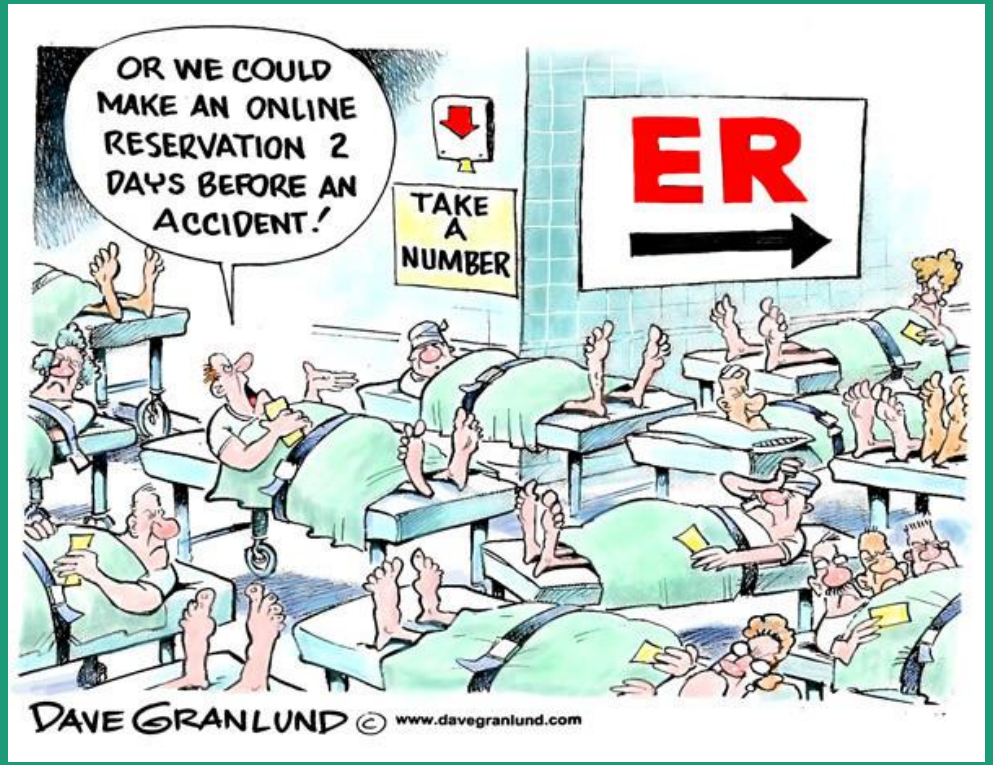
HISTORIE TŘÍDĚNÍ A JEHO FILOSOFIE

Jana Šeblová

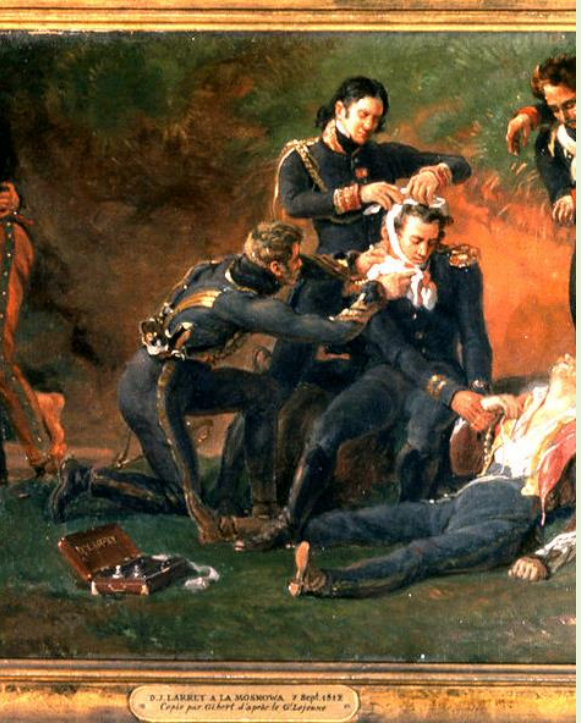
Urgentní příjem ON Kladno, a.s.

Oddělení urgentního příjmu a LSPP dětí FN Motol



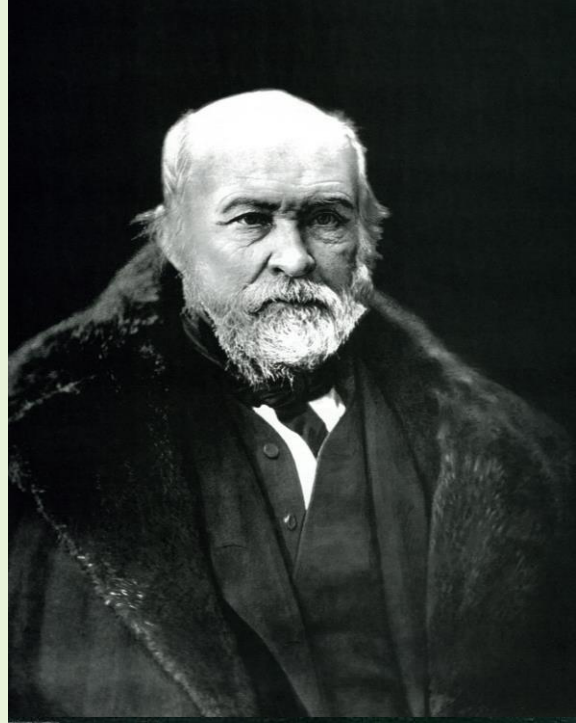
„FIRST COME, FIRST SERVED“
PROČ TENTO PRINCIP NA UP NEMŮŽEME POUŽÍT?

- **Mnoho příchozích, málo (závažně) nemocných**
- **Nutná identifikace závažných stavů, ale i odsunutí méně závažných např. přivezených ZZS**
- **→ kdo dřív přijde/přijede, ten (někdy) dřív nemele….**
- **Přetížení UP:**
  - **snížení bezpečnosti pacientů**
  - **riziko závažné chyby**



HISTORIE?

- **Třídění a následný rychlý transport mimo oblast frontových bojů + další stupeň třídění na obvazišti**
- **Dominique Jean Larrey (1766-1842) – napoleonské války**
- **John Wilson, britský námořní lékař**
- **Nikolaj Ivanovič Pirogov (1810-1881) – ruský válečný chirurg**



TŘÍDĚNÍ V CIVILNÍCH PODMÍNKÁCH

- od 60. let 20. století na odděleních typu EMERGENCY
- USA, Velká Británie, Austrálie, Kanada
- později i asijské země, které převzaly americký systém PNP a UP
- Richard Weinerman, Robert Rutzen, David Pearson – Effects of Medical „Triage“ in Hospital Emergency Service (1965)

Effects of Medical "Triage" in Hospital Emergency Service

E. RICHARD WEINERMAN, M.D., S. ROBERT RUTZEN, B.A., and DAVID A. PEARSON, M.P.H.

TWO DECISIVE trends have characterized hospital emergency services in recent years: sharply rising patient loads and disproportionate increases in numbers of nonemergency cases. Visits to emergency rooms throughout the country have risen far out of proportion to increases in clinic attendance or inpatient hospital admissions (*1–9*). At the same time, recent studies of utilization patterns indicate that one-third to one-half of emergency service cases can be classified as nonurgent (*3–8*).

Recent studies at the Yale-New Haven Medical Center have documented these general trends for this institution and are reported elsewhere (*10–13*). Findings to date suggest that a large proportion of persons using the emergency facilities for general health conditions are from the low economic status, urban core segment of the community.

The search for causes of these trends leads directly to the community at large and to involvement with the basic socioeconomic and medical care issues of the day. Two factors appear to be most significant: the inadequacy of general health services for the economically depressed population in the central areas around large urban hospitals and the pattern of solo and specialized private medical practice which limits the physician's ability to satisfy sudden and off-hour service demands. The emergency rooms have provided, thus, a research laboratory of great value, not only as the basis for program planning within the hospital but also as a source of information about the medical care needs of the general community.

The cumulative pressures, both quantitative and qualitative, have placed emergency stations under severe strain. Corrective measures have included expansion of facilities (without modification of the traditional model), restrictive admission policies, and development of alternative treatment facilities elsewhere in the community. As a result of the previous Yale-New Haven studies, however, a new program has been developed to deal directly with the major finding, that of the increasing amount of inappropriate use of this complex and expensive service. The new system is called medical "triage," a French term introduced in military medicine, which referred originally to the sorting of mass casualties for priority of treatment. It was instituted on July 1, 1963, in the emergency service of the affiliated Grace-New Haven Community Hospital.

The Triage Program

The experimental triage program is designed to provide each emergency service patient with brief medical evaluation, decision regarding

The authors are with the departments of medicine and epidemiology and public health, Yale University School of Medicine and the Grace-New Haven Community Hospital, New Haven, Conn. Dr. Weinerman is professor of medicine and public health and director of ambulatory services, Mr. Rutzen is a doctoral candidate in sociology and assistant in medical care research, and Mr. Pearson is a doctoral candidate in epidemiology and assistant in medical care instruction.

This paper represents the second in a projected series of research reports on ambulatory care. The investigation was supported in part by Public Health Service Research Grant No. 00037–02, 03 from the Division of Community Health Services.

EFFECTS OF MEDICAL „TRIAGE“ IN HOSPITAL EMERGENCY SERVICE, 1965

- **Studie z roku 1963v New Haven Community Hospital**
- **reakce na:**
    - **Zvyšování počtu pacientů**
    - **Disproporční rozložení – převaha neurgentních stavů**
- **„vojenská“ terminologie – třídící důstojník, třídící stanice**
- **Rezidenti z oborů interna, chirurgie a pediatrie a se zkušeností práce na UP + zkušená sestra**
- **Od 10 do 22 hod. denně**

EEFFECTS OF MEDICAL „TRIAGE“ IN HOSPITAL EMERGENCY SERVICE, 1965FEFFECTS OF MEDICAL „TRIAGE“ IN HOSPITAL EMERGENCY SERVICE,1965 EMERGENCY SERVICE, 1965

<u>VÝSLEDEK TŘÍDĚNÍ (žádný pacient nesměl odejít, aniž by byl vyšetřen lékařem):</u>

1. **Propuštění po ošetření na UP**
2. **Dojednání termínu u specialisty v nemocnici**
3. **Předání do soukromé ambulantní péče**
4. **Příjem na nemocniční oddělení**
5. **Předání do jiného zařízení (vč. psychiatrické, zubní péče, policii, záchytnou stanici, sociálního zařízení atd.)**
6. **Jiné řešení**

SYSTÉMY TRIÁŽE A JEJICH ADAPTACE

- Emergency Severity Index (ESI) – 5 stupňů (4 stupně);
- Manchester Triage System (MTS) – 5 stupňů;
- Pediatric Early Warning System (PEWS) – 5 stupňů;
- Australasian Triage Scale (ATS) – 5 stupňů;
- Canadian Triage and Acuity Scale a paedCTAS pro děti – 5 stupňů, retriage povinně podle doby čekání
- Simple Triage nad Rapid Treatment (START) a JUMP-STARTpro děti – 4 stupně, pro MU
- South African Triage Scale (SATS) – 4 stupně;
- Care Flight Triage Algorithm – 3 stupně, pro paramediky při MU;
- Triage Sieve Algorithm – 3 stupně;
- Pediatric Triage Tape (PTT) – 3 stupně, dětská modifikace předchozího algoritmu

OVĚŘENÉ A VALIDIZOVANÉ SYSTÉMY TRIÁŽE

PĚTISTUPŇOVÉ

- Emergency Severity Index (ESI)
- Manchester Triage Scale (MTS)
- PEWS (Paediatric Emergency Warning System)
- Canadian Triage and Acuity Scale
- Australian Triage Scale

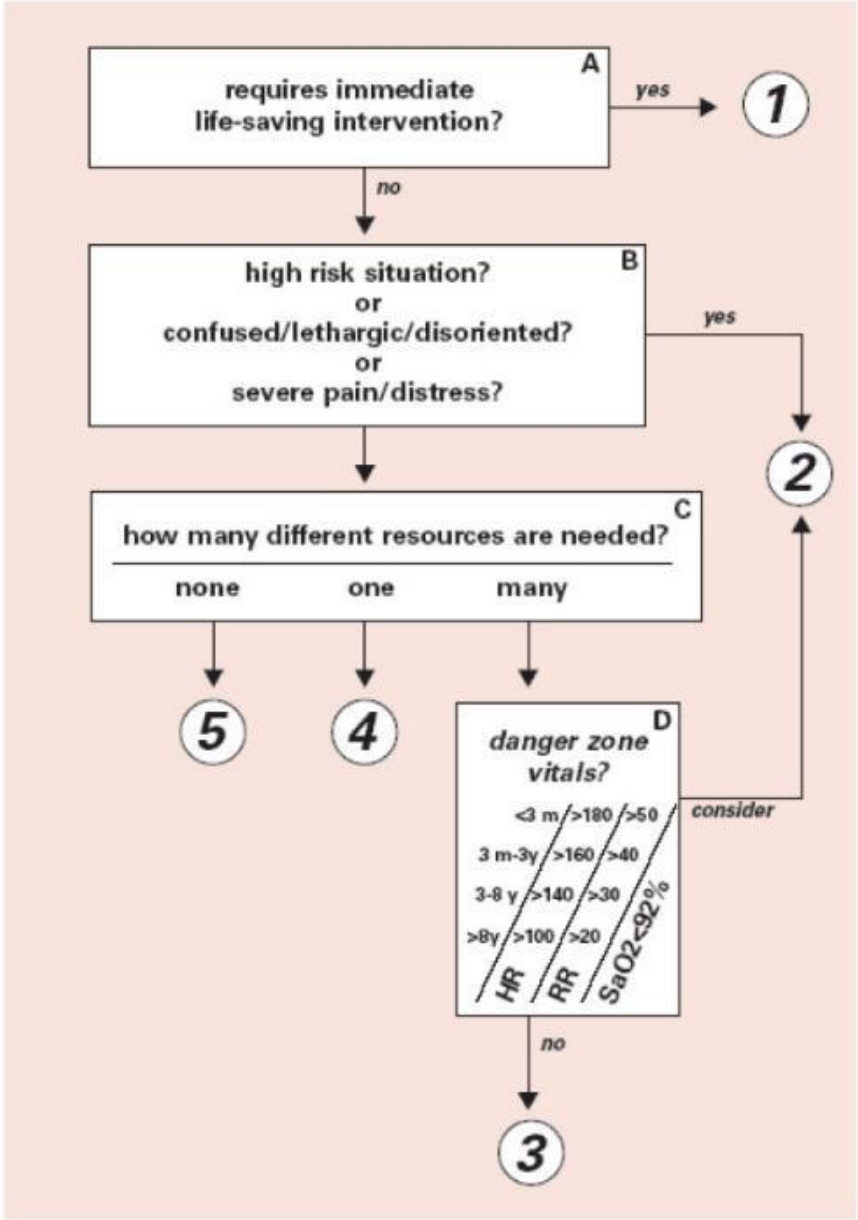
ČTYŘSTUPŇOVÉ

- Simple Triage and Rapid Treatment (START) – JUMP-START
- South African Triage Scale

TŘÍSTUPŇOVÉ

- Care Flight Triage Algorithm
- Pediatric Triage Tape
- vlastní modifikace na některých urgentních příjmech v ČR

EMERGENCY SEVERITY INDEX



	1 Red Resuscitation (0min)	2 Orange Urgent (15min)	3 Yellow Less urgent (60min)	4 Green Not urgent (180min)
A	Obstructed airway Stridor	Threatened airway		
B	SpO_2 < 80 RR > 35 or < 8	SpO_2: 80-89 RR: 31 - 35	SpO_2: 90-94 RR: 26 - 30	SpO_2 ≥ 95 RR: 8 – 25
C	HR > 130 BP_{sys} < 80	HR: 121 – 130 HR < 40 BT_{sys}: 80 – 89	HR: 111 – 120 HR: 40 - 49	HR: 50 – 110
D	GCS ≤ 8	GCS: 9 – 13	GCS = 14	GCS = 15
E		Tp > 40 Tp < 32	Tp: 38.1 – 40.0 Tp: 32 – 34	Tp: 34.1 – 38.0

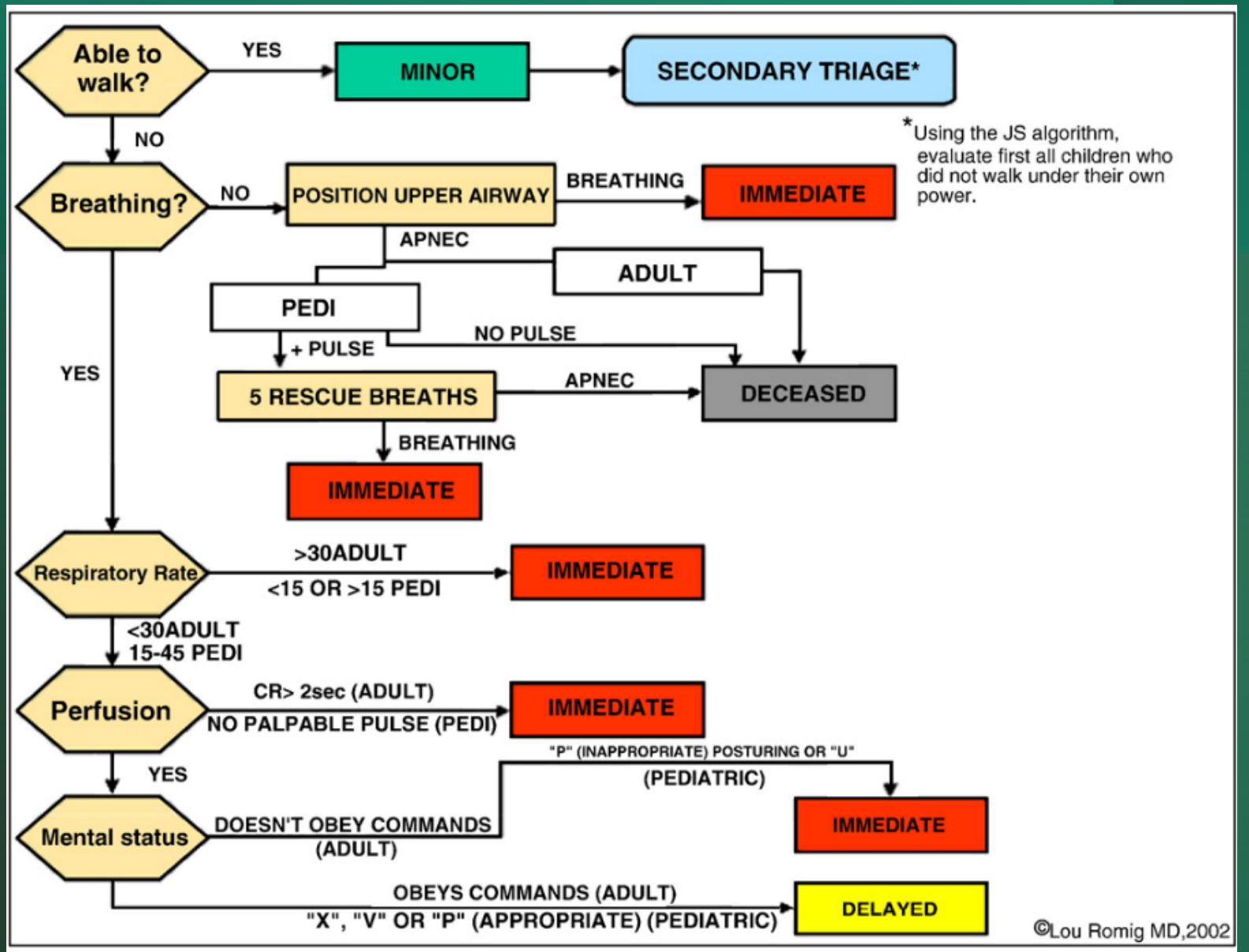


FIGURE 2. Combined START/JumpSTART triage algorithm.

Příloha 2

Příklad skórovacího systému pro včasnou detekci zhoršujícího se stavu pacienta

SYSTÉM VČASNÉHO VAROVÁNÍ – PACIENTI DO 12 LET
PEDIATRIC EARLY WARNING SCORE CARD (PEWS)

	3	2	1	0
Chování	• spavé či zmatené • snížená reakce na bolest	• dráždivé	• spánek	• přiměřené, hraje si
Krevní oběh	• mramoráž • CRT 5 s • tachykardie • > 30 /min nad normu • bradykardie	• šedé/cyanotické • CRT 4 s • tachykardie > 20 /min nad normu	• bledé nebo • CRT 3 s	• růžové nebo CRT <2 s
Dýchání	• Df > 5 /min pod normu + zatahuje či grunting • HFNO > 50% O_2 či O_2 > 8 l/min	• Df > 10 /min nad normu • zapojení pomocných svalů • zatahuje • HFNO > 40% O_2 či O_2 > 6 l/min	• Df > 10 /min nad normu • zapojení pomocných svalů • zatahuje • HFNO > 30% O_2 či O_2 > 3 l/min	• normální, nezatahuje

CRT – kapilární návrat (Capillary Refill Time), Df – dechová frekvence, FiO_2 – inspirační frakce kyslíku

	Tepová frekvence [min^{-1}]	**Dechová frekvence** [min^{-1}]
novorozenec (<1 měsíc)	100-180	40-60
Kojenec (1-12 měsíců)	100-180	35-40
Batole (1-3 roky)	70-110	25-30
Předškolák (4-6 let)	70-110	21-23
Školní věk (7-12 let)	70-110	19-21

TRIÁŽ U ZÁVAŽNÝCH STAVŮ

- **ÚRAZY**
  - **Věstník MZ 2015, částka 15, s.2-20; Centra vysoce specializované traumatologické péče a Centra vysoce specializované péče o pacienty s popáleninami**
- **POPÁLENINY**
  - **Věstník MZ 2019, částka 5, s. 74-75; Triáž popálených dospělých a dětí**
- **ŘEŠENÍ STAVŮ HROZÍCÍHO NEBO NÁHLE VZNIKLÉHO SELHÁNÍ VITÁLNÍCH FUNKCÍ (MET týmy)**
  - **Věstník MZ 2019, částka 11, s. 76-84; Metodický pokyn – Řešení stavů hrozícího nebo náhle vzniklého selhání základních životních funkcí**

ZPŮSOBY ZLEPŠENÍ PRŮCHODNOSTI UP

- **Funkční triáž na vstupu**
- **Sledování funkčních parametrů kvality práce UP**
    - **Čekací doba (waiting time)**
    - **Čas do kontaktu s lékařem (time to be seen by a doctor)**
    - **Počet pacientů, kteří nevyčkali ošetření**
- **Vytvoření oddělených tras („fast track“ versus „low priority cases“)**
- **Týmová triáž – se zapojením lékaře – návrat zpět ke kořenům?**
- **V případě kritického nedostatku lůžek v nemocnici – „reverse triage“**
    - **Identifikace pacientů, které je možné propustit nebo přeložit, u kterých nehrozí riziko potřeby náročné lékařské péče v následujících 96 hodinách**

Reverse triage: more than just another method

Gwen Pollaris and Marc Sabbe

Reverse triage is a way to rapidly create inpatient surge capacity by identifying hospitalized patients who do not require major medical assistance for at least 96 h and who only have a small risk for serious complications resulting from early discharge. Electronic searches were conducted in the MEDLINE, TRIP, Cochrane Library, CINAHL, EMBASE, Web of Science, and SCOPUS databases to identify relevant publications published from 2004 to 2014. The reference lists of all relevant articles were screened for additional relevant studies that might have been missed in the primary searches. There will always be small individual differences in the reverse triage decision process, influencing the potential effect on surge capacity, but at most, 10–20% of hospital total bed capacity can be made available within a few hours. Reverse triage could be a response to Emergency Department (ED) crowding, as it gives priority to ED patients with urgent needs over inpatients who can be discharged with little to no health risks. The early discharge of inpatients entails negative consequences. They often return to the ED for further assessment, treatment, and even readmission. When time to a medical referral or bed is less than 4–6 h, 100 additional lives per annum are predicted to be potentially saved. The results of our systematic review identified only a small number of publications addressing reverse triage, indicating that reverse triage and surge capacity are relatively new subjects of research within the medical field. Not all research questions could be fully answered. *European Journal of Emergency Medicine* 23:240–247 Copyright © 2016 Wolters Kluwer Health, Inc. All rights reserved.

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Keywords: emergency service, hospital, mass casualty incidents, patient discharge, surge capacity, triage

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Introduction

Mass casualty incidents (MCIs) can no longer be ignored in today's society. They lead to unexpected and sudden increases in patient volume at hospitals. This major influx can easily overwhelm an emergency department (ED) and even the entire hospital's capacity and resources. A healthcare system's ability to rapidly expand its normal capacity to meet the increase in demand is called surge capacity [1]. If full surge capacity is not achieved quickly, ED crowding will occur, leading to a decrease in the overall quality of delivered patient care [2–4]. For most situations, it is assumed that hospitals should be able to sustain medical services for up to 96 h without external aid. To ensure this, methods to improve surge capacity are being developed [5]. One of these methods – called reverse triage – addresses both problems by simultaneously creating additional surge capacity and reducing crowding. The term reverse triage originates from the military. This approach prioritizes treating the least wounded soldiers first so that they can recover and return to the battlefield as soon as possible. The civilian model of reverse triage suggests a similar approach, one in which patients who need the least amount of medical assistance are prioritized so that they can be discharged as soon as possible [5]. Implementing reverse triage in the civilian model is a way to rapidly create inpatient surge capacity by identifying hospitalized patients who do not require major medical assistance for at least 96 h and who only have a small risk for serious complications resulting from early discharge. Such patients can be immediately discharged in MCIs so that disaster victims, who are in greater need of hospital care and resources, can receive priority [6–10]. Low-risk patients can be discharged home or to less acute-care facilities (e.g. nursing homes or public health contingency stations) [5]. When patients have been downgraded to an onsite nursing facility, paramedic personnel could support nurses by helping with the patients' activities of daily living, medication distribution, and wound care [6]. There is also a moral principle relevant to reverse triage that guides allocation of inpatients in a disaster surge situation. This moral framework captures the idea that '… patients must be considered as individuals competing on equal terms for the limited resources available and are judged in purely clinical terms' [10]. Some authors believe this principle – to achieve the most good for the greatest number of patients – can be used not only in extraordinary situations but also in daily practice, as ED crowding is an increasing problem [11, 12]. Proponents believe that it is justifiable to reduce ED crowding by prioritizing ED patients who need urgent medical attention at the expense of inpatients [10]. Others are more reticent to apply reverse triage to everyday hospital surge. In an MCI, a certain surge of

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Can a reverse triage clinical decision support tool create sufficient surge capacity and reduce emergency department crowding?

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Mass casualty incidents (MCIs) such as terrorist attacks (e.g. Brussels, 22 March 2016; Paris, 13 November 2015) or the present COVID-19 pandemic, can no longer be ignored in today's society [1,2]. In addition, daily emergency department (ED) crowding also leads to unexpected and sudden increases in patient volumes. This major influx due to MCIs or ED crowding can easily overwhelm an ED and subsequently the entire hospital capacity and its resources. In the search for coping strategies, triage systems and new technologies have been studied [3–5]. A healthcare system's ability to rapidly expand its normal capacity to meet the increase in demand is called surge capacity. If full surge capacity is not achieved in time, ED crowding will occur, leading to an overall lower quality of patient care and a potential increase in morbidity and mortality [6–9].

The reverse triage method is on the basis of the principle that patients with the least need for medical care should be the first to be assessed for early hospital discharge. Reverse triage is a process to rapidly create inpatient surge capacity by identifying hospitalized patients who do not require major medical assistance for at least 96 h. As a result, these patients have only a small risk of serious complications in case of early discharge. Conversely, it offers the possibility to prioritize disaster victims who are in greater need of hospital care and resources. Low-risk patients can be discharged home or to less acute-care facilities such as nursing homes, public health contingency stations or an onsite nursing facility [9,10]. Although never studied before, the reverse triage principle could also be applied to reduce the daily phenomenon of ED crowding. By simultaneously prioritizing ED patients who need urgent medical attention and prioritizing inpatients ready for discharge, a daily hospital surge capacity could be achieved.

As stated by Hudson *et al.* [5], it is of more value to focus on predicting the outflow of admitted patients rather than predicting the influx, as the outflow is a more critical influencer of ED crowding.

However, choices have to be made as executing reverse triage protocols, in case of MCIs or ED crowding, requires medical personnel who are simultaneously needed to provide care. Therefore, a clinical decision support tool to facilitate the outflow of admitted patients, on the basis of the reverse triage principle, was piloted in a previous monocentric study within the University Hospitals of Leuven. This application, the Reverse Triage Tool Leuven, was able to detect hospitalized patients who undeniably could not be discharged early in case of a MCI. As such, the number of inpatients to be clinically evaluated for potential early discharge in MCIs was reduced by 65% [11].

In contrast to MCIs where a certain degree of risk will be considered acceptable, this would not be tolerable in the case of ED crowding. Therefore, the cut-off values of reverse triage in case of MCI to indicate inpatients who are not ready for hospital discharge, potentially need to be reconsidered when it comes to ED crowding. In order to redefine the definitions and cut-off values for daily ED crowding, as well as to update and reassess the underlying American framework, an e-Delphi study with a European expert panel, is currently in progress [12]. In addition, the renewed definitions will be validated in several Flemish hospitals that use the same health electronic record (HER) platform.

Finally, validation in other European countries and in hospitals using a different HER platform is mandatory. Following the recovery of the current COVID-19 pandemic, we all have to further refine patient flows of unplanned care in a healthcare system that is mainly oriented to planned admissions, not only in case of a MCI but also in case of ED crowding. Therefore, an international consortium has to be set up to search for funding and to execute this innovative project. This is an open call for those interested to participate in such a consortium.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

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REVERSE TRIAGE

EUSEM QUALITY INDICATOR PROJECT

Structure/ system: Documentation	**Ability to actively record signs that indicate vital (life sustaining) function both at triage and monitor through ED visit.**	Demonstrate (A) the ability to record signs (body temperature, pulse rate, blood pressure, oxygen saturation, respiratory rate) in the patients record (digital or otherwise) and demonstrate (B) that this ability is being used greather than X% of patients in a selected period of time. (Potentially X =95) (C) that this measurement is ongoing through ED visit rather than only at triage for those who's vitals are either abnormal or patients at risk of deterioration.
Structure/ system: Documentation	**Ability to actively record patient's reason for attending emergency department (complaint/ symptom) and precipitating factor (accident, illness, injury)**	Demonstrate (A) the ability to record this in the patients record either digitally or otherwise, demonstrate (B) where this ability is being used greater than X% of patients in a selected period of time. (Potentially X=95)
Structure/ system: Time related elements of patient trajectory:	**Time to be seen by doctor depending on triage category**	Understanding that triage systems in use vary between regions, demonstrate the ability to measure time to doctor review for a given set of patient visits and demonstrate that these

EUSEM QUALITY INDICATOR PROJECT

Structure/ system: Documentation	**Ability to actively record triage category**	Demonstrate (A) the ability to record triage category in the patients record (digital or otherwise) and demonstrate (B) that this ability is being used greather than X% of patients in a selected period of time. (Potentially X =95)
Structure/ system: Triage	**Triage system in place**	Demonstrate that a system is in place to assign degrees of urgency and assign order of assessment and treatment to patients presenting to the ED. Describe this system including any local modifications to standardised systems.

NA CO PŘI TŘÍDĚNÍ NEZAPOMÍNAT?

- **Technika (procesy, kvantifikace) versus filosofie (etické ospravedlnění)**
- **Založeno na distributivní spravedlnosti**
- **Třídění = systematická alokace benefitů zdravotní péče versus odepření nebo odložení péče jiným**
- **Systém třídění podporuje**
  - **hodnoty lidského života a zdraví, efektivní využití zdrojů a spravedlnost (ve smyslu „fairness“)**
  - **potlačuje autonomii**

TŘÍDĚNÍ JAKO AKTIVITA MĚNÍCÍ CHAOS V SYSTÉM…

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