

Poster Presentations—Triage

(K107) Process Review using Lean Methodology at the Department of Emergency Medicine: Triage before Registration

Gopalan Pokkan

Singapore General Hospital, Singapore, Singapore

Introduction: A multi-disciplinary team was formed to review the Department of Emergency Medicine process in Singapore.

Methods: The team set the current Department of Emergency Medicine performance as the baseline, and after analysis, met with management and agreed to work toward three main objectives: (1) reducing patient waiting time; (2) improving the staffing and workload; and (3) improving key patient concerns by reducing the number of steps in the process and increasing communication. A patient and information flow analysis chart was mapped to scrutinize the entire process and to identify opportunities for improvement. Triage before registration was identified as one of the key initiatives. This eliminates the need to register and wait before the first point of clinical contact (triage). Visits were made to other hospitals to gain fresh insights and current literature was studied to learn more about worldwide trends and improvements. Weekly meetings were held to craft the implementation plan. Presentations were made to the Department of Emergency Medicine staff and management to get feedback and buy-in.

Results: Triage before registration would reduce the waiting time by approximately seven minutes for each patient (with potential for further savings with the streamlining of the triage process). Resuscitation and critical care patients who require more expeditious treatment also will be identified earlier, leading to a better clinical outcome. Triage before registration also results in patients that are seen earlier by a staff nurse who can order tests and treatment as the patient waits for consultation. The empowerment of nurses to initiate more tests and treatment before consultation will improve patient experience and reduce downstream delays. The Patient Care Assistant at the test/treatment station will reduce the workload of the triage nurse conducting additional tests and speed up the triage process. Patient flow is streamlined and congestion at the waiting area is reduced.

Conclusions: Triage before registration significantly reduces overall waiting time and improves patient experience.

Keywords: department of emergency medicine; emergency health; patient flow; triage

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(K108) Survey of Education and Experience in Triage Nursing

Amir Mirbaghi;¹ Hamed Sarani;¹ Asghar Golafshani;² Hassan Sharifi;³ Maryam Nesari;¹ Masood Roudbari⁴

1. Zahedan University of Medical Sciences, Iranshahr, Iran
2. Amir-alam Hospitals, Tehran University of Medical Sciences, Tehran, Iran
3. Mashad University of Medical Sciences, Mashad, Iran
4. Zahedan University of Medical Sciences, Zahedan, Iran

Background: The role of education and experience among triage nurses has been studied. The extent to which nurses must be educated or how much experience is needed to perform safe and secure triage is uncertain.

Objective: The objective of this study was to describe any relationships between nurses' triage decisions and the type of education and amount of experience received.

Methods: Ten paper-based patient scenarios were distributed to triage nurses in a multi-center survey. The reliability of the questionnaire was 0.87 using Cronbach's alpha. Content validity was based on the CTAS.

Results: A total of 47 nurses from four emergency departments participated. Two centers scored significantly higher than the other two centers. Overall agreement for all nurses was almost perfect $r = 0.85$, and for each nurse alone was slight $r = 0.11$. Nurses with ≥ 2 years of experience scored significantly higher compared with nurses with < 2 years of experience. Nurses became familiar with triage via different methods, such as: (1) workshops (48.9%); (2) through colleagues (19.1%); (3) in publications (6.4%); or (4) courses taken for credit (4.3%). A total of 8.5% of the nurses had no formal education. No educational method was significantly more effective than other methods.

Conclusions: At least two years of experience working in an emergency department is recommended for nurses to be eligible to perform triage consistently. Formal training is recommended to enhance triage category allocation.

Keywords: competency; education; experience; nursing; training; triage

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(K109) Assessment of Knowledge of Hospital Triage among Nurses in the Emergency Department of Zahedan University Hospitals

Amir Mirbaghi;¹ Hassan Sharifi;² Masood Roudbari;³ Mitra Kakhki;³ Fatemeh Elahidoost;³ Fatemeh Sancholi;³ Maryam Kamrani;³ Samaneh Basavand³

1. Zahedan University of Medical Sciences, Iranshahr, Iran
2. Mashad University of Medical Sciences, Mashad, Iran
3. Zahedan University of Medical Sciences, Zahedan, Iran

Background: Triage in emergency departments is performed by nurses. In recent years, hospital triage has developed in Iran, and few studies have addressed nurses' competency in triage.

Objective: The objective of this study was to assess the knowledge of nurses about triage in hospitals of Sistan-vabalouchestan state in Iran.

Methods: A survey was conducted among nurses in emergency departments ($n = 10$). The questionnaire was com-

posed of factual knowledge questions about triage ($n = 15$) and triage decision-making questions ($n = 10$). Seventy nurses working in hospitals in Sistan-va-Balouchestan state participated. The questionnaire reliability was 0.60 using the test-re-test method. Content validity was considered based on Canadian Triage and Acuity Scale.

Results: The response rate was 68% (70/102). Nurses proved to be unfamiliar with triage. Only 28% of their responses were correct. Only three emergency departments have specified special nurses to perform triage. Inter-rater agreement between nurses for all was $r = 0.56$ and for each nurse was $r = 0.12$.

Conclusions: Emergency departments were not committed to a valid, reliable triage scale. Specialized education about hospital triage with a new approach is recommended. Further research on emergency department triage scales, standards, and guidelines is recommended.

Keywords: assessment; competency; education; emergency department; Iran; knowledge; nurse; training; triage

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(K110) Effects of Triage on Waiting Time for Health Services and Patient Satisfaction in an Iranian Emergency Department

Hamid Reza Khankeh; Mohammad A. Hosseini; Mohsen Pazoki; Farah Azizi; Mehdi Rahgozar

University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Establishing a triage process can improve the patient flow, and thus, patient satisfaction in the emergency department. This study was carried out to determine effect of triage on waiting time and patient satisfaction.

A sample ($n = 600$) was utilized for this quasi-experimental design, and 300 subjects were selected for each group (intervention and control groups) through random allocation.

Data were collected using a time measuring form and a patient satisfaction scale.

The mean waiting time before and after triage was 10.7 \pm 3.77, 8.5 \pm 3.77 minutes, respectively ($p = 0.000$). Mean patient satisfaction score in the two groups (before and after) was 29.6 \pm 5.07 and 37.7 \pm 5.86 ($p = 0.000$).

A reduction in waiting time and increased patient satisfaction with the triage process indicate a reorganization of emergency department layout and staffing can improve the patient flow and quality of care.

Keywords: emergency department; emergency health; satisfaction; triage; waiting time

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(K111) A Review of On-Scene Disaster Triage Schemes and Proposal for a Standardized Triage System

Phillip L. Coule;¹ E.B. Lerner;² Richard B. Schwartz¹

1. Medical College of Georgia, Augusta, Georgia USA

2. Medical College of Wisconsin, Milwaukee, Wisconsin USA

Introduction: Mass-casualty triage is a critical skill. There are any systems exist to guide providers in making triage decisions, however, there is little scientific literature to validate current systems. There are no internationally agreed

upon categories or color. The lack of standardization in triage can lead to confusion.

Methods: An expert panel reviewed existing triage systems. Each member was assigned a triage system and asked to conduct an exhaustive literature review and Internet search and to develop a report to the panel. Each system had two or more members assigned to conduct a review.

Results: The committee identified nine existing mass casualty triage systems, including two pediatric-specific systems. The systems were noted to be similar in naming and color representations, but differed on the inclusion of an expectant category. Studies that compared the various mass casualty triage systems and found that the ability to obey commands and systolic blood pressure were the best predictors were identified.

Conclusions: The committee concluded that no one system could be embraced as a validated system. The committee decided to use the best available scientific information and consensus opinion to develop a system that could serve as a proposed national guideline. The group discussed each component until consensus was reached. The guideline incorporates pieces of most existing triage systems; it was given the name SALT Triage (sort, assess, lifesaving interventions, and treatment and/or transport). This guideline is intended for use on-scene in all-hazards events for both adults and children.

Keywords: disaster; emergency medical services; mass casualty; SALT; standardization; triage

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(K112) Use of SALT Triage during a Simulated Mass-Casualty Incident

E. Brooke Lerner;¹ Richard Schwartz;² Phillip Coule;² Ronald Pirrallo¹

1. Medical College of Wisconsin, Brookfield, Wisconsin USA

2. Medical College of Georgia, Augusta, Georgia USA

Objectives: To determine the accuracy of SALT Triage during a simulated mass casualty incident and the average time to make triage designations.

Methods: Thirty trainees (11 medical doctors (MDs), six registered nurses (RNs), eight emergency medical technicians (EMTs), one RN/EMTs, four other) were taught to use SALT (sort, assess, life-saving interventions, treatment and/or transport) Triage during a 30 minute lecture. The following day, all trainees participated in 1 of 4 simulated mass-casualty incidents. For each incident, trainees were told to assess and prioritize all victims. Each scenario was comprised of 29 victims, including 11 moulaged mannequins and 18 moulaged actors. Each victim had a card that stated the victim's respiratory effort, pulse quality, and ability to follow commands. Initial and final assigned triage categories were recorded and compared to the intended category. Ten of the victims were equipped with stop-watches to measure the triage time interval. Timing began when the trainee approached the victim and ended when they verbalized their triage designation. The times were averaged and standard deviations calculated.

Results: Of the 30 participants, 20 reported having prior drill experience, and 11 had prior mass-casualty incident