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Pain management policies and reported practices in Swiss emergency departments: a national survey

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Faculté de biologie
et de médecine

UNIVERSITE DE LAUSANNE - FACULTE DE BIOLOGIE ET DE MEDECINE

Service des urgences

Pain management policies and reported practices
in Swiss emergency departments:
a national survey

THESE

Préparée sous la direction du Professeur Olivier William Hügli

et présentée à la Faculté de biologie et de médecine de
l'Université de Lausanne pour l'obtention du grade de

DOCTEUR EN MEDECINE

par

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***Pain management policies and reported practices in Swiss
emergency departments: a national survey***

Lausanne, le 6 février 2020

*pour Le Doyen
de la Faculté de Biologie et de Médecine*



*Monsieur le Professeur John Prior
Vice-Directeur de l'Ecole doctorale*

RESUME DE LA THESE

Politiques et pratiques de gestion de la douleur dans les services d'urgence suisses : Enquête nationale

La douleur est la principale plainte qui amène les patients à consulter le service d'urgences. Malgré sa haute prévalence, nombreuses études montrent une prise en charge insuffisante de la douleur ou oligoanalgésie.

Dans notre pays, une enquête nationale de 1997 reflète cette prise en charge insuffisante de la douleur. Une échelle validée pour quantifier l'intensité de la douleur n'était utilisée que dans 14% des centres, un protocole d'antalgie que dans < 5% des centres. Uniquement 1,1 % avait un protocole médico-délégué aux infirmiers. Seuls 68% des centres utilisaient de la morphine pour des douleurs sévères.

Depuis 1997 le contexte des services d'urgence s'est considérablement développé et aucune nouvelle étude n'a été menée. En Suisse, la médecine d'urgence est devenue une sous-spécialité en 2009. De nombreuses publications signalent l'importance des protocoles d'antalgie médicaux et des protocoles médicaux-délégués aux infirmières dans la prise en charge de la douleur. Le traitement de la douleur est devenu un droit humain et un indicateur de qualité du système de santé.

L'objectif de notre étude a été d'évaluer l'impact du développement de la médecine d'urgence sur les différents aspects de la prise en charge de la douleur adulte et pédiatrique, ainsi que de déterminer si des améliorations sont nécessaires.

Il s'agit d'une enquête nationale menée auprès de tous les centres d'urgences hospitaliers entre 2014 et 2016, portant sur l'état des services des urgences en 2013.

Nous observons une amélioration significative de la prise en charge de la douleur dans les services d'urgence au cours des 20 dernières années. L'utilisation d'une échelle pour l'évaluation de la douleur s'est généralisée ; la disponibilité d'un protocole d'antalgie médical et infirmier a augmenté de 75% et 71% respectivement. Les opioïdes sont autorisés dans la majorité des protocoles infirmiers.

Si les résultats sont globalement très favorables, il y a encore de la place pour de l'amélioration notamment dans les protocoles de prise en charge de la douleur pédiatrique ainsi que les protocoles d'analgésie-sédation. Seulement la moitié des centres disposent d'un protocole d'analgésie-sédation pour les médecins et un tiers des centres pour le protocole infirmier.

De futures études sont nécessaires pour vérifier que la présence de ces outils de documentation et traitement puissent se traduire par une antalgie efficace auprès du patient.

Pain management policies and reported practices in Swiss emergency departments: a national survey

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Summary

BACKGROUND: Acute pain is the most common complaint of patients presenting to emergency departments (EDs). Effective pain management is a core ED mission, but numerous studies have pointed to insufficient pain treatment or oligoanalgesia. According to a 1997 national survey in Swiss EDs, a validated pain scale was used in only 14%, an analgesia protocol in <5%, and 1.1% had a nurse-initiated pain protocol. Since then, numerous societal and health care factors have led to improved ED pain care. The aim of this study was to assess the state of ED pain management in Switzerland.

METHODS: Hospital-based Swiss EDs open 24 hours a day and 7 days a week in 2013 were surveyed using a questionnaire. Data from 2013 were collected. Questions queried the pain management process by nurses and physicians in each ED.

RESULTS: The response rate was 115 of 137 eligible EDs (84%). Pain intensity was assessed with a validated instrument in 71% of waiting rooms and in 99% of treatment areas. A nurse-initiated analgesia protocol was available in 56% of waiting rooms and in 70% of treatment areas. Physician pain protocols were available in 75%, and analgesia-sedation protocols in 51%.

CONCLUSION: The pain management processes in Swiss EDs have improved over the last 17 years, and are now equivalent to other western countries. Our study did not, however, assess if these improvements resulted in better analgesia at the bedside, an important topic that will require further study.

Keywords: emergency medicine, acute pain, pain documentation, pain management, treatment protocol, analgesics, opioids, Switzerland

Introduction

Acute pain is the most common reason for emergency department (ED) consultations, affecting 40–70% of patients [1, 2]. EDs provide care to a significant proportion of the population in most countries, and the burden of acute pain is significant in this setting. Prompt, safe and effective pain management is therefore a core ED mission [3]. However, over the past 40 years numerous studies have pointed to insufficient ED pain treatment, or oligoanalgesia [4]. A significant proportion of patients do not receive any analgesia [1, 2], or administered analgesics are inadequate in terms of therapeutic class or dosage [2, 5]. The barriers to adequate analgesia in emergency medicine (EM) are numerous. Lack of training, suboptimal pain assessment, underestimation of pain intensity by healthcare providers, lack or failure to implement pain management protocols, opiophobia or time constraints are a non-exhaustive list of such barriers [6]. In a national survey on pain management conducted in 87 hospital-based EDs in 1997 in Switzerland, only 53% of staff surgeons or anaesthetists had received any formal pain therapy education, a validated pain scale was used in only 14% of EDs, an analgesia protocol in <5%, and just 1.1% had a nurse-initiated pain management protocol, and only 68% of EDs used morphine for severe pain [7]. Since this 1997 study, the negative impact oligoanalgesia has been better appreciated [8], and international campaigns and local initiatives have emphasised the importance of treating acute pain aggressively [2, 9]. Over the same period, the field of EM has expanded, and EM

Author contributions
OH, OTR, CHN, AE, PNC and SS designed the questionnaire. OH, CHN, AE, SS, SE, MPG, DK, KM, RS and ST conducted the survey in their respective parts of Switzerland. OH created the survey instrument, the database and performed the statistical analyses. OH and MB entered the data in the database and interpreted the data. MB wrote the initial draft. All authors contributed to the collection of questionnaires and critically revised the manuscript.

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has become a recognised specialty in several countries in Europe. Numerous publications support its value for better medical education [10], improved ED patient care [11] and better analgesia [12]. In Switzerland, EM has been a subspecialty since 2009 [13]. However, there has been no new study conducted in the last 20 years to investigate whether these societal and healthcare factors have indeed led to improved pain management in Swiss EDs. The aim of this study was therefore to assess the state of ED pain management in Switzerland.

Methods

This survey was a follow-up study of our 2006 survey, which provided the first description of the structural characteristics, location, number of patient visits, and the medical organisation and personnel of Swiss hospital-based EDs [14]. This first study did not include any data on care processes. In this new survey, we used identical questions to provide an updated description of eligible EDs and to document changes in activity over the 7-year period. We added new items to investigate a few care processes: management of pain and time-sensitive conditions such as myocardial infarction, stroke and sepsis. All hospital-based EDs were eligible if they were open 24 hours a day and 7 days a week in 2013, with the exception of exclusively psychiatric or ophthalmological EDs. We collected data for the period from 1 January 2013 to 31 December 2013. Switzerland was divided into five regions, each the responsibility of one or two of the co-authors in charge of sending the questionnaire to the head physician of each ED and collecting completed questionnaires. Non-responding EDs were contacted by email or by telephone. Data collection was initiated in mid-2014, and the data collection period closed in 2015, after which we did not obtain any new return questionnaires.

The new questions regarding the pain management process addresses were the use of a validated instrument to document pain intensity, availability of a nurse-initiated protocol and the class of analgesics that nurses could administer. A nurse-initiated protocol provides guidance and allows nurses to administer analgesics, including opioids, prior to a patient being seen by a physician. We also assessed the availability of physician pain management and procedural analgesia-sedation protocols. The French, German and Italian versions of the questionnaire are provided in appendix 1.

Crowding was defined as more patients than available examination bays or beds at 18:00 on a typical day. Boarding was defined as a wait in the ED for more than 2 hours before transfer to a hospital ward at 18:00. EDs were also characterised by their academic status, the annual number of visits (1–5000, >5000–10,000, >10,000–20,000, and >20,000 per year); they were also analysed by linguistic region (French-, German- and Italian-speaking parts of Switzerland), and if they had an EM residency programme accredited by the Swiss Society of Emergency and Rescue Medicine (SSERM).

Statistical analyses

Our data are presented with standard descriptive statistics: mean and standard deviation (SD), or median and interquartile range (IQR) or proportion for categorical vari-

ables, as appropriate. Missing data were not imputed. Groups were compared using the χ^2 -test or Fisher's exact test, as appropriate. Statistical analyses were performed using Stata 15 (StataCorp, College Station, TX, USA). A two-sided p-value <0.05 was indicative of statistical significance.

Results

The questionnaire was posted to 145 EDs, of which 8 (6%) had closed since 2006 or no longer fulfilled the inclusion criteria. Of the 137 remaining EDs, 4 (2.8%) refused to participate and 18 (12%) did not return the questionnaire, resulting in a response rate of 115 out of 137 eligible EDs (84%). Eleven (9.6%) EDs were based in a university hospital and 96 (83%) were in public hospitals. Fourteen EDs (12%) were dedicated paediatric EDs, 63 (55%) adults only, and 38 (33%) combined adult and child EDs; 80 (70%) were in German-speaking, 27 (23%) in French-speaking, and 8 (7.0%) in Italian-speaking Switzerland (fig. 1). The response rate was not significantly different between regions. The median total number of annual ED visits in 2013 was 12,612, with a range from 1230 to 60,488. Overcrowding and boarding affected 58% and 57% of all EDs, respectively.

Pain management

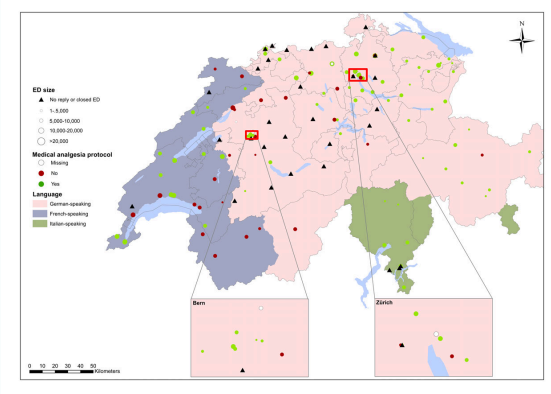
Pain assessment (table 1)

Pain intensity was assessed with a validated instrument in 99% of EDs. No variation was found based on ED characteristics. The proportion of EDs starting the evaluation in the waiting room was 71%, but this increased significantly with the number of annual ED visits and in accredited EDs. Crowded EDs also evaluated pain in the waiting room more frequently, although the 16% difference did not reach statistical significance; in the treatment bay, 98% of EDs quantified pain, a percentage not correlated with hospital or ED characteristics.

Nurse-initiated analgesia (table 2 and fig. 2)

A nurse-initiated analgesia protocol was implemented in 71%, but varied according to ED characteristics. It was more common in university EDs, and all dedicated paediatric EDs had such a protocol, but only slightly more than half of combined adult and child EDs did. It was also

Figure 1: Emergency department (ED) location, stratified by participation, annual visit volume and medical pain management protocol.



more common in busier and accredited EDs. A protocol was available in the waiting room in 56% and in treatment areas in 70% and in both in 55%. A nurse-initiated protocol in the waiting room was associated with ED type and size, crowding, and accreditation. A nurse-initiated protocol in

the treatment area was associated with academic status, ED type and size, and the issues of crowding and boarding (table 1).

Nurse-initiated protocol medications

The nurse-initiated analgesia protocol allowed for the use of paracetamol in 98%, opioids in 77%, nonsteroidal anti-inflammatory drugs (NSAIDs) in 75%, and nitrous oxide in 16%. The administered opioids were morphine in 77%, fentanyl in 40%, tramadol in 25%, pethidine in 6.5% and codeine in 1.6%. A pain intensity threshold to initiate opioids was defined in 66% of protocols. Its median was 5 (IQR 4–6), and varied between EDs (fig. 3).

Physician pain protocol for adult and paediatric patients (table 3 and fig.1)

Physicians had a pain protocol available in 75% of EDs. The protocol was available as a pocket card only in 3.7%, on a computer or a print format in 43% and as both forms in 54%. A physician pain protocol was found more frequently in university EDs, and in dedicated paediatric EDs than in adult only or combined adult-paediatric EDs.

Figure 2: Emergency departments (EDs) stratified by nurse-initiated analgesia protocol and type of patient.

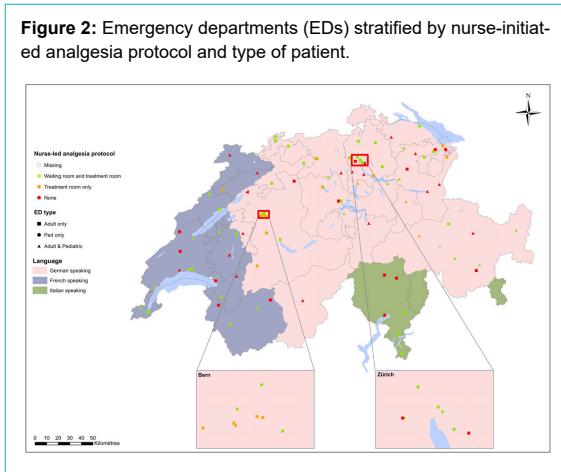


Table 1: Assessment of pain with a validated tool and emergency department (ED) characteristics.

		Overall		Waiting room		Treatment bay	
		n (%)	p-value	n (%)	p-value	n (%)	p-value
University hospital	Yes	11 (100)	0.74	9 (82)	0.41	11 (100)	0.64
	No	102 (99)		70 (70)		98 (98)	
ED type	Paediatric only	13 (100)	0.34	12 (92)	0.17	13 (100)	0.13
	Adult only	63 (100)		43 (70)		62 (100)	
	Paediatric and adult	37 (97)		24 (65)		35 (95)	
Annual ED visits	≤5000	15 (100)	0.67	5 (38)	0.001	14 (100)	0.63
	>5000–10,000	33 (100)		19 (58)		31 (100)	
	>10,000–20,000	44 (98)		36 (82)		43 (96)	
	>20,000	21 (100)		18 (90)		21 (100)	
ED crowding*	Yes	65 (98)	0.40	28 (78)	0.06	63 (97)	0.24
	No	47 (100)		51 (62)		100 (100)	
ED boarding†	Yes	64 (98)	0.38	46 (73)	0.62	63 (98)	0.83
	No	49 (100)		33 (69)		46 (98)	
Accredited ED‡	Yes	70 (99)	0.53	25 (89)	0.004	27 (100)	0.38
	No	28 (100)		40 (59)		68 (97)	

* Crowding defined as having more patients than available examination beds at 18:00. † Boarding defined as having a longer than 2-hour wait for a hospital bed. ‡ Accredited for adult emergency medicine residency.

Table 2: Nurse-initiated protocol pain intensity emergency department (ED) characteristics.

		Overall		Waiting room		Treatment bay	
		n (%)n	p-value	n (%)	p-value	n (%)	p-value
University hospital	Yes	11 (100)	0.03	9 (82)	0.07	67 (67)	0.02
	No	70 (68)		53 (53)		11 (100)	
ED type	Paediatric only	13 (100)	0.01	12 (92)	0.02	13 (100)	0.01
	Adult only	46 (73)		33 (53)		45 (73)	
	Paediatric and adult	22 (58)		17 (47)		20 (56)	
Annual ED visits	≤5000	8 (53)	0.03	2 (15)	<0.001	8 (53)	0.03
	>5000–10,000	21 (64)		13 (39)		20 (63)	
	>10,000–20,000	32 (71)		29 (64)		30 (68)	
	>20,000	20 (95)		18 (90)		20 (95)	
ED crowding*	Yes	57 (86)	<0.001	46 (71)	<0.001	55 (86)	<0.001
	No	23 (49)		15 (33)		22 (48)	
ED Boarding†	Yes	53 (82)	0.004	39 (62)	0.14	51 (81)	<0.01
	No	25 (857)		23 (48)		27 (56)	
Accredited ED‡	Yes	30 (97)	<0.001	25 (93)	<0.001	25 (96)	<0.001
	No	50 (62)		24 (35)		39 (56)	

* Crowding defined as having more patients than available examination beds at 18:00 † Boarding defined as having a longer than 2-hour wait for a hospital bed ‡ Accredited for adult emergency medicine residency

Physician and nurse-initiated analgesia-sedation protocols (table 3)

A physician analgesia-sedation protocol was implemented in 51% of EDs. It tended to be more prevalent in larger EDs but was significantly more frequent in university EDs and accredited EDs (table 3). A nurse-initiated protocol was in place in 32% of EDs, and its implementation was not associated with any hospital or ED characteristics.

Discussion

Our study shows a significant improvement over the last 17 years in the processes to manage pain in Swiss EDs compared with a 1997 survey. Pain is now nearly universally evaluated with a validated instrument, up from 14% in 1997, and this evaluation is conducted in the waiting room in over 70%. A nurse-initiated protocol is now available in 71% of EDs, up from 1.1%. More than three quarters of nurse-initiated protocols included the administration of opioids, most often morphine or fentanyl. A physician pain protocol was available in three quarters and an analgesia-sedation protocol in half of EDs. Our study is one of the first to document such an improvement in pain management over time. This is a very positive de-

velopment, as pain relief is one of the core missions of EDs. The results of our survey are similar to those of recent surveys from other countries. Pain intensity was documented in 80% of EDs participating in a worldwide survey, most frequently using the 0–10 verbal numeric rating scale [15]. A study from the Netherlands found that 77% of EDs had pain management practice guidelines [16], whereas this figure was 88.8% in Australia [17]. In the latter study, 69.4% of EDs also had nurse-initiated pain protocols, a figure very close to our own finding.

This improvement in Swiss EDs, as in other countries, is the result of several factors. First, pain relief is now considered a fundamental human right [18]. There have been ongoing efforts to improve early identification and quantification of pain intensity, with healthcare providers encouraged to consider pain as the fifth vital sign [19]. Respect for pain management standards has become a requirement for hospital accreditation in some countries such as the USA, although not in Switzerland [20]. National campaigns in several countries have increased awareness of the general population regarding pain and its treatment [21], although we could not find evidence of such interventions in Switzerland. Patients contribute also to this improvement, as they have explicit expectations regarding pain treatment and relief in the ED [22, 23]. Adequate pain management is an important criterion for patient satisfaction, as reported in both medical studies [24] and online surveys [25].

In the past, a minority of physicians had received formal pain treatment education as part of their undergraduate curriculum: 8% in 1997 in Switzerland and 3% in 2008 in the USA [7, 26]. Since then, medical schools in many countries have implemented a pain curriculum over recent years, although its content remains limited and fragmentary [27], and does not cover all the necessary topics [28, 29]. At the postgraduate level, Swiss ED physicians have progressively developed and implemented local pain management protocols, resulting in improved pain management [2, 30]. This drive to improve pain management is also the result of the development of EM as a medical specialty. Countries with deployment of EM specialists report better pain management through improved documentation of pain or implementation of new procedures, such as pro-

Figure 3: Pain threshold to initiate opioids in nurse-initiated analgesia protocols.

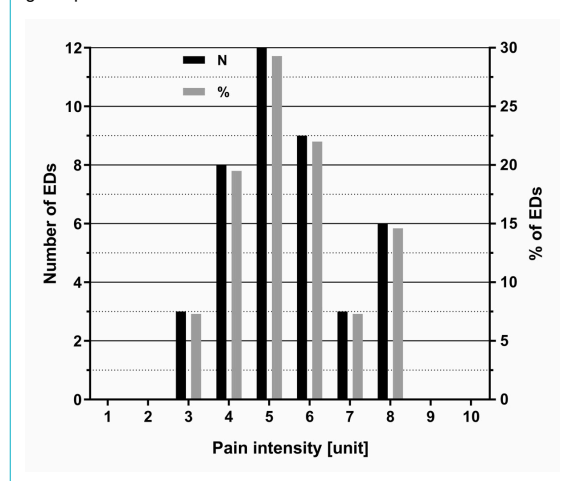


Table 3: Physician pain protocol and analgesia-sedation protocol by emergency department (ED) characteristics.

		Physician pain protocol		Analgesia-sedation protocol			
				Physician		Nurse-initiated	
		n (%)	p-value	n (%)	p-value	n (%)	p-value
University hospital	Yes	10 (100)	0.05	9 (82)	0.03	3 (30)	0.91
	No	72 (72)		48 (48)		32 (32)	
ED type	Paediatric only	13 (100)	0.02	9 (75)	0.21	5 (42)	0.71
	Adult only	47 (87)		30 (48)		19 (31)	
	Paediatric and adult	25 (69)		18 (47)		11 (29)	
	Adult protocol only	8 (22)	–	n.a.	–	n.a.	–
	Paediatric protocol only	1 (2.8)	n.a.	n.a.	n.a.	n.a.	
	Protocols for both	16 (44)	n.a.	n.a.	n.a.	n.a.	
Annual ED visits	≤5000	12 (86)	0.28	5 (33)	0.06	4 (27)	0.73
	>5000–10,000	25 (76)		19 (47)		11 (34)	
	>10,000–20,000	29 (66)		36 (47)		12 (27)	
	>20,000	17 (85)		18 (76)		8 (40)	
Accredited ED*	Yes	23 (79)	0.55	25 (71)	0.01	26 (33)	0.60
	No	59 (74)		34 (43)		8 (28)	

* Accredited for adult emergency medicine residence

cedural sedation or nerve blocks [31–33]. This beneficial impact of EM is also supported by our study, where Swiss EDs with an EM residency programme accredited by the SSERM were more likely to start documenting pain in the waiting room, and have nurse-initiated pain protocols or physician sedation protocols. Accredited EDs are required to have $\geq 25\%$ of their nursing staff EM trained in small EDs and $\geq 50\%$ in larger ones. Better nurse qualification is a way to support and delegate the implementation of new procedures, such as nurse-led pain management.

For children, pain management protocols were ubiquitous in dedicated paediatric Swiss EDs, but less frequent in combined adult-paediatric Swiss EDs. Implementation of pain protocols is particularly important for this age group, as children are less likely to receive analgesia than adults for similar conditions [34]. Lastly, a quarter of dedicated EDs had no analgesia-sedation protocols. Thus, our study indicates that there is still room for improvement in paediatric pain management in Switzerland.

Crowding and boarding have been associated with a reduction in the quality of pain management, in particular increased delays in the administration of analgesia [35, 36]. Nearly half of EDs were affected by crowding and boarding in 2006, a figure reaching 84% for the former and 74% for the latter in the larger EDs. Our study shows that larger and crowded EDs were more likely to start assessing and treating pain in their waiting rooms, contributing to shortening of the door-to-analgesia time in busy EDs.

Our study shows large variation in the threshold of pain intensity used to initiate opioid treatment in nurse-initiated protocols, with a median pain level of 5/10, but some EDs started at 3/10 while others used a level of 8/10. We could not identify any hospital or ED factor associated with this variation. Other co-interventions or co-treatments not captured by our survey may explain these differences. Nevertheless, administration of opioids is recommended for severe pain [37]. The use of a pain scale to initiate opioids has been debated recently. Values from these scales do not always predict the desire for analgesia [38], and a value from a scale should be one of several factors on which to base the decision to administer opioids [39]. However, Swiss patients in pain may not be treated similarly in different EDs. These national practice variations need further investigation to determine whether their causes include idiosyncrasies of local pain management protocols or reluctance on the part of patients or healthcare providers regarding opioid use.

Although we documented an improved ED pain management process, we did not verify if this improvement resulted in better bedside care. We and others have shown a persistent gap between protocols and their application [2, 30]. However, our study provides circumstantial evidence of better pain treatment. Pain intensity evaluation is associated with increased analgesic administration [40, 41]. Nurse-initiated analgesia is associated with a reduction in the door-to-analgesia time and faster pain relief [42]. Lastly, physician pain protocols also improve pain management [2, 43]. Taken together, these studies therefore point to a reduction of the burden of pain in Swiss EDs since 1997.

Our study has several limitations. Firstly, non-responding EDs may differ from responding ones. Specifically, EDs

with suboptimal pain management practices might have declined to participate in our survey, biasing our results toward optimistic estimates of current pain management practices. However, our response rate was 84%. Although not perfect, this figure is as good as or better than similar national surveys, and we believe that our results are robust. Secondly, data were self-reported and we could not verify their accuracy. Thirdly, as mentioned previously, we did not measure the quality of pain management in Swiss EDs, and the improvement since 1997 can only be inferred and is not proven. Lastly, the 1997 Swiss study included only surgeons and anaesthesiologists working in the ED, but no internists [7]. It is unclear if their results would have been closer to ours if they had done so.

Conclusion

Pain management has markedly improved in Swiss EDs over the last 20 years. Pain is now universally evaluated in the ED, most EDs have pain management protocols for nurses and physicians, and about half provide analgesia-sedation. Nurses evaluated and treated pain in the waiting room and treatment bays, using class III analgesics of the WHO pain ladder, thus were capable of treating adequately even severe pain. Our study also highlighted areas where there is room for improvement. A quarter of EDs did not provide their physicians with pain management guidelines, and only half had analgesia-sedation protocols. A short door-to-analgesia time, the provision of adequate analgesia, and analgesia-sedation if necessary, to all patients must be a priority for all EDs, and systematic assessments of pain management practices using quantitative measures must be part of the key indicators evaluating the quality of ED care.

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Appendix 1

French, German and Italian versions of the questionnaire

The questionnaires are available in a separate file at <https://smw.ch/article/doi/smw.2019.20155>.