Triage with the French Emergency Nurses Classification in Hospital scale: reliability and validity

Pierre Taboulet, Véronique Moreira, Laurent Haas, Rapheal Porcher, Adelia Braganca, Jean-Paul Fontaine and Marie-Cecile Poncet

Introduction **The FRench Emergency Nurses Classification in Hospital scale (FRENCH) is the first French triage tool for patients visiting an emergency department. The FRENCH scale modified in 2006, based on about 100 determinants (complaints, signs, and vital parameters), allows the triage of adult patients according to five increasing levels of complexity/severity. We evaluated FRENCH version 2 (v.2) in our emergency department.**

Methods **Reliability was evaluated on 300 prospectively selected patient records (50% of patients admitted). Three nurse pairs, blinded with respect to the original triage, retrospectively and independently triaged 100 patients. Interrater reliability within the pairs was measured with a weighted κ. Validity was evaluated on all triaged patients ($N=941$) over 14 days by studying the relationships between the original triage category assigned by the triage nurse and resource consumption and the admission rate.**

Results **Interrater reliability was good [$K=0.77$ (95% confidence interval: 0.71–0.82)]. Distribution of the 941 patients included in the validation study (18% of whom were admitted) was as follows [*n* (%)]: 2 (0.2), 33 (4), 258 (27), 451 (48), and 197 (21) for a triage from 1 to 5, respectively. Resource consumption correlated well with case severity as assessed by the triage category ($R=-0.643$, $P<0.0001$). Finally, the area under the receiver operating characteristic curve for prediction of admission as a function of triage was 0.858 (95% confidence interval: 0.831–0.885).**

Conclusion **FRENCH v.2 is a reliable and validated triage tool to predict the complexity/severity of a patient in our emergency department.** ***European Journal of Emergency Medicine*** **16:61–67 © 2009 Wolters Kluwer Health | Lippincott Williams & Wilkins.**

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Emergency Department, St Louis Hospital, (AP-HP), René Diderot University, Paris, France

Correspondence to Dr Pierre Taboulet, MD, Hopital Saint-Louis-Service des Urgences 1, avenue Claude Vellefaux 75 475, Paris cedex 10, France
Tel: +33 142 494 557; e-mail: pierre.taboulet@sls.aphp.fr

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Introduction

It is largely recognized that triage of patients aimed at providing immediate care to the most critical patients is a French concept [1]. Moreover, the word triage is derived from the French word *trier*, to sort, used on the Napoleonic battlefields from 1792 onwards by Baron Dominique Jean Larrey, Head Surgeon of the Imperial Guard. It may, therefore, seem somewhat paradoxical that, in contrast with most other industrialized countries, France does not have a uniform triage scale for use in French hospital emergency departments. The reason is that, for a long time, the prehospital triage performed by SAMU (emergency medical system), staffed by fully qualified physicians, met this need to direct the most serious patients toward the most adapted treatment units bypassing the emergency department unlike many other countries.

With the growing influx of patients to our emergency department in the 1990s, we created a triage tool called FRench Emergency Nurses Classification at Hospital (FRENCH) [2]. This first version of the FRENCH scale (v.1), like the Australian [3], American [4,5], Canadian [6], and British [7] triage scales, defined five levels of increasing priority (from 5, no functional impairment, to 1, critical). The majority of presenting complaints and pathological variations of vital parameters were included in this scale [about 100 items presented on a single page associated with a triage score or an interval between triage categories (1–2, 2–3, etc.)]. The final triage was based on the nurse's assessment according to triage 'modulators' such as intensity of pain, age, or comorbidities. Interindividual reproducibility was found to be good ($\kappa = 0.75$). Furthermore, evaluation of the impact of this triage scale in our department showed that a triage strategy based on the FRENCH scale reduced the waiting time for the most seriously ill patients and increased general patient satisfaction [2].

Several factors led to a revision of the FRENCH scale. First, FRENCH v.1 ranked case severity in an order opposite to the majority of published scales; second

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certain triage determinants were missing or poorly defined, necessitating reevaluation to more effectively meet the dual objective of managing patients according to their complexity/severity and/or according to the intensity of their symptoms. The thought process leading to the creation of FRENCH version 2 (v.2) now being used by a number of metropolitan and overseas French hospitals took place during the first 3 months of 2006, and included almost all the department's physicians and nurses. First, we defined five general triage categories according to complexity/severity of the patient, 5 being the least severe and 1 the most severe. A type of action to be taken by the paramedical and medical coordination was assigned to each category (Table 1). Concepts of complexity (resource consumption) and severity (admission rate) were based on the work of Tanabe *et al.* [4,5] for evaluation of the Emergency Severity Index (ESI).

We then revised the list of presenting complaints, signs, and vital parameters defined in FRENCH v.1 and empirically attributed to each of these parameters (named 'triage determinants' in v.2), a triage category or interval corresponding to our triage objectives (Table 2). To facilitate the nurse's choice of a triage number within an interval, we have introduced into FRENCH v.2, and trained the paramedical team in the use of, five standard questions: (i) chief complaint (what?); (ii) date and time of onset (when?); (iii) type of onset and subsequent course (how?); (iv) intensity of the symptom (how much?); and (v) similar episodes, history, and comorbidities (who?). Each answer to these questions can regulate the severity of a symptom or a sign, hence facilitating assignment of a triage category. Finally, we have introduced the concept of a triage modulator (star or *) in v.2 to accelerate the management of a patient whose triage determinant justifies rapid corrective action without falsifying the complexity/severity of the situation. For example, a patient with intense pain (renal colic or acute urinary retention), agitation, epistaxis, or high fever classified as triage category 4 or 3 had to be managed in less than 20 min when the triage nurse added a star. Of note is that it is the highest determinant in anyone category that gives the category, that is, there is no cumulative effect of the different categories.

We designed this modified version of the FRENCH scale more to be a triage determinant learning tool and an aid to the decision-making process than a rigid set of rules. We reviewed the triage records every morning during 3 months discussing the main differences between our triage objectives and the actual category assigned by the triage nurse and adjusting the list of triage determinants. We finalized v.2 on 15 June 2006. Evaluation of FRENCH v.2 was performed 3 months after its routine implementation.

Methods

The evaluation was conducted in a Paris teaching hospital emergency department visited by about 30 000 adult patients each year. As the incidence of immunodepressed patients is high in the hospital, we did not see any outpatients brought by paramedics at the time of the study. We did, however, see self-referred patients.

Reliability was evaluated by the retrospective analysis of 300 records of patients evaluated in the emergency department by a triage nurse after the 15 September 2006. To obtain a sufficient number of patients with high triage categories (i.e. more severely ill patients), we included equal numbers of admitted and discharged patients. We selected patients as follows: every 5 days, we selected the records of 20 patients who registered after 09 : 00 h. This allowed us to review the records of 10 admitted patients and 10 discharged patients. For admitted patients, we selected the first 10 patients consecutively admitted to the hospital. As we admit approximately one patient in five, this was representative of about an 18 h period. To obtain a similarly representative sample for discharged patients over 18 h, we selected one in every five discharged patients until we reached 10. We excluded patients already triaged by SAMU or police, patients transiting through the emergency department for organizational reasons (preadmits), acute overdosed patients, and children. If a selected patient did not meet

Table 1 FRENCH scale: general description of triage and the actions considered

Triage	Description	Action
1	Immediately life-threatening	Actions focused on support of one or more vital functions Immediate medical and paramedical intervention
2	Marked impairment of a vital organ or imminently life-threatening or functionally disabling traumatic lesion	Actions focused on treatment of the vital function or traumatic lesion Immediate paramedical and medical intervention within 20 min
3	Functional impairment or organic lesions likely to deteriorate within 24 h or complex medical situation justifying the use of several hospital resources	Multiple actions focused on diagnostic evaluation and prognostic evaluation in addition to treatment Medical intervention within 60 min ± followed by paramedical intervention
4	Stable, noncomplex functional impairment or organic lesions, but justifying the urgent use of at least one hospital resource	Consultation with limited diagnostic and/or therapeutic procedures Medical intervention within 120 min ± followed by paramedical intervention
5	No functional impairment or organic lesion justifying the use of hospital resources	Consultation with no diagnostic or therapeutic procedure Medical intervention within 240 min
*	Intense symptom or abnormal vital parameter justifying rapid corrective action	Specific action within 20 min The star can complete a triage 3 or 4

Table 2 FRENCH scale: triage determinants

Cardiology	Triage	Infectious diseases	Triage
Pulse ≥ 180 bpm	1	Meningitis (suspected)	2
Systolic blood pressure: 90–75/<75 mmHg	2/1	Hypothermia <35.5°C/<32°C	3/2
Chest pain (pathological ECG: senior opinion)	2-1	Fever ≥ 40°C*	3
Pulse 120–140/141–180 bpm	3/2	Fever ≥ 39°C and comorbidity or high-risk travel	3
Pulse 50–40/<40 bpm	3/2	Risk of HIV contamination	5-4
HT ≥ 200/220 mmHg and related symptom	3/2	Lymphadenopathy	5-4
Acute limb ischemia*	3-2		
Chest pain (nonpathological ECG: senior opinion)*	3	Respiratory medicine	
Phlebitis (suspected)	3	Major distress (e.g. RR >40/min and tugging)	1
Malaise or loss of consciousness	3	Apnea or RR ≤ 8/min	1
Peripheral edema	4-3	Major hypoxia with O_2 saturation <85%	1
Palpitations	4	Dyspnea and PF <50% predicted (asthma)	2
HT <200/220 mmHg	5	Dyspnea and RR <32/min/32–40/min	3/2
		Hypoxia with O_2 sat 94–91/90–85%	3/2
Dermatology		Hemoptysis, sputum/if clots	3/2
Febrile skin disease, erysipelas (suspected)	4-3	Pneumonia or embolism (suspected)	3
Extensive erythema	4-3	Lateral chest pain*	4-3
Venereal disease	5-4	Dyspnea and PF ≥ 50% (suspected asthma attack)	4-3
Circumscribed cutaneous disease	5	Cough ± sputum	5-4
Endocrine -metabolism		Ophthalmology	
Blood glucose >13.7 mmol/l and blood ketones ≥ 0.5/1.5 mmol/l	3/2	Visual disorder or loss of vision	3-2
Blood glucose >13.7 mmol/l and ketonuria + / ≥ + +	3/2	Ocular foreign body or burn*	4-3
Metabolic abnormality (senior opinion)	3	Inflammation of eye or appendages	5-4
Hypoglycemia without/with altered consciousness*	4/3		
Deterioration of general state and comorbidity	4-3	ENT-dentistry	
Blood glucose >13.7 mmol/l/if >20 mmol/l*	5/4	Disorder or loss of hearing	3-2
Deterioration of general state without comorbidity	5	Epistaxis or bleeding gums	5-4
		Vertigo	5-4
Gastroenterology		Pharyngitis, odynophagia, ENT swelling, rhinitis	5-4
Hematemesis-melena-rectal bleeding	3-2	Toothache	5-4
Bowel obstruction, appendicitis (suspected)	3		
Jaundice	3	Rheumatology	
Ascites	3	Peri (articular) inflammation or arthritis	4-3
Abdominal pain*	4-3	Neuralgia (sciatica...)	5-4
Ingested or rectal foreign body	4-3	Muscle or joint pain	5-4
Constipation or diarrhea	5-4	Neck pain, back pain, or low back pain	5-4
Nausea or vomiting	5-4	Chronic foot problem	5
Dysphagia or hiccoughs	5-4		
Proctology (thrombosis, fissure...)	5-4	Toxicology	
		Overdose (senior opinion)	3
Gynecology		Intoxication, drunkenness (suspected)	5-4
Gynecological hemorrhage	3-2		
Threatened delivery	3-2	Traumatology	
Pelvic pain*	4-3	Violent multiple trauma	2-1
		Violent trauma to face, neck, spine, thorax, abdomen	3-2
Hematology		Violent trauma to limbs/if signs of ischemia	3/2
Anemia: Hb ≤ 8 g/dl without/with related symptom	3/2	Head injury and LOC /if confusion post-LOC	3/2
Thrombocytopenia: ≤ 50 000 without/with symptom	3/2	Trauma to limbs or pelvis without/with disability	5/4
Granulocytopenia: ≤ 1000 without/with fever	3/2	Head injury without LOC	5-4
		Destructive wound, amputation	2-1
Neurology-psychiatry		Superficial wound(s) of neck, thorax, or abdomen/deep	3/2
Coma: GCS ≤ 8	1	Superficial wound(s)/deep	4/3
Coma: GCS=9–12 or GCS ≥ 12 and fever	2	Wound(s): superficial erosion, abrasion	5
Sensory or motor deficit >2 h/<2 h	3/2	Burn >10%, face or hands, or deep	3-2
Recent/ongoing seizures	3/2	Superficial burn <5%/if 5–10%	5/4
Mental confusion, altered consciousness: GCS ≥ 12	3	Abscess or hematoma	4
Headache: unusual and sudden*	3	Subcutaneous foreign body	5-4
Headache: ≥ 24 h or in a context of migraine*	4	Electrocution	5-4
Violent agitation*	4		
Psychiatric disorder, without agitation	5-4	Urology-nephrology	
Anxiety, tetany*	5-4	Acute scrotal pain*/if suspected torsion	3/2
		Acute urinary retention or anuria*	3
Other		Pyelonephritis or renal colic (suspected)*	3
Any problem referred by SAMU	2-1	Lumbar fossa or flank pain*	4-3
Any problem with tube, catheter, plaster problem*	4	Macroscopic hematuria	4-3
Other problem (e.g. renewal of prescription)	5	Trauma to external genitalia, priapism*	4-3
Intense pain (e.g. NS ≥ 8 and obvious suffering)*	*	Dysuria, burning on micturition, discharge	5-4

*Management expected within 20 min (analgesics, antipyretics, hemostasis, insulin, etc.).
/, guides the nurse in the choice of triage category; -, leaves the choice of triage category to the nurse.
ENT, ear, nose, and throat; GCS, Glasgow coma score; HT, hypertension; LOC, loss of consciousness; PF, peak flow; NS, numerical scale; RR, respiratory rate.

the inclusion criteria, we selected the following patients without affecting the subsequent selection calculations. Triage nurses were blinded with respect to the days of evaluation and the method of selection. Tanabe *et al.* [5] used this type of selection for evaluation of ESI v.3. The records of included patients were edited (leaving only the initial information collected by the triage nurse, neither her triage ranking nor further clinical assessments) and evaluated by nursing coinvestigators paired by comparable experience (three pairs). Each pair reviewed 100 records. The coinvestigators of the pair performed their own triage, independent of each other and blind to the original triage established by the triage nurse. The reproducibility of FRENCH v.2 was evaluated by measuring interrater reliability (weighted κ test) within the pairs of coinvestigators.

We evaluated the validity by retrospectively analyzing all consecutive patients who visited the emergency department over a 2-week interval beginning 15 September 2006. We applied the same exclusion criteria as for the first study. As both studies started on the same day, we included 60 patients of the reliability study into the validity study (15, 20, and 25 September). We assessed the validity of FRENCH v.2 by the precision with which it described the relationships between the triage ranking assigned by the triage nurse and the complexity of patients (estimated by hospital resource consumption) on one hand and their severity (estimated by admission rate) on the other. Examples of hospital resources – technical procedures or complementary investigations – are presented in Table 3. Oral medications and antitetanus injections are examples of resources not taken into account. We evaluated the relationship between triage and complexity by Spearman's correlation coefficient.

Table 3 Definition of resource consumption

Nurse procedures	Medical procedures	Complementary investigations
Injection or infusion	Wound closure	Radiograph
ECG	Plaster or splint	Laboratory tests
Oxygen or aerosol	Reduction of dislocation	Specialist opinion
Catheterization	Aspiration or other procedure[a]	Complex imaging
Complex dressing	Resuscitation procedure	Endoscopy

[a]e.g. drainage, packing, or removal of foreign body.

Table 4 Analysis of types of agreement within pairs

Type of agreement	*N* (%)
Concordant	238 (79)
Discordant with a difference of one class	60 (20)
2 and 3	4 (1)
3 and 4	38 (13)
4 and 5	18 (6)
Discordant with a difference of two classes	2 (0.7)
3 and 5	2 (0.7)

To study the relationship between triage and severity, we calculated the area under the receiver operating characteristic (ROC) curve for prediction of hospitalization.

Results

Distribution of the 300 patients analyzed for the reproducibility of FRENCH v.2 in triage categories 1, 2, 3, 4, and 5 was 2, 10, 46, 32, and 9% (50% of admitted patients), respectively. Calculation of interrater reliability in each pair gave a mean κ of 0.69 [95% confidence interval (CI): 0.61–0.75] and a weighted κ of 0.77 (95% CI: 0.71–0.82). Discordant or concordant pairs as a function of the scores established by the triage nurse or by the coinvestigators are presented in Table 4. Log-linear models were used to analyze the quality of the triage scale in terms of differentiation between the various categories (1–5). The differentiation was identical between adjacent categories 1 and 2, and 2 and 3 and greater between the other categories (3 and 4, and 4 and 5) ($P < 0.0001$).

We included 941 patients during the 14 days of the validity study (Table 5). In this sample, the patient distribution according to triage categories 1, 2, 3, 4, and 5 was 0.2, 4, 27, 48, and 21% (18% of hospitalized patients), respectively. Triage categories 1 ($n = 2$) and 2 ($n = 33$) were pooled owing to the small sample sizes. Resource consumption was proportional to severity of the patient as reflected by the triage category (Spearman's correlation coefficient: -0.643, $P < 0.0001$) (Tables 6 and 7). Area under the ROC curve for prediction of admission as a function of triage was 0.858 (95% CI: 0.831–0.885). Finally, the waiting time was inversely proportional to the triage category (Spearman's correlation coefficient: 0.228, $P < 0.0001$).

Table 5 Validity study: patients characteristics ($n = 941$)

Patients	
Age: median (range), years	37 (15–98)
Male sex, *n* (%)	554 (59)
Triage, *n* (%)	
1	2 (0.2)
2	33 (4)
3	258 (27)
4	451 (48)
5	197 (21)
Waiting time: median (IQR), min	35 (15–70)
Technical procedure, *n* (%)	341 (36)
Nursing procedure, *n* (%)	236 (25)
Medical procedure, *n* (%)	37 (4)
Orthopedic procedure, *n* (%)	77 (8)
Resource consumption: median (IQR)	1 (0–2)
Laboratory tests, *n* (%)	267 (28)
Standard radiology, *n* (%)	317 (34)
Specialized imaging, *n* (%)	44 (5)
ECG, *n* (%)	114 (12)
Another specialist opinion, *n* (%)	38 (4)
Hospitalization, *n* (%)	167 (18)

IQR, interquartile range.

Discussion

The FRENCH scale v.2 is a reliable tool, as the reproducibility study on 300 real cases demonstrated a good interrater reliability [8]. The weighted κ obtained in this study ($\kappa = 0.77$, 95% CI: 0.71–0.82) was comparable to those obtained on real cases with other triage scales. For example, the single-center evaluation of the Canadian Triage Acuity Scale based on 50 real cases obtained a weighted κ of 0.80 [9] and evaluation of the English triage scale, the Jones Dependency Tool, based on 38 real patients obtained a weighted κ of 0.75 [10]. Multicentric evaluation of the American triage scale (ESI v.2) based on 486 real cases obtained a weighted κ between 0.69 and 0.87 [11], whereas evaluation of ESI v.3 based on 403 real cases obtained a weighted κ of 0.89 [12]. Finally, evaluation of the 'Soterion Rapid Triage System' (a five-point computerized triage system used in Oklahoma) based on 423 real cases obtained a weighted κ of 0.87 [12]. Similar or better levels of reliability have sometimes been obtained, but based on fictitious scenarios [13–16].

FRENCH v.2 is a precise tool to describe the complexity of a patient, as the validity study based on 941 patients showed a good correlation between resource consumption and triage ranking. Spearman's correlation coefficients obtained in our study ($R = -0.643$) were also comparable to those obtained for other triage scales: −0.54 for ESI v.3 and −0.48 for CTAS on the same sample of 486 patients [17]. ESI v.3 achieved a correlation of −0.683 in 929 patients older than 65 years [18]. Finally, in a descriptive analysis, Tanabe *et al.* [19] demonstrated a good correlation of ESI v.3 between triage and resource consumption. It should be noted that the excellence of ESI v.3 to predict resource consumption is related to the fact that design of this scale was based on this prediction, and that the study by Tanabe *et al.* was performed on a patient sample with a high admission rate (50% of patients were admitted).

Table 6 Validity study: description of patients ($n = 941$)

Triage	Patients *N* (%)	Resource consumption median (Q1–Q3)	Admissions *N* (%)	Waiting time (min) median (Q1–Q3)
1 and 2	35 (4)	4 (3–4)	29 (83)	10 (0–20)
3	258 (27)	2 (1–3)	114 (44)	25 (10–45)
4	451 (48)	1 (0–1)	22 (5)	45 (20–80)
5	197 (21)	0 (0–0)	2 (1)	40 (15–75)

FRENCH v.2 is also a tool that can be used to describe the severity of a patient, as the validity study on 941 patients showed that the area under the ROC curve for prediction of admission as a function of triage was excellent. This area (0.86 95% CI: 0.83–0.89) was comparable to those reported for other triage scales. Evaluation of ESI v.3 in 1087 geriatric patients obtained an area of 0.77 [18], and evaluation of a pediatric triage scale in 744 children obtained an area of 0.82 [20]. Calculation of the area under the curve allows for easier comparisons of two triage scales than the odds ratios used by some authors [21] or admission rates as a function of triage [4,22–24].

Despite the stakes involved in triage, there is neither gold standard to evaluate the validity of the triage scale nor any guidelines [25,26]. Nevertheless, the capacity of a triage scale to predict resource consumption and/or admission has been considered to be a validity standard since evaluation of ESI v.2 by Wuerz *et al.* in 2000 [23], as the resource–admission 'measuring stick' associated with triage clearly describes the complexity/severity of a patient and most studies have subsequently used this parameter as a validity criterion [4,18,22,23,27–29]. However, resource consumption is not always defined homogeneously and local practices and/or constraints probably have a considerable impact on prescription or admission decisions. Emergency department triage nurses never use the triage scale following strictly the rules, but as a tool, and many factors can influence their triage decisions. Some of these factors are related to their own experience or personality, whereas others are related to the patients (such as the way the patient voices their complaint, age, sex, appearance, or general behavior), and finally other factors are related to the emergency department structure (such as workload and the team's practices) [30]. Consequently, evaluation of a triage scale based on real cases is equivalent to evaluating the way in which the nursing team performs triage without being able to independently evaluate the tool *per se*.

The implicit objective of a triage scale is to obtain a reduction in morbidity and mortality [31], but this reduction has never been measured in any contemporary evaluations. Similarly, improvement of patient and/or medical team satisfaction is no longer a primary objective as it once was [2] and correlations between triage and

Table 7 Validity study: description of resource consumption as a function of triage ($n = 941$)

Triage	Nursing procedure % × 100	Medical procedure % × 100	Sum of procedures (a)	Laboratory tests % × 100	Radiographs % × 100	Specialist opinion % × 100	ECG % × 100	Complex imaging % × 100	Sum of complementary examinations (b)	Resource consumption (a + b)/100
1	100	0	=100	100	100	100	50	0	=350	4.5
2	94	0	=94	91	76	58	52	6	=283	3.8
3	51	6	=57	62	49	38	24	12	=185	2.4
4	15	21	=36	16	30	10	7	2	=65	1.0
5	3	3	=06	2	14	2	1	1	=20	0.3

length of stay in the emergency department, length of hospital stay, or mortality are often nonexistent [4,17], and are less and less measured because they depend on so many parameters unrelated to triage. For example, triage 1 or 2 patients do not always have the longest stays in the emergency department, as they present major problems, and the urgent need for treatment rapidly leads to appropriate admission. Triage 3 patients often have the longest stay because of the diagnostic and therapeutic complexity of this category [2,19].

Owing to the difficulty in demonstrating an improvement in morbidity and mortality, the objective of medical teams is to prioritize patients requiring immediate or long-term management to reduce their symptoms and their stay in the emergency department, and to improve the fluidity of the system [23,29]. Consequently, FRENCH v.2 is a useful tool, as illustrated by the inverse relationship between waiting time and the patient's complexity/severity. In our study, triage 1, 2, and 3 patients were managed in accordance with our objectives, that is, with waiting times less than 5, 20, and 60 min, respectively. It may seem surprising that triage 4 and 5 patients had similar waiting times, but this can be explained by the fact that triage 4 patients tended to be managed in the traumatology unit, a unit that is more accessible in our emergency department.

It should also be noted that triage 5 patients, similar to patients consulting a general practitioner, represented only one-fifth of all patients triaged. This small proportion of triage category 5 has been frequently reported [21,24] and, as observed and discussed by other authors [19], should help to dissipate the myth that 'emergency departments are full of nonurgent cases that shouldn't be there'.

The present study has certain limitations. A truly randomized choice of cases in the reliability study would have ensured a better patient mix. However, we used a previously published method to ensure sufficient recruitment of serious patients [19]. Nevertheless, the reliability and validity studies comprised a small number of triage 1 patients (seven cases and two cases, respectively) owing to the fact that triage 1 patients are generally triaged by SAMU doctors and, therefore, cannot be included in a study evaluating nurse triage. The percentage of triage 1 patients in an emergency department is generally less than 1% [23,24] and it is, therefore, difficult to include about 20 triage 1 patients without conducting an extremely extensive study. Moreover, the number of triage 1 patients in the validation study of ESI v.3 (1% of 400, i.e. four) was similar to the number of patients included in our reliability study (2.5% of 300, i.e. seven). Retrospective evaluation of a triage scale is also dependent on the quality of recording of triage determinants. Any evaluation of reproducibility based on real cases or scenarios is, therefore, influenced by the quality of information available for this evaluation. Finally, this study was performed in an urban teaching hospital with less than 100 patients per day and a fairly different recruitment from that of a general community hospital. Furthermore, children were not included as they represent a very small proportion of our recruitment and the medical situations and vital parameters associated with emergencies in children are not the same as in adults, requiring a specific triage scale. The results, therefore, cannot be generalized to other structures with different recruitments without preliminary validation.

In conclusion, the results of this study suggest that FRENCH v.2 is a reliable and precise emergency department triage tool tailored to the French healthcare system to predict the complexity/severity of adult patients. We believe that the tools added to version 2, such as triage determinants, standard questions, and the triage modulator (star), improve the reproducibility and precision of triage. However, the FRENCH scale needs to be further validated in other emergency department structures before generalizing its use in adults.

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