain assessment with transdermal patch
2. Reducing human error	• interruptions • additional time required for opioid administration - independent double check, patient assessment • not routinely checking every dose	• awareness and application of local policies re opioid delivery • supporting vigilance in delivery of opioids (high risk medicine)

Priority area	Perceived causes/contributing factors	Proposed strategies to reduce error
	• shortcuts/workarounds to reduce time	
3. Clinician knowledge and skills	• assumption clinicians (junior and senior) are confident with core clinical skills • steep learning curve for junior clinicians or clinicians new to palliative care • clinicians' pharmacology knowledge often lacking	• opportunities to identify knowledge and skill gaps • reduce the stigma of 'not knowing' by offering education options that can be undertaken individually vs. in a group

Participating clinicians (n=9): Medical oncology consultants (n=2), palliative care consultant (n=1), palliative care nurse unit manager (n=1), oncology clinical nurse educator (n=1), palliative care clinical nurse consultants (n=2), pharmacists (n=2).