Trauma team activation at a level 1 trauma centre: perceived importance of patient factors influencing emergency nurses’ decisions

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Introduction: Trauma team activation (TTA) is a kind of triage the staff of an Emergency Department (ED) exerts to determine whether a trauma team needs to be activated for severely injured patients and in what composition the team needs to be deployed. It is a complex decision-making process which is mostly performed by ED nurses and led by guidelines and protocols. Several factors influence the decision-making process, such as patient factors, contextual factors and individual factors of the decision maker.

Objective: Understand the TTA decision-making process at a level 1 trauma centre, as well as to obtain insight in the importance of patient factors influencing emergency nurses’ decisions.

Methods: This study has a cross-sectional fractional factorial design. Six patient factors (attributes), of which four with four levels and two with three levels, were identified. SPSS® Orthoplan was used to generate a fraction (n=25) of all possible alternative scenarios (n=2304), that consisted of combinations of the attribute levels. These scenarios were presented to 44 ED nurses at a level I trauma centre using a questionnaire with clinical vignettes (Figure 1). ED nurses ranked the attributes according to their perceived importance. To assess the relative impact of the attributes and levels on the decision-making, (normalized) mean rank scores were calculated. A low score means a high perceived importance in the TTA decision. Consistency of the rank scores among ED nurses was calculated with the intraclass correlation coefficient (ICC).

Results: 27 ED nurses completed the questionnaire (response rate 61%). Airway-Breathing (2.68) scored the highest attribute importance, followed by Mechanism of injury (3.19) and Circulation (3.37). The level Airway-Breathing unstable was the most important level for TTA based on the relative rank sum weight (0.115), followed by Mechanism of injury Fall of height >5m (0.171) and Airway-Breathing Intubation (0.172). There was no difference in attribute mean rank scores between ED nurses who had ≤12.5 years of experience compared to nurses with >12.5 years of experience. The ICC for the different levels occurring in three duplicate vignettes varied from 0.432 to 0.795, from 0.712 to 0.802 and from 0.071 to 0.639.

Discussion: We observed variation in decisions for TTA and in consistency of the rank scores among the ED nurses under study. This raises questions about the ED nurse being the best suited professional to make the decision on TTA and if a decision support system could improve uniformity in the TTA decision-making process. In addition, other possible influencing factors such as contextual factors need to be taken into account.
Figure 1. Example of a Clinical Vignette

**Vignette 12**

Pre-notification from ambulance:
“We will arrive at your ED with a female patient who fell down the stairs halfway. She sustained possible fractures to her right upper arm and right femur. Airway and Breathing are stable. RTS 12.”

What kind of team would you activate for this patient?
- Normal ED team (ED physician and ED nurse)
- Modified trauma team
- Full trauma team

Why? Please rank the 3 most important factors in your decision.
(1=most important)
1.
2.
3.