EUR REV MED PHARMACOL SCI
2026; 30: 143-151

EVALUATION OF THE IMPACT OF POST-EMERGENCY VISIT ON DIAGNOSTIC AND THERAPEUTIC CHANGES IN ORTHOPEDICS

A. LAUDAT[1], T. STOCLET[1], N. KLOEK[1], M. LEPLOMB[3], L.-M. JOLY[3], M. TAALBA[3], M. LALEVÉE[1,2]

[1]Orthopedic and Trauma Surgery Department, Rouen University Hospital, Rouen, France
[2]Normandie Univ, UNIROUEN, CETAPS UR3832, Groupe d'Étude Normand Interdisciplinaire de l'Appareil Locomoteur (GENIAL), Rouen, France
[3]Emergency Department, Rouen University Hospital, Univ Rouen Normandie, Rouen, France

Corresponding Author
Alexis Laudat, MD; e-mail: aldtapple@gmail.com

ABSTRACT – *Objective:* Musculoskeletal trauma accounts for more than a third of emergency department visits, and accurate diagnosis and treatment can be challenging in the acute setting. The objective of our study was to evaluate the impact of a post-emergency orthopedic visit on diagnostic and therapeutic changes in patients with minor trauma.

Materials and Methods: We conducted a prospective observational study in two French university hospitals. Adult patients referred to a post-emergency orthopedic visit for minor upper or lower limb trauma were included. Exclusion criteria included immediate surgical indication or injuries outside the limbs. Data collected during both initial and follow-up visits were compared to identify diagnostic changes (DCs) and therapeutic modifications (TMs), with TMs classified as resulting in either more or less intensive care.

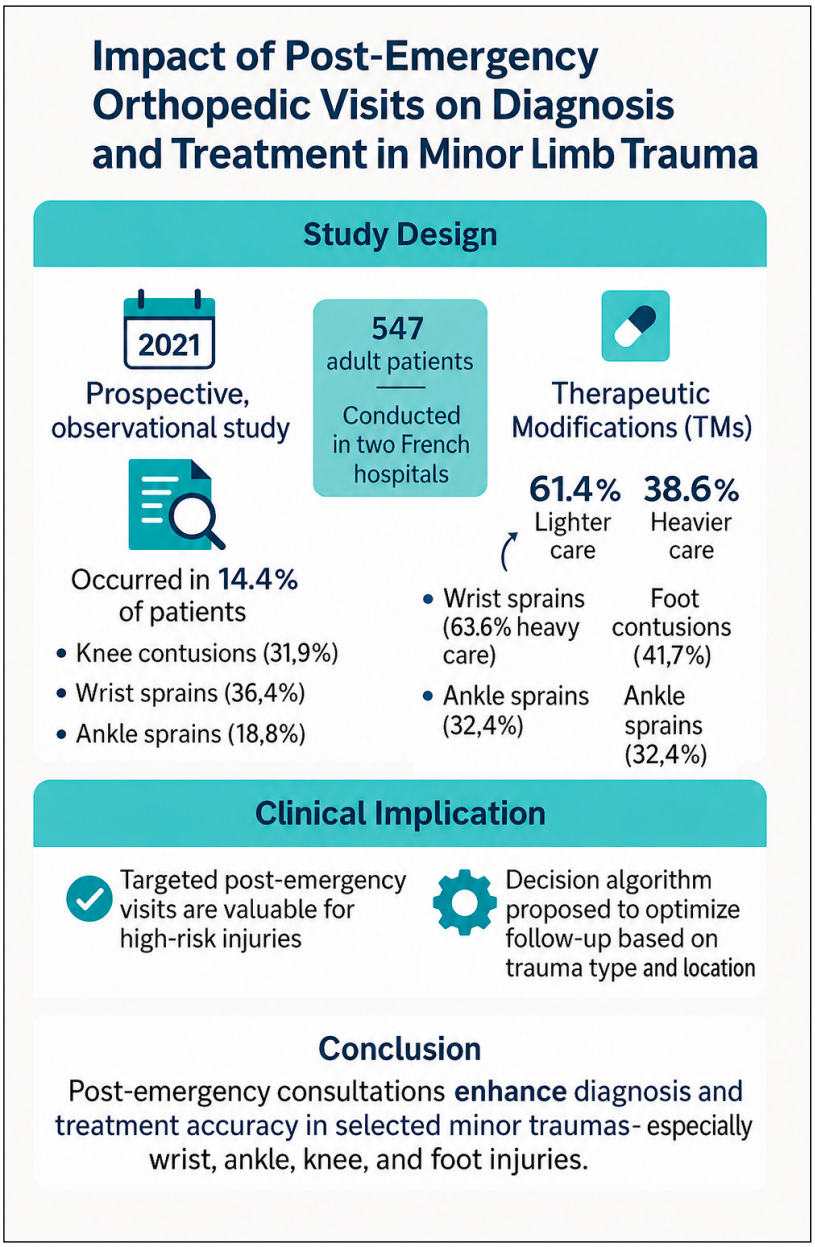
Results: A total of 547 patients were included. DCs occurred in 14.4% patients (n=79), and TMs were made in 23.2% (n=127). Among patients with TMs, 61.4% (n=78) received less intensive treatment, while 38.6% (n=49) required more intensive care. The highest rates of DCs were observed for knee contusions (31.9%, n=15/47), wrist sprains (36.4%, n=4/11), and ankle sprains (18.8%, n=12/64). TMs leading to less intensive care were most frequently noted in ankle sprains (21.9%, n=14/64), knee contusions (21.3%, n=10/47), foot fractures (11.3%, n=7/62), and wrist fractures (10.6%, n=9/85). More intensive care was frequently required for wrist sprains (63.6%, n=7/11) and foot contusions (25%, n=3/12). Injuries such as shoulder dislocations (TM: 0%) and shoulder fractures (DC: 6.9%, TM: 10.3%) rarely led to modifications during the post-emergency visit.

Conclusions: The post-emergency visit is of interest when targeting trauma pathologies at risk of diagnostic change or therapeutic modification.

KEYWORDS: Post-emergency care, Orthopedic follow-up, Emergency department, Musculoskeletal injuries, Treatment adjustment, Clinical decision-making, Healthcare resource optimization, Secondary assessment.

INTRODUCTION

Musculoskeletal trauma is a frequent cause of emergency department visits, ranging from minor contusions to more severe injuries such as fractures[1]. These injuries account for approximately one-third of all annual emergency visits[2]. The primary causes are mainly related to leisure and sporting activities, with contusions, wounds, sprains, and fractures being the most common types of traumas, affecting both the upper and lower limbs.



Graphical Abstract. Prospective study of 547 adults showing that post-emergency orthopedic follow-up leads to therapeutic modifications in 14.4% of minor limb trauma cases, improving diagnostic accuracy and optimizing management—particularly for wrist, ankle, knee, and foot injuries.

The management of minor musculoskeletal trauma varies widely due to differences in trauma types, the involvement of multiple specialties, and patient compliance. This variability complicates the standardization of treatment protocols. Additionally, the increasing number of emergency department visits poses both economic and logistical challenges[3,4].

The growing number of patients in emergency departments increases the risk of diagnostic and therapeutic errors[5-7]. These errors may involve diagnosing a nonexistent lesion or failing to identify an existing injury, both of which can negatively impact patient care[8,9], sometimes with irreversible consequences[10,11]. To reduce these risks, some healthcare centers have implemented trauma follow-up visits, conducted by physicians specialized in this type of care (emergency physicians or orthopedic surgeons)[12,13]. The purpose of these follow-ups is to reassess patients with minor trauma initially diagnosed in the emergency department, using clinical and radiological evaluations to refine diagnoses and optimize treatment. However, systematically re-examining all patients presenting with minor trauma is neither feasible nor necessary[14,15].

The objective of our study was to evaluate the impact of a post-emergency orthopedic vis-

it on diagnostic and therapeutic changes in patients with minor trauma. The hypothesis was that post-emergency follow-ups are relevant only for specific pathologies and anatomical locations, where diagnostic changes and treatment modifications are more likely to occur.

MATERIALS AND METHODS

Study design and setting

A prospective observational study was conducted in 2021 at two sites: the University Hospital of Rouen and the Saint-Julien Hospital, in Rouen. The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Rouen University Hospital (approval date: September 8, 2020; additional administrative review in 2025, protocol E2025-18). This study uses data collected prospectively as part of routine care and falls under Category 3 of the Jardé law.

According to French regulations (Jardé law), patients were informed about the use of their data and had the right to object (non-opposition procedure).

Selection of participants

Adult patients were included if they attended a post-emergency follow-up visit for a musculoskeletal injury involving the upper or lower limb.

Exclusion criteria included initial emergency visits for other anatomical regions (e.g., spine, skull), absence of diagnosis in the emergency department, trauma involving multiple anatomical sites, and cases requiring surgical intervention at the initial visit.

Assessment criteria and data collection

Data collection was performed during both emergency and post-emergency visits, recording patient demographics, diagnosis, anatomical site, type of immobilization, and any diagnostic or therapeutic changes. Four of the emergency physicians organized their own post-emergency visit for non-surgical trauma. When an orthopedic surgery opinion was given, the patient was reviewed in the orthopedic surgery post-emergency visit.

The primary endpoint was any modification in diagnosis or treatment at the post-emergency visit compared to the initial visit.

In the event of changes, treatment modifications were categorized as shifts toward less intensive or more intensive care. The severity of care was graded as follows (from least to most intensive): functional treatment (offering minimal or no immobilization, primarily for pain relief), cast treatment (requiring strict, constant immobilization), and surgical treatment (requiring surgical intervention).

Statistical analysis

Quantitative data were reported as means ± standard deviations for normally distributed variables or as medians and interquartile ranges for non-normally distributed variables. Categorical data were presented as frequencies and percentages. Associations between categorical variables were tested using the Chi-square test or Fisher's exact test when appropriate. A significance level of 5% was used for all tests. Analyses were performed using EasyMedStat (version 3.37.1; www.easymedstat.com).

RESULTS

Patient characteristics

Between January 1st and December 31st, 2021, a total of 547 patients met the inclusion criteria. Patient demographics, diagnoses, and anatomical sites are summarized in Table I. Participants had a mean age of 43 years (standard deviation: 24).

Fractures accounted for most initial diagnoses (57%, n=313), followed by sprains (18%, n=100) and contusions (16%, n=88). Dislocations, wounds, tendon injuries, and infections represented less than 10% of the initial diagnoses.

The most affected anatomical sites were the ankle (23.9%, n=131), wrist (19%, n=104), foot (16.6%, n=91), and knee (12.4%, n=68).

In both female and male patients, fractures were the most frequent injury type (58.5% and 56.0%, respectively), followed by sprains (18.1% and 18.4%) and contusions (14.4% and 17.7%). The ankle was the most involved region in both sexes (23.7% in females and 24.2% in males).

In adults aged 35-54 years, fractures were the most frequent injury type (56.9%), followed by sprains and contusions (both 16.3%). In late adults aged 55-64 years, fractures were even more frequent (67.2%), followed by sprains (13.8%) and contusions (10.3%).

Initial treatment was a cast treatment in 81.2% of cases (n=444) and functional in 18.8% of cases (n=103).

Table I. Patient characteristics.

	Male (n=277)	Female (n=270)	Total (n=547)
Age (years)			
<35 years	173 (31.6%)	99 (18.1%)	272 (49.7%)
35-54 years	69 (12.6%)	58 (10.6%)	127 (23.2%)
55-64 years	21 (3.8%)	41 (7.5%)	62 (11.3%)
>64 years	14 (2.6%)	72 (13.2%)	86 (15.7%)
Type of lesion			
Fracture	155 (28.3%)	158 (28.9%)	313 (57.2%)
Sprain	51 (9.3%)	49 (9%)	100 (18.3%)
Contusion	49 (9%)	39 (7.1%)	88 (16.1%)
Dislocation	11 (2%)	12 (2.2%)	23 (4.2%)
Wound	6 (1.1%)	3 (0.5%)	9 (1.6%)
Tendon injury	4 (0.7%)	4 (0.7%)	8 (1.4%)
Infection	1 (0.2%)	5 (0.9%)	6 (1.1%)
Location			
Ankle	67 (12.2%)	64 (11.7%)	131 (23.9%)
Wrist	44 (8%)	60 (10.9%)	104 (19%)
Foot	49 (9%)	42 (7.7%)	91 (16.6%)
Knee	37 (6.8%)	31 (5.6%)	68 (12.4%)
Shoulder	17 (3.1%)	34 (6.2%)	51 (9.3%)
Hand	26 (4.8%)	20 (3.6%)	46 (8.4%)
Elbow	14 (2.6%)	10 (1.8%)	24 (4.4%)
Shoulder girdle	17 (3.1%)	6 (1.1%)	23 (4.2%)
Forearm	1 (0.2%)	1 (0.2%)	2 (0.4%)
Leg	2 (0.4%)	0 (0%)	2 (0.4%)
Pelvis	0 (0%)	1 (0.2%)	1 (0.2%)
Arm	1 (0.2%)	0 (0%)	1 (0.2%)
Collarbone	1 (0.2%)	0 (0%)	1 (0.2%)
Thigh	0 (0%)	1 (0.2%)	1 (0.2%)
Hip	0 (0%)	1 (0.2%)	1 (0.2%)

Most frequent type of lesion	Male (n=277)	Female (n=270)	35-54 years (n=127)	55-64 years (n=62)
Fracture	155 (56%)	158 (58.5%)	72 (56.7%)	42 (70.7%)
Sprain	51 (18.4%)	49 (18.1%)	21 (16.5%)	9 (12.2%)
Contusion	49 (17.7%)	39 (14.4%)	21 (16.5%)	7 (9.8%)
Dislocation	11 (4%)	12 (4.4%)	2 (1.6%)	2 (2.4%)
Wound	6 (2.2%)	3 (1.1%)	6 (4.7%)	1 (2.4%)
Tendon injury	4 (1.4%)	4 (1.5%)	4 (3.1%)	0 (0%)
Infection	1 (0.4%)	5 (1.9%)	1 (0.8%)	1 (2.4%)

Most frequent location	Male (n=277)	Female (n=270)	35-54 years (n=127)	55-64 years (n=62)
Ankle	67 (24.2%)	64 (23.2%)	29 (22.8%)	15 (24.2%)
Foot	44 (15.9%)	60 (22.2%)	25 (19.7%)	17 (27.4%)
Wrist	49 (17.7%)	42 (15.6%)	20 (15.7%)	10 (16.1%)
Knee	37 (13.4%)	31 (11.5%)	15 (11.8%)	7 (11.3%)
Hand	17 (6.1%)	34 (12.6%)	14 (11%)	9 (14.5%)
Shoulder	26 (9.4%)	20 (7.4%)	10 (7.9%)	2 (3.2%)
Others	37 (13.4%)	19 (7%)	14 (11%)	2 (3.2%)

Values are expressed as number (percentage). Percentages are calculated on the total study population (n=547).

Diagnostic changes (DCs) (Table II, Figure 1)

During the post-emergency visits, a total of 14.4% (n=79/547) DCs were made. These DCs occurred in 27.3% (n=24/88) of contusions, 24% (n=24/100) of sprains, and 8.3% (n=26/313) of fractures.

The highest rates of DCs were observed in injuries involving the knee (35.3%, n=24/68), particularly in knee contusions (31.9%, n=15/47), followed by the wrist (14.4%, n=15/104), including wrist fractures (9.4%, n=8/85) and wrist sprains (36.4%, n=4/11). The ankle showed 13.7% DCs overall (n=18/131), including ankle fractures (9.2%, n=6/65) and ankle sprains (18.8%, n=12/64). For the foot, DCs were observed in 9.9% (n=9/91), mainly due to foot fractures (8.1%, n=5/62) and foot contusions (16.7%, n=2/12).

There was a significant difference in diagnostic changes between lesion groups ($p<0.001$) and between site groups ($p<0.001$).

Therapeutic modifications (TMs) (Table II, Figure 1)

Therapeutic modifications were carried out in 23.2% of cases (n=127/547). The final treatment was functional in 54.3% (n=69/127), cast treatment in 35.4% (n=45/127), and surgical in 10.2% (n=13/127). Among TMs, 44.1% involved fracture

Table II. Post-emergency visit modifications and their effects on global care.

	Cases	Post-emergency modifications				Effect of therapeutic modifications			
		DC		TM		More intensive		Less intensive	
Ankle	131	18	13.7%	35	26.7%	12	9.2%	23	17.6%
Fracture	65	6	9.2%	13	20%	4	6.2%	9	13.8%
Sprain	64	12	18.8%	22	32.4%	8	12.5%	14	21.9%
Contusion	2	0	0%	0	0%	0	0%	0	0%
Knee	68	24	35.3%	19	27.9%	5	7.4%	14	20.6%
Contusion	47	15	31.9%	13	27.7%	3	6.4%	10	21.3%
Sprain	12	5	41.7%	1	8.3%	0	0%	1	8.3%
Fracture	5	2	40%	3	60%	1	20%	2	40%
FP dislocation	4	2	50%	2	50%	1	25%	1	25%
Foot	91	9	9.9%	21	23.1%	10	11%	11	12.1%
Contusion	12	2	16.7%	5	41.7%	3	25%	2	16.7%
Sprain	6	1	16.7%	3	50%	2	33.3%	1	16.7%
Tendon injury	3	1	33.3%	2	66.7%	1	33.3%	1	33.3%
Fracture	62	5	8.1%	10	16.2%	3	4.8%	7	11.3%
Infection	4	0	0%	1	25%	1	25%	0	0%
Wound	4	0	0%	0	0%	0	0%	0	0%
Wrist	104	15	14.4%	25	24%	12	11.5%	13	12.5%
Contusion	8	3	37.5%	5	62.5%	1	12.5%	4	50%
Sprain	11	4	36.4%	7	63.6%	7	63.6%	0	0%
Fracture	85	8	9.4%	13	15.3%	4	4.7%	9	10.6%
Shoulder	51	3	5.9%	4	7.8%	2	3.9%	2	3.9%
Contusion	3	0	0%	1	33.3%	1	33.3%	0	0%
Fracture	29	2	6.9%	3	10.3%	1	3.4%	2	6.8%
Dislocation	16	1	6.3%	0	0%	0	0%	0	0%
Tendon injury	3	0	0%	0	0%	0	0%	0	0%
Others	102	10	9.8%	23	22.5%	8	7.8%	15	12.7%
Contusion	16	4	25%	4	25%	1	6.3%	3	18.8%
Sprain	7	2	28.6%	3	42.9%	1	14.3%	2	28.6%
Fracture	67	3	4.5%	14	20.9%	6	8.9%	8	11.9%
Wound	5	1	20%	1	20%	0	0%	1	20%
Dislocation	3	0	0%	1	33.3%	0	0%	1	33.3%
Tendon injury	2	0	0%	0	0%	0	0%	0	0%
Infection	2	0	0%	0	0%	0	0%	0	0%

Percentages are calculated based on the number of cases within each subgroup. DC, Diagnostic changes; TM, Therapeutic modifications; FP, Femoro-patellar.

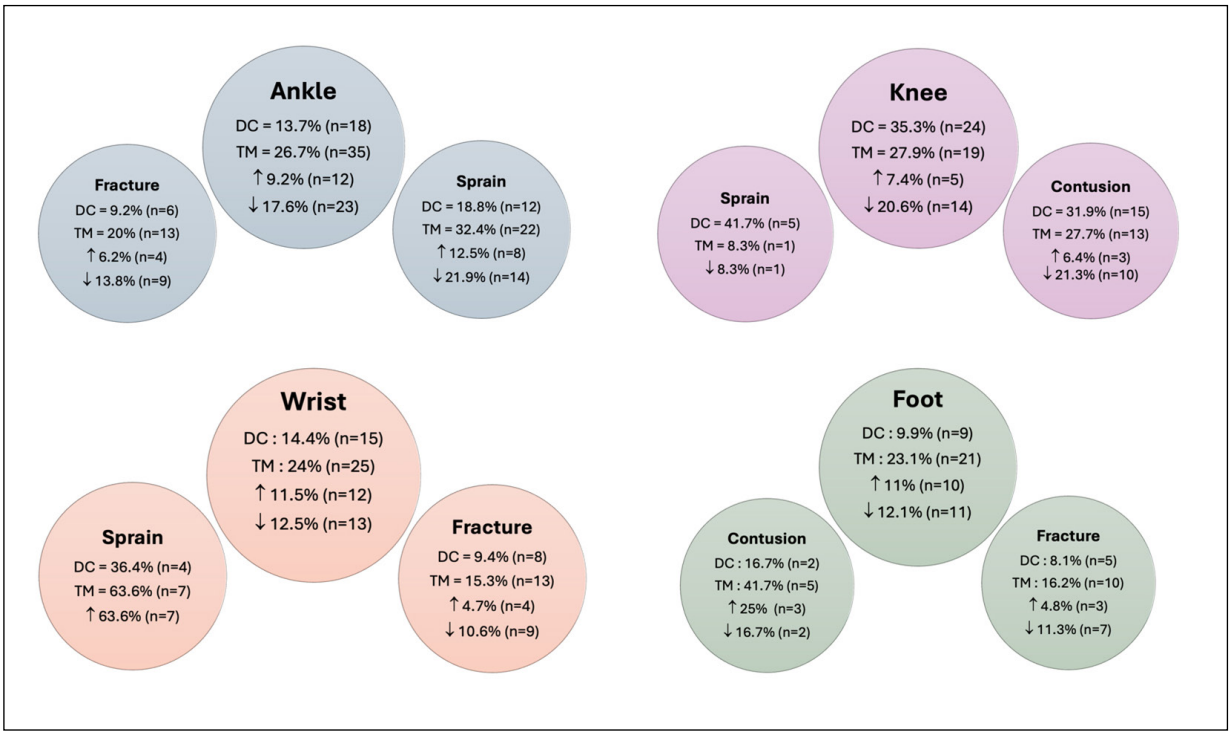


Figure 1. Post-emergency modifications according to anatomical location.
DC, Diagnostic changes; TM, Therapeutic modification; ≠, More intensive care; ¯, Less intensive care.

cases (n=56/127), 28.3% sprains (n=36/127), 22% contusions (n=28/127), and 6% wound injuries, infections, and dislocations (n=7/127).

The most frequently involved anatomical sites were the knee (27.9%, n=19/68), ankle (26.7%, n=35/131), wrist (24%, n=25/104), and foot (23.1%, n=21/91).

Subgroup analysis showed the highest rates of TMs for:

- Wrist sprains: 63.6% (n=7/11)
- Foot contusions: 41.7% (n=5/12)
- Ankle sprains: 32.4% (n=22/64)
- Knee contusions: 27.7% (n=13/47)
- Foot fractures: 16.2% (n=10/62)
- Wrist fractures: 15.3% (n=13/85)
- Ankle fractures: 20% (n=13/65)

Among the 127 patients with TMs, 61.4% (n=78/127) benefited from less intensive treatment and 38.6% (n=49/127) required more intensive care. The treatment was considered less intensive if the cast was changed to an orthosis rather than a splint, or if the duration was reduced. Complete removal of immobilization was also considered a less intensive treatment. Treatment was considered more intensive if the immobilization was longer or if a functional treatment became a cast treatment. Surgical recourse was considered a more intensive care.

TMs leading to less intensive care were most frequently observed for ankle sprains (21.9%, n=14/64), knee contusions (21.3%, n=10/47), foot fractures (11.3%, n=7/62), and wrist fractures (10.6%, n=9/85).

More intensive care was most required for wrist sprains (63.6%, n=7/11) and foot contusions (25%, n=3/12).

Absence of diagnostic changes (DCs) and therapeutic modifications (TMs) (Table II)

Overall, 67.6% (n=370/547) of patients had no DCs, and 76.8% (n=420/547) had no TMs.

Certain subgroups showed particularly low rates of both DCs and TMs. Shoulder dislocations resulted in no TMs and only one DC (6.3%, n=1/16), while shoulder fractures showed DCs in 6.9% (n=2/29) and TMs in 10.3% (n=3/29).

DISCUSSION

Post-emergency visits led to frequent DCs (14.4%) and TMs (23.2%). Among patients with therapeutic modifications, about two-thirds received less intensive treatment, and one-third required more intensive care. These visits were particularly relevant for wrist sprains and foot contusions, which frequently required more intensive care. Conversely, injuries such as shoulder dislocations

and shoulder fractures rarely resulted in DCs or TMs, suggesting limited added value of this visit in those cases. These findings confirm our initial hypothesis that post-emergency follow-up is particularly relevant for selected injury types and anatomical locations.

This study highlights the impact of post-emergency consultations, which lead to a significant increase in clinical decisions and therapeutic modifications. Systematic follow-up is particularly relevant for certain categories of injuries and specific anatomical locations. Diagnostic adjustments may be related to the initial examination, edema, or functional deficits, making clinical assessment more complex in the context of acute trauma[16,17].

The analysis of therapeutic modifications reveals that among patients with TMs, approximately two-thirds received less intensive treatment and one-third required more intensive care. This high proportion underscores the importance of specialized follow-up to optimize clinical outcomes. The impact of post-emergency follow-up varies depending on the type and anatomical location of the injury. Injuries affecting the foot and wrist, particularly in cases of sprains or contusions, frequently require treatment reevaluation, such as initial cast refurbishment or surgical management. Non-surgical fractures, particularly those involving the knee, foot, wrist, and ankle, were mostly managed with conservative treatment. Injuries affecting certain anatomical locations, as well as tendon wounds, dislocations, or complex injuries, did not frequently lead to therapeutic adjustments, likely due to well-established treatment protocols for these types of trauma[11,18,19].

A decision-making algorithm would enable patients to be categorized according to their risk of therapeutic or diagnostic modification, thereby facilitating fluid follow-up with the general practitioner or traumatologist (Figure 2). This algorithm,

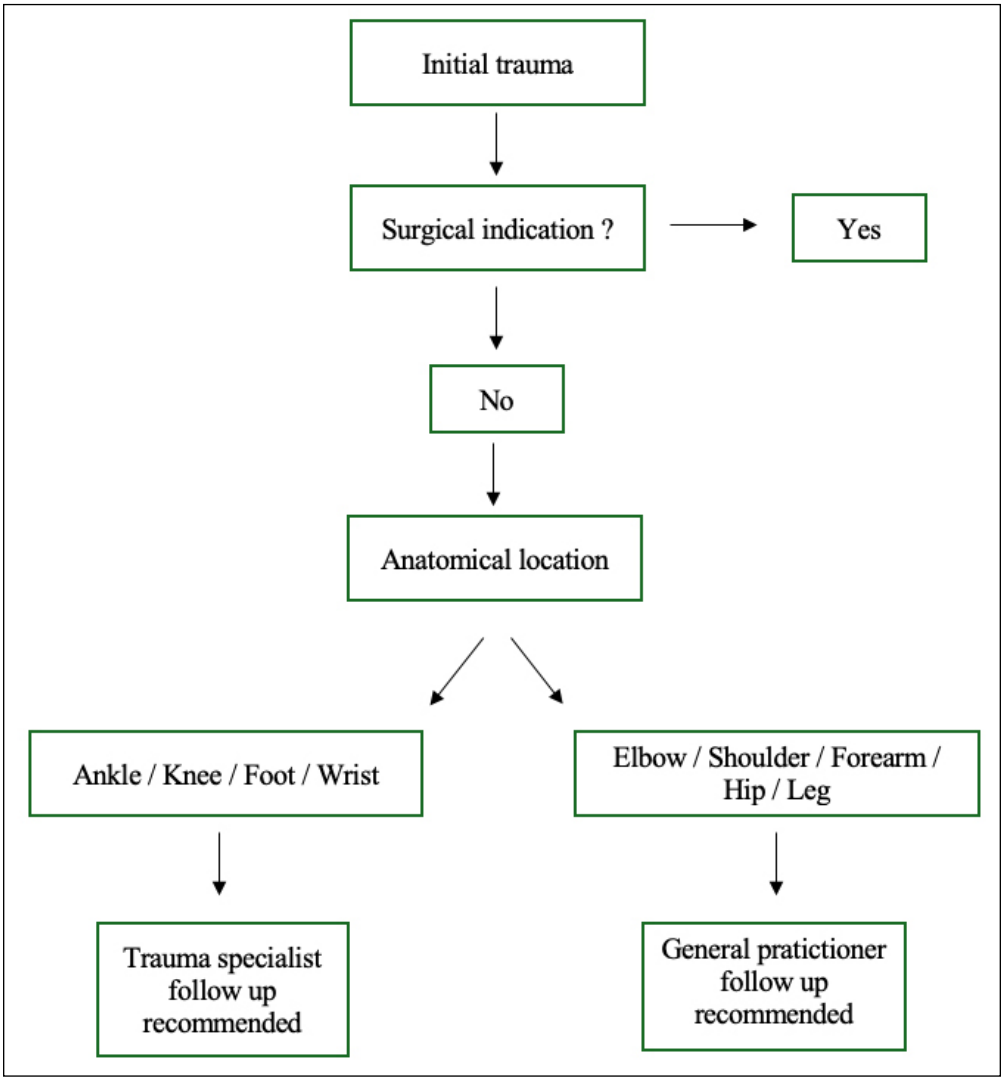


Figure 2. Decision tree of patient follow-up according to trauma.

based on anatomical location, could optimize patients' follow-up by reducing the need for systematic referral to a specialist trauma opinion and the consumption of medical resources[20-22]. Particular attention must be given to the diagnosis of fracture, ankle sprain, knee contusion, foot contusion and wrist sprain. Bollen[23] demonstrated that triage errors in the emergency department can lead to inaccurate diagnoses in up to 30% of cases involving knee ligament injuries, underscoring the need for well-defined care pathways and robust decision-making algorithms. Decision trees can serve as valuable tools for guiding young residents in clinical decision-making. Smith et al[24] found a readmission rate to the emergency department of up to 4.5% despite follow-up. Lunardi et al[25] found that the rate of readmission to the emergency department increased over the six months following the trauma. Dalton et al[26] found no difference in emergency readmission rates between initial clinic and hospital care. These studies did not include an organizational pathway dedicated to trauma follow-up.

A functional post-emergency consultation would reduce the rate of unscheduled emergency consultations. Organizational links between hospitals and outpatient clinics are the best guarantee of appropriate care in terms of time and quality.

The emergency department, and trauma care in particular, is a sector of the healthcare system that is very prone to patient complaints. Reducing diagnostic and therapeutic errors is therefore a major challenge.

This study has limitations. First, patients were only included during the post-emergency visit, introducing a selection bias due to patients who never attended the recommended follow-up. Of the patients who reconvened for the post-emergency visit, 1 in 5 did not attend. In both centers of this study, the triage process for post-emergency visits is well defined, typically including patients without a surgical indication but with injuries severe enough to require a cast or wound care that necessitates clinical and/or radiological follow-up.

Second, the study was conducted at a French university hospital, limiting the generalizability of our findings. Our results are mainly applicable to centers with a similar organizational structure. The Rouen University Hospital is a level 1 trauma center, which could induce a recruitment bias. It is likely that the organization of care in other countries or in private hospitals differs significantly, leading to different patterns of patient flow that could affect recommendations for post-emergency visit algorithms. These centers may still benefit from our findings and adapt them to the specific activity and structure of their emergency departments.

Third, the therapeutic and diagnostic changes are based on the expertise of experienced traumatologists and orthopedic physicians, and the design of this study does not allow the possible errors of these experts to be measured.

From an organizational point of view, there is no rule on follow-up by emergency physicians established at the time of the emergency visit.

CONCLUSIONS

Post-emergency visits led to frequent DCs (14.4%) and TMs (23.2%). Among patients with therapeutic changes, about two-thirds received less intensive treatment, and one-third required more intensive care. These visits were particularly relevant for wrist sprains and foot contusions, which frequently required more intensive care. Injuries such as shoulder dislocations and shoulder fractures rarely resulted in DCs or TMs, suggesting limited added value of this visit in those cases. By improving patient selection, emergency departments could optimize resources and costs by reducing unnecessary consultations while enhancing overall patient outcomes. A decision-making algorithm would help to reduce the rate of unscheduled consultations in emergency departments, while directing patients to the right physician for their care.

Conflict of Interest
The authors declare that they have no conflicts of interest.

Funding
No funding source to be declared.

Ethics Approval
The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Rouen University Hospital (approval date: September 8, 2020; additional administrative review in 2025, protocol E2025-18).

Informed Consent
According to French regulations (Jardé law), patients were informed about the use of their data and had the right to object (non-opposition procedure).

Authors' Contributions
Alexis Laudat: conceptualization, methodology, writing–original draft preparation. Théophile Stoclet: writing, manuscript revision. Nicolas Kloek: manuscript revision. Mathilde Leplomb: data collection. Luc-Marie Joly: manuscript revision. Mehdi Taalba: supervision, manuscript revision. Matthieu Lalevée: methodology, writing.

Data Availability
The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

REFERENCES

1. Hörauf JA, Schindler CR, Mühlenfeld N, Ahlers M, Kortekamp J, Kämmer JE, Neugebauer EAM, Weismann D. Who when why? Traumatological patients in the emergency department of a maximum care provider. Life 2023; 13: 2046-2046.
2. DREES. Les raisons du recours aux urgences selon la tranche d'âge du patient et la zone géographique. Tableau 3. DREES Santé Gouv. Available at: https://data.drees.solidarites-sante.gouv.fr/explore/dataset/507_l-enquete-nationale-sur-les-structures-des-urgences-hospitalieres/table/?sort=tableau [Accessed on March 22, 2025].
3. Krochmal P, Riley TA. Increased health care costs associated with ED overcrowding. Am J Emerg Med 1994; 12: 265-266.
4. Hoot NR, Aronsky D. Systematic review of emergency department crowding: causes effects and solutions. Ann Emerg Med 2008; 52: 126-136.
5. Guly HR. Diagnostic errors in an accident and emergency department. Emerg Med J 2001; 18: 263-269.
6. Wei CJ, Tsai WC, Tiu CM, Wu HT, Chiou HJ, Chang CY. Systematic analysis of missed extremity fractures in emergency radiology. Acta Radiol 2006; 47: 710-717.
7. Di Somma S, Paladino L, Vaughan L, Lalle I, Magrini L, Magnanti M. Overcrowding in emergency department: an international issue. Intern Emerg Med 2015; 10: 171-175.
8. Hallas P, Ellingsen T. Errors in fracture diagnoses in the emergency department: characteristics of patients and diurnal variation. BMC Emerg Med 2006; 6: 4-4.
9. Pinto A, Berritto D, Russo A, Caruso M, Belfiore MP, Bracale R, Iacobellis F, Grassi R. Traumatic fractures in adults: missed diagnosis on plain radiographs in the emergency department. Acta Biomed 2018; 89: 111-123.
10. Richardson DB. Increase in patient mortality at 10 days associated with emergency department overcrowding. Med J Aust 2006; 184: 213-216.
11. Venkatasamy A, Ehlinger M, Bierry G. Acute traumatic knee radiographs: beware of lesions of little expression but of great significance. Diagn Interv Imaging 2014; 95: 551-560.
12. Coleman MM, Medford-Davis LN, Atassi OH, Siler-Fisher A, Reitman CA. Injury type and emergency department management of orthopaedic patients influences follow-up rates. J Bone Joint Surg 2014; 96: 1650-1658.
13. Moonen PJ, Mercelina L, Boer W, Fret T. Diagnostic error in the emergency department: follow up of patients with minor trauma in the outpatient clinic. Scand J Trauma Resusc Emerg Med 2017; 25: 13.
14. Eves TB, Oddy MJ. Do broken toes need follow-up in the fracture clinic? J Foot Ankle Surg 2016; 55: 488-491.
15. Ferguson KB, McGlynn J, Jenkins P, Madeley NJ, Kumar CS, Rymaszewski L. Fifth metatarsal fractures: is routine follow-up necessary? Injury 2015; 46: 1664-1668.
16. DiMaggio CJ, Avraham JB, Lee DC, Frangos SG, Wall SP. The epidemiology of emergency department trauma discharges in the United States. Acad Emerg Med 2017; 24: 1244-1256.
17. Aaland MO, Smith K. Delayed diagnosis in a rural trauma center. Surgery 1996; 120: 774-779.
18. Knutson T, Bothwell J, Durbin R. Evaluation and management of traumatic knee injuries in the emergency department. Emerg Med Clin North Am 2015; 33: 345-362.
19. Simon LV, Matteucci MJ, Tanen DA, Roos JA, Riffenburgh RH. The Pittsburgh decision rule: triage nurse versus physician utilization in the emergency department. J Emerg Med 2006; 31: 247-250.
20. Abou-Hanna J, Kugler NW, Rein L, Szabo A, Carver TW. Back so soon? Characterizing emergency department use after trauma. Am J Surg 2020; 220: 217-221.
21. Ladha KS, Young JH, Ng DK, Efron DT, Haider AH. Factors affecting the likelihood of presentation to the emergency department of trauma patients after discharge. Ann Emerg Med 2011; 58: 431-437.
22. Hansen L, Shaheen A, Crandall M. Outpatient follow-up after traumatic injury: challenges and opportunities. J Emerg Trauma Shock 2014; 7: 256-260.
23. Bollen S. Epidemiology of knee injuries: diagnosis and triage. Br J Sports Med 2000; 34: 227-228.
24. Smith SM, Zhao X, Kenzik K, Michael C, Jenkins K, Sanchez SE. Scheduled follow-up and association with emergency department use and readmission after trauma. J Am Coll Surg 2024; 239: 234-241.
25. Lunardi N, Mehta A, Ezzeddine H, Delmonaco R, Slattery S, Sahai V, Fingerhut A. Unplanned readmission after traumatic injury: a long-term nationwide analysis. J Trauma Acute Care Surg 2019; 87: 188-194.
26. Dalton MK, Fox NM, Porter JM, Hazelton JP. Outpatient follow-up does not prevent emergency department utilization by trauma patients. J Surg Res 2017; 218: 92-98.