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Perceptions, impact and scope of medication errors with opioids in Australian specialist palliative care inpatient services: A mixed methods study (the PERISCOPE project)

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Chapter 5: Exploring reported opioid error contributory factors in specialist palliative care inpatient services

5.1 Chapter preface

Chapter 4 reported the results of two retrospective reviews of clinical incidents with opioids reported in NSW and local palliative care services. These reviews identified that opioid administration errors account for three-quarters of reported opioid errors in specialist palliative care inpatient services, and that omitted dose errors are the most frequently reported error type in this setting. Half of palliative inpatients who experience an opioid error will require a clinical intervention to manage or preclude harm.

Having determined opioid errors prevalence, patient impact and characteristics, it was essential to next identify opioid error contributory factors in specialist palliative care inpatient services. As mentioned previously, only two specialist palliative care inpatient services participated in this final retrospective review as reported opioid error contributory factors were not accessible from the remaining palliative care services in the PERISCOPE project. This chapter reports the results of a retrospective review of reported opioid error contributory factors (Study 4) undertaken in two specialist palliative care inpatient services in NSW.

5.2 Publication reference

This study was published in 2018 in the *Journal of Palliative Medicine*, a peer reviewed journal which covers medical, psychosocial, policy, and legal issues in end of life care. This chapter contains an edited version of the published study.

Heneka, N., Shaw, T., Rowett, D., Lapkin, S., & Phillips, J. L. (2018). Exploring factors contributing to medication errors with opioids in Australian specialist palliative care inpatient services: a multi-incident analysis. *Journal of Palliative Medicine*, 21(6), 825-835.

Journal of Palliative Medicine: Impact factor: 2.49

5.3 Overview

Medication safety with opioids is increasingly being recognised as a palliative care patient safety priority (Dietz et al., 2013; Dy, 2016; Heneka, Shaw, Azzi, & Phillips, 2018). Opioid errors account for one-third of all reported medication errors in specialist palliative care inpatient services (Heneka, Shaw, Rowett, Lapkin, & Phillips, 2018b). Yet, little is known about the factors contributing to opioid errors in this specialist setting. Understanding the factors contributing to opioid errors is an essential first step in reducing error occurrence and resultant patient harm (Lawton et al., 2012).

System versus individual clinician factors

Factors contributing to medication errors can be broadly categorised into two groups: errors caused by systems factors, and errors due to individual clinician factors (McBride-Henry & Foureur, 2006). Few medication errors have a single cause, with most errors occurring as a result of differing combinations of individual, team, environmental and/or organisational factors (Institute of Medicine, 2007; Lawton et al., 2012; Reason, 2008). Adopting a systems approach to medication errors recognises that the health care settings in which clinicians work are, themselves, subject to latent failures, which manifest as error promoting conditions in the workplace (Lawton et al., 2012). Hence, focussing solely on the actions of the clinician (active failures) when errors occur will not prevent error recurrence, if, in fact, failings within the system itself are the issue (Lawton et al., 2012; McBride-Henry & Foureur, 2006).

Integral to a systems approach to patient safety is the use of incident reporting systems. These systems are widely used in healthcare to identify, investigate and respond to medication errors (Australian Commission on Safety and Quality in Health Care, 2017; Institute of Medicine, 2007; Kohn, Corrigan, & Donaldson, 2000; Smetzer & Cohen, 2007). While preliminary analysis of opioid error contributory factors in palliative care services across NSW has been undertaken (Heneka, Shaw, Rowett, Lapkin, & Phillips, 2018a), in almost half of incident reports (44%, n=63) an error contributory factor was not documented, limiting data analysis. This study sought to explore opioid error contributory factors reported over three years in

specialist palliative care inpatient services to better understand the individual and systems factors that may be contributing to opioid errors in this specialist setting.

5.4 Objective

The objective of this study was to identify opioid error contributory factors documented in clinical incident reports, in specialist palliative care inpatient services.

5.5 Methods

Study methods have been described in Chapter 3.

As previously mentioned, only two of the specialist palliative care inpatient services in the PERISCOPE project participated in this study (Service 1 and Service 3). Service 2 could not be included in this study as a rebuild of the services' incident management system prevented extraction of documented error contributory factors for the retrospective review period.

5.6 Results

5.6.1 Incident characteristics

A total of 78 opioid incidents met the inclusion criteria, with an equal number of incidents identified in each service (n=39), representing 1.7 reported opioid incidents per 1000 occupied bed days. The majority of incidents involved palliative care inpatients with cancer (86%, n=63), who had been admitted for symptom management (59%, n=43) and died during their admission (70%, n=51). The mean length of stay was 23.3 (\pm 20.0) days (Table 5.1).

Three quarters of incidents were due to administration errors (76%, n=59), with a smaller number of prescribing errors (19%, n=15) and near miss incidents (5%, n=4) reported (Table 5.2). The most common administration errors were omitted opioid doses (34%, n=20), accounting for a third of all administration errors, followed by wrong dose errors (17%, n=10). Prescribing errors were predominately related to medication charting errors (33%, n=5). Almost half of all errors occurred at times, which coincide with peak medication administration and/or change of shift, namely between: 08:00 to 08:59 (13%, n=10); 20:00 to 20:59 (13%, n=10); 14:00 to 14:59 (10%, n=8); or 22:00 to 22:59 (10%, n=8).

Table 5.1 Patient demographics: reported clinical incidents with opioids

Demographics		Service 1		Service 3		Total		P-value
		N=37	(100%)	N=36	(100%)	N=73	(100%)	
Gender	Male	20	(54.1)	18	(50.0)	38	(52.1)	0.816
	Female	17	(45.9)	18	(50.0)	35	(46.7)	
Age (years)	Mean (SD)	75.2	(±10.9)	69.1	(±10.6)	72.2	(±11.1)	0.018
	Median (IQR)	76.0	(13)	71.0	(18)	74.0	(18)	
Cancer diagnosis	Yes	29	(78.4)	34	(94.4)	63	(86.3)	0.085
	No	8	(21.6)	2	(5.6)	10 ^b	(13.7)	
Primary reason for admission	Symptom management	20	(54.1)	23	(63.9)	43	(58.9)	0.329
	End-of-life care	8	(21.6)	4	(11.1)	12	(16.4)	
	Pain control	5	(13.5)	6	(16.7)	11	(15.1)	
	Respite	2	(5.4)	3	(8.3)	5	(6.8)	
	Palliative rehab	2	(5.4)	0	0	2	(2.7)	
Length of stay (days)	Mean (SD)	18.9	(±14.1)	27.9	(±24.0)	23.3	(±20.0)	0.206*
	Median (IQR)	14.0	(21)	20.5	(26)	17.0	(23)	
Died during admission	Yes	22	(59.5)	29	(80.6)	51	(69.9)	0.074
	No	15	(40.5)	7	(19.4)	22	(30.1)	

^a Three patients experienced more than one incident during admission; two near miss incident were not linked to a specific patient in the incident report. ^b Other than cancer diagnosis: heart disease/failure (n=3), COPD (n=2), end stage renal disease (n=1), ischemia (n=1), motor neuron disease (n=1), pulmonary fibrosis (n=1), sepsis (n=1).

*Adjusted with age as covariate.

Collectively, two-thirds of reported incidents involved hydromorphone (37%, n=29) or morphine (28%, n=22). The remaining errors involved fentanyl (15%, n=12), oxycodone (9%, n=7), methadone (6%, n=5), and oxycodone/naloxone (4%, n=3). Administration errors occurred most frequently with hydromorphone (34%, n=20), morphine (25%, n=15), and fentanyl (20%, n=12), whereas the majority of prescribing errors (n=9, 60%) involved hydromorphone.

Table 5.2 Opioid incidents by problem type (N=78)

Problem type	Incident type	Service 1		Service 3		Total	
		N=39	(100%)	N=39	(100%)	N=78	(100%)
Administration	Total	26	(66.7)	33	(84.6)	59	(75.6)
	Omitted dose	10	(38.5)	10	(30.3)	20	(33.9)
	Wrong dose	4	(15.4)	6	(18.2)	10	(16.9)
	Transdermal patch – missing or not removed	-	-	7	(21.2)	7	(11.9)
	Wrong patient	3	(11.5)	2	(6.1)	5	(8.5)
	Wrong drug	4	(15.4)	-	-	4	(6.8)
	Wrong route	1	(3.8)	3	(9.1)	4	(6.8)
	Syringe driver error	1	(3.8)	2	(6.1)	3	(5.1)
	Incomplete administration	2	(7.7)	1	(3.0)	3	(5.1)
	Challenge – non-compliance with policy	-	-	2	(6.1)	2	(3.4)
	Clinical management	1	(3.8)	-	-	1	(1.7)
Prescribing	Total	11	(28.2)	4	(10.3)	15	(19.2)
	Medication charting	4	(36.4)	1	(25.0)	5	(33.3)
	Opioid conversion error	3	(27.3)	-	-	3	(20.0)
	Wrong dose	2	(18.2)	1	(25.0)	3	(20.0)
	Wrong drug	2	(18.2)	-	-	2	(13.3)
	Illegible order	-	-	1	(25.0)	1	(6.7)
	Delayed order	1	(14.3)	1	(25.0)	1	(6.7)
Near miss – arrested or interrupted sequence	Total	2	(5.1)	2	(5.1)	4	(5.2)
	Wrong patient	2	(100)	1	(50.0)	3	(75.0)
	Wrong dose	-	-	1	(50.0)	1	(25.0)
Total		39	(100)	39	(100)	78	(100)

5.6.2 Error contributory factors

Analysis of the 78 incident case report summaries identified four primary factor domains per the Yorkshire Contributory Factors Framework (Lawton et al., 2012): i) active failures, ii) individual factors, iii) communication systems, and iv) staff workload (Table 5.3). For a number of incidents (n=8), multiple contributory factor domains applied.

Active failures

Active failures were identified in two-thirds (n=53) of reported opioid incidents, of which 42% (n=22) were violations, specifically, non-compliance with medication management policies.

Active failures - violations

Non-compliance was identified in three policy areas: safe medication administration, second person checks prior to administration, and medication charting. Violations of safe medication administration policy (n=14) included: failure to correctly document opioid administrations, either in the patient's medication chart or the Schedule 8 drug register (n=5); and failure to check medication charts between and during shifts (n=4). Failure to fully implement a second person check prior to opioid administration was noted in four incidents, and led to wrong dose or wrong route errors, all of which resulted in opioid overdose. Non-compliance with medication ordering/prescribing policies was relatively infrequent (n=2), comprising medication charting errors only (Table 5.3). Two incidents reported challenges to practices when non-compliance with medication administration policy was identified. In both cases the nurse being challenged proceeded with the incorrect administration procedure and the challenging nurse reported the violation.

Active failures – slips, lapses and mistakes

Slips, lapses and mistakes collectively comprised half (51%, n=27) of active failures. Slips (n=11) and lapses (n=5) occurred more frequently during opioid administration processes (n=15, 94%); whereas, mistakes (n=11) were predominantly identified in the prescribing process (n=8, 73%). Slips resulted primarily in wrong dose (n=3) and wrong drug (n=2) errors. All lapses resulted in omitted doses, mainly during night shift (n=3). In all cases the incident report noted nursing staff could not recall why the dose had been omitted, they had simply forgotten to do so. Mistakes during prescribing comprised opioid conversion errors (n=3), wrong dose (n=3) and wrong drug (n=2) errors (Table 5.2).

Individual factors

Individual factors were identified as contributing factors by the notifier in 12% (n=9) of incidents. In one third of individual factors (n=3), staff workload also underpinned the incident. Inattention and/or distraction were the primary individual factors identified (n=4) followed by inexperience (n=3) and fatigue (n=2). All incidents linked with individual factors occurred during the opioid administration process.

Communication systems

Communication related factors were evident in 17% (n=13) of incidents, all of which resulted in opioid errors that reached the patient. Deficiencies were primarily identified in communication during clinical handover (n=8) and in written communication (n=5). Poor clinical handover caused dose omissions for multiple patients, which adversely impacted patients' previously well-managed pain. Failure of medical staff to document and/or handover changes to route of opioid administration also contributed to omitted doses. The interpretation of written opioid orders was affected by ambiguous written orders (n=3), e.g., '*chart with morphine order altered from 3mg to 4mg, (clinician) signature could be mistaken as 8 mg*', and poorly handwritten orders (n=2), which resulted in dose misinterpretation by the administering nurses.

Staff workload

Factors related to the work environment at the time of the incident, such as increased workload due to staffing levels and/or high unit workload, were explicitly identified in 10% (n=8) of incidents, predominantly resulting in omitted doses. Multiple incident reports cited the '*...busy nature of the ward*' as a contributing factor to opioid incidents, at times underpinning non-compliance with policy, such as failing to implement a two-person medication check. Increased workload contributed to opioid errors regardless of staff experience (Table 5.3).

Table 5.3 Opioid incident contributing factors categorised by Yorkshire Contributory Factors Framework domains (Lawton et al., 2012)

Contributory factor and domain (proximal to latent) (Lawton et al., 2012)	N =78 (100%)	Key subthemes	Incident example (from incident narrative)
Active failures (proximal)	53 (67.9)		
Violation	22 (41.5)	Non-compliance with medication management policy	<p>Administration error – missing transdermal patch: ‘Patient fentanyl 50mcg patch was due for change/administration. Nursing staff were unable to locate previous patch on patient for removal. The palliative care plan was signed to say that the patch was sighted on the morning shift on [date] but not the (previous) afternoon or night shift. Care plan states that fentanyl patches should be sighted on all shifts, had this occurred on the afternoon and night shifts the patch may have been identified as loose or missing sooner.’ Site Incident ID_18</p> <p>Prescribing error – order not ceased resulting in wrong dose: ‘Whilst checking patient’s syringe driver it was discovered that the contents of the syringe differed from the order given. There were two medication orders for a syringe driver, one had not been cancelled from the previous day when the next one was written. Order for [date] was hydromorphone 5mg, new order was hydromorphone 6mg. The correct medication was reloaded on [date]. Contents of incorrect syringe driver discarded. The Medical Officer has been advised to be sure to cancel orders when another is written.’ Site Incident ID_49</p>
Slip	11 (20.8)		<p>Administration error - wrong drug: ‘Hydromorphone 2 mg subcutaneous given at regular drug round instead of morphine 2 mg subcutaneous. I discussed this error with the two nurses involved. Both are experienced in palliative care nursing and both understand the difference in strength between the two drugs. Neither could offer an explanation for the error.’ Site Incident ID_42</p> <p>Prescribing error – wrong dose: ‘Rechart of medications done, oxycodone 40mg bd re-charted (unintentionally) as oxycodone 40mg d, with 0800 the only time entered. No oxycodone given at 2000 on [date].’ Site Incident ID_21</p>
Mistake	11 (20.8)		<p>Prescribing error – wrong dose: ‘Patient had been taking 4/24 9mg oral morphine, yesterday this was changed to bd 60mg MS Contin. Medical staff had made an error in calculating dosage when changing MS Contin, however, as the dosage was within the normal range of MS Contin given frequently in the unit this was not picked up, and the higher dose was given on two occasions.’ Site Incident ID_41</p>
Lapse	5 (9.4)		<p>Administration error – omitted dose: ‘During regular drug round, noted three doses of regular 4/24 10 mg oral morphine had not been given overnight. Nurses on shift</p>

Contributory factor and domain (proximal to latent) (Lawton et al., 2012)	N =78 (100%)	Key subthemes	Incident example (from incident narrative)
			<i>unable to explain or recall why dose omitted, other than agreeing that morphine not given.</i> Site Incident ID_56
Could not be determined	4 (7.5)		
Situational factors	9 (11.5)		
Individual factors	9 (100)	Inattention/distraction Inexperience Fatigue	Administration error – wrong drug: <i>'Regular subcutaneous morphine 10 mg due, subcutaneous hydromorphone 10 mg given instead. The incident was discussed with the nurses concerned who are both experienced palliative care nurses. They stated they had given several subcutaneous hydromorphone injections prior to this patient and did not pay sufficient attention to this (patient's medication order).'</i> Site Incident ID_43
Local working conditions	8 (10.3)		
Staff workload	8 (100)	Staffing levels at time of incident High unit workload	Administration error – omitted dose: <i>'Patient stated this morning that nocte Oxycontin 70 mg had not been administered. Oxycontin PM dose not signed for in medication chart. Patient requiring 1 x breakthrough subsequent AM. Reviewed roster - 3 x staff had taken sick leave, with 1 x hospice casual and 1 x permanent RN on the PM shift (sick leave replaced with 1 x agency RN & 1x agency EEN).'</i> Site Incident ID_31 Administration error – wrong drug: <i>'Suspected wrong drug used in subcutaneous infusion pump – morphine instead of fentanyl. Two regular staff involved in incident, neither staff member had a history of medication errors. Ward extremely busy at time of incident with more than normal requirements of breakthrough analgesia required for multiple patients.'</i> Site Incident ID_19
Applies across all factor types (proximal to latent)	13 (16.6)		
Communication systems	13 (100)	Poor clinical handover Written communication	Administration error – omitted dose: <i>'Patient seen by Medical team at 1600 [date]. Subcutaneous infusion pump (SCIP) ordered and team handed instruction over to afternoon shift nursing staff. Team noted in progress notes that patient was a high falls risk and should be transferred to different bed. Nursing staff failed to hand over instructions regarding SCIP order to Pt's accepting nursing staff and as a result the SCIP was not commenced. At 0200, night staff found the SCIP order and commenced same.'</i> Site Incident ID_34

Contributory factor and domain (proximal to latent) (Lawton et al., 2012)	N =78 (100%)	Key subthemes	Incident example (from incident narrative)
			<p>Administration error – transdermal patch not removed: <i>‘Patient presented to unit with fentanyl patches insitu. Medical review indicated that the patient was becoming intolerant to fentanyl and was rotated to another oral opioid, however nil documentation in progress notes of request to remove fentanyl patch noted. Found to still have patches on body when there was a verbal order to remove. On review of medication chart, order to remove patch was written over initial order, the modified request is unclear.’</i> Site Incident ID_20</p> <p>Administration error – wrong dose due to poorly written order: <i>‘(Nurse A) and I gave patient subcutaneous hydromorphone at 1000. When I went to give another dose later, Nurse B checking it with me said that the order was 5 mgs to 6 mgs. Nurse A and I had given 3mgs for the dose before instead of 5 mgs as we read the order as 3 mg. It was a new (as-required/PRN) re-chart and Nurse B knew it was 5 mg from the previous order, and the patient was generally having a 6 mg dose.’</i> Site Incident ID_39</p>
Multiple	8 (10.2)		
<ul style="list-style-type: none"> • Active failure: violation • Situational factors: individual factors • Local working conditions: staff workload 	8 (100)	Non-compliance with medication management policy Fatigue High unit workload	<p>Administration error – wrong dose: <i>‘At 2300 patient was given 20mg breakthrough of oxycodone instead of 10mg. The wrong strength of medication was taken out of the cupboard and used. The shift was busy and the medication was not checked correctly against the order as outlined in the policy. Was also night shift and staff were fatigued.’</i> Site Incident ID_30</p>

5.6.3 Error mitigating factors

A number of incidents (n=8) highlighted the nurses' role in preventing opioid errors. In one example, nurses intercepted a potential 10-fold overdose of hydromorphone before it was administered (Table 5.4). Nurses also instigated additional checks of opioid orders that were considered 'unusual' (for example, very high doses or doses that were not routinely ordered) by cross-referencing with what had been recorded as dispensed and administered in the drug register previously, before administering the opioid. Adherence to medication management policy, such as second person checks prior to administration, was noted in a small number of incident narratives (n=4) to have prevented errors from reaching the patient, or mitigated patient impact following an error (Table 5.4).

Table 5.4 Examples of error mitigating factors identified in incident narrative

Nurses' role in preventing opioid error:

'Patient was admitted to ward from [external service], according to the medical discharge summary and medication chart from [external service], patient was on regular hydromorphone 0.75 mg per oral q4h, however, regular hydromorphone 7.5 mg per oral q4h was ordered by doctor. Nurse A and I double checked the dose given at [external service] and advised doctor who corrected the order on the medication chart.' (Site Incident ID_54)

Adherence to medication management policy:

'When checking patient to locate the fentanyl patch on the afternoon shift, patch was found to be missing. Medication chart indicated that patch had been applied to Right side of patient's chest. On the morning shift (of the same day), per the patient's care plan, fentanyl patch had been checked and recorded to say it was insitu. Nurses contacted the morning shift who confirmed patch was insitu on patients right chest when showered that morning. Medical staff notified and a stat order given to replace fentanyl patch. Fentanyl patches are sighted and recorded on the patients care plan each shift this is an example of how well this process works, the patient didn't suffer unnecessary pain as the missing patch was identified quickly.' (Site Incident ID_04)

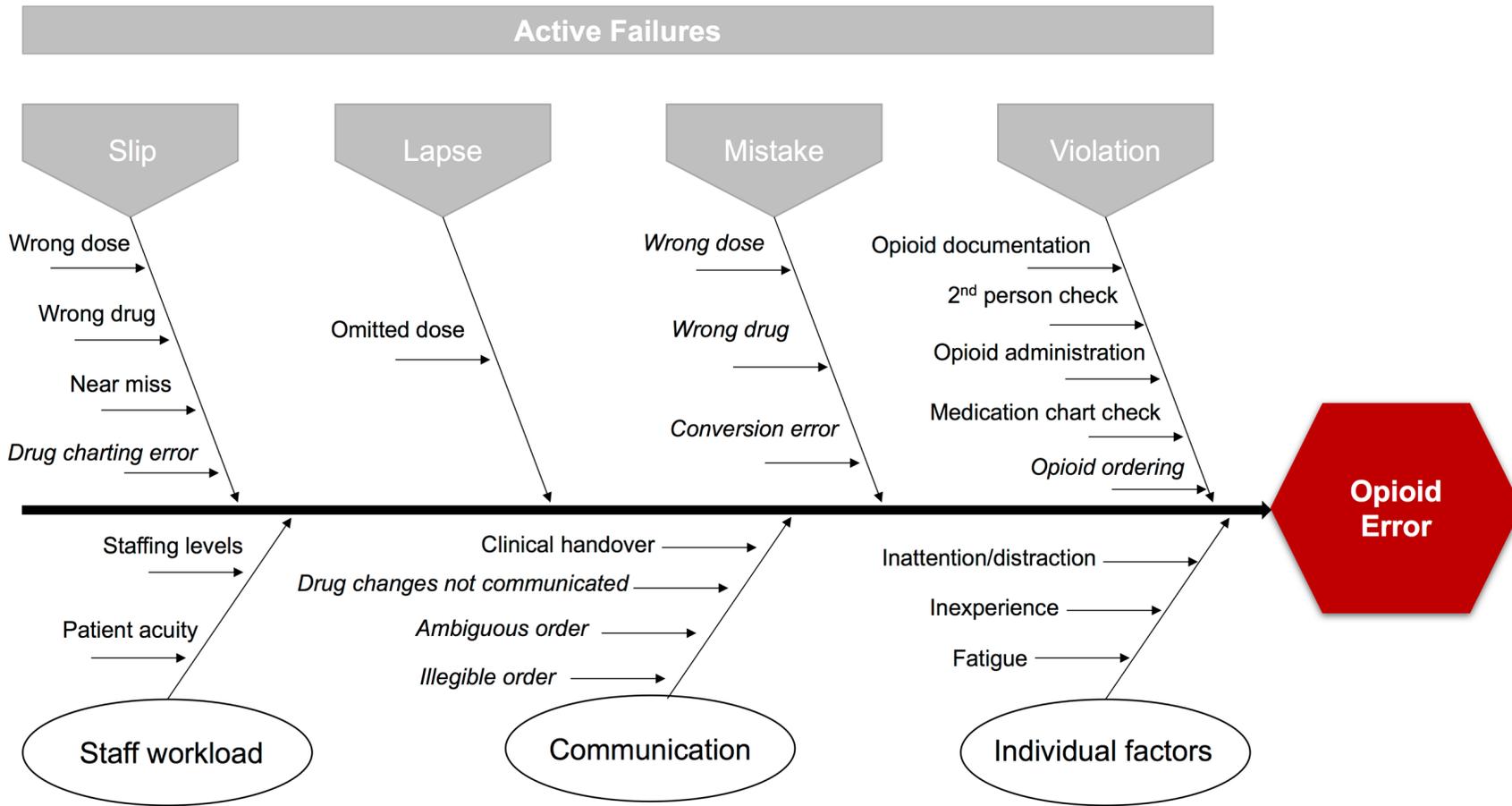
5.7 Discussion

This retrospective review has provided valuable insights into the characteristics of, and factors contributing to, reported opioid errors in specialist palliative care

inpatient services. Opioid errors were primarily reported during the administration process, versus the prescribing process, consistent with findings from other health care services (Carson, Jacob, & McQuillan, 2009; Desai et al., 2013; Dy, Shore, Hicks, & Morlock, 2007). While none of the errors resulted in serious adverse events or death, opioid errors impacted adversely on patients' symptom management, with almost half of the patients affected requiring clinical intervention as a direct consequence of an opioid error, largely due to omitted dose errors.

Local working conditions and clinical communication failures appear to play a role in facilitating opioid errors; however, the focus on contributing factors in this multi-incident analysis tended towards active failures (Figure 5.1). Active failures were most often due to violations, primarily during the administration process. Unlike slips and lapses, which are unintentional, violations are an intentional, behavioural choice (Reason, 1990). Given the number of opioid errors due to violations of medication management policy, understanding the factors that prompt non-compliance with policy, and strengthening adherence to these policies, is essential to reducing opioid errors and patient symptom burden in specialist palliative care services. Factors contributing to non-compliance with medication management policy are comprehensively explored in Chapters 6 and 8.

Slips and lapses (skill-based errors) were readily identified during the administration process; however, in-depth analysis was restricted, as information provided in the incident summary was often limited. Errors in prescribing were more likely to be knowledge-based (mistakes), than a result of a slip or lapse. However, whether the errors were due to rule-based, knowledge-based, or other mistakes (Reason, 1990), it could not be determined from the incident summary, as this information was not documented by the incident notifier. These deficiencies in the analysis highlight the need to further explore the systems factors and/or conditions that prompt slips, lapses and mistakes throughout the opioid delivery process. Given both services utilised paper-based medication charts, the implementation of digital health solutions, such as electronic medication management systems and clinical decision support tools, which have been shown to reduce these error types (Ammenwerth, Schnell-Inderst, Machan, & Siebert, 2008), warrants consideration.



Italics denotes error in the prescribing process

Figure 5.1 Opioid error contributory factor categories (Lawton et al., 2012; Reason, 1990)

Despite the predominance of active failures, several latent or ‘systems’ factors contributed to opioid errors in this analysis. Similar to factors contributing to medication errors in other hospital settings (Brady, Malone, & Fleming, 2009; Parry, Barriball, & While, 2015; Santell, Hicks, McMeekin, & Cousins, 2003; Tully et al., 2009), a combination of sub-optimal communication systems and local working conditions, directly contributed to, and/or facilitated opioid errors in specialist palliative care services. Poor clinical communication has been associated with increased administration errors of all drug types (Parry et al., 2015), as has the quality of written prescriptions (Brady et al., 2009). Identifying opportunities to improve clinical handover, particularly when changes to opioid orders are made, and encouraging nurses to question and report ambiguous written opioid orders, are key considerations to address the clinical communication gaps identified in this study.

The relationship between clinical staff workload and rates of opioid error in specialist palliative care services warrants further investigation. Increased workload has been linked with higher rates of medication administration and prescribing errors in acute care settings (Dean, Schachter, Vincent, & Barber, 2002; Parry et al., 2015; Tully et al., 2009). In this analysis, high unit workload at the time of the incident was identified as an error contributing factor, reflecting the complexity of patient care and corresponding medication regimens in palliative care service provision (Australian Institute of Health and Welfare, 2014). However, it could not be conclusively determined if additional latent factors, such as management of staffing levels or patient scheduling, contributed to increased workload.

Latent organisational and/or external factors, such as physical environment, scheduling and bed management, and/or external policy context, did not appear to contribute to error producing conditions in this analysis. However, further investigation is required to confirm or refute this finding.

Beyond error contributing factors, the role of palliative care nurses in identifying and intercepting opioid errors was evident in the incidents reported. An important next step in addressing opioid errors in specialist palliative care services, is to better understand the factors that empower, or disempower, nurses to challenge opioid orders and practices they perceive to be incorrect. Also critical is an understanding of service safety culture, which cannot be ascertained from incident reports alone,

rather, requires input from clinicians and other stakeholders involved in patient and/or medication safety within specialist palliative care services.

5.7.1 Limitations

This analysis reports opioid errors from two specialist palliative care inpatient services in one Australian state and may not be generalisable. Medication incidents are consistently under-reported (Westbrook et al., 2015) and dependent on clinicians' recognition that an incident has occurred, and their willingness to report the incident (Australian Commission on Safety and Quality in Health Care and NSW Therapeutic Advisory Group Inc., 2013). Data analysis in this study was predicated on the incident narrative as reported by the incident notifier, which may not capture all relevant information pertaining to the incident (Vincent, 2007).

While this study has provided initial insights into factors contributing to opioid errors in specialist palliative care inpatient services, further research is necessary to confirm or refute the study findings.

5.8 Summary

In order to support safe opioid medication processes in specialist inpatient palliative care services, it is essential to better understand the factors and conditions that may give rise to error, beyond the errors made by clinicians at the front line of medication delivery. This study has provided a starting point from which further exploration of the conditions that may underpin active failures, and the latent factors impacting safe opioid delivery processes can be undertaken. An essential next step is identifying and understanding palliative care clinicians' and service managers' perceptions of factors contributing to opioid errors in their service, and the impact of service safety culture on opioid incident reporting.

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