



CHARACTERISTICS AND LIMITATIONS OF THE START METHOD ON THE PREHOSPITAL CARE: INTEGRATIVE REVIEW

CARACTERÍSTICAS E LIMITAÇÕES DO MÉTODO START NO ATENDIMENTO PRÉ-HOSPITALAR: REVISÃO INTEGRATIVA

CARACTERISTICAS Y LIMITACIONES DEL MÉTODO START EN LA ATENCIÓN PRE-HOSPITALARIA: REVISIÓN INTEGRADORA

Clayton Lima Melo¹, Bruno César Amorim Machado², Zélia Lopes Alexandre³

ABSTRACT

Objective: to analyze the scientific production on the triage method *Simple Triage and Rapid Treatment* (START), in accidents with multiple victims and their limitations. **Method:** integrative review aiming at answering the question << *What are the characteristics and limitations of the START method in prehospital care?* >>, by searching for publications between 2002 and 2012 based on the database IBICS, Medline, Google Scholar and the virtual library SciELO. **Results:** six selected articles published since 2004, in English, written by physicians, 50% had level 3 evidence. It was evident that the START is based on the patient's ability to walk, the airway permeability, breathing rate, the presence of pulse and ability to follow simple commands. The method does not consider mechanisms specific of injury and has limited points of evaluation. It is designed for adults and presents significant rate of improper triage in major incidents, for lack of training. **Conclusion:** the START does not have adequate sensitivity and specificity when used for screening children or patients with minor or moderate risk. **Descriptors:** Triage; Mass Casualty Incidents; Emergency Medical Services.

RESUMO

Objetivo: analisar a produção científica sobre o método de triagem *Simple Triage and Rapid Treatment* (START), em acidentes com múltiplas vítimas e suas limitações. **Método:** revisão integrativa com vistas a responder a questão << *Quais as características e limitações do método START no atendimento pré-hospitalar?* >>, com busca de publicações entre 2002 e 2012 nas bases de dados IBICS, Medline, no portal Google Acadêmico e na biblioteca virtual SciELO. **Resultados:** seis artigos selecionados publicados a partir de 2004, no idioma inglês, escritos por médicos, 50% apresentaram nível de evidência 3. Evidenciou-se que o START baseia-se na capacidade do paciente andar, permeabilidade das vias aéreas, taxa de respiração, presença de pulso e seguir comandos simples. O método não considera mecanismos de lesão específica e tem pontos de avaliação limitados. É desenvolvido para adultos e apresenta significativa taxa de triagem indevida em grandes incidentes, por falta de treinamento. **Conclusão:** o START não apresenta especificidade e sensibilidade adequadas quando utilizado para triagem de crianças ou pacientes com menor ou moderado risco. **Descritores:** Triagem; Incidentes com Feridos em Massa; Serviços Médicos de Emergência.

RESUMEN

Objetivo: analizar la producción científica sobre el método de selección *Simple Triage and Rapid Treatment* (START), en accidentes con múltiples víctimas y sus limitaciones. **Método:** revisión integradora con el objetivo de responder a la pregunta << *¿Cuáles son las características y limitaciones del método START en la atención pre-hospitalaria?* >>, con búsqueda de publicaciones entre 2002 y 2012 en las bases de datos IBICS, Medline, en el portal Google Académico y en la biblioteca virtual SciELO. **Resultados:** seis artículos seleccionados publicados a partir de 2004, en el idioma inglés, escritos por médicos, 50% presentaron nivel de evidencia 3. Se evidenció que el START se basa en la capacidad del paciente andar, permeabilidad de las vías aéreas, tasa de respiración, presencia de pulso y seguir comandos simples. El método no considera mecanismos de lesión específica y tiene puntos de evaluación limitados. Es desarrollado para adultos y presenta significativa tasa de selección indevida en grandes incidentes, por falta de entrenamiento. **Conclusión:** el START no presenta especificidad y sensibilidad adecuadas cuando utilizado para selección de niños o pacientes con menor o moderado riesgo. **Descriptores:** Selección; Incidentes con Heridos en Masa; Servicios Médicos de Emergencia.

¹Nurse, Teacher, PhD student and Master in Nursing UFMG, PUC Minas and Centro Universitário UNA. Belo Horizonte (MG), Brazil. E-mail: claytonmelobh@yahoo.com.br; ²Nurse, Specialist in Nursing in Urgency, Emergency and Prehospital Care. Office of the Military Fire Force of Minas Gerais. Belo Horizonte (MG), Brazil. E-mail: brunochedidsports@yahoo.com.br; ³Nurse, Specialist in Nursing in Urgency, Emergency and Prehospital Care, Hospital Municipal José Lucas Filho. Contagem (MG), Brazil. E-mail: zelllya@hotmail.com

INTRODUCTION

The emergency situation for the care of multiple victims is a sudden event that produces a number of victims, leading to an imbalance between available and required resources, in which it is intended to maintain an adequate standard of care with the local resources.¹ Especially in multiple victims events, classified as disasters, it is necessary to establish a system of at least four orders of contact: first, the community; second, prehospital care; third, infrastructure; fourth, order; the regional level, through contact with the authorities in order to minimize damage in interstate scale. By adopting this approach it is possible to ensure that response activities will occur in a comprehensive manner, which minimizes the load of patient care in each subsequent order, and reducing the overall need for effective, fair and equitable care.² Nurses, depending on the composition of the emergency service, together with the team assumes the responsibility for the care of the victims, working in various environments with limited physical space and time limits.³

Teams working in prehospital care are faced with various situations, among them disasters: "sudden events with tragic and calamitous consequences, a great disaster or misfortune" and Multiple Victims Accidents: "sudden events that produce a number of victims that lead to an imbalance between available medical resources and needs."³

In the prehospital phase, the most widely used method for triage in Brazil and in the world is the *Simple Triage and Rapid Treatment* (START) method, used in Brazil since 1999. Triage is the term given to situation recognition and selection of victims by priorities at the scene of the emergency.⁴ This algorithm, focus of this review, was created in 1983 by researchers at Hoag Hospital, in conjunction with the Fire Department of "Newport Beach", California in the United States of America (USA).⁵ However, the true origin of this method is French, probably from 1792 and linked to Baron Dominique Jean Larrey, chief surgeon of the Napoleao Imperial Guard.⁶

The START method is officially adopted in Brazil in the Manual of Medical Regulation of Urgencies¹, which contains the order of priority of care according to this algorithm, and which agrees with the American College of Surgeons⁷ which recommends that patients with higher priority of care are those more serious, when the claim exceeds the resources and those with the greatest chance of

survival, if available resources are not exceeded.

PRIORITY 1 (RED): victims who need some medical treatment before rapid transport to the hospital, or need to quickly go to the hospital for surgery.

PRIORITY 2 (YELLOW): victims in need of some treatment on site while awaiting transport to the hospital, not at immediate risk of life.

PRIORITY 3 (GREEN): victims who do not require immediate medical treatment or transportation, they have no life-threatening injuries .

PRIORITY 4 (BLACK): dead victims or with no chance of surviving.^{1:103}

Internationally, there are other algorithms for triage in the care of multiple victims in the prehospital setting. They are: Health Emergency Operations Center (STARTHEOC); Severe Acute Respiratory Syndrome (SARS); Secondary Assessment of Victim Endpoint (SAVE); Sort, Assess, Lifesaving interventions, Treatment and/or transport (SALT); Move, Assess, Sort, Send (MASS); Sacco Treatment Method (STM); Circulation, Respiration, Abdomen, Motility and Psyche (CRAMP) and Simple Triage and Rapid Treatment for Children (JUMPSTART). Through the analysis of these other methods, the selected activities will establish, beyond the basic features of the START protocol, some limitations and also advocate the importance of standardization of the primary triage systems adopted, since multiple victims accidents do not obey political boundaries.⁵

A little over a year, in the municipality of Bandeira do Sul, Minas Gerais, Brazil, a metal coil was thrown from the top of an electric trio, in a power cord during a pre-Carnival party in February 27, 2011. The cable would have broken and fallen to the ground, affecting the electric trio and victimizing 16 pessoas.⁸ In this incident, classified as multiple victims, the START protocol was probably adopted and there are doubts as to its applicability, since it must be used for the specific classification of trauma victims, and in the accident in question there were victims of electrical accident. Besides this episode occurred in the town in Minas Gerais in 2011, there is scant familiarity of the prehospital care teams of RMBH with the method of triage of multiple victims. Because it is a subject with little scientific exploration and searching for relevant information about the START method, the authors investigated the following problem: what are the features and limitations of the start method in prehospital care?

Considering the upcoming events with large concentration of people in the country, as the 2014 World Cup and 2016 Olympics, it is necessary to provide greater familiarity with the methods of screening multiple victims, especially the START algorithm, based on the forecast of receiving a large population contingency in stadiums, airports and other public reception environments. Moreover, it is necessary to know the limitations of the method in specific situations described in the literature, to enable preventive actions and agreements of complementary algorithms as an alternative form of care in multiple victim incidents involving more than one state institutions. Thus, we sought to prepare this integrative review in order to contribute to the expansion of scientific collections on the topic and summarize the specificities of this method.

OBJECTIVE

- To analyze the scientific literature on the triage method *Simple Triage and Rapid Treatment* (START) in accidents with multiple victims and their limitations.

METHOD

This study used as a methodological strategy, an integrative literature review, which has a strong influence on evidence-based practice, seeking to unravel the question under study: characterization of the START patients triage method and its limitations during prehospital care of multiple victim accidents.⁹⁻¹⁰

The integrative review combines research with clinical/operational experience and preferences of professionals to justify a decision about a specific problem, providing a reasoned and consistent understanding, with enrichment of the professional practice.^{9,11} To

this end, the steps described below were used.¹²

Identification of the problem: it is the initial phase of this research endeavor. It is a clear identification of the problem and of the purpose of associated revision. Subsequently, the method and the variables of interest are determined. This study seeks to answer the question << *What are the characteristics and limitations of the START method in prehospital care?* >>

Bibliographic research: essential step to build a review of good quality, since it consists in finding literature relevant to the problem specified, in the database, in order to show a scope of work that will be critically evaluated.

Evaluation of data: once the relevant literature has been collected, the common data are extracted from primary studies for subsequent analysis.

Data Analysis: data analysis requires the researcher to sort, categorize, and summarize data from individual primary studies into a unified conclusion about the research problem.

Presentation of results: The search results can be presented as a summary, an analysis or synthesis.

The total primary data consisted of 354 articles in the database Medline, 803 data in IBECs, 782 in the virtual library ScieLO and 399 in Google Scholar portal. Just a sample of 6 items better to the variable of interest, with those being obtained in the database Medline and Google Scholar website, and only in English, according to figure 1.

Database/Portal/Virtual library	Population	%	Sample	%
Google Scholar	399	17	1	17
Medline	354	15	5	83
Scielo	782	34	0	0
IBECs	803	34	0	0
TOTAL	2338	100	6	100

Figure 1. Distribution of the research population and sample, according to database, Belo Horizonte - MG, 2012.

Over 2,338 research articles were evaluated. They were included in the population according to the following criteria: articles published in English, Spanish and Portuguese, with full texts available in the database of the International Literature on Health Sciences (Medline), Spanish Bibliographic Index of Health Sciences (IBECs), Scientific Electronic Library Online (SciELO) and Google Scholar search site, in the period

between 2002 and 2012, using the health terminology: mass casualty incidents, emergency medical services and triage, according to the query of Health Science descriptors (DeCS/BIREME).

Data collection was conducted through a survey instrument as proposed by autor¹³, aiming to facilitate the analysis of studies containing data related to the researcher, the article and the study objective. The search

was performed, in full, by the free access online, using as a guideline the question: What are the characteristics and limitations of the start method in prehospital care?

For synthesis and subsequent discussion of articles, a summary table containing data related to the author, year, journal of publication and conclusions about the START method was prepared. The presentation and discussion of the results were performed descriptively, from three categories (pediatric studies, studies related to the conceptualization and related to preparation of rescuers), enabling the reader to review the applicability of the evidence obtained in the literature search on best indications of the START method of triage in prehospital care.

RESULTS

In this integrative review six (6) articles that met the inclusion criteria of research were analyzed. All articles from the sample set were published from the year 2004, with the first, being considered with a year of publication in 2004 and the others, one by each year from 2006 through 2010.

All studies reviewed were written by physicians, and their absolute majority (83.3%) performed in the United States of America (USA) due to major disasters such as the Northridge earthquake of 1989 and 1992 and attacks in 1995, in Oklahoma City, and 2001, in New York (World Trade Center).⁵ A single study was conducted in the city of Manchester/UK.

Para análise da qualidade dos periódicos de publicação do grupo amostral, utilizamos o nível de evidência científica descrito pelo autor:^{12:104}

To analyze the quality of the journals published in the sample group, we used the level of scientific evidence described by the author:^{12:104}

Level 1: evidences from meta-analysis of multiple controlled and randomized clinical studies;

Level 2: evidences from individual studies with experimental design;

Level 3: evidences from quasi-experimental studies;

Level 4: evidences of (non-experimental) descriptive studies or with qualitative approach;

Level 5: evidences from case reports or experience;

Level 6: evidences based on opinions of specialists.

We observed that the studies found are classified as average validity, among the extracts of intellectual production, 17% are classified as evidence level 6, 33% were literature reviews and 50% were original articles with level of evidence 3.

In figures 2, 3 and 4 below, the synthesis of the six scientific articles in the sample group of this study are presented.

Article, authors, year and journal of publication	Characteristics and limitations of the START method on prehospital care
Title: PLUS Prehospital mass-casualty triage: A strategy for addressing unusual injury mechanisms. Authors: Daniel J. Neal; Joseph A. Barbera; John R. Harrald Year: 2010 Journal: Pre Hospital and Disaster Medicine	The START protocol was conceived around three evaluations: (1) breathing, (2) pulse, and (3) mental state, and is based on the physiological reaction of how the human body reacts to trauma. Patients are classified into four categories: (1) Red (2); yellow; (3) Green; (4) and black. Limitations: does not consider specific injury mechanisms it has limited points of evaluation, does not truly refine priority among patients with "Minor" or "Moderate" risk.
Title: START Triage: Does It Work? Authors: Mark E. Gebhart; Robert Pence Year: 2007 Journal: Disaster Management and Response	It evaluated whether the START system is a real predictor of potentially surviving victims, by assigning scores of 0-3 for the sum of the three parameters assessed in the START method (RR, Pulse and Conscience), symbolizing the rate 0 bad parameter 0 and rate 1 parameter good in each of the three signals evaluated. Among the survivors (96% of patients evaluated), 92.68% actually had FR<30, 96.06% had detectable pulse and 78.31% had Glasgowe Scale as 15. It indicates that those with the greatest chance of survival have a tendency to receive higher scores, when the START is applied to trauma patients, which justifies the use of the algorithm in the primary triage.
Title: Mass-casualty triage: Time for an evidence-based approach. Authors: Jennifer Lee Jenkins; Melissa L. McCarthy; Lauren M. Sauer; Gary B. Green; Stephanie Stuart; Tamara L.Thomas; Edbert B. Hsu Year: 2008 Journal: Pre hospital and Disaster Medicine	START is a method of primary triage that prioritizes patients in the area of evacuation and transportation for the definition of medical operational assistance. It assigns priority treatment based on the patient's ability to walk, evaluation of airway permeability, breathing rate, presence of radial pulse or capillary refill in more or less time than two seconds, and ability to follow simple commands. By recognizing that normal physiologic parameters of children differ from adults a pediatric version of START, known as JumpStart, was developed in which it is only offered five rescue breaths in an attempt to stimulate spontaneous breathing in children aged 1-8 years.

Figur2. Presentation of the synthesis of articles characterizing the START method in the sample, period 2002-2012. Belo Horizonte-MG, 2012.

Article, authors, year and journal of publication	Characteristics and limitations of the START method on prehospital care
Title: Effectiveness of a simple Internet-based triage educational tool Authors: Amado Alejandro Baez; Matthew D. Sztajnkrzyer; Pablo Smester; Ediza Giraldez Year: 2005 Journal: Prehospital Emergency Care	The study used the method to assess the knowledge and capabilities of an internet tool to train providers of prehospital services. Five (9.1%) of the 55 participants correctly answered four or more proposed scenarios as real scenes of care when questioned in a pre-trial intervention, compared with 53 (96.4%) of 55 in the post-test on the risk [p <0.001, and 95% CI]. Similar results were obtained when the accuracy in screening all five scenarios was assessed, with zero in 55 on the pre-test, to 49 in 55 on the post-test (p < 0.001). No statistical difference was found in sub-analyzes comparing the immediate intervention group scores of the 38 subjects who participated for only one month of monitoring against 17 participants who participated in the entire cycle of training, which can attest to the rapid assimilation of the tool START. The authors justify the need for training in the reporting of several studies that have shown a significant rate of improper triage in major incidents and the adverse effects of inadequate triage on patient outcome.

Figure 3. Presentation of the synthesis of articles characterizing the START method in the sample, period 2002-2012. Belo Horizonte - MG, 2012.

Article, authors, year and journal of publication	Characteristics and limitations of the START method on prehospital care
Title: Pediatric Mass Casualty: Triage and Planning for the Prehospital Provider. Authors: Kristin Lyle; Tonya Thompson; James Graham Year: 2009 Journal: Pediatric Mass Casualty	The primary triage must be performed very quickly, requiring approximately 30 seconds per patient and should be based solely on the physiology of the patient. It emphasizes the anatomical and physiological differences in children, which imposes a need for a viable tool for pediatric victims. There is not, as yet, a tool for prehospital care to multiple victims specifically developed for children under 1 year, only the JumpStart for children 1-8 years that lacks concrete scientific data results, making it very difficult to endorse a single tool. In July 2008, a panel of experts issued a proposal entitled SALT (Sort, Assess, Save Lives, Transport and Treatment), which allows a gray category higher than those of START, which is applied to any age group. Patients in the gray category have serious injuries or signs of impending death, but they are not at risk of dying at the time of primary triage according to START.
Title: Comparison of pediatric major incident primary triage tools. Authors: LA Wallis e S Carley Year: 2006 Journal: Emerg Med J.	The study tested the sensitivity and specificity of four tools for prioritizing prehospital care, the PediatricTriage Tape (PTT), oCareflight, START and JumpStart (for child assessment). None of the tools showed high sensitivity and specificity, including the START method. According to this study, the PTT or CareFlight methods should be used in pediatric incidents preferably to Jumpstart or the START methods, since the score CareFlight had the best performance in terms of sensitivity and specificity, and the performance of PTT was very similar.

Figure 4. Presentation of the synthesis of articles characterizing the START method in the sample, period 2002-2012. Belo Horizonte - MG, 2012.

From the analysis of articles in the sample group, their distribution, according to the three categories were: 50% of concept studies, 33% of pediatric and 17% of studies related to the preparation of rescuers.

♦ **Category1: Characterization studies of the START method**

In selected studies, this issue was addressed in order to enable the

characterization of the START and raise their shortcomings from the definitions of the authors and the comparison with other methods. In the algorithm below, it is possible to see how the colors are assigned to victims:

14

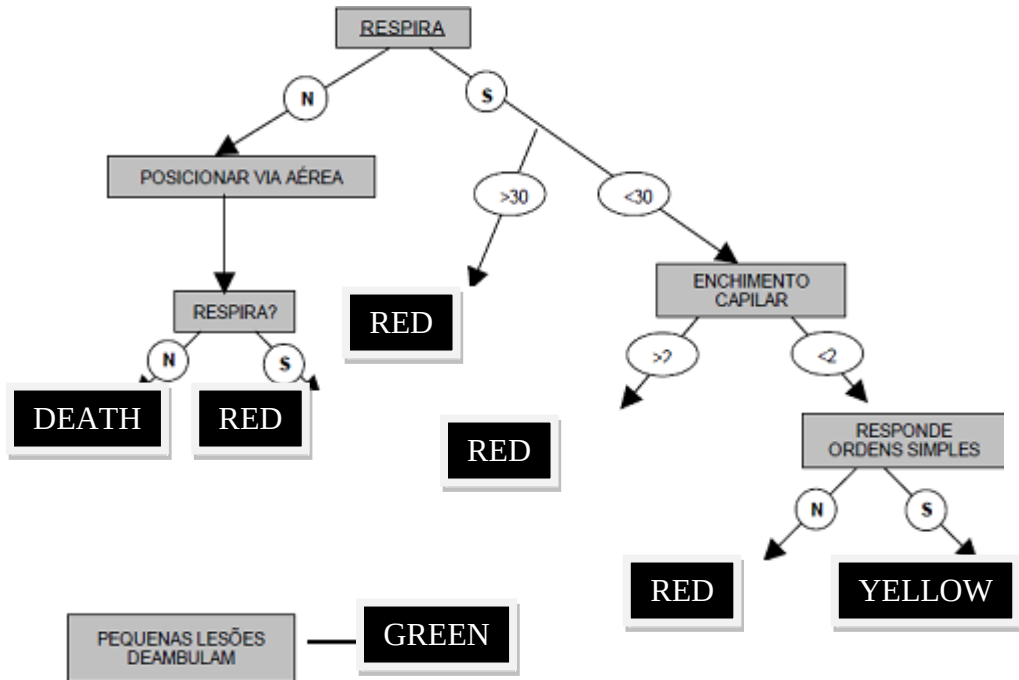


Figure 5. START algorithm evaluation. Belo Horizonte - MG, 2012.

Among the studies analyzed, one study¹⁴ shows that among 96% survivors, 92.68% actually had respiratory rate (RR)<30, 96.06% had pulse and 78.31% had a Glasgow Coma Scale (GCS) = 15 and only 0.85% had a GSC equal to 15 in the non-survivors group. Thus, this study indicates that there is a tendency that those victims with the greatest chance of survival to receive higher score. However, when START is applied to trauma patients, it emphasizes that the majority evaluated in this study had blunt trauma.

Victims of an accident with multiple victims may be at risk for penetrating trauma and exposure to chemical and/or biological agents. The use of weapons of mass destruction could further complicate the shortcomings of triage protocols. These involve the use of personal protective equipment and make the assessment and treatment even more difficult. There really is no means by which to consider the impact of chemical and biological weapons, unless a retrospective study is conducted.¹⁵

Corroborating this author¹⁴, another study¹⁶ describes that the START protocol consists of a rapid triage and has significant limitations: does not consider specific injury mechanisms, it has limited evaluation points and it does not truly refine the priority among patients with "lower" or "moderate" risk, situations where the transport thereof may be delayed. These authors¹⁶ propose the Prehospital Casualty Triage System called PLUS in order to expand the strengths of START, an existing and widely accepted method.

At PLUS, an initial triage provides guidance to rescuers to subsequently perform a re-triage of the victims considered of less or moderate seriousness, in order to identify and consider the subtle symptoms and signs of specific prediction of critical injuries to the relevant mechanisms, such as penetrating injuries, other unconventional, smoke and inhalation of toxic products.¹⁶

One factor that hampers the assessment of the validity of START is the absence of studies in a real scenario, since the studies were designed with trauma patients in the doorway of hospitals and may therefore not be representative of victims of an accident with multiple victims. It is observed that studies focused on the presentation of non-traumatic patients may question the widespread use of the START method. This contradicts the findings of authors¹⁵ suggesting that the use of START is predictive in identifying victims that would possibly survive in an MCI, through the rapid assessment of respiration, perfusion, and communication. Therefore, the START is

an appropriate method, but not sufficient in targeting resources to serve patients in an MCI.

♦ Category 2: Studies related to the preparation of rescuers

According to authors¹⁷, the Dominican Society of Prehospital Medicine revealed a persistent lack of standardization of procedures among Latin American providers of emergency services. For them, the current literature demonstrates the importance of adequate triage during a disaster, showing how an improper triage may adversely affect the results and highlighting the need for training.

One study¹⁷ evaluated the preparation of attendants of prehospital services in Colombia, Cuba, Dominican Republic, Puerto Rico, and Venezuela regarding the proper evaluation of five MCI scenarios with START method in the United States, considered quick to perform and easy to teach.

Despite being an algorithm of easy comprehension in relation to other already proposed internationally, the study¹⁷ did not confirm this idea. In the survey done by Internet, even with a mean $\pm$ standard deviation of years of experience of the participants of 5.9 ± 3.6 years, 54.5% declared themselves as being of a more advanced level of training. For example, emergency medical technicians, nurses or doctors, with 36.4% reporting having experience in real disasters and 34.5% reporting prior knowledge about the START system. The findings were: only five answered four or more scenarios in the pre-intervention test correctly (9.1%) of the 55 participants, compared with 53 (96.4 %) of the 55 participants in the post-test intervention [$p < 0.001$, relative risk (RR) 10.60 (95% CI 4.59 -24.49)]. Similar findings were obtained for those with accuracy in sorting all five scenarios, 55 with zero (0%) found in pre-test compared to 49 of 55 (89.1 %) in the post-test ($p < 0.001$).

♦ Category 3: Pediatric Studies

There is a great concern with the assessment of tools aimed at prehospital care of pediatric multiple victims. Attacks like the one in Oklahoma City, a school in 1995, and the several pediatric victims of Hurricane Katrina induced this reflection.⁵

A major challenge faced by rescue teams is to take care of children in an event of mass casualties, since the physiology and anatomy of children differ from adults. Children are particularly vulnerable to disaster and protocols developed for adults may not work well.¹⁸

Children are physiologically and psychologically less able than adults to survive in a disaster, their body has a larger surface area/mass ratio, which leads to a predisposition to heat loss and increased capacity for contact with toxins. Babies have a larger head relative to the body when compared to adults, which poses the greatest risk for injury to the skull, making the Traumatic Brain Injury (TBI) the most prevalent in this age group.¹⁸

Depending on the developmental stage of the child, there may be limited communication skills and self-protection. When lying in dorsal decubitus, the chin is tucked and the head is thrown forward, making it difficult to maintain proper positioning of the airway. Such characteristics may influence the choice of the triage protocol directed to children involved in a MCI.¹⁸

A study¹⁸ shows that there is, as yet, no tool for prehospital care to multiple victims specifically developed for children less than one (1) year old, only the JumpStart, aimed at children 1-8 years and no data with concrete scientific results, which makes it very difficult to endorse a single tool.

In a pioneer study¹⁹ with 3,461 children of South Africa, the sensitivity and specificity of four tools for prioritizing prehospital care were compared, the Pediatric Triage Tape (PTT), the CareFlight, START and JumpStart, focused on child assessment. This study showed that none of the tools had adequate efficacy in the evaluated criteria. In the work of the authors¹⁸ children admitted to the emergency unit of South Africa through the four algorithms were reassessed and cases were compared with the tools Injury Severity Score (ISS), its new version (NISS), and a modification of the Garner criteria (one measure of the need for urgent clinical intervention). The result showed that the JumpStart and START scores had very low sensitivities, which meant that they could not identify patients with serious injuries or that the services would have lost most of victims seriously injured in models of major incidents. The authors' conclusion is that due to the low performance in the study, the use of START for the triage of children is not recommended.

DISCUSSION

The studies reviewed demonstrate similarity in the characteristics and the definition of the START method. The authors note that, although not based on scientific evidence, its wide use qualifies it in the prediction of severity among patients in

accidents with multiple victims, especially when it involves mechanism of injury by blunt trauma in adults. However, it is essential that clearly defined studies and with a high degree of evidence, preferably in real scenarios, are conducted in order to consolidate the level of excellence of this method.

According to the studies analyzed in this study, the START algorithm, widely used in Brazil, has the following limitations:

- a) It does not consider mechanisms specific injury, it has limited points of evaluation and does not truly refine the priority among patients with "minor" or "moderate" risk situations where transport of these can be postponed.
- b) It does not have adequate sensitivity and specificity when used for the triage of children, since they do not consider the physiological, anatomical and psychological variations present in pediatric patients; even in JumpStart, victims under one year are not considered.
- c) Although considered to be easily assimilated and not having significant differences in learning with long or reduced training it is required to be exercised, because the rates of erroneous triage scenarios, even among experienced professionals are high.

CONCLUSION

This integrative review allowed us to analyze the characteristics of the START method, widely used in Brazil as a tool for screening patients in accidents with multiple victims, and show the limitations of the algorithm. From the analysis of these studies, we realize that it is necessary to stimulate further studies on triage in incidents with multiple victims, with a focus on pediatric victims and on the evaluation regarding the training of providers.

Among the publications used for the construction of this article, it is noted that the vast majority have important scientific relevance. However, when trying to understand the results of a review, it is necessary to evaluate beyond purely technical results. It is essential to evaluate aspects related to knowledge, the need to compromise professional with organizational, social and cultural changes, to allow changes in individual behavior. In addition, there is a need to develop methods that encourage making decision based on scientific evidence, setting the context in which the professional

is inserted, which positively affects the quality of care. These results can help to construct new studies focused on pediatric care, conceptualization and training on the START method, assisting providers in its routine practice.

REFERENCES

1. Ministério da Saúde, Secretaria de Atenção à Saúde. Regulação médica das urgências. Brasília [Internet]; 2006 [cited 2011 Nov 28]. Available from: <http://www.saude.gov.br/bvs>
2. Bostick NA, Subbarao I, Burkle Jr. FM, Hsu EB, Armstrong JH, James JJ. Disaster triage systems for large-scale catastrophic events. Disaster Med Public Health Preparedness. [Internet]. 2008 [cited 2011 Nov 28];2(suppl 1):S35-S39. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18769264>
3. Salvador PTCO, Alves KYA, Dantas RAN, Dantas DV. The pre-hospital care to nursing after an accident with multiple victims: an integrative literature review. J Nurs UFPE on line [Internet]. 2010 [cited 2010 Sept 25];4(esp):1195-203. Available from: http://www.ufpe.br/revistaenfermagem/index.php/revista/article/view/1090/pdf_96 DOI 10.5205/01012007
4. Teixeira WA, Olcerenko DR. A utilização do método START em acidentes com múltiplas vítimas. Trabalho publicado no 10º Congresso de Iniciação Científica, 4ª mostra de Pós-Graduação e 1ª Mostra do Ensino Médio. [Internet]. 2011 [cited 2011 Mar 23]. Available from: http://www.unisa.br/pesquisa/arquivos/livro_10_congresso.pdf#page
5. Jenkins JL, McCarthy ML, Sauer LM, Green GB, Stuart S, Thomas TL, et al. baez Prehospital Disast Med [Internet]. 2008 [cited 2011 Nov 28];23(1):3-8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18491654>
6. Robertson-Steel I. Evolution of triage systems. Emerg Med J. [Internet] 2006 [cited 2011 Nov 28]. 23(2): 154-5. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16439754>
7. National Association of Emergency Medical Technicians, Pre-Hospital Trauma Life Support Committee; American College of Surgeons, Committee on Trauma. 7th ed.
8. Paes C Fajardo V. Acidente com trio elétrico deixa mortos e feridos no Sul de MG. Portal G1/MG [Internet]. 2011 [cited 2012 Apr 11]. Available from: <http://www.g1.globo.com/minas-gerais/noticia/2011/02/acidente-com-trio-eletrico-deixa-mortos-e-feridos-no-sul-de-mg.html>
9. Galvão CM, Sawada NO, Rossi LA. A prática baseada em evidências: considerações teóricas para sua implementação na enfermagem perioperatória. Rev Latino-Am enferm [Internet]. 2002 [cited 2011 Nov 28];9(4):37-43. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S010411692002000500010&lng=en&nrm=isso
10. Whittemore R. Combining evidence in nursing research: methods and implications. Nurs Res [Internet] 2005 Jan-Feb [cited 2011 Nov 28];54(1):56-62. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/15695940>
11. Mendes KDS, Silveira RCCP, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. Texto & contexto enferm [Internet] 2008 [cited 2011 Nov 28];17(4):758-64. Available from: http://www.scielo.br/scielo.php?pid=S010407072008000400018&script=sci_arttext&tlng
12. Whitmore RA. Revisão integrativa: metodologia atualizada. J Adv Nurs [Internet]. 2005 [cited 2011 Nov 28]. Available from: <http://www.onlinelibrary.wiley.com/journal/10>
13. Sousa MT, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer. Einstein. [Internet]. 2010 [cited 2011 Nov 28];8(1Pt1):102-6. Available from: <http://xa.yimg.com/kq/groups/17775537/1511367040/name/revisao+integrativa+1.pdf>
14. Corpo de Bombeiros do Paraná. Catástrofes e atendimento a múltiplas vítimas [Internet]. 2006 [cited 2011 Mar 23]. Available from: <http://www.defesacivil.pr.gov.br/arquivos/File/...2/cap28amuvi.pdf>
15. Gebhart ME, Pence R. START Triage: Does It Work? Disaster Manage Response [Internet]. 2007 [cited 2011 Nov 28];5(3):68-73. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17719507>
16. Neal DJ, Barbera JA, Harrauld JR. PLUS Prehospital mass-casualty triage: A strategy for addressing unusual injury mechanisms. Prehosp Disaster Med [Internet]. 2010 [cited 2011 Nov 28];25(3):227-36. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20586016>
17. B´aez A, Sztajnkrzyer MD, Smester P, Giraldez E, Vargas LE. Effectiveness of a simple internet-based disaster triage educational tool directed toward latin-american ems providers. Prehosp Emerg Care

Melo CL, Machado BCA, Alexandre ZL.

Characteristics and limitations of the start...

[Internet]. 2005 [cited 2011 Nov 28]; 9:227-30. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16036851>

18. Lyle K, Thompson T, Graham J. Pediatric Mass Casualty: Triage and Planning for the Prehospital Provider. Clin Pediatr Emerg Med [Internet]. 2009 [cited 2011 Nov 28];10(3):173-85. Available from: <http://www.ny2aap.org/pdf/Disaster/173.pdf>

19. Wallis LA, Carley S. Comparison of pediatric major incident primary triage tools. Emerg Med J [Internet]. 2006 [cited 2011 Nov 28];23:475-8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16714518>.

Submission: 2013/01/01

Accepted: 2014/04/16

Publishing: 2014/07/15

Corresponding Address

Clayton Lima Melo
Rua Célia de Souza, 661 /Ap. 301
Bairro Sagrada Família
CEP 3103 0500 – Belo Horizonte (MG), Brasil