

# BMJ Open Quality **Implementing criteria-led discharge for acute admissions to facilitate the elective recovery from COVID-19: an example in acute tonsillitis**

Callum Findlay <sup>1,2</sup>, Wei Chern Gavin Fong,<sup>2</sup> Simon Goldie,<sup>2</sup> Huw Jones<sup>2</sup>

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<sup>1</sup>Clinical and Experimental Sciences, Faculty of Medicine, University of Southampton, Southampton, UK

<sup>2</sup>Department of Otolaryngology, University Hospital Southampton NHS Foundation Trust, Southampton, UK

## Correspondence to

Mr Callum Findlay;  
[c.findlay@soton.ac.uk](mailto:c.findlay@soton.ac.uk)

## ABSTRACT

**Background** Healthcare systems face unprecedented numbers of patients waiting for elective treatments in the wake of the COVID-19 pandemic. Hospitals must urgently optimise patient pathways and build capacity to meet the populations health needs. Criteria-led discharge (CLD) is frequently used to optimise elective care pathways but may hold potential in discharging patients at the end of an acute hospital admission.

**Methods** We conducted a quality improvement project to design and introduce a novel inpatient pathway using CLD for patients with severe acute tonsillitis. Our analysis compared the standardisation of treatment, length of stay, discharge time and readmission rate between those treated on the novel pathway compared with standard treatment.

**Results** The study population included 137 patients admitted to a tertiary centre with acute tonsillitis. Introduction of the tonsillitis pathway using CLD resulted in a significant reduction in median length of stay from 24 hours to 18 hours. Of those treated on the tonsillitis pathway, 52.2% were discharged prior to midday compared with 29.1% who received standard treatment. No patient discharged using CLD required readmission.

**Conclusion** CLD is safe and effective at reducing length of stay in patients requiring acute hospital admission for acute tonsillitis. CLD should be used and evaluated in further novel patient pathways across different areas of medicine to optimise care and build capacity for provision of elective healthcare services. Further research is required to investigate safe and optimal criteria which indicate patients are fit for discharge.

## INTRODUCTION

Acute admissions account for a large proportion of hospital bed occupancy within the National Health Service (NHS) each year.<sup>1</sup> Beds within surgical departments are frequently occupied by patients requiring urgent but non-surgical treatment. This places pressure on bed availability, prevents patients transferring from critical care beds to wards and limits capacity to treat patients waiting for elective surgery.<sup>2</sup> This issue has become particularly pressing during

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Healthcare services need to increase the elective treatment capacity to catch up on the waiting list backlog that develop prior to and during the COVID-19 pandemic.
- ⇒ Criteria-led discharge (CLD) is frequently used safely for patients who have undergone elective surgery and has been shown to reduce length of stay and costs.
- ⇒ There is limited evidence regarding the safety of CLD in patients requiring acute hospital admission and it is unclear whether the use of CLD could yield similar reductions in time to initiate treatment and length of stay as seen in elective patients.

## WHAT THIS STUDY ADDS

- ⇒ We demonstrate that CLD can be used to standardise patient care and safely discharge patients admitted who have required acute admission.
- ⇒ Using CLD can reduce the length of stay and result in patients being discharged earlier in the day, thereby easing bed pressures.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ CLD should be adopted more widely for use in patients requiring acute inpatient admission to optimise patient pathways and build more capacity to meet the demands of the National Health Service elective backlog.
- ⇒ Further research is required to determine how effective CLD could be used in different areas of healthcare and to standardise criteria used to determine discharge is appropriate.

COVID-19 pandemic recovery and growing NHS waiting lists.<sup>3</sup>

The NHS plan for tackling the NHS COVID-19 backlog highlights that there are now over 6 million people in the UK on NHS waiting lists up from 4.4 million before the pandemic.<sup>3</sup> Around 1.2 million of these people are waiting for treatment requiring an inpatient hospital stay. It is estimated that a further 10 million people avoided seeking treatment during the pandemic and may

present in the coming months. It is, therefore, vital that the NHS adapts to increase capacity to both cope with an increasing number of acute hospital admissions but also build capacity for elective treatment. The backlog recovery plan focuses on four areas of delivery, increasing capacity, prioritising diagnosis and treatment, transforming the provision of elective care and providing better information to patients.

One way to build capacity and prioritise treatment is to streamline hospital inpatient pathways, particularly around patient discharge. One approach to optimising patient readiness for discharge is criteria-led discharge (CLD), commonly called nurse-led discharge. Recommended by the department of health, CLD has become routine practice in many surgical departments for postoperative patients.<sup>4-6</sup> CLD empowers members of the multidisciplinary team who are constantly evaluating patients, to accelerate discharge when a number of predetermined criteria have been met,<sup>7</sup> rather than waiting for a set daily medical ward round to make a discharge decision. Evidence shows that CLD is safe, reduces length of stay and does not result in higher readmissions or a higher rate of patients seeking medical advice in the community.<sup>6 8 9</sup> Despite its safety and efficacy, CLD has largely been limited to the discharge of patients postelective surgery and transfer between units within hospitals, for example, high-dependency units and wards.<sup>10</sup> Very little is known about the efficacy of CLD for acute admissions except for a scoping review of acute paediatric admissions and a quality improvement project report in paediatric patients presenting with toxic ingestion. Although the authors of the scoping review were not able to comment on how safe or effective CLD was in this setting,<sup>11</sup> they were able to reduce time to treatment, length of hospital stay and costs.<sup>12</sup> This study aims to investigate the utility of CLD in acute surgical admissions using acute tonsillitis in a tertiary otolaryngology department as an exemplar.

Patients with acute tonsillitis are a good example of surgical department admissions requiring conservative management within otolaryngology. Acute tonsillitis is inflammation of the palatine tonsils in the lateral oropharynx. A common disease, it is predominantly caused by viral or bacterial infection.<sup>13</sup> Symptoms typically include sore throat and tonsillar exudates but in more severe cases can present with odynophagia, dysphagia, fever and tender cervical lymphadenopathy.<sup>14</sup> Patients require admission when they are no longer able to maintain oral intake including medications. Once admitted, patients are typically treated with a combination of intravenous antibiotics and analgesia and sometimes intravenous dexamethasone is added to reduce inflammation. Across the UK, mean length of stay for each patient with acute tonsillitis is 19.2 hours.<sup>1</sup> In 2019–2020, there were over 73 000 NHS hospital admissions in England for acute tonsillitis representing over 58 000 bed days. A safe reduction in length of stay for patients with tonsillitis, particularly if discharged in the morning, would provide increased hospital capacity for surgical beds could assist

with increased elective operating capacity as part of COVID-19 recovery plan.

## METHODS

### Study design

This study is a quality improvement project. A retrospective practice audit was initially undertaken. The results of the initial practice audit were used to develop a new patient pathway to both standardise treatment for those admitted under otolaryngology (ENT) with acute tonsillitis and introduce CLD.

### Setting

The study was completed in a 28-bed surgical ward affiliated with the otolaryngology department at a tertiary NHS hospital. Patients were typically admitted to the ward under otolaryngology following referral from the emergency department and general practitioners. The study was conducted between January and March 2020 and October 2020 and April 2021. The study was suspended between March and October 2020 due to the SARS-CoV-2 pandemic.

### Population

#### Eligibility criteria

- ▶ Diagnosis of acute tonsillitis.
- ▶ Unable to maintain oral intake for hydration and medication.

#### Exclusion criteria

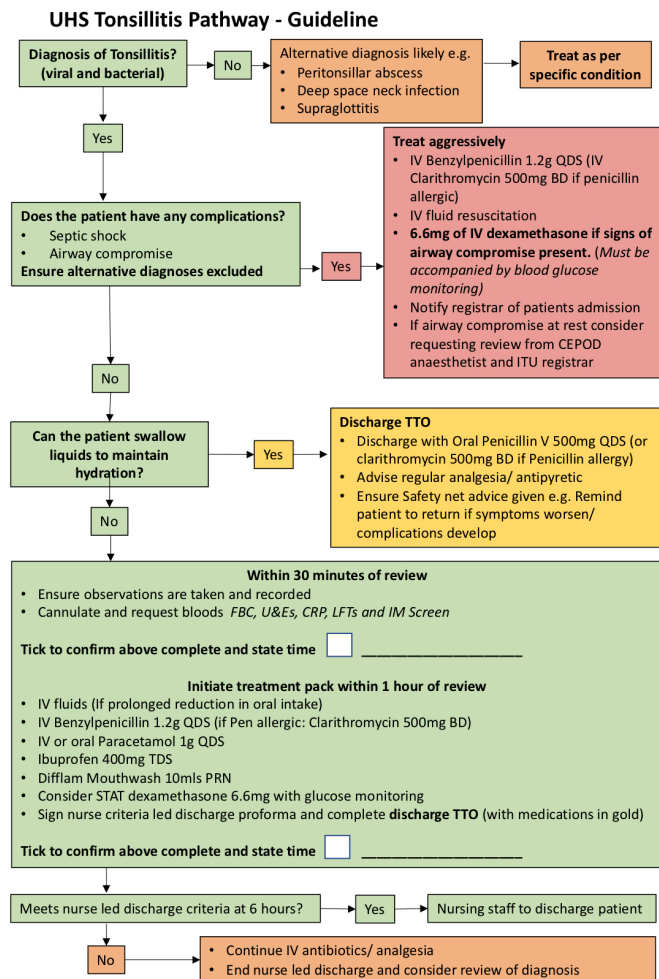
- ▶ Complication of tonsillitis present, for example, peritonsillar abscess.
- ▶ Alternative diagnosis likely, for example, pharyngitis or supraglottitis.
- ▶ Evidence of septic shock.

### Intervention

All patients who met the eligibility criteria to be treated using the new patient pathway introduced for acute tonsillitis (see [figure 1](#)).

### Tonsillitis pathway

The acute tonsillitis patient pathway introduced as part of the intervention for this trial was adapted from the tonsillitis pathway published by Bird *et al*, with the addition of CLD.<sup>15</sup> The pathway consisted of the following treatment: benzylpenicillin sodium intravenously, (clarithromycin intravenously for those allergic to penicillin), intravenous crystalloid fluids, intravenous paracetamol, ibuprofen solution orally and benzydamine 0.15% w/v mouthwash. Clinicians were advised to consider dexamethasone intravenously with blood glucose monitoring if appropriate. Initiation of treatment was conducted within 30 min of diagnosis. Protocols were created within the local electronic prescribing system. These protocols, called 'acute tonsillitis' and 'acute tonsillitis (Penicillin Allergy)' contained all medications forming the treatment intervention.



**Figure 1** Novel patient pathway for patients admitted to ENT with acute tonsillitis. ENT, Ear, Nose and Throat Surgery; UHS, University Hospital Southampton; CEPOD, Emergency operating list; ITU, Intensive Therapy Unit; TTO, Medication to take home; FBC, Full blood count; U&E, Urea and Electrolytes; CRP, C-reactive protein; LFT, Liver function test; IM, Infectious Mononucleosis; STAT, Immediately; PRN, As required.

### Criteria-led discharge

At the time of admission, all patients placed on the acute tonsillitis pathway should also have been eligible for CLD. As part of the CLD pathway, nursing staff on the ward continuously assess patients under their care through clinical evaluation as well regular physiological observations. The CLD form authorised nursing staff to discharge the patients as soon as the following criteria were met; tolerating soft food and oral fluids, have received a dose of intravenous antibiotics, pain controlled with adequate analgesia, no sign of airway difficulty, afebrile, National Early Warning Score of 0–2 with heart rate <100 on bedside observations. The form required the signature of two nurses permanently employed by the trust, including the nurse in charge of the ward. See CLD form in online supplemental appendix 1. This replaced the need to wait for a medical review prior to discharge. All patients with tonsillitis were continued to be seen on the daily ward

round. Patients discharged using CLD were not routinely followed up in the outpatient clinic.

### Discharge letter

As part of the CLD process, the patient's discharge paperwork (Called HMR - locally) was completed and signed. Discharge medications were also prescribed and prepared.

### Data collection

Data were collected retrospectively. An initial practice audit was conducted prior to design and implementation of the acute tonsillitis pathway. Following implementation, data were collected retrospectively between January and March 2020 and October 2020 and April 2021 with an interruption due to COVID-10 pandemic and local workforce pressures. Patients were identified by diagnosis using International Classification of Disease (ICD-10) codes J03.90 (acute tonsillitis—unspecified), J03.80 (acute tonsillitis due to other specified organisms) and B27.90 (infectious mononucleosis).

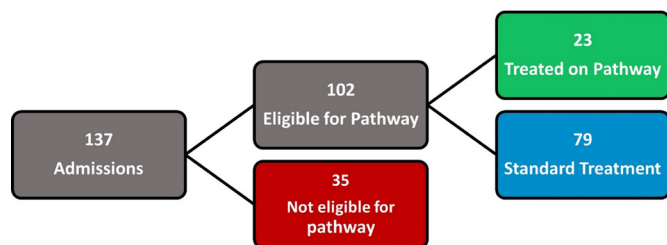
Data collected for each patient included: age, gender, ethnicity, comorbidities, date and time of admission to inpatient ward and discharge (patient leaving ward), incidence of readmission and compliance with the acute tonsillitis pathway. Length of stay and readmission rates were calculated from these parameters. We also collected data on whether patients were discharged before midday. This was chosen as an outcome as discharges early in the day increases bed capacity for elective operating.

### Statistical analysis

Data analysis was performed by the clinical quality improvement team using GraphPad Prism V.9. Power calculations following the initial practice audit suggested to detect a 20% reduction in length of stay with 80% power would require 22 participants in each of the pathway and standard treatment groups. Descriptive statistics were reported as mean with SD for parametric data and median with IQR for non-parametric continuous data. Mean age of the study groups was compared using paired sample t-test as these data were parametric and  $\chi^2$  test for all other categorical demographics. Analysis of length of stay was presented as a median as the data was non-parametric. Comparison between length of stay for the tonsillitis pathway group and the control group was performed using a Mann-Whitney U test. A  $\chi^2$  test was used to compare categorical data such as the time of discharge (before midday, yes/no) and rates of readmission. Statistical significance was set at <0.05 for all analyses.

This manuscript was prepared according to the Revised Standards for Quality Improvement Reporting Excellence 2.0 on 15 September 2015 and the Standards for Reporting Implementation Studies: the StaRI, 2017.





**Figure 2** Breakdown of admissions with acute tonsillitis following the introduction of the tonsillitis pathway including eligibility and treatment group; treated on pathway and standard treatment.

## RESULTS

### Initial practice audit

Findings from the initial practice audit were derived from 41 patients admitted with acute tonsillitis. Most patients (74.0%) were treated with benzylpenicillin with 31% also receiving metronidazole. Other antibiotics prescribed include, co-amoxiclav, clarithromycin, clindamycin and ceftriaxone. There were nine variations of dexamethasone prescription, doses ranged from 3.3mg as a single dose to 6.6mg four times a day. Median length of stay was 31.28 hours (IQR: 13.1) The 48-hour readmission rate for patients discharged with tonsillitis was 7.3%.

### Pathway results

There were 137 patient admissions for acute tonsillitis during the post pathway implementation period. Thirty-five patient admissions were excluded from the study as they did not meet the pathway eligibility criteria. These patients were either being readmitted (n=8), too unwell (n=14), for example, evidence of septic shock or had an uncertain diagnosis at the time of admission (n=12). One individual was not placed on the pathway due to pregnancy but was not otherwise ineligible. Of the 102 patients deemed eligible, 23 were treated on the tonsillitis pathway and 79 received standard treatment (see figure 2). The number of comorbidities was the only significant difference between study groups with those on the pathway having more concurrent conditions than those who received standard treatment. There was no difference, in age, gender, ethnicity or incidence of EBV (Ebstein Barr Virus) positive tonsillitis. 95.7% of patients placed on the tonsillitis pathway were prescribed medications according to the locally published guideline (see table 1).

Implementation of the tonsillitis pathway has demonstrated reduced length of stay (median:18hours, IQR: 11.5) compared with those receiving standard treatment (median: 24hours, IQR : 19.5, p=0.002) (see figure 3). Of those treated on the tonsillitis pathway, 52.2% were discharged prior to midday compared with 29.1% who received standard treatment (p=0.04). No patients treated on the tonsillitis patients required readmission compared with 3.8% who received standard treatment (p>0.05).

**Table 1** Characteristics of patients admitted with tonsillitis following the implementation of the tonsillitis pathway

	Standard treatment	Tonsillitis Pathway	P value
No (n)	79	23	
Age (years)	26.2	25.9	0.85
Gender (% male)	55.7	47.8	0.85
Ethnicity (%)			
British	62.0	47.8	0.58
Chinese	1.3	4.3	
Pakistani	1.3	4.3	
Other white	8.9	8.7	
Not asked/stated	26.6	34.8	
No of comorbidities (%)			0.01
0	84.8	60.9	
1	11.4	39.1	
2	3.8	0.0	
Ebstein Barr Virus +ve (%)	26.6	17.4	0.38

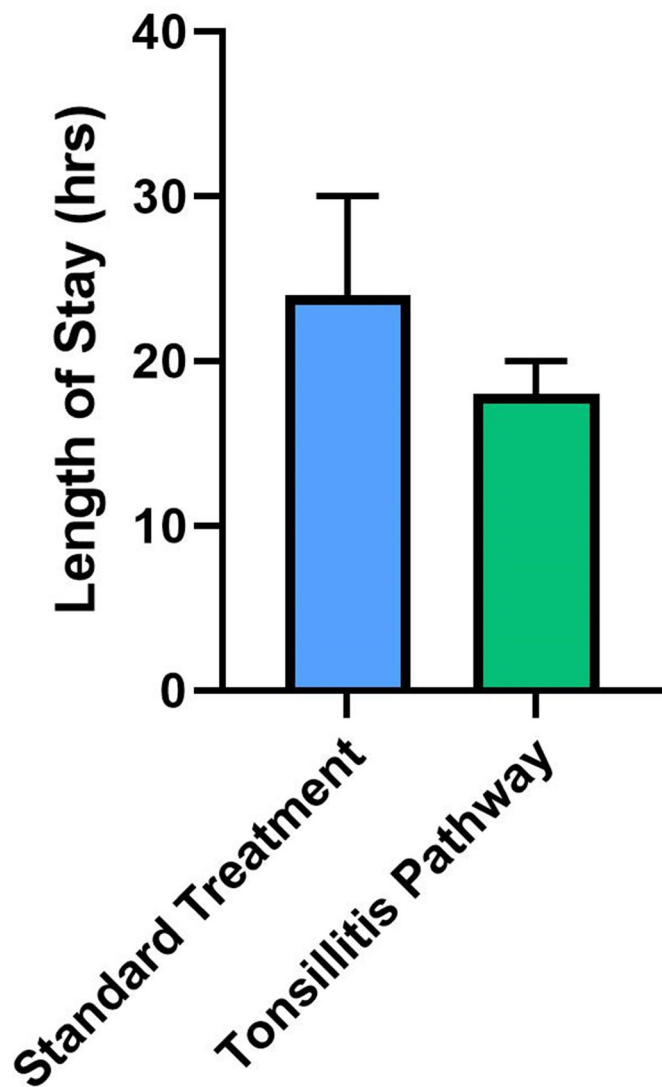
Patients are divided into those who received standard treatment and those who were treated according to the tonsillitis pathway with criteria-led discharge.

## DISCUSSION

CLD is safe and results in reduced length of stay for patients with acute pathology requiring an inpatient hospital admission for medical treatment. The majority of patients admitted with acute tonsillitis were eligible for CLD with only a minority requiring ongoing input from medical staff. The bundling of medications together in condition-specific protocols results in high compliance with local guidelines. This project adds to the evidence base for extending CLD to acute admissions.

Cancellation of planned surgery impacts substantially on patients' health and the NHS' capacity to provide elective procedures. The risk of a planned operation in the NHS being cancelled on the day of surgery is around 13.9%. Additionally, studies have shown that 31% of on the day cancellations are due to a lack of available inpatient beds.<sup>2</sup> Reducing length of stay and bringing time of discharge forward through CLD increases bed availability for elective patients. Discharging patients prior to midday allows hospital bed managers and surgeons to identify beds for patients to occupy postoperatively. This prevents procedures being cancelled but also prevents operating lists being put on hold while beds are found. Delays in starting operating lists while beds are identified reduces available operating theatre capacity, currently responsible for 12.7% of cancellations.<sup>2</sup>

Key to the success of implementing CLD pathways is the collaboration within the multidisciplinary team and in particular ward nursing staff. One of the reasons CLD or nurse-led discharge works is due to the continuous assessments nursing staff make, allowing them to recognise



**Figure 3** Median length of stay in hours for patients treated on the tonsillitis pathway compared with standard treatment. Bars show IQR ( $p=0.002$ ).

when discharge is appropriate in a timely manner. The purpose of CLD is not to shift responsibility and workload from medical staff to nursing colleagues but rather empower them. Nursing staff face unprecedented workload and pressure. The 2019 major survey of nursing staff found 61% of nurses were too busy to provide the level of care they desire and 54% said too much time was sent completing paperwork rather than delivering care.<sup>16</sup> This situation has only worsened during the COVID-19 pandemic. It is, therefore, important to design safe CLD pathways, which are complementary to the care already delivered by nursing staff rather than in addition. The CLD we used in this study exclusively contains assessments carried out as part of routine care for patients with tonsillitis. Like all healthcare professionals the law imposes a duty of care on nurses for the care they provide alongside the Nursing and Midwifery council and the individuals' employer. Nurses must ensure they are working within their level of competence and taking on appropriate

responsibility. CLD is widely supported by senior nurses as a high impact role for modern nursing practice.<sup>17,18</sup> Many definitions of CLD state that the responsibility of patient discharge is delegated and highlight the importance of nursing staff being willing to accept the delegated role and responsibility.<sup>7</sup> We suggest that when using CLD for acute admissions medical teams must maintain responsibility for patients, this should typically include a daily senior medical review and adequate support for nurses by reviewing patients in a timely manner when requested. The CLD pathway in this study divides discharge responsibility by requiring the signature of two registered nurses including the nurse in charge of the clinical area.

This study is the largest trial of CLD for acute hospital admissions to date and the first study to trial CLD in acute adult admissions. This study also presents more detailed characteristics of the study cohort compared with existing published evidence, demonstrating safety in a wider population. The most significant limitation of this study is the modest adoption of the tonsillitis pathway compared with the number of eligible patients. The reason for poor pathway adoption is not known. There may be a degree of mistrust about the pathway, the results of this study will be disseminated locally, particularly highlighting the reduction in length of stay but and that the pathway is safe. The modest population within the pathway group is likely contributing to the low readmission rate and also lead to those treated on the tonsillitis pathway having significantly more comorbidities compared with those who received standard treatment. While a limitation, we can still be confident that the reduced length of stay in the pathway group was not due to patients being less complex or less unwell. This also demonstrates that modest pathway adoption is not caused by clinicians imposing their own eligibility criteria or picking specific patients to be treated on the tonsillitis pathway. One potential reason is medical staff not seeing the increased length of stay as a 'real' problem, and therefore, a degree of apathy among medical and nursing staff when asked to adopt the pathway.<sup>19</sup> With a mean length of stay around 30 hours prior to implementation of CLD, the length of stay of most patients with acute tonsillitis remains relatively short and therefore may not be considered a priority for discharge. This may be demonstrated in the reduction in length of stay between the initial practice audit and standard treatment group following CLD implementation. Through the process of conducting this study, staff were made aware of the impact tonsillitis admission on bed occupancy and the departmental effort to discharge them earlier, which may have led to patients on the standard treatment being discharged more quickly. Patients with acute tonsillitis are typically admitted by medical staff called senior house officers, with 1–4 years of clinical experience. While the value of engaging junior doctors in quality improvement and NHS management have been recognised and a number of national schemes have been created for self-selecting individuals, junior doctors are not often involved with healthcare management at a

systems level.<sup>20 21</sup> As a result, many junior doctors may not see the link between length of stay and discharge time of patients requiring acute inpatient treatment and the provision of elective care.

The current study demonstrates the potential to use further CLD pathways for patients requiring acute hospital admission. We recommended that other departments investigate where CLD could be safely used to increase capacity for the provision of elective care. It is imperative that this is done with collaboration between medical and nursing staff, allied health professionals and hospital managers.

## CONCLUSION

This study set out to evaluate the potential for using CLD in patients requiring acute hospital admission. CLD is safe to use in acute ENT admissions and can result in reduced length of stay and discharge earlier in the day. This has the potential to reduce costs and increase capacity for hospitals to provide elective care. Further research is required to understand and optimise criteria used in novel CLD pathways. Imposition of CLD pathways runs the risk of burdening nursing colleagues through delegation of responsibilities and should be developed jointly with all members of the healthcare team.

**Twitter** Callum Findlay @C\_Findlay

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**Contributors** CF and HJ designed the overall quality improvement project including the CLD pathway and data collection. SG and HJ completed local governance process to conduct the study. WCGF designed and implemented specific parts of the CLD pathway including electronic prescribing bundles. Data collection was performed by CF and WCGF. CF and SG designed the statistical analyses which was conducted by CF. The manuscript was prepared by CF with the input of all authors. CF is the author acting as guarantor.

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## ORCID iD

Callum Findlay <http://orcid.org/0000-0003-0104-3435>

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