

## Anticipatory Prescribing in End-of-Life:

### A Completed Audit Loop

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#### Abstract

##### *Introduction*

Anticipatory prescribing is an important facet of patient care for those approaching end of life to ensure timely and effective symptom control. It is reasonable to expect medical teams in an inpatient setting to have anticipatory medicines available for the management of non-complex end-of-life symptoms. Our aim was to assess anticipatory prescribing practices before referral to palliative care services.

##### *Methods*

We assessed prescriptions of 32 patients in our initial audit cycle followed by 20 prescriptions of patients referred following educational intervention. We assessed completeness and accuracy of anticipatory prescribing. Our intervention consisted of intern education via didactic lecture on anticipatory prescribing and national guidance on anticipatory prescribing was also disseminated and promoted to hospital doctors via our local hospital intranet.

##### *Results*

12% of patients had complete anticipatory prescribing in the first audit cycle consisting of an opioid, sedative, anti-emetic and anti-secretory medication. This increased to 50% in the second audit cycle. Of the medications that were prescribed, there was an increase in accuracy of dosage and frequency following intervention from 80% pre-intervention to 100% accuracy of dose and frequency post intervention.

##### *Conclusions*

There was a noticeable improvement in anticipatory prescribing on re-audit following intervention. Ongoing prescriber education is essential in ensuring accurate prescription of anticipatory medications.

#### Introduction

Anticipatory prescribing is an important facet of patient care for those approaching end of life. It is essential to have “as needed” medications available in anticipation of troubling end-of-life symptoms to ensure good symptom control and to avoid delay in the alleviation of distressing symptoms.<sup>1</sup>

In keeping with the Palliative Care Core Competence Framework for Ireland and the Adult Palliative Care Services Model of Care for Ireland strategy, it is reasonable to expect referring teams in an inpatient setting to have anticipatory medicines available for the management of non-complex end-of-life symptoms before escalation to specialist palliative care services.<sup>4,5</sup> Medications should be prescribed for symptoms commonly experienced towards end of life including pain or dyspnoea, agitation, nausea and respiratory secretions. Four end-of-life medications commonly prescribed include an opioid, a sedative, an anti-emetic and an anti-secretory medication.<sup>2,3</sup>

## Methods

We assessed end-of-life anticipatory prescribing carried out by primary teams of patients referred to the specialist palliative medicine service in a tertiary referral centre for end-of-life care and symptom management. Anticipatory prescribing was carried out by all non-consultant hospital doctors (NCHDs) including interns, senior house officers, registrars and specialist registrars. Our aim was to assess what anticipatory medications were available to patients prior to the review of the specialist palliative care team and compare this to the standard as set out in the Palliative Care Core Competence Framework.<sup>4</sup> After the initial audit cycle, we aimed to improve NCHD education regarding end-of-life prescribing resulting in an improvement in anticipatory prescribing for patients approaching end of life.

In the initial audit cycle, we reviewed drug Kardex prescriptions of 32 patients referred to our palliative care consults services for end-of-life care between 8/8/22 and 12/9/22. We compared anticipatory medications prescribed and the appropriateness of dosage and medication frequency with our current practice as per by our Symptom Control & Palliative Care: NCHD Handbook (See table 2) and national guidance regarding anticipatory prescribing.<sup>2,3</sup> However, variations of medications<sup>2,3</sup> and doses were accepted as appropriate depending on the clinical context of the patient in question.

Following the initial audit cycle, we identified a clear need for non-consultant hospital doctor education regarding anticipatory prescribing. An educational intervention was undertaken. A pre-existing lecture series for interns aimed at improving preparedness for dealing with death and dying patients was underway, and an additional didactic lecture was provided as part of this lecture series to interns specifically regarding appropriate anticipatory prescribing. 87.5% of interns attended this lecture. As anticipatory prescribing is carried out by all NCHDs, it was important that education extend beyond intern doctors. A designated palliative care folder

was formed within the hospital intranet, the presence of which was promoted among all non-consultant hospital doctors in our tertiary referral centre. This contained national guidance regarding anticipatory prescribing, allowing quick access to national guidance on prescribing when needed.<sup>2</sup>

Following our intervention, the second cycle of our audit was completed. Drug Kardex prescriptions of twenty patients referred to our palliative care consults services for end-of-life care between 17/10/22 and 27/11/22 were reviewed.

## Results

Of the thirty-two patients referred to our services in our initial audit cycle, four patients were prescribed a subcutaneous opioid, sedative, anti-emetic and anti-secretory medication by their primary team prior to palliative care review. Each medication was also prescribed at an appropriate dose and frequency.

Of the remaining twenty-eight patients, eight had no anticipatory medications prescribed on review by the palliative medicine team. Five patients had an opioid and sedative prescribed, two of which were charted at an inappropriate frequency, and did not have an antiemetic or anti-secretory medication prescribed. Nine patients had an opioid, sedative and anti-secretory medication prescribed but no antiemetic. Of these patients, five were prescribed at least one medication of an inappropriate frequency or dose.

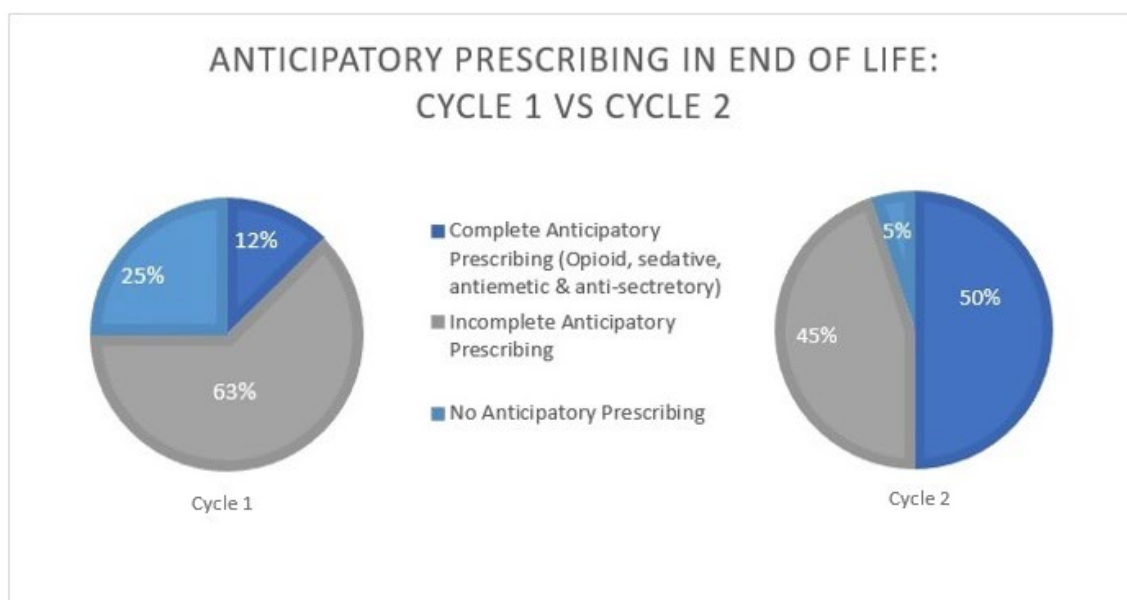


Figure 1: Anticipatory Prescribing in End-of-life: Cycle one versus cycle two

The remaining six patients were prescribed a varying combination of end-of-life “as needed” medications: a combination of an opioid, antiemetic and anti-secretory medication, a combination of a sedative, antiemetic and anti-secretory medication, an opioid alone, an anti-secretory medication alone, a combination of an opioid and anti-secretory medication, and finally, a combination of a sedative and anti-secretory medication. These were also often prescribed at inappropriate doses and frequencies for patients approaching end of life.

In the second cycle of our audit, prescriptions of twenty patients were assessed following intervention. Of the twenty patients referred to our services for end-of-life care, ten patients were prescribed a subcutaneous opioid, sedative, anti-emetic and anti-secretory medication by their primary team prior to palliative care consult review. Of these ten patients, each medication was also prescribed at an appropriate dose and frequency.

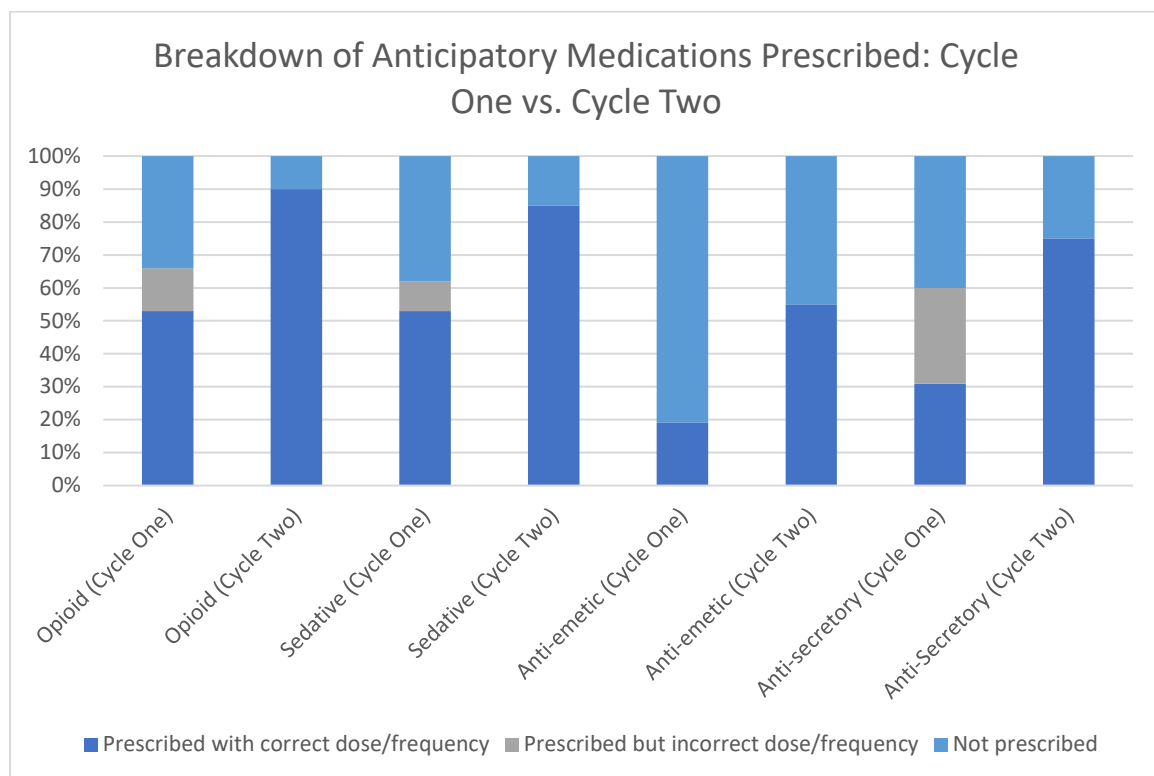


Figure 2: Breakdown of anticipatory medications prescribed: cycle 1 vs. cycle 2

Of the remaining ten patients, only one patient had no anticipatory medications prescribed. Four patients were prescribed an opioid, sedative and anti-secretory medication at an appropriate dose and frequency, but no antiemetic. Two patients were prescribed an opioid and sedative at appropriate dose and frequency, however they did not have an antiemetic or anti-secretory medication prescribed. The remaining three patients were prescribed a combination of different anticipatory medications; one was prescribed an opioid only, one

was prescribed an anti-secretory medication only and the final patient was prescribed an opioid, sedative and anti-emetic but no anti-secretory medication.

In comparison between cycle one and cycle two, there was a noticeable improvement in anticipatory prescribing carried out by primary teams before palliative care review. While only 12% of referrals had complete prescribing initially (i.e.. four medications consisting of an opioid, sedative, anti-emetic and anti-secretory at appropriate doses and frequency), following intervention this increased to 50%. Incomplete prescription (i.e.. incorrect dose/frequency or omitted medications) decreased from 63% in cycle one to 45% in cycle two. Patients with complete absence of anticipatory medications decreased from 25% in cycle one to 5% in cycle two. Of the medications that were prescribed for patients, the percentage of medications prescribed at incorrect doses or frequency decreased from 20% in cycle one to 0% in cycle two (see table 1).

	Number of patients prescribed medications	of Number of patients prescribed medication at correct dose/frequency	Of medications prescribed, number that were correct dose/frequency
<b>Cycle 1</b>			
Opioid	21/32 (65.6%)	17/32 (53.1%)	17/21 (80.9%)
Sedative	20/32 (62.5%)	17/32 (53.1%)	17/20 (85.0%)
Anti-Emetic	6/32 (18.8%)	6/32 (18.8%)	6/6 (100%)
Anti-Secretory	17/32 (53.1%)	11/32 (34.3%)	11/17 (64.7%)
			Total average: 51/64 (79.68%)
<b>Cycle 2</b>			
Opioid	18/20 (90.0%)	18/20 (90.0%)	18/18 (100%)
Sedative	17/20 (85.0%)	17/20 (85.0%)	17/17 (100%)
Anti-Emetic	11/20 (55.0%)	11/20 (55.0%)	11/11 (100%)
Anti-Secretory	15/20 (75.0%)	15/20 (75.0%)	15/15 (100%)

Table 1: Anticipatory prescription in cycle one and cycle two

Overall, the accuracy of medication dose and frequency improved from cycle one to cycle two with no medication dose or frequency errors noted in cycle two. In cycle one, the error rate on average across medications was 17.75% (See table 1).

Combining the improvement in overall rates of medication prescription and the reduction in prescription of inaccurate medication dose or frequency, there was a clear improvement in anticipatory prescribing between cycle one and cycle two.

Drug Name	SC PRN Starting Doses	Indication
Morphine Sulfate	2.5-5mg 2-4 Hourly SC	Pain Dysnopea/Tachypnea
Midazolam	2.5-5mg 2-4 Hourly SC	Anxiety Dyspnoea/Tachypnoea Agitation/Distress
Nozinan	6.25mg 4 Hourly SC	Nausea Agitation
Hyoscine Butylbromide	20mg 4 Hourly SC	Respiratory Secretions
Glycopyrronium	200-400mcg 4 hourly SC	

Table 2: Anticipatory Prescribing Guideline, Symptom Control & Palliative Care: NCHD Handbook

## Discussion

On initial review of patients referred for end-of-life symptom control, the vast majority did not have a suitable subcutaneous “as needed” medication available for the management of pain or dyspnoea, agitation, nausea and respiratory secretions. We addressed this by correcting prescriptions and ensuring patients had adequate medications at appropriate doses and frequency available. Education of doctors through a lecture series in an educational workshop was completed and national guidelines regarding end-of-life prescribing was distributed through hospital intranet for all NCHDs. Following this intervention, overall anticipatory prescribing improved, and rates of incorrect medication prescription decreased. The initial rate of medication dose/frequency error was 20% which decreased to 0% in cycle two. Although there is limited research available into prescription errors in Irish hospitals, as opposed to overall medication errors, some research carried out in a UK hospital suggests an overall prescription error rate of 1.5%.<sup>6</sup> Prescription of anti-emetics, despite showing some

subsequent improvement, remained low following intervention. Further investigation into the reason behind this is warranted, although it may suggest a perception among NCHDs that nausea is not one of the more commonly encountered or troublesome symptoms at end of life.

Overall, it was difficult to assess which intervention had the greatest impact on prescribing. It was challenging to distinguish which level of NCHD had prescribed a patients' medication thus indicating whether the intern-based lecture had a greater effect than the hospital-wide dissemination of national guidance to all NCHDs. As such, it was also difficult to know if interns' prescribing practices improved to a greater extent than prescribing practices of other doctors. Due to the open nature of the hospital intranet, which is accessible on all hospital computers without specific login requirements, we were unable to assess how many NCHDs had accessed guidance via the hospital intranet.

Cycle two of our audit still highlights some deficiencies in anticipatory prescribing. In the age of technology, we plan to address this by forming an accessible smartphone application, allowing non-consultant hospital doctors to quickly access reliable guidance on anticipatory prescribing. A third audit cycle is then planned to further assess rates of anticipatory prescribing by primary teams prior to review by specialist palliative care services.

It is internationally recognised that anticipatory prescribing is an important part of the care of a patient nearing end of life although it is felt that current practice and policy requires further research.<sup>1, 7</sup> Previous audits on an international level have been undertaken to ascertain levels of inpatient anticipatory prescribing, the initial findings of which are in keeping with this audit.<sup>8,9</sup> This audit highlights the importance of ongoing assessment of current practice, particularly to ascertain deficiencies in practice and to identify potential areas for improvement. Simple interventions can result in obvious improvements which would likely contribute to an overall improvement in patient care. Ongoing NCHD education and accessibility of reliable guidelines is an integral aspect of the provision of palliative-focused healthcare.

**Declaration of Conflict of Interest:**

There are no conflicting interests or funding to declare.

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