

BMJ Open Quality Increasing take-home naloxone kit distribution to patients with substance use disorder before hospital discharge: a quality improvement project

Daniel Wong ,¹ Lingsa Jia^{1,2}

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ABSTRACT

The ongoing drug toxicity crisis is a growing public health challenge in many countries across the world. Despite the WHO's recommendation of take-home naloxone (THN) kits as a cost-effective harm reduction strategy to prevent drug toxicity deaths, the Addiction Medicine Consult Team (AMCT) at Burnaby Hospital found that only 51% of their eligible patients were receiving a kit before discharge. In response, the AMCT created a quality improvement (QI) team with the aim of increasing their THN kit distribution rate on two hospital wards from 51% to over 80% within 10 months.

Change ideas were implemented with the aim of targeting various components of the THN kit distribution process. Changes included adjusting THN kit inventory on wards, hosting education sessions for nurses, creating just-in-time training using nursing station whiteboards, streamlining the documentation process for nurses and standardising the ordering process for providers. The QI team collaborated with hospital interest holders including senior executives, nursing and pharmacy groups to facilitate change ideas. The project culminated with 4 months of sustained THN kit provision above 80%. The QI team is currently in talks with hospital operations to ensure that an effective documentation system will be integrated into the new electronic medical record system when the hospital transitions away from paper charting in 2025.

PROBLEM

Drug toxicity deaths continue to climb in Canada at an alarming rate, especially in the province of British Columbia (BC). Despite the province's efforts to increase access to addiction care resources, deaths per 100 000 people continued to grow from 16.6 in 2016 to 48.3 in 2023.¹

Burnaby Hospital is a 286-bed community hospital situated in Burnaby, BC. The Addiction Medicine Consult Team (AMCT) was established at Burnaby Hospital in July 2021 to provide multidisciplinary inpatient services for over 450 patients with substance use disorders (SUDs) annually. One year after the creation of the AMCT, an audit in the form of a retrospective chart review found that

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Take-home naloxone (THN) kits are a major pillar for harm reduction in the community, with several studies suggesting that THN reduces drug overdose-related deaths. Although many hospitals have shared their own experience creating a THN distribution programme, limited published data exist on documenting quality improvement initiatives aimed at improving distribution.

WHAT THIS STUDY ADDS

⇒ This is the first quality improvement project to our knowledge aimed at increasing THN distribution rates on hospital inpatient wards. This study also explains and teaches the quality improvement process required to create change, using different Institute for Healthcare Improvement change ideas.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Optimising THN distribution to the community is a complex, but worthwhile process that can be approached with a combination of increasing education, supply of kits and standardisation of procedures.

only 51% of eligible patients received a take-home naloxone (THN) kit before discharge. Given the opioid overdose-reversing ability of naloxone to potentially save lives, a quality improvement (QI) project was initiated with the aim of increasing THN kit distribution rates from 51% to at least 80% within 10 months.

BACKGROUND

The ongoing opioid overdose crisis is a growing public health challenge in many countries across the world. In the Canadian province of BC, SUDs were staggeringly the second most common diagnosis responsible for inpatient hospitalisations in 2021–2022, highlighting the amplified crisis in BC and



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¹Faculty of Medicine, The University of British Columbia, Vancouver, British Columbia, Canada

²Addiction Medicine and Substance Use Services, Burnaby Hospital, Burnaby, British Columbia, Canada

Correspondence to

Dr Lingsa Jia;
lingsa.jia@fraserhealth.ca

the greater need for improved access to rapid treatment and local resources.²

Opioid overdose leads to death primarily due to its respiratory depressive effects.³ Naloxone is an opioid antagonist that, when administered parenterally or intranasally, quickly reverses the pharmacological effects of opioids, including apnoea.³ It carries no abuse potential and became a global recommendation by the WHO in 2014 to prevent drug toxicity-related deaths.³ Therefore, THN kit distribution programmes have become a major pillar for harm reduction in communities, where anyone witnessing a potential opioid overdose can administer naloxone in a timely manner. Although there are no randomised controlled trials to study these programmes' effectiveness, most of the available literature suggests a mortality benefit.^{4–8} Moreover, a North Carolina-based cost–benefit analysis in 2015–2016 estimated that each dollar invested into a THN kit distribution programme yielded a US\$2742 benefit by avoiding opioid overdose deaths.⁸

Given the promising success of THN kits, many hospitals, especially emergency departments, have shared their own experience creating a local THN programme.^{9–17} Many shared a similar process of a provider identifying patients and ordering a kit for a nurse to give to the patient. Interestingly, one programme established an automated dispensing system that patients could access for free without any clinician intervention.¹¹ Not all programmes published their kit distribution rates, but they ranged from a low of 30.9%¹¹ up to 70%.^{12–14 16 17}

The audit findings at Burnaby Hospital were therefore identified as a cost-effective target for improvement as only 51% of eligible patients received a THN kit before discharge. If THN kits can prevent drug toxicity-related deaths, then increasing kit provision in hospitals will further disseminate THN in the local community of people who use drugs, thereby reducing the risk of opioid overdose. Although many institutions have shared their THN programme data, this is the first QI project to our knowledge aimed at increasing distribution rates, while also addressing a gap in data from inpatient wards.

MEASUREMENT

The audit of the AMCT at Burnaby Hospital was a retrospective chart review of 71 AMCT patients after the first year of service. The aim was to elucidate patient demographics and interventions made by the team, such as dispensing THN kits or prescribing opioid agonist therapy. While 100% of eligible patients were continued on or had opioid agonist therapy initiated by the AMCT in hospital, only 51% of patients received a THN kit before hospital discharge. Patients were considered eligible for a THN kit if they were diagnosed with an opioid use disorder or another SUD featuring substances such as stimulants or sedatives, which are commonly contaminated with illicit opioids in the street supply.¹⁸

For this QI project, monthly chart reviews were completed to collect data and feedback while interventions were made based on several of the Institute for Healthcare Improvement's (IHI) Change Concepts—a group of standard approaches to change that are widely implemented in QI work.¹⁹ Scanned paper charts were reviewed using the MEDITECH electronic medical record system. The main outcome measure was the percentage of AMCT patients who received a THN kit before discharge from the hospital. Process measures included the percentage of patients who were ordered a kit and the inventory supply of THN kits on hospital wards.

Balancing measures were also accounted for. Due to workload concerns and staffing shortages exacerbated by the COVID-19 pandemic, feedback from nursing staff was sought for workload changes implicated by project interventions. All reviewed charts were also checked for any potential increases in SUD-related readmissions within 30 days of discharge.

DESIGN

During the collection of baseline data, it was unclear whether the THN kit distribution rate was truly low or if documentation of kit provision was incomplete. The QI team therefore used a multipronged approach in the first few months with several change ideas to target different drivers along the entire THN kit distribution process. The team planned to monitor for change and adapt with additional plan–do–study–act (PDSA) cycles as required.

Given the project's dependence on essential stakeholders like nursing staff and the hospital pharmacy, it was integral to communicate regularly with their respective leadership groups. The team met with nursing leadership and frontline nursing staff once every 2 months and liaised with pharmacy leadership at the start of the project, then on an as-needed basis. The project was initiated in one medical ward first and was later expanded to a second ward for the remainder of the project. Baseline measurement showed that among these two wards, only 50% of eligible patients received a THN kit, similar to the overall rate of 51% across the entire hospital.

Data were collected every month by thoroughly examining all charts for eligible patients seen by the AMCT on the two wards. Because there was no official documentation process for THN kit distribution prior to this project, all sections of the chart were reviewed due to notable heterogeneity in how nurses documented this information.

The QI team included a physician champion, nurse champion, medical student and a QI consultant. They met monthly to discuss chart review results and strategise subsequent PDSA cycles.

STRATEGY

The QI team's aim was to increase THN kit distribution rates from 51% to at least 80% over a timeframe from September 2022 to July 2023. A process map and a driver

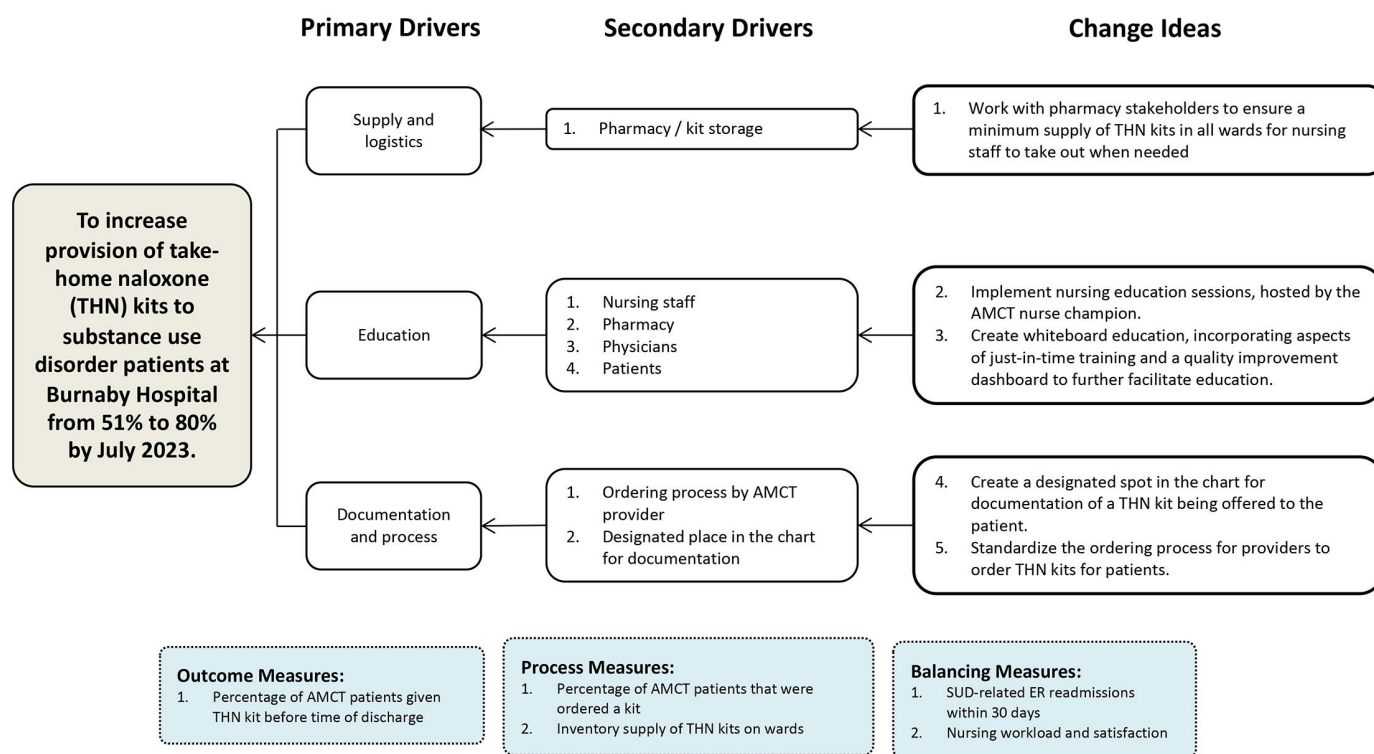


Figure 1 Driver diagram. AMCT, Addiction Medicine Consult Team; SUD, substance use disorder; THN, take-home naloxone; ER, emergency room

diagram (figure 1) were employed to develop an organised framework and generate change ideas targeting different steps of the kit distribution process.

Change Idea #1 (IHI Change Concept #23—match inventory to predicted demand): each ward's THN kit inventory is entirely maintained by the hospital's pharmacy department. Because kit inventory was identified as one of several potential drivers behind the distribution process, the QI team arranged discussions with pharmacy management to determine the minimum supply of kits before a pharmacy technician is prompted to refill inventory. The goal of this approach was to ensure that each ward always had an adequate supply of THN kits.

Change Idea #2 (IHI Change Concept #31—conduct training): nursing education sessions were facilitated by the nurse champion in the early phase of the project as improved education has previously been recommended to improve THN kit distribution.¹⁶ The QI team designed a short Microsoft PowerPoint slideshow as well as a small, printed handout. The objective of the education sessions was to empower nurses with knowledge on how to distribute and educate patients about THN. Sessions were designed to be concise and only 5 min long to minimise barriers and time taken away from bedside. In collaboration with the clinical nurse educator of the ward, these sessions were held during staff huddles to optimise attendance. Because most nurses in this hospital work both

day and night shifts, education sessions were only implemented during the day.

Change Idea #3 (IHI Change Concept #27—give people access to information): to increase presence on the wards and provide another layer of education, the QI team implemented whiteboard education. Using whiteboards on each ward's nursing station, the team illustrated instructions on how to dispense THN and document their work, emulating a form of just-in-time training—an effective strategy used in QI projects to provide accessible education exactly when it is required.²⁰ The whiteboards also served as a dashboard for communication and positive reinforcement where staff were updated every month with the current THN provision rate. Dashboards, ranging from paper to electronic variations, have been frequently used with success in QI to encourage reflection by front-line staff on their quality of care.²¹

Change Idea #4 (IHI Change Concept #51—standardisation): prior to this project, there was no place in the patient chart for kit provision to be documented by nurses. Discussions with the pharmacy department found that THN kits could not be added to the medication administration record as kits are not an inpatient medication. In response, the QI team sought to create a standardised documentation process because it was unclear if the low THN provision rate at baseline was truly low or if it was a byproduct of inconsistent documentation. The

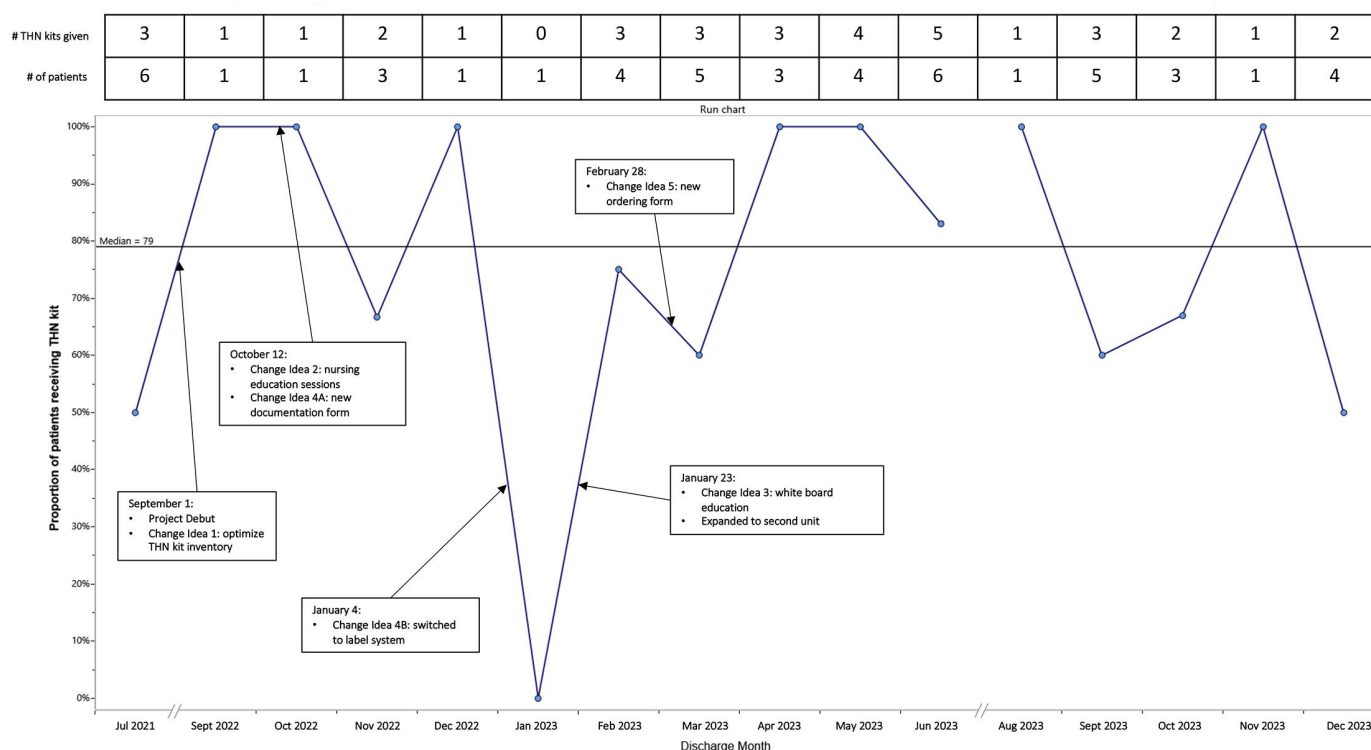


Figure 2 Improving THN kit provision rates in AMCT patients at Burnaby Hospital. AMCT, Addiction Medicine Consult Team; THN, take-home naloxone.

team created a one-page form that contained educational material about naloxone and a section for nurses to document their work.

Change Idea #5 (IHI Change Concept #59—use reminders): a new standardised ordering form for AMCT physicians to use for all of their patients was designed. The form included many aspects of standard management for SUDs, along with an optional tick box to order a THN kit for appropriate patients. The goal of this change idea was to create a reminder for providers and ensure that all eligible patients were considered for a kit. A published paper reported a distribution rate of only 30.9% using an automated machine that dispensed kits to patients without any prescription.¹¹ This highlights the impact that clinicians can make by offering THN to their patients, thereby making it imperative to have a structured ordering process in place.

RESULTS

THN provision rates reached the objective of 80% by April, a few months before the endpoint of July and consistently stayed above target through August (figure 2). Unexpectedly, there were no eligible patients in July, resulting in no collected data that month.

Initially, THN provision rates appeared to debut at 100% in the first few months. While the early results were promising after implementing the nursing education sessions, the QI team felt that the data were unreliable given the small sample size and mixed feedback indicating

that several nurses were unaware of the project. Provision rates after this short period decreased as expected, prompting the need for further intervention.

For change idea #4, the goal of standardising documentation by nurses required a series of PDSA cycles for optimisation. The initial one-page form was not used by any nurses as they continued to document THN inconsistently in the chart. The QI team responded by pivoting from the one-page form to adhesive paper labels that were attached to each physical THN kit. Nurses were instructed to apply a label to the medication administration record before dispensing a kit to a patient. Together with whiteboard education (change idea #3), provision rates began to rise and become more consistent, while receiving generally agreeable feedback from nursing staff.

Process measures were monitored monthly along with the main outcome. Over the course of the entire project, 2 of the 29 patients did not have THN ordered by a provider. Both cases occurred prior to the implementation of change idea #5 with the new standardised ordering form. Collaboration with the pharmacy department led to an increase in the minimum supply of kits per ward from 2 to 6. The pharmacy department's records showed that inventory was never depleted on any ward at any given time.

Data regarding the nursing education session were also tracked. Six individual nursing education sessions were hosted, with 24 different nurses and student nurses in attendance—an average of 4 per session. There are

currently 24 full-time nurses employed on both wards, although there are more part time and casual staff.

Regarding balancing measures, 2 of the 29 patients in the project had a SUD-related ER (emergency room) readmission at 30-days postdischarge. This number was neither alarming nor did it suggest the project was impacting patient safety. Nursing feedback was acquired in various methods over several PDSA cycles, although this was challenging. The primary mode of feedback was through monthly meetings with nursing leadership staff. The QI team left feedback forms on the wards for nurses to complete anonymously, but due to having no responses, they pivoted to a new approach. A small section of the whiteboards used for education was established for nurses to tally with a marker if they agreed with different basic statements, including 'I like this', 'I understand' and 'This is too much work'. This method acquired a few responses for 1 month only. Therefore, the QI team primarily depended on feedback from nursing leadership staff and through individual discussions with nurses on the wards. Feedback suggested that staff were willing to engage with the adhesive labels, which correlated with improvement in THN kit provision rates.

Early postproject sustainability monitoring over 4 months has shown variable distribution rates, with some months performing below the 80% target.

LESSONS AND LIMITATIONS

The number of patients seen by the AMCT was dependent on patient flow through the hospital system, and thus the sample size for each month was inconsistent. Although the variability between each month was extreme in the first half of the project, expanding the project to two wards and implementing adhesive labels and whiteboard education appeared to at least temporarily improve THN kit distribution rates.

The biggest lesson learnt by the QI team was the importance of stakeholder buy-in. Nursing shortages have unfortunately become very common in BC and were further exacerbated by the COVID-19 pandemic. Although the team was initially proud of the original documentation form, they learnt that a process change is only successful if it does not impede the current workflow in place. After pivoting to the use of adhesive labels, uptake of the change idea improved and THN provision rates increased.

Comparing this project to other THN programmes in institutions already using electronic charting systems, documentation interestingly does not come up as an issue, highlighting the utility of an electronic system.^{9 10 14 15 17} Brief education sessions for nurses were still a common cornerstone.^{9 10 15} One project even included simulation training for their nurses, although it was unclear what their distribution rates were as a result of this innovative approach.¹⁵ Even so, this form of interactive, hands-on training could be considered for future education sessions as a PDSA cycle.

Acquiring adequate feedback from nursing staff was a challenge. Despite attempting several approaches, the QI team repeatedly relied on representative feedback from nursing management. It was unexpectedly difficult to develop a responsive and anonymised system to collect individual feedback. In the future, the QI team may consider exploring other avenues to acquire feedback, including online surveys.

Determining the individual effect of each change idea is a common limitation in quality improvement projects. An action hierarchy was applied to frame the changes for efficiency in terms of effort input versus effective output. Based on the action hierarchy, both whiteboard education and optimisation of documentation relatively had high impact with moderate effort involved. In comparison, increasing THN kit inventory levels yielded little impact, although it required minimal effort. Based on subject matter expertise and temporal association as well, the combination of using whiteboard education and optimising the documentation process appeared to be the main drivers. Nursing staff also expressed general support for the documentation labels, especially compared with the one-pager form which had significantly poorer uptake.

There are several confounding factors to consider. Some patients may preferentially acquire THN outside of the hospital given that it is free in local pharmacies. This was a notable finding in a UK qualitative study, where many patients in the emergency department declined THN due to having a kit from the community already.²² Some charts also showed that several patients who did not receive a kit were noted by nurses to be hostile, violent or frequently absent from the ward. These behavioural issues likely affected workflow or made nurses feel too uncomfortable to offer THN, resulting in lower provision rates. This was particularly noticeable in the surveillance months after the project was completed, affecting concerns on sustainability. For example, in September 2023, one of the two patients who did not receive THN was noted to be agitated and required a security escort out of the hospital. A potential avenue for future quality improvement projects could be to develop a contingency care plan for these patients who leave the hospital abruptly.

There have also been challenges in finding an appropriate staff member to continue printing and applying adhesive labels to THN kits. Unfortunately, the pharmacy department was unable to allocate a technician to this task, also due to staffing shortages. Therefore, the QI team is currently maintaining upkeep of this service themselves. As Burnaby Hospital transitions from paper to an electronic charting system in the next 2 years, the QI team has already held discussions with hospital administrators to optimise the documentation system of THN kits. Currently, there are concrete plans to incorporate THN kits into the medication administration record along with other inpatient medications when the new system goes live. When this happens, it will certainly be

interesting from a QI perspective if this will impact THN kit provision rates.

CONCLUSION

The QI team implemented a series of PDSA cycles to target different drivers behind the THN distribution process, achieving a rate above target for 4 months. Ultimately, while many institutions have already transitioned to a fully electronic system, there are change ideas in this project that can translate to other sites looking to improve their provision of THN kits.

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Competing interests LJ: funding for project from Fraser Health Physician Quality Improvement and manuscript publishing from Doctors of BC. All authors: funding for project from Burnaby Medical Staff Association, no award/grant number.

Patient and public involvement Patients and the public were not involved in the development of this project, but the AMCT plans to partner with patients with lived experiences to help promote the outcomes of this project and other facets of harm reduction.

Patient consent for publication Not applicable.

Ethics approval As a quality improvement project, this project was deemed to be exempt from Fraser Health Research Ethics Board review.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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ORCID iD

Daniel Wong <http://orcid.org/0009-0002-3983-6115>

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