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Limited use of opioid prescribing guidelines in Dutch emergency departments: results of a nationwide survey

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Abstract

Background In recent years, the Netherlands has experienced a notable increase in opioid prescriptions and associated fatalities. Emergency department (ED) patients exhibit relatively high rates of opioid use (15%) and misuse (23% of patients who present to the ED and use prescription opioids test positive for misuse). To mitigate opioid-related harm, the American College of Emergency Physicians (ACEP) advocates for the use of non-opioid analgesics and minimal opioid prescriptions. In the Netherlands, the Society for Anesthesiology has issued a guideline for appropriate opioid use, which are also relevant to EDs. However, the extent of implementation in EDs remains unclear. This study utilized an online survey to assess the implementation of opioid-prescribing guidelines in Dutch EDs. Chief medical officers from various EDs across the Netherlands were invited via email to complete questionnaires. These questionnaires gathered general information about the EDs, details on the application of opioid-prescribing guidelines, management of problematic opioid use, and specifics of the guidelines in practice.

Results Questionnaires were completed by chief medical officers from 33 Dutch EDs, yielding a 52.4% response rate. Nineteen EDs (57.6%) used guidelines for opioid prescribing, predominantly local protocols, with only two of them (10.5%) using the national guideline. The guidelines varied in content, with 68.4% advising on specific opioids (mainly preferring oxycodone) and dosage, and in 63.2% giving advice on prescription duration (typically 3–7 days). Patient education with opioid prescriptions was specified in the guidelines at 57.9% (11/19) of EDs, with brochures provided at 17.6% (6/19) of EDs. The primary focus of patient education was on adverse effects, with addiction risks mentioned at 36.4% (4/11) EDs.

Conclusions This study reveals significant variability and gaps in opioid prescribing guidelines across Dutch EDs. Compared to US guidelines, Dutch practices are less cautious, highlighting the need for improvement. This study underscores the necessity for a Dutch guideline tailored for EDs to manage opioid prescriptions and problematic opioid use.

Keywords Emergency department, Opioids, Prescribing guidelines, Problematic opioid use, Opioid use disorder

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Background

The United States (US) is facing an opioid misuse epidemic, resulting in significant morbidity and mortality [1, 2]. Compared to the US, the scale of opioid misuse in the Netherlands is limited. However, between 2008 and 2017, the number of opioid prescriptions substantially increased, together with opioid-related hospital admissions and mortality [3, 4]. In 2022, over 600,000 patients received strong opioids, a 6.4% increase from 2021 [5]. Opioid-related deaths more than tripled between 2013 and 2022 to 170 per year [4, 6].

Emergency Departments (EDs) play a significant role in the opioid crisis, prescribing opioids and treating related adverse effects and overdoses. A study in three Dutch EDs showed 15.0% of patients used prescription opioids, with 22.6% showing signs of misuse and 9.8% meeting opioid use disorder criteria. At discharge, 2.8% of opioid-naïve patients and 4.7% of current users received new opioid prescriptions [7].

The extent to which short-term opioid prescriptions from the ED lead to problematic opioid use remains controversial. Previous international studies have attempted to determine the risk of prolonged opioid use and misuse following an ED visit, applying various definitions and yielding diverse results. For instance, a 2019 Canadian study of 524 opioid-naïve patients discharged from the ED with an opioid prescription reported that 9% continued opioid use after three months [8]. Another American study of 23,381 ED visits reported 14% persistent or high-risk opioid use among previously opioid-naïve patients twelve months post-ED visit [9]. In contrast, a large Australian study of 6.3 million ED visits found only 1% prolonged use, defined as continuous use for 90 days within 90–270 days post-ED visit [10]. Similarly, a 2020 American study of 484 opioid-naïve patients found 1% persistent use six months post-discharge [11]. Focusing on opioid misuse, the data show even greater variability. In a 2014 American study, 36% of patients reported opioid misuse 30 days after discharge from the ED with an opioid prescription. Misuse was defined as self-escalation of dosage, use of opioids for reasons other than pain, and obtaining opioids without a physician's prescription. However, a significant portion of this population had already been using opioids for chronic pain prior to the study (the exact percentage is not specified in the study) [12]. A 2019 Canadian study found less than 1% used opioids for reasons other than pain, suggesting misuse, three months post-ED visit [8]. This significant variation is likely related to application of various definitions of misuse, but might also reflect unwarranted practice variation related to opioid prescribing practices in EDs [13].

Recognizing that some patients may continue using prescription opioids and develop problematic opioid use after receiving their initial prescription in an ED, the American College of Emergency Physicians (ACEP) established clinical policies on opioid use in 2012 and 2020. (14–15) ACEP recommends prioritizing non-opioid analgesic therapies for the treatment of acute pain in patients discharged from the ED. When opioids are necessary, it is advised to prescribe the lowest effective dose of a short-acting opioid for the shortest duration indicated [15].

In the Netherlands, the Dutch Society of Emergency Physicians (DSEP) lacks specific guidelines for pain management upon ED discharge. However, the Netherlands Society for Anesthesiology (NSA) has a 'Generic guideline module for appropriate opioid use' aimed at secondary healthcare, including EDs. This guideline recommends a maximum seven-day opioid prescription and prefers short-acting opioids. The prescriber is encouraged to exercise extra caution when prescribing opioids to patients with an increased risk of problematic opioid use, and consider consulting a mental health specialist. However, the guideline does not specify the factors that would indicate an increased risk for problematic opioid use [16].

The extent of implementation of this or other opioid-prescribing guidelines at Dutch EDs is unclear. This study aims to investigate the implementation of such guidelines through a nationwide online survey.

Methods

Aim

This study aims to investigate the implementation of opioid-prescribing guidelines at EDs in the Netherlands.

Design

This research was conducted as an online survey study.

Participants

The chief medical officers (CMOs) of EDs in the Netherlands were solicited via email to complete questionnaires pertaining to the utilization of guidelines on opioid prescription and the management of problematic opioid use within their respective EDs.

Questionnaire

The digital platform 'Google Forms' was employed to design the questionnaire and gather responses. The questionnaire encompassed general information about the ED (such as the annual patient volume), inquiries about the application of a guideline for opioid prescription and the handling of problematic opioid use, and the specifics of these guidelines (for instance: checking for risk factors for opioid misuse when prescribing an opioid and the education that patients should receive alongside an opioid prescription). It also contained questions about the

use of standardized, digital prescriptions. The questionnaire is included as Additional File.

The survey was conducted in a semi-anonymous manner: participants were not required to provide their names but were asked to indicate the name of their hospital. This was primarily to ensure that no EDs participated more than once. To encourage candid responses, participants were assured that the names of the specific hospitals would remain confidential and not be published.

Procedure

The Dutch Society of Emergency Physicians (DSEP) keeps a list of Chief Medical Officers (CMOs) in Dutch EDs and disseminated the questionnaires to all ED CMOs of whom they had email addresses (63 EDs). There are 77 EDs in the Netherlands that operate 24/7. Among these, ten hospitals have two ED locations [17]. For this study, a maximum of one location per hospital was included, as protocols are typically shared between locations, resulting in a total of 67 distinct EDs. This email was dispatched on behalf of both the research group and the toxicology section of the DSEP. The first email was sent on the 29th of January, a reminder email was sent on the 13th of February and a last reminder email was sent on the 4th of March 2024. The CMO had the option to forward the questionnaire to a direct colleague. The estimated time to complete the questionnaire was between 5 and 15 min.

Ethical approval was obtained from the Leiden University Medical Center (LUMC) ethics committee before study conduction (protocol nr N055).

Analysis

IBM SPSS Statistics Version: 29.0.0.0 (241) was used for descriptive statistics [18].

Results

Questionnaires were filled out by CMOs from 33 different EDs spread over the Netherlands, resulting in a response rate of 52.4%. Except for one ED, all included EDs employed emergency physicians. Most EDs had an annual patient volume of 25,000–35,000 patients. Various medical professionals were involved in the process of opioid prescribing at these EDs, such as emergency physicians, other medical specialists of different specialties, physician assistants, residents, trainees and nurse practitioners.

Guidelines regarding prescription of opioids

Nineteen EDs (19/33, 57.6%) utilized a guideline for the prescription of opioids, while the remaining fourteen EDs (14/33, 42.4%) did not. Of EDs using opioid-prescribing guidelines, eighteen (18/19, 94.7%) used a local protocol, sometimes complemented by regional or national protocols or guidelines. At two EDs (2/19, 10.5%) the national 'Generic guideline module for appropriate opioid use' by the NSA was in use [16].

The EDs included in the study were distributed across the four NUTS 1 regions (north, east, west, south) in a manner largely proportional to the national distribution of EDs [19]. The urbanization levels of the locations of the included EDs were also largely consistent with the national distribution [20]. Additionally, a classification into hospital types was conducted. These ED characteristics were then compared to the use of a guideline for opioid prescription, as illustrated in Table 1.

The content of the used guidelines regarding opioid prescription varied. At thirteen EDs (13/19, 68.4%), a specific opioid was preferred when a patient was discharged with an opioid prescription; in the majority (11/13, 84.6%) this was oxycodone. The guideline provided advice on the dose of the opioid to be prescribed at thirteen EDs (13/19, 68.4%). It provided advice on the duration of the opioid prescription at twelve EDs (12/19, 63.2%), which varied from three to seven days. At three EDs (3/12, 25.0%), a 'short-term' prescription was advised, which was not further specified. At four EDs (4/19, 21.1%), the used guideline provided advice regarding a repeat prescription. Information on the content of the used guideline regarding opioid prescriptions at ED discharge is shown in Table 2.

Standardized, digital prescriptions (predefined medication orders) were used when prescribing opioids at 17 EDs (17/33, 51.5%). At two EDs, it was mentioned that standard medication orders were used for 'all opioids', without further specification. Fourteen EDs (14/17, 82.4%) used a standard, digital prescription for oxycodone.

At five EDs (5/17, 29.4%), no duration was included in the standard prescription, meaning there was no defined end date of the prescription. At six EDs (6/17, 35.3%), the standard duration of the prescription varied from three to seven days. At one ED (1/17, 5.9%), the standard duration of SA oxycodone was 14 days, at one ED the standard duration of SA oxycodone was 20 days. The standard, digital prescription dose of ER oxycodone varied from 5 mg to 40 mg, for SA oxycodone this was 5–10 mg. At one ED (5.9%), a standard prescription for tramadol was used, the standard duration of the prescription was 21 days. Standard, digital prescriptions at different EDs are shown in Table 3.

From 24 EDs (24/33, 72.7%), it was indicated that there is a need for a guideline when prescribing opioids at ED discharge.

Patient education with opioid prescription

Patient education with opioid prescriptions was specified in the used guideline at 11 EDs (11/19, 57.9%). At

Table 1 An analysis comparing the distribution and characteristics of included EDs to all Dutch EDs, focusing on regional, urban and hospital type differences and adherence to opioid prescription guidelines

	All Dutch EDs (total *n* = 67) *n* (%)	**Included EDs (total *n* = 33) *n* (%)**	**Use of guideline for opioid prescription (total *n* = 19) *n* (%)**
Region			
North	7 (10)	4 (12)	2 (50)
East	16 (24)	8 (24)	7 (88)
West	29 (43)	13 (39)	8 (62)
South	15 (22)	8(24)	2 (25)
Urbanization level			
Urban	52 (78)	25 (76)	16 (64)
Rural	15 (22)	8 (24)	3 (38)
Hospital type			
Academic	7 (10)	3 (9)	1 (33)
Small, non-academic	60 (90)	12 (36)	5 (42)
Large, non-academic		17 (52)	12 (71)
Missing		1 (3)	1 (-)

Region: The classification into regions was based on the NUTS 1 regions [19]. Urbanization: The classification into urban and rural followed the CBS classification [20]. For clarity, the five categories were consolidated into two. Hospital type: EDs with an annual patient volume < 25.000 were classified as 'small', EDs with an annual patient volume > 25.00 were classified as 'large'. Due to the lack of national data on annual patient volumes per ED, these categories were merged

Table 2 Content of the guideline regarding the prescription of opioids at ED discharge

	Yes Number (%)	**No Number (%)**	**Total Number (%)**
Preference for specific opioid	13 (68.4)	6 (31.6)	19 (100)
Oxycodone	11 (84.6)	2 (15.4)	13 (100)
Tramadol	1 (7.7)	12 (92.3)	13 (100)
Morphine (oral)	1 (7.7)	12 (92.3)	13 (100)
Specific advice on dosage	13 (68.4)	6 (31.4)	19 (100)
Specific advice on duration	12 (63.2)	7 (36.8)	19 (100)
3 days	3 (25.0)	9 (75.0)	12 (100)
3–4 days	1 (8.3)	11 (91.7)	12 (100)
5 days	3 (25.0)	9 (75.0)	12 (100)
7 days	2 (16.7)	10 (83.3)	12 (100)
'short term'	3 (25.0)	9 (75.0)	12 (100)
Advice regarding repeat prescription	4 (21.1)	15 (78.9)	19 (100)
No possibility for repeat prescription	2 (50.0)	2 (50.0)	4 (100)
One-time repeat prescription	2 (50.0)	2 (50.0)	4 (100)

six EDs (6/19, 17.6%), a brochure was provided when a patient was prescribed an opioid. Regarding the education that patients were provided upon receiving an opioid prescription, the primary focus was on potential adverse effects. These included constipation, impairment of driving capabilities, and somnolence. At four EDs (4/19, 21.1%), the risk for an opioid addiction was explicitly mentioned.

Guidelines regarding the prescription of opioid, for patients already using an opioid

Guidelines regarding the prescription of an opioid for patients already using an opioid, were provided at four EDs (4/19, 21.1%), with the following recommendations: only add an extra opioid 'as needed'; prescribe a long-acting opioid; continue medication already in use and contact the patients' own general practitioner as soon as possible.

At two EDs (2/19, 10.5%), risk factors for problematic opioid use were mentioned in the guideline, namely addiction and frequent opioid use in the past. At one ED (1/19, 5.3%), the guideline recommended to try to avoid prescribing opioids to those with a high risk of problematic opioid use.

Problematic opioid use

The respondents of 25 EDs (25/33, 75.8%) indicated there is attention for problematic opioid use at their ED, while at nine EDs (9/33, 24.2%) this was not the case. Attention was given to problematic opioid use in various way, including education about opioids, 'by being vigilant to this', or referral of patients to their general practitioner or organization of a multidisciplinary discussion in case of problematic opioid use. From 26 EDs (26/32, 81.3%), it was indicated that there is a need for a guideline for dealing with problematic opioid use.

Discussion

This study surveyed chief medical officers from 33 Dutch EDs. Over half (57.6%) have guidelines for opioid prescribing, mostly local protocols. Only 6.1% uses the national guideline. Oxycodone is preferred by 84.6% of

Table 3 Variation in standard, digital prescriptions at different EDs ranked from lowest to highest possible MME/day

Emergency Department	Agents	Dose	Duration	MME / day	Maximum MME total
#25	Oxycodone SA	1–6 td 5 mg	NED	**7.5**–45.0	NED
#27	Oxycodone SA	1–6 td 5 mg	NED	**7.5**–45.0	NED
#30	Oxycodone SA Oxycodone ER	4–6 td 5 mg 1–2 td 5/10/20 mg	NED	30.0–45.0 **7.5**–60.0	NED NED
#22	Oxycodone ER	2 td 5–10 mg	NED	15.0–30.0	NED
#23	Oxycodone SA Oxycodone ER Tramadol	4–6 td 5 mg 2 td 5 mg 3 td 50 mg	20 days 6 days 21 days	30.0–45.0 90.0 15.0 30.0	900.0 90.0 630.0
#16	Oxycodone SA Oxycodone ER	3 td 5 mg 2 td 10 mg	5 days 5 days	22.5 30.0	112.5 150.0
#7	Oxycodone SA Oxycodone ER	4 td 5 mg 2 td 10 mg	3 days	30.0 30.0	90.0 90.0
#6	Oxycodone ER	2 td 10	NED	30.0	NED
#5	Oxycodone SA Oxycodone ER	6 td 5 mg 2 td 10 mg	NED	45.0 30.0	NED NED
#12	Oxycodone SA Oxycodone ER	4–6 td 5 mg 2 td 10 mg	1–5 days 1–7 days	30.0–45.0 30.0	225 210
#32	Oxycodone SA Oxycodone ER	2–4 td 5–10 mg 2 td 5–40 mg	5–14 days NED	15.0–*60.0* 15.0–*120.0*	840.0 NED

Only EDs that specified dosages were included in this table

*MME=Morphine Milligram Equivalents, SA=short acting, ER=extended release, NED=No end date, td=times daily. **Bold**=lowest MME/day. Italics=highest MME/day

EDs for discharged patients. Guidelines typically recommend a 3–7 day prescription duration. About half use standardized, digital prescriptions, with durations ranging from 3 to 21 days or more, and daily doses from 7.5 to 120 morphine equivalents. Around 40% of guidelines lack specific patient education, and when provided, it mainly covers side effects, rarely mentioning addiction risks.

Despite oxycodone being the preferred opioid in many Dutch EDs, the white paper on the management of opioid use disorder in the ED, prepared for the American Academy of Emergency Medicine (AAEM) by Strayer et al., advices against prescribing oxycodone because of its euphoric and addictive effects [21]. This paper prefers prescribing of immediate-release morphine sulfate, which is likely less abuse-prone, amongst others due to its limited passage of the blood-brain-barrier [21]. Similarly, the US ACEP and Centers for Disease Control and Prevention (CDC) guidelines advice against the prescription of long-acting opioids [15, 22].

Guidelines from the included EDs typically recommend a 3–7 day duration for opioid prescriptions. Standardized, digital orders are used in 52.9% of EDs, mainly for oxycodone. However, prescription durations vary, with some outliers up to 20–21 days and some lacking end dates. This contrasts with the Netherlands Society for Anesthesiology's seven-day maximum guideline [16]. Strayer et al. stated in 2020 a course of three days of opioid therapy should be the maximum [21]. More recent US guidelines by the CDC and ACEP advice a 'short duration' of opioid therapy, discouraging providers from using hard limits on duration and putting more focus on clinical judgement and shared decision-making [15, 22]. From US research it is known that the risk of long-term opioid use is linearly correlated to the number of days of supply of the first prescription [23]. This highlights a potential area for improvement in ensuring consistent and appropriate opioid prescription practices at Dutch EDs.

Further, it is noteworthy that a significant majority of the used guidelines (89.5%), including the national guideline for pain management, do not specify risk factors for problematic opioid use. Yet, several international guidelines do state that risk factors for opioid misuse should be considered before prescribing opioids [15, 21, 22].

Patient education is another critical aspect of opioid prescription [21, 24]. In over 40% of the protocols in use at the participating EDs, the education that patients should receive with an opioid prescription is not specified. When patient education is specified, it is mainly directed at side effects. Most guidelines do not mention the risk for opioid misuse, addiction or overdose. This indicates a potential gap in patient education and communication. Strayer et al. recommend discussing the benefits and harms of an opioid prescription with the patient at the ED, including the risk for problematic opioid use [21].

The majority of the included EDs indicated a need for a guideline regarding opioid prescriptions. This finding is noteworthy given the existence of a national guideline, which is utilized by only a minority of EDs. However, this national guideline is not specifically tailored for use in EDs and lacks detailed recommendations on preferred agents, dosages, and potential risk factors for problematic opioid use, rendering it less applicable in this context. Previous literature demonstrates that the implementation of guidelines in EDs focused on opioid prescriptions results in significant and sustained reductions

in the prescription of opioids for minor and chronic conditions in EDs [25, 26].

The included EDs in this study indicate that guideline advice for managing patients who are already on opioid therapy and addressing problematic opioid use is notably limited, despite the majority of EDs indicating a need for such guidance. The American Society of Addiction Medicine (ASAM) published the National Practice Guideline for the Treatment of Opioid Use Disorder – a focused update in 2020 [27]. This guideline includes several recommendations pertinent to the ED, such as pain management strategies for patients using opioids and/or with opioid use disorder, treatment of opioid withdrawal, and initiation of methadone or buprenorphine therapy for patients with opioid use disorder. The guidelines by CDC and ACEP are more limited on this aspect [15, 22]. While the ASAM guideline can serve as a valuable resource, its recommendations cannot be directly applied to the Dutch context due to significant differences in the organization of the healthcare system and the opioid situation between the US and the Netherlands.

This study underscores the necessity for specific guidance concerning opioid prescriptions in Dutch EDs, while current (national) guidelines and protocols are often limited and not ED specific. Such guideline should be tailored for the ED and encompass recommendations on preferred agents, dosage, and duration. The standardized, digital medication orders should match the advice from the guideline. Additionally, the guideline should delineate risk factors for problematic opioid use and incorporate these considerations into prescribing practices. Moreover, it is imperative to engage in shared decision-making with patients when prescribing opioids. Patients should be thoroughly informed about potential side effects and the risk of addiction. Furthermore, this guideline should provide concrete advice on managing patients who present with acute pain and are already on opioid therapy or have an opioid use disorder. Further research is required to establish effective screening methods for problematic opioid use among ED patients and to determine the optimal treatment strategies for these individuals.

Limitations

The study included 33 Dutch EDs out of 67 operating 24/7 in the Netherlands. Only 63 EDs were invited due to incomplete contact information, resulting in a 52.4% response rate. The sample may not fully represent all Dutch EDs, potentially overestimating national guideline usage, as more proactive EDs in opioid prescription policies likely participated (possibility for response bias).

The online survey, completed by 33 CMOs, efficiently gathered data but may not accurately reflect guideline implementation due to CMOs' limited knowledge of departmental practices. This could lead to an overestimation of compliance. A different methodology would be necessary for precise assessment. Furthermore, this study did not assess whether EDs with guidelines have better outcomes (such as fewer patients returning for opioid-related harm or effects on opioid prescribing).

Comparing the Dutch implementation of opioid guidelines in EDs to other regions is difficult due to limited literature on this topic.

Conclusions

This study reveals significant variability and gaps in the use of opioid prescribing guidelines across Dutch EDs. Opioid prescribing guidelines are used in only a small majority of EDs. EDs that utilize guidelines or protocols predominantly rely on local protocols. These protocols typically recommend oxycodone as the first-choice opioid and emphasize a preferred short duration of prescription. These protocols often lack comprehensive patient education and risk factor considerations. The national guideline for appropriate opioid use is not widely implemented. A comparative analysis with US guidelines reveals a more cautious approach towards opioid prescribing, advocating for immediate-release formulations and shorter prescription durations to mitigate abuse potential. This contrast underscores areas for improvement in Dutch ED practices, particularly in aligning with international best practices to ensure safer opioid use.

Abbreviations

AAEM	American Academy of Emergency Medicine
ACEP	American College of Emergency Physicians
ASAM	American Society of Addiction Medicine
CDC	Centers for Disease Control and Prevention
CMO	Chief Medical Officer
DSEP	Dutch Society of Emergency Physicians
ED	Emergency department
ER	Extended release
LUMC	Leids University Medical Center
MME	Morphine milligram equivalents
NSA	Netherlands Society for Anesthesiology
SA	Short acting
US	United States

Supplementary Information

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Supplementary Material 1

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Author contributions

NK was primarily responsible for designing the study, following discussions with AS, CK, and AD. NK collected the data and conducted the analysis. NK drafted the manuscript, with all authors making significant revisions and contributions. All authors reviewed and approved the final manuscript.

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Data availability
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request (only anonymized).

Declarations

Ethics approval and consent to participate
Ethical approval was obtained from the Leiden University Medical Center (LUMC) ethics committee before study conduction (protocol nr N055). Chief medical officers of Dutch emergency departments (EDs) were invited via email to complete questionnaires regarding the implementation of opioid prescribing guidelines and the management of problematic opioid use within their respective EDs. Prior to completing the questionnaire, they were provided with information about the study's objectives, procedures, and privacy considerations. They were informed that participation in the study was voluntary and that no financial compensation would be provided.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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