

EC EMERGENCY MEDICINE AND CRITICAL CARE Research Article

Triage Nurse - Activity Assessment, Errors Solutions

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Abstract

Introduction: The National Triage Protocol has been implemented in Romania since 2009. After several conversations and comparisons with other countries where emergency triage stategies exist, it has been concluded [1] that the best person who can carry out the emergency triage is the triage nurse, who has the appropriate training and competencies.

Goals and Objectives: This article aims to synthesize the activity of the Emergency Unit nurses in Cluj-Napoca, 4 years after the implementation of the triage protocol.

This article aims to:

- Assess triage nurses' activity.
- Observe potential errors due to misidentifying cases that are urgent, critical and require resusciation.
- Suggest solutions for improving the triage activity and, implicitely, the emergency treatment received by the patient.

Material and Method: The study is observational, prospective, conducted between february - april 2012 in the two units abovementioned. There are two lots of nurses, noted as Adults ER - 14 nurses and Pedriatic ER - 11 nurses.

The study was conducted by applying a questionnaire and evaluating a sample of observation sheets drawn up by the triage nurses. The data was centralized in Excel tables, graphically represented in graph types "pie, bar, column" and the statistical value of the test was evaluated by the Fisher test method - two tailed.

Results: During the period february - april 2012, 1574 observation sheets were evaluated in Adults ER and 3700 observation sheets in Pediatric ER, out of which 1025 sheets (65,03%) respectively 783 sheets (21,16%) were graded in levels: urgent, critical and resuscitation. The main results show that errors in emergency show up mainly due to several subjective factors (overcrowded space, lack of personnel, lack of consultation space, fatigue among the triage nurses).

I wished to research whether the age of the patients, pathological antecedents and the experience of the nurses have a certain influence over the appearance of errors in triage. It was observed that, in the case of younger people, predesposal to the risk of error in grading the triage level is higher than in the case of older people, mainly by underevaluating the triage level (p = 0.044); error apparition in triage is not influenced by the experience of the nurse or by pathological history.

After evaluating the activity, I offered recommendations for improvement: introducing as parametre in triage, along with the vital functions of the pain scale with mentioning its evaluation in writing, assuring the comfort and fit conditions in the workplace by another colleague (nurse or resident doctor) in high-intensity moments, as well as supplementing consultation space when waiting rooms are overcrowded. Part of my recommendation were also continuous professional trainings, by organizing periodic triage training courses for mixed teams including case discutions and simulations, informing people about triage protocol and its use and adding a psychologist consultant to the team, in order to assure effective communication between the medical personnel and the patient's relatives.

Conclusion: For well-performed activity in the ER, the triage nurse must possess solid knowledge about the triage protocol, must have sufficient consultation space, must be in psychological and physical comfort and, last but not least, must be encouraged by the entire team. All these lead to less waiting time in triage, faster access to emergency measures needed by the patients, and an increasing patient satisfaction.

Keywords: Triage Nurse; Triage Protocol; Errors; Solutions

Introduction

A stressful environment, as well as varied and critical cases can lead, in time, to staff exhaustion and the tendency to underestimate a patient's condition which does not "seem critical", or on the contrary to developing an objective patient assessment capacity. Special work conditions in ER require the triage of patients, which in turn requires development of the ability to objectify and to discern in the identification of critical cases of the least critical ones or those which may aggravate in a short time [4].

The National Triage Protocol was implemented in Romania in 2009. After discussions during national conferences between the members of Specialty in Emergency Medicine, and after comparing the situation to other states in which the emergency triage is done, the conclusion reached was that the most fit person to triage patients is the triage nurse which has the necessary training and specific skills for this [1-19].

Aims of this Study:

- 1. Evaluation of triage nurses from a medical practice point of view.
- 2. Observation of the errors that can appear by failure to recognize urgent, critical and resuscitation cases.
- 3. Suggestion of solutions to improve triage activity and implicitly the emergency measures needed by patients.

Materials and Methods

The study proposes an evaluation of the triage nurses' activity in two emergency units, the Emergency County Clinical Hospital for Adults Cluj-Napoca (Adults ER) and the Emergency Clinical Hospital for Children Cluj-Napoca (Pediatric ER), with the purpose of evaluating the possible errors of medical practice of the nurse that may appear in triage, and based on the practical records, offering solutions for improving the activity of the triage nurses.

The study is observational, prospective, conducted between february - april 2012 in the two units abovementioned. There are two lots of nurses, noted as ER I - 14 nurses and Pedriatic ER - 11 nurses.

The study was conducted by applying a questionnaire and evaluating a sample of observation sheets drawn up by the triage nurses.

Criteria for inclusion in the study:

- Nurses who perform triage and who have completed the questionnaire and informed consent
- The observation sheets that were signed by the selected triage nurses and which were classified as ESI were taken into account.

Criteria for exclusion out of the study:

- Nurses who work in those units but do not perform triage
- · Nurses who perform triage but did not wish to complete the questionnaire and informed consent
- The observation sheets that were not signed or were not included in the ESI were excluded.

The data was centralized in tables in Excel. Descriptive and inferential statistical analysis (Fisher test - two tailed) was performed using GraphPad software. The statistical results were presented in the form of "pie, bar, column" graphs, being considered statistically significant at values of p < 0.05.

At Pediatric ER, the observation sheets were not checked but marked with colored bullets, which is why the number of errors can be increased due to the omission of the corresponding bullet placement.

Between February and April 2012, 1574 observation sheets were evaluated at Adults ER and 3700 observation sheets at Pediatric ER, of which 1025 sheets (65.03%) and 783 sheets (21.16%) respectively were classified as urgent, critical and resuscitation.

In order to be able to report the activity of the nurses to the patients' state, I established the profile of the patients who came in the two medical units. Children, geriatric patients, are constituted in disadvantaged populations.

The profile of the patients who came to the triage.

	Adults ER	Pediatric ER	
Average age	54,89 ± 28,27 (95% CI 53.1593 to 56.6207)	5,95 ± 6,04 (95% CI 5.5276 to 6.3724)	
Males	535 (52,2%) 462 (59%)		
Females	490 (47,8%)	321 (41%)	
Patients with preexistent pathology	391 (38,1%)	13 (1,6%)	

Table

It was observed in the group from Adults ER that the average age of the patients was 54.89 years, mainly males (52.2%), and 38.1% of the patients had a personal history of pathology (cardiac, neurological, respiratory, other).

Almost half of the history of patients in Adults ER is cardiac and in many cases accompanied by neurological, respiratory or other pathologies. The presence of the pathologies associated with presentation in the ER provides the triage nurse with information about the chronic manifestations (medical acts) with the possibility of exacerbation in the context of the acute injury for which the patients from the Adults ER group were presented. In these situations, the clinical context can be complex, the triage can be influenced in the sense of "overrun" most frequently.

In the group from Pediatric ER the average age of the patients was 5.95 years, the males predominating with a percentage of 59%, and the pathological antecedents were insignificant (4%). The 29 cases had predominantly neurological (8 - predominantly epilepsy and spastic tetraparesis), respiratory (7 - predominantly asthma, etc.), cardiac (1-mitral valve prolapse) and 8 other pathologies. The presentation of children with a pathological history was generally due to their complications (seizures, asthma attack, palpitations, etc).

The study quantified pain as a stated symptom (headache, chest pain, abdominal pain, etc). It is observed that a large part of the adult patients and a part of the pediatric patients have manifested pain. It is important to place it on a pain scale because it is one of the parameters that can increase or decrease the level of triage.

Descriptive analysis of the triage assistants studied

The profile of the nurses performing the triage in the two medical units was analyzed. It was observed that the emergency seniority of most nurses exceeds 5 years (Adults ER average 5.98 years with a standard deviation of 1.63 years; Pediatrics ER average of 8.08 years with a standard deviation of 3.55 years), and triage nurses have an ER experience of 3.72 years \pm 1.65 years at Adults ER and 3.59 years \pm 2.7 years at Pediatrics ER.

From the point of view of the gender of the triage nurses, at Adults ER the female predominates with a percentage of 92%, and at Pediatric ER the distribution of the nurses is approximatively equal.

In order to perform an efficient triage, nurses must possess certain qualities. The analysis of the self-perception of these qualities by the triage nurses taken in the study highlighted particularities related to the profile of the emergency department: patience and intuition at Pediatric ER, respectively patience and experience at Adults ER.

The nurses participating in the study considered that the main characteristics needed in the triage are: patience, experience, medical knowledge, intuition.

Pediatric ER		Adults ER	
Characteristics	Nr. Ans.	Characteristics	Nr. Ans.
Intuition	5	Intuition	3
Patience	7	Patience	5
Precision	2	Calmness	4
Experience	7	Experience	6
Observational affinity	1	Observationl affinity	2
Comunication	4	Stress resistance	3
Medical knowledge	5	Medical knowledge	4
Diplomacy	2	Tact	2

Table 1: Analysis of the perception of the qualities of the triage nurse.

They have defined many strengths that they think they have, the most frequent being at ER I professionalism, calmness, decision-making power, medical knowledge and patience.

At Pediatric ER the strengths identified were: patience, experience, effective communication and intuition.

From the point of view of the qualities perceived as deficient, which the nurses from the studied groups have regarding triage, it turns out that at Adults ER 50% of the nurses have no issues, 35.71% do not have enough patience, the rest blaming inattention and subjectivism.

In Pediatric ER appear as weaknesses identified by self-evaluation in triage: lack of patience (36.36%), lack of collaboration with the rest of the team, fatigue and inattention (27.27%); 18% are undecided and the remaining 18% have no issues.

From the point of view of improvement regarding triage, the opinions were divided, 15 nurses considering that the activity and the skills can be continuously improved.

It was further analyzed the need for continuous improvement of the triage. Most of the nurses consider that they would need regular courses (32%), together with the doctors, to update on the notions of triage, have discussions or simulations of multiple major emergencies. Some believe that it could help them to better collaborate with the medical staff, with the doctors and of course in the education of the patients' relatives, respectively of the caregivers. There are also colleagues (20%) who believe that there is nothing that could improve their activity.

The perception of triage nurses regarding the possibility of optimizing their activity in triage was also analyzed. Some of them (20%) believe that, due to overcrowding, they would need more room, more space for consultations. They would like better communication, first with the doctors on the shift, and then with the patients and their caregivers. Furthermore, they see as beneficial a psychological counselor who will provide them with an interface with the caregivers and who can relieve them of their worries in critical situations that may occur. Last but not least, they feel the need to be assisted during busy periods in triage by a colleague (nurse, resident, doctor). 12% of the nurses consider that they do not need anything in addition to the current conditions of the triage.

Descriptive analysis of triage errors

The role of the triage nurse is not just to prepare a patient sheet, by documenting the triage parameters. The triage itself is a complex cognitive process in which the nurse must concentrate, analyze the information he/she receives, become aware of the complications that may arise during the wait for triage, and provide the resources needed to solve the patient's problems. Thus, we redevided the patients

from the sample of sheets in parallel with the nurses, according to the reasons for presentation, the vital functions at triage, the general condition of the patient and the resources used to solve the case.

From the point of view of precision of the patients' evaluation in triage, the results were the following:

Batch of triage nurses from Adults ER

- Most cases were correctly classified, 82% in the levels of urgent, critical or resuscitation triage.
- The condition of 10% of patients was underestimated.
- 6% of patients were over-evaluated.
- 2% of patients left it appears as a sorting error because they were classified as level 3 urgent, their maximum waiting time should have been 30 minutes, with a reassessment at 15 minutes. The error is most likely due to lack of reassessment and waiting time of more than 30 minutes (average waiting time for departed patients being> 2 hours).

Batch of triage nurses from Pediatric ER

- Most patients were correctly classified (68%).
- 30% were underevaluated, probably due to the framing (by omitting the application of colored bullets).
- 2% of cases were overevaluated.
- There are no leaving situations for triage because the way of performing triage is different from the one in ER I.

Wanting to find out what could be the cause of the errors in triage, I further studied the relationship between the occurrence of errors and the age of the patients, whether those with personal pathological antecedents (PPA) are more likely to be cataloged incorrectly or not and whether the seniority of the nurses in the ER or the seniority in the triage activity influences the occurrence of errors.

Inferential statistical analysis using the Fisher test (p = 0.044) revealed a statistically weak difference in the error of triage at the age of under 60 years. This shows that in young people the risk of classification errors at a triage level is higher than in the case of the elderly.

The distribution of errors according to the personal pathological background does not require inferential statistical analysis because the ratio between variables is > 0.9; it is thus observed that the wrong classification of cases is not related to the existence of PPA.

The evaluation of the distribution of classification errors in the degree of triage according to the seniority of the assistants in Adults ER, evaluated by using the Fischer test, revealed the lack of statistical significance (p = 0.36), thus observing that the occurrence of errors is not influenced by the experience of the nurse in the emergency service.

The inferential analysis using the Fischer test, of the impact of the triage nurse's experience on the errors of assignment of the triage degree, highlighted the lack of statistical significance, (p = 0.55) highlighting that the occurrence of the errors is not affected by the triage experience of the nurses. In pediatric emergency, the situation is similar, so that the appearance of triage errors does not depend on the experience in emergency (p = 1) nor on the experience in triage of the nurses (p = 0.75).

Analysis of the practical records that can be constituted in solutions for optimizing the quality of triage

Triage work involves a great deal of mental wear and tear, extremely high concentration power, good communication skills and stress. The moment when their limits are exceeded is the trigger point of fatigue, subjectivism, irascibility and the main reason for sorting errors.

Summarizing the answers received after the study, it is outlined as solutions for optimizing the activity in the following triage:

1. The introduction as a parameter in triage, together with the vital functions of the pain scale, with a written mention of its evaluation. Although the study shows a rather high frequency of pain as the main symptom at presentation, none of the evaluated sheets indicate its intensity, neither in Adults ER nor in Pediatric ER.

- Ensuring the comfort and good work conditions for the triage nurse by providing him/her with support from another colleague (nurse/resident doctor) during high-intensity times, as well as supplementing the space for consultation during overcrowding periods.
- 3. Continuous professional training, by organizing triage courses (periodically) in the form of case discussions, simulations, in mixed teams (nurses, resident doctors, specialist doctors, etc.) to clarify certain difficult triage issues.
- 4. Informing, raising awareness at the population level regarding the triage protocol and its use (TV shows, flyers in waiting rooms, on sites dedicated to parents or with a medical profile, etc).
- 5. Adding to the care team a psychological counselor to provide the interface between the medical staff and the caregivers, to offer counseling in case of critical situations both to the caregivers or to the patients and to the personnel of the unit.

All these recommendations are aimed at reducing the risk of errors in triage, staff exhaustion (insufficient staff), the reduction of waiting time in triage and implicitly better coordination of emergency situations and increasing patient satisfaction.

Discussions

The purpose of triage is to evaluate and classify the clinical priorities of patients presenting to the emergency department. In an ideal emergency service, all patients should be diagnosed and treated at the time of emergency presentation. Although patient reception conditions and available resources are in constant improvement, this is impossible, and the existence of a tool such as the triage protocol optimizes patient flow and their safety.

In a qualitative study evaluating a triage protocol by nurses from an emergency service in Denmark, published in the Danish Medical Bulletin in 2011 [20], the triage eased patient prioritization, reduced the fear of the healthcare providers to not observe important signs at the initial assessment and changed their thinking, from the assumption of a diagnosis to a rapid evaluation, which is based on both the signs/symptoms of the patients and on the measurement of vital functions. At the same time, it has been proven that the application of the protocol has improved communication. The triage protocol establishes the maximum patient waiting time before being seen by the doctor, which reduces the amount of discussion between the doctor and the nurse about which patient will be seen first, and facilitates the distribution of patients to the appropriate area of the emergency department.

Triage is a complex process, so for it to be effective, the nurses who perform it must be well trained, must know the protocol in depth and must be able to correlate its levels with the clinical evaluation and the patient's vital signs in a very short time (the average sorting time should not exceed 3 - 5 minutes). To be able to achieve this, they must have certain qualities such as professionalism, calmness, decision-making power, medical knowledge, patience, experience, effective communication and intuition, aspects also identified by the triage nurses who were part of the study.

Goransson., et al. in a study published in the Journal of Advance Nursing [2] notes that, in order to perform the triage, nurses use multiple thinking strategies, from searching for information and generating hypotheses to making decisions and allocating the appropriate triage level.

The decision-making process is a difficult one, influenced by different factors. There are multiple studies that focus on determining these factors. Cone (2000) [21] notes that the decision-making process differs depending on the seniority of emergency nurses. In contrast, a number of studies (Ferrario, 2001 [22], Jelinek and Little 1996 [23], Considine., et al. 2001 [24], Goransson., et al. 2006 [25]), show that the level of experience of the nurses from triage is not a factor that explains the variation in triage acuity, a result that is consistent with that obtained in this study.

One factor that can influence decision making is time, information must be obtained and analyzed quickly, so that the decision can be made in the shortest time. To obtain data, the nurse observes the patient, asks questions and monitors vital functions [26].

Other factors reported that would influence triage and the possible occurrence of errors are the large influx of patients, fear of overlooking some important details, the personal capacity of the triage nurse and the working environment [27,28].

Errors frequently occur in a busy emergency service. Frodice [11] states that errors occur in almost every aspect of the emergency: diagnosis, administrative procedures (take over/discharge, language difficulties, incorrect registration, etc.), pharmacotherapy (improper indications, incorrect administration, incorrect medication retention, etc.), monitoring, communication (with relatives, interpersonal, interdepartmental, etc.), poor maintenance of the equipment. The patients most prone to errors, according to the same study, are people under the age of 65, which was also observed in this study.

In the article "Strategies used by nurses to recover medical errors in an academic emergency department setting", Henneman EA., et al. [12] notes that there are several factors that can lead to errors: the need to intervene immediately, without obtaining a complete history, overcrowding, the need for a person to perform multiple tasks and the inexperience of staff. The strategies used by the nurses to identify and eliminate errors focus on 5 directions: supervision (the triage nurse must know the situation of all patients in the ward as well as the staff and available places), anticipation (awareness of potential problems), verification (indications, medication, to the less trained staff), to have an overview of the situation, to be aware of the moment when the error occurs, to interrupt and correct.

Nurses' experience seems to play an important role in their ability to correct errors. The competence, the confidence, the capacity of supervision, facilitate the identification, interruption and correction of errors. In addition, a sound scientific basis, good critical thinking and adherence to the basic principles of patient safety are critical in reducing errors [12].

It has been more than 10 years since the establishment of emergency units at national level. During this time, the number of patients presenting in an emergency unit increases from year to year, and the waiting time in an emergency unit increases, thus delaying access to the necessary treatment. There are multiple factors that overwhelm the unit, including: increased triage, denoting outpatient and non-emergency consultations (grade 4, 5), availability of consultation space/beds, delay of paraclinic results, etc., not least that the emergency unit is used as first contact for primary medicine. In addition, the pathology for which patients present is increasingly complex due to living conditions.

In the current social context, the migration of personnel to other specialties, the blocking of positions and the improper remuneration lead to the over-saturation, exhaustion and permanent dissatisfaction of those remaining in the state health system. There is already the mentality "Why should I do it, why should I get involved? I'm not paid for it".

Thus, a palpable sense of carelessness emerges, the feeling of empathy is lost, causing patients a state of uncertainty, anguish, irritation to the extent of conflict.

The paper aims to evaluate the current situation of triage nurses, the first line of emergency, those who, most of the time, are responsible for the subsequent evolution of the situation, to identify the main problems that may arise and to offer solutions for improvement of the activity in triage thus increasing the level of satisfaction of both staff and patients.

Conclusion

- 1. The qualities identified by the triage nurses to perform the activity optimally were professionalism, patience, calm, intuition.
- 2. Seniority in triage and the existence of the personal pathological background did not statistically significantly influence the incidence of the triage errors
- 3. The age of the adult patients under the age of 60 was found to not have influence over the incidence of the correct classification error in the degree of triage.

- 4. Summarizing the responses received from the study, a series of recommendations are outlined that are designed to reduce the risk of errors in triage, staff wear (insufficient), decrease waiting times in triage and implicitly better coordination of emergency situations and satisfaction growth in the case of the patient:
 - a. The introduction as a parameter in triage, together with the vital functions of the pain scale, with a written mention of its evaluation.
 - b. Ensuring comfort and good working conditions for the triage nurse by offering support by another colleague (nurse/resident doctor) when in need.
 - c. Continuous professional training to clarify certain difficult triage issues.
 - d. Informing and raising awareness among the population regarding the triage protocol and its use.
 - e. Adding to the team a psychological counselor to provide the interface between the medical staff and the patient's relatives, to offer counseling in the case of critical situations both to the caregivers or to the patients and to the personnel of the unit.

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