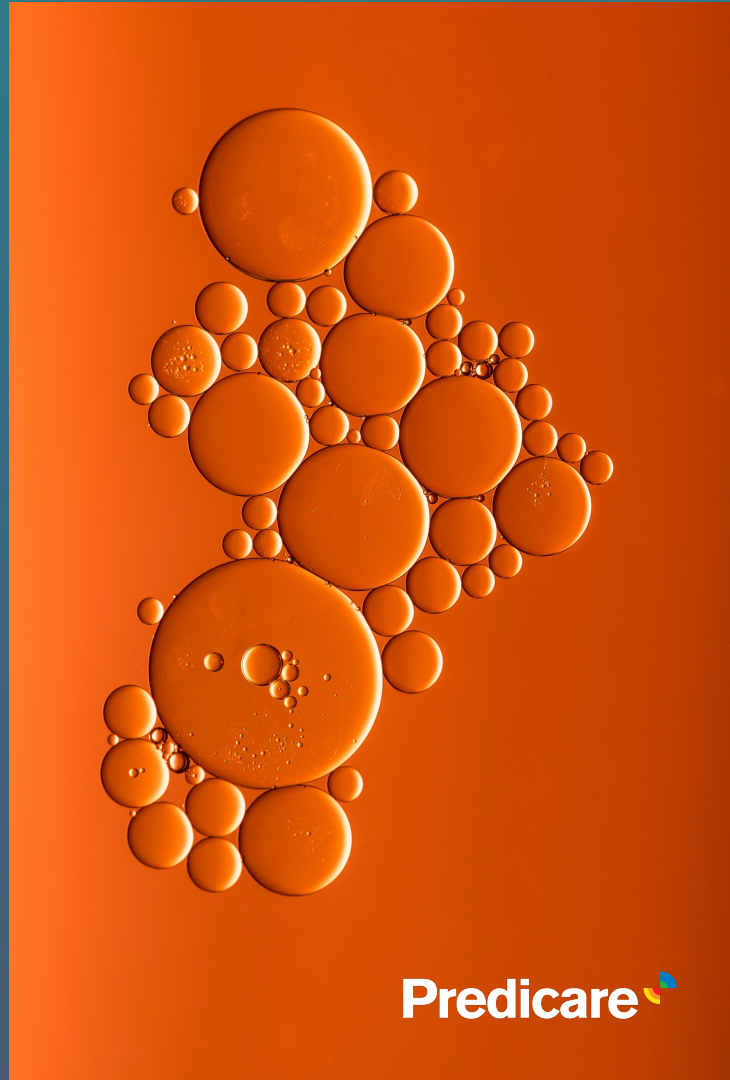
RETTS save lives

Decision support system for emergency care

Bengt Widgren
MD, PhD, Associate professor
CMO Predicare



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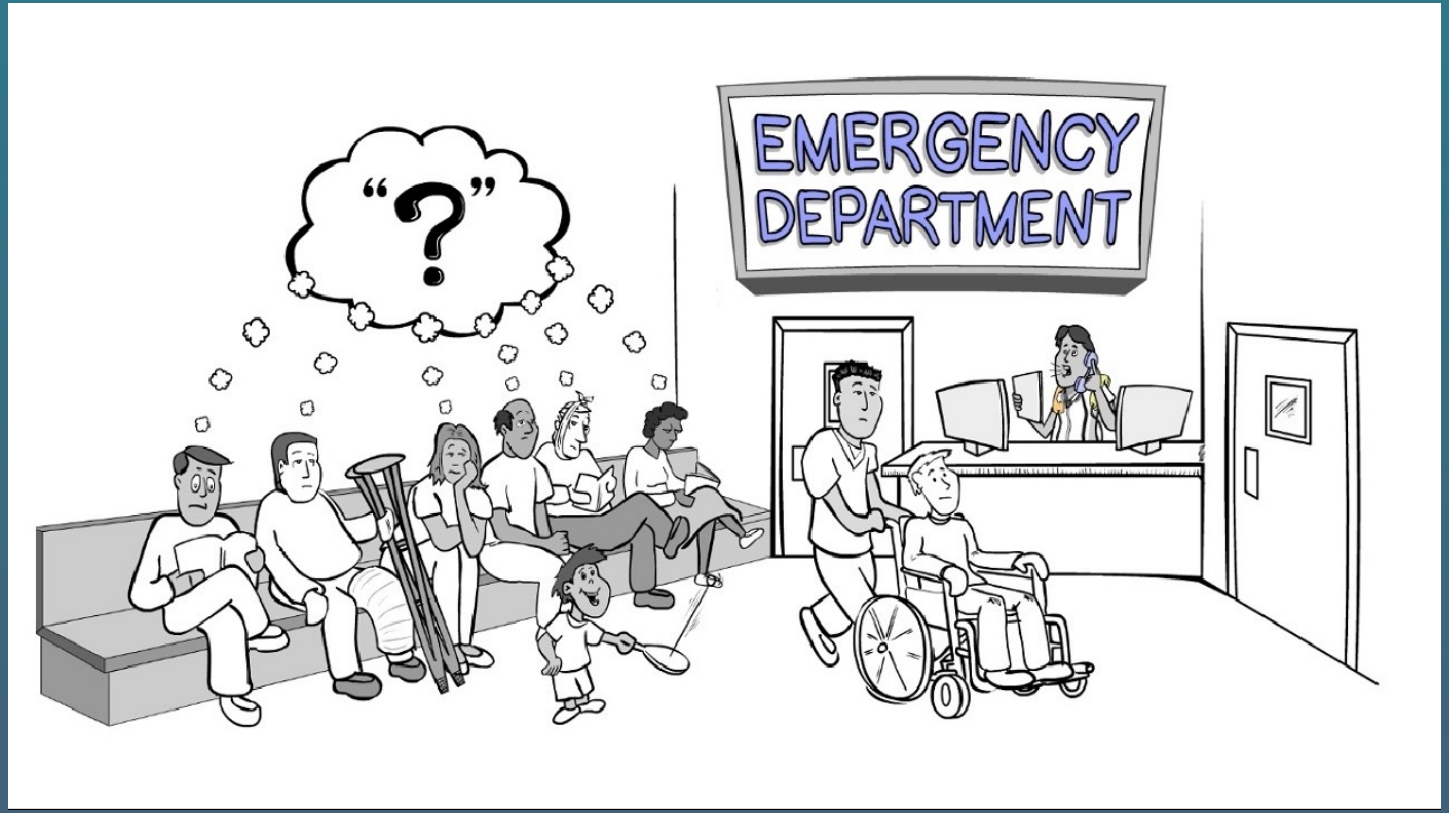

Triage
= to sort

Patients demand for ED: A safe and correct medical decision

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Challenges for ED

1. Aging population = increased ED visits
2. Non-emergency visits of ED = “misuse” of emergency care units
3. A way to refer to other medical care performer (primary care)
4. No national standard for triage or decision systems: START, SALT, CPSS, JTAS

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RETTS

Rapid
Emergency
Triage &
Treatment
System

History

2003	Demand for solution at ED arised from Swedish hospitals
2004	Dr. Bengt Widgren, head of the ED, developed RETTS/METTS
2005	RETTS© was introduced at Sahlgrenska University Hospital
2005	RETTS© validations and still ongoing
2011	Company Predicare was grounded and managed RETTS
2018	RETTS covers 95% market in Sweden, 65% in Norway
2019	RETTS has been used in a pilotstudy at ED in Chinese hospital
2021	RETTS has been used in over 50 million patients so far

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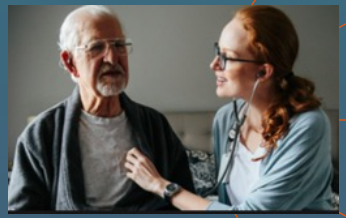
RETTS for clear and secure communication

*After implemention of RETTS we find a much lower interindivdual variation
ie. high concordance (nurse, instructor, MD, midwife during simultanously assment: **kappa 0,8**6)



RED
ORANGE
YELLOW
GREEN
BLUE

Red patient → High medical risk
Orange patient → Medium medical risk
Yellow patient → Low medical risk
Green patient → Low medical risk
Blue patient → No medical risk

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RETTS usability

- Very high sensitivity to find those with high medical risk
  - Based on vital signs, because of measurable objective data
- Lower ability with specificity
  - Based on patient history and collected subjective data

High **sensitivity** is most important factor while **specificity** is handled by the skills at the staff

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Is RETTS reliable & predicable ?

Medical risk level are based on these data

n=12317	Blue n= 3430	Green n=3391	Yellow n=3461	Orange n=1339	Red n=696
Discharged	91%	70%	46,6%	24%	12,4%
Hospitalized	9%	30%	53,4%	75,8%	80,4%
Mortality at ED	0%	0%	0%	0,2%	7,2%

GHB intox

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TODAY TO TOMORROW

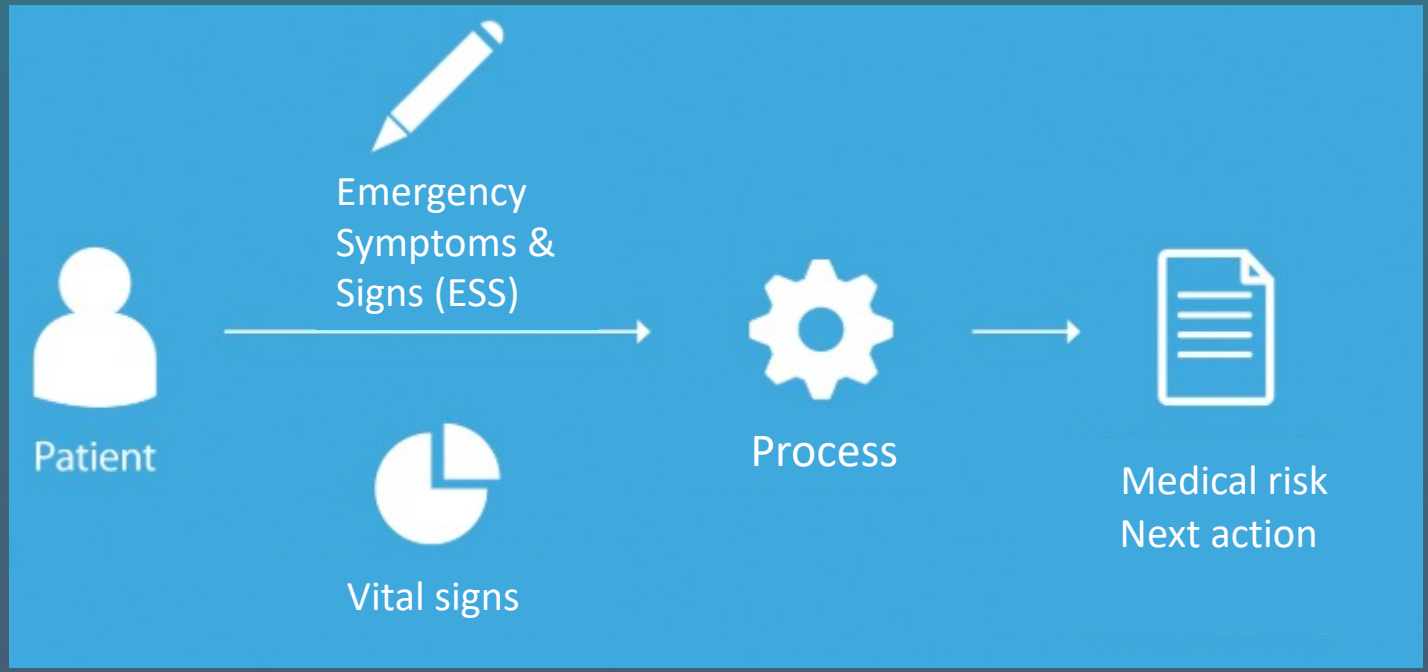
- RETTS© Next Gen to be developed 2022 together with members of the profession
- Further growth and pilot projects ongoing on several markets
- Strategic partnerships and integrations with EMR suppliers
- RETTS© Summit live meetings

Using RETTS to assess patients‘ risk level and to support redirection decisions in Sweden

Maria Frånlund

MD, PhD
CMO Predicare
CEO Carlanderska Hospital Dept of Surgery and Urology
Göteborg, Sweden

How to use RETTS©



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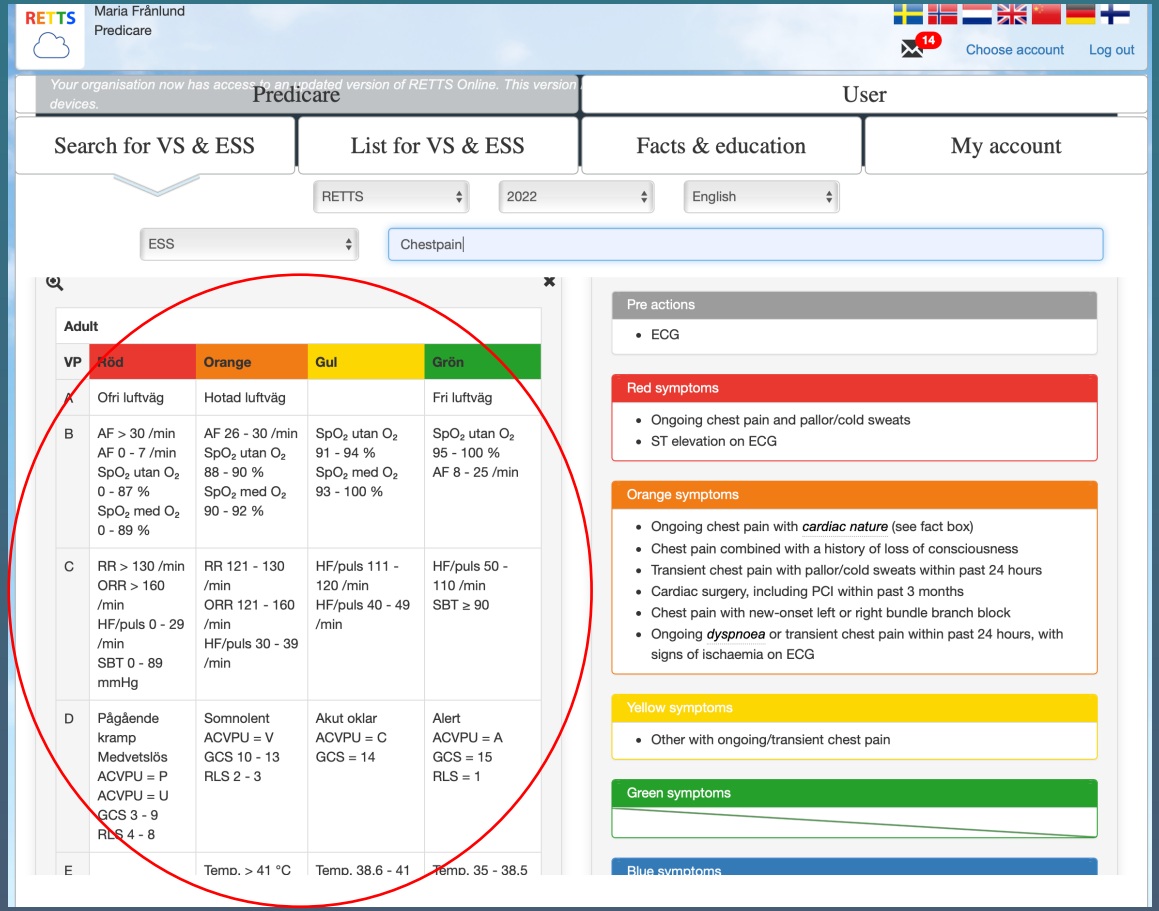
The RETTS process include 3 main decision steps



1. Vital parameters
2. ESS - Emergency Symptoms and Signs (medical history and clinical signs)
3. The medical assessor (knowledge, experience)

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1. RETTS vital parameters (VP)

- A, B, C, D, E
- Assessment of VP should be performed together with anamnese (presenting complaint and other illnessess)

	VP	ESS
RED	91%	9%
ORANGE	55%	45%
YELLOW	13%	87%
GREEN	0%	100%

VP	Röd	Orange	Gul	Grön
A	Ofri luftväg	Hotad luftväg	-	Fri luftväg
B	AF > 30 /min AF -7 /min SpO_2 utan O_2 -87 % SpO_2 med O_2 -89 %	AF 26-30 /min SpO_2 utan O_2 88-90 % SpO_2 med O_2 90-92 %	SpO_2 utan O_2 91-94 % SpO_2 med O_2 93-100 %	SpO_2 utan O_2 95-100 % AF 8-25 /min
C	RR > 130 /min ORR > 160 /min HF/puls -29 /min SBT -89 mmHg	RR 121-130 /min ORR 121-160 /min HF/puls 30-39 /min	HF/puls 111-120 /min HF/puls 40-49 /min	HF/puls 50-110 /min SBT ≥ 90
D	Pågående kramp Medvetslös ACVPU = P ACVPU = U GCS 3-9 RLS 4-8	Somnolent ACVPU = V GCS 10-13 RLS 2-3	Akut oklar ACVPU = C GCS = 14	Alert ACVPU = A GCS = 15 RLS = 1
E	-	Temp. > 41 °C Temp. < 35 °C	Temp. 38.6-41 °C	Temp. 35-38.5 °C

This is why VP are important!

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2. Emergency Symtoms and Signs (ESS)

- Presenting complaint(s) are based on symptoms and clinical signs
- Presenting complaint(s) are structured in algorithms (ESS) which give support when collecting the anamnese and clinical signs (rash, neck stiffness or ECG deviation etc)
- Each ESS have a risk-grading or colour
- ESS algorithm ”finds the severe ill patients” even if vital signs are “ok”
- Low inter-rater variability

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1. The objective part: Measurements of the vital parameters (ABCDE)

2. The subjective part: ESS=emergency symptoms and signs. Include both the actual medical history and clinical signs (ECG etc)

3. The 3 part is the: opinion, knowledge and experience of the assessor

RETTS is a combination of 1+2+3= medical risk both when RETTS is used prehospital, at the ED or in the primary care settings

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Search for VS & ESS | List for VS & ESS | Facts & education | My account

RETTS | 2022 | English

ESS | 44. Cough

VP	Röd	Orange	Gul	Grön
A	Ofri luftväg	Hotad luftväg		Fri luftväg
B	AF > 30 /min AF 0 - 7 /min SpO_2 utan O_2 0 - 87 % SpO_2 med O_2 0 - 89 %	AF 26 - 30 /min SpO_2 utan O_2 88 - 90 % SpO_2 med O_2 90 - 92 %	SpO_2 utan O_2 91 - 94 % SpO_2 med O_2 93 - 100 %	SpO_2 utan O_2 95 - 100 % AF 8 - 25 /min
C	RR > 130 /min ORR > 160 /min HF/puls 0 - 29 /min SBT 0 - 89 mmHg	RR 121 - 130 /min ORR 121 - 160 /min HF/puls 30 - 39 /min	HF/puls 111 - 120 /min HF/puls 40 - 49 /min	HF/puls 50 - 110 /min SBT ≥ 90
D	Pågående kramp Medvetslös ACVPU = P ACVPU = U GCS 3 - 9 RLS 4 - 8	Somnolent ACVPU = V GCS 10 - 13 RLS 2 - 3	Akut oklar ACVPU = C GCS = 14	Alert ACVPU = A GCS = 15 RLS = 1
E		Temp. > 41 °C Temp. < 35 °C	Temp. 38.6 - 41 °C	Temp. 35 - 38.5 °C

Adult

44. RETTS — Version: 2022

- Blisters in the mouth (J06.9)
- Sore throat, cold (J06.9)
- Cough (R05.9)

Dyspnoea, see also ESS 4
Suspected serious infection, see ESS 47

Red symptoms

Orange symptoms

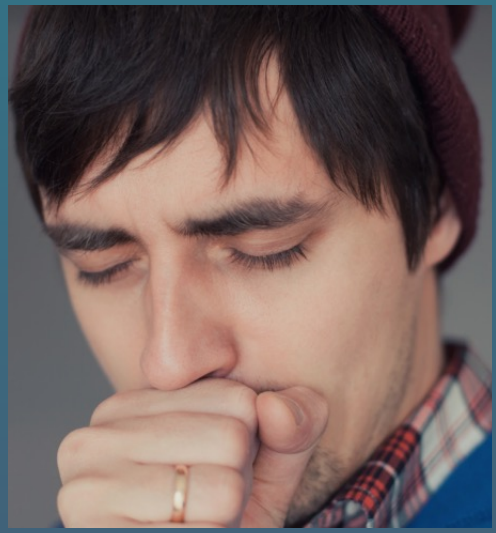
- Immunosuppressed patient

Yellow symptoms

- Sore throat and hoarse voice

Green symptoms

- Swollen tonsil with visible uvula displacement/recurring peritonsillar abscess
- Dry mouth
- None of the above



Redirect some patients?

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RETTS gives support in the initial evaluation

- RETTS: enable medical decisions with high safety and quality for both patients and organisations and their staff
- The strengths are that the assessor can rely on the algorithms and the risk prediction in RETTS
- In Sweden RETTS has been used in the prehospital ambulance organization to refer patients to primary care and avoid the ED for those patients with lowest medical risk

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Original Contributions

MEDICAL EMERGENCY TRIAGE AND TREATME PROTOCOL IN PRIMARY TRIAGE AND SECONI EMERGENCY MEDIC

Bengt R. Widgren, MD, PHD* and Maj

*Department of Accident and Emergency Medicine and †Department of Inte Göteborg, Sweden

Reprint Address: Bengt R. Widgren, MD, PHD, Department of Accident and Emerg University Hospital, Goteborg 413 45,

☐ **Abstract—Background:** In many Emergency Department (ED) triage scoring systems, vital signs are not included as an assessment parameter. **Objectives:** To evaluate the validity of a new protocol for Emergency Medicine in a large cohort of patients referred to in-hospital care. **Methods:** From January 1 to June 30, 2006, 22,934 patients were admitted to the ED at Sahlgrenska University Hospital. Of those, 8695 were referred to in-hospital care and included in the study. A new five-level triage tool, combining vital signs, symptoms, and signs in the triage decision, was used. A small control of the inter-rater disagreement was also performed in 132 parallel, single-blinded observations. **Results:** Fifty percent of the patients were admitted by ambulance and the other 50% by walk-in. Hospital stay was significantly ($p < 0.001$) longer in those admitted by ambulance (9.3 ± 14 days) as compared with walk-in patients (6.2 ± 10 days). In-hospital mortality incidence was higher (8.1%) in patients admitted by ambulance, as compared with walk-in patients (2.4%). Hospital stay and in-hospital mortality increased with higher level of priority. In the highest priority groups, 32–53% of the patients were downgraded to a lower priority level after primary treatment. **Conclusion:** In the present study, the METTS protocol was shown to be a reliable triage method and a sensitive tool for secondary re-evaluation of the patient in the ED. © 2011 Elsevier Inc.

☐ **Keywords—triage; vital signs; mortality; hospital stay; emergency medicine**

Early iden into priori ment (ED Emergenc made clos different n been intro recent yea physiologi described, signs or la assessmen to be of i and stratif been shov hospital ir lated to th detect tho safety has over-triag

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Observational Study > Eur J Emerg Med. 2016 Feb;23(

doi: 10.1097/MEJ.0000000000000173.

The predictive validity of RETTS triage tool in the emergency dep Regional Hospital

Noel Pérez [1], Louise Nissen, Rasmus F Nielsen, Poul Peters

Affiliations + expand

PMID: 24849609 DOI: 10.1097/MEJ.0000000000000173

Abstract

Introduction: The Rapid Emergency Triage and Treatment S HEV) is a triage system used in the emergency department categorizes patients according to priority and defines a time before being seen by a doctor depending on the severity of study was to determine the predictive validity of RETTS-HE between triage scores and outcomes such as the admissior mortality.

Materials and methods: We performed an observational c records of all patients who attended the ED from 1 Septemb Regional Hospital West Jutland in Herning, Denmark (N=46 to make associations with the patients' triage category: in-h day mortalities, the hospital LOS and the admission rate, on the Danish National Patient Registry.

Results: The distribution of age, comorbidity, admission, LO differed as expected. After making adjustments for these di association between triage categories and in-hospital morta the hospital LOS, and the admission rate.

Conclusion: RETTS-HEV was found to be closely related to useful in the risk stratification of ED patients.

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Scandinavian Journal of Resuscitation and Emergency

ORIGINAL RESEARCH Open A

A validity study of the rapid emergency Triage and treatment system for children

Siv Steinsmo Ødegård[1,2*], Thuy Tran[3], Lars E. Næss-Pleym[4], Kari Risnes[1,3] and Henrik Døllner[1,3]

Abstract

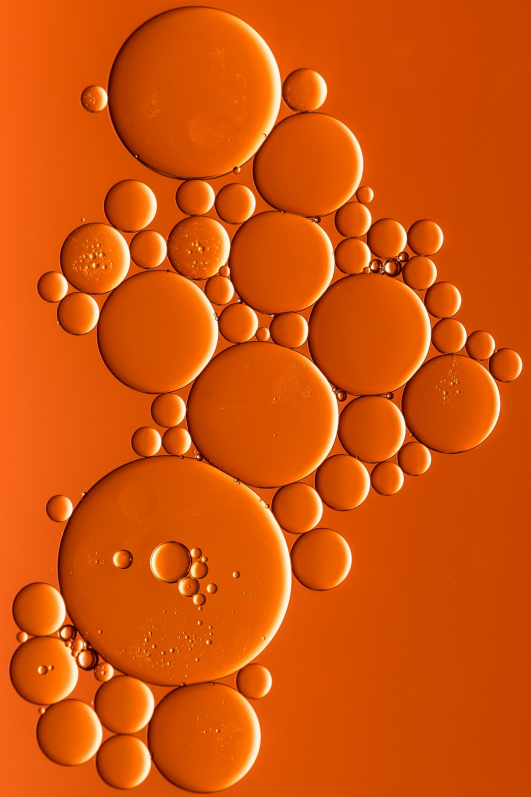
Background: The Scandinavian Rapid Emergency Triage and Treatment System-pediatric (RETTS-p) is a reliab triage system that includes both assessment of vital parameters and a systematic approach to history and symptoms. In Scandinavia, the system is used in most pediatric emergency departments (PED). We aimed to the validity of RETTS-p.

Methods: We conducted a study based on triage priority ratings from all children assessed in 2013 and 201 PED at St. Olavs University Hospital Trondheim, Norway. Patients were assigned one of four priority ratings, b on the RETTS-p systematic evaluation of individual disease manifestations and vital parameter measurements absence of a gold-standard for true disease severity, we assessed whether priority ratings were associated w proxy variables: 1) hospitalization to the wards (yes vs. no), 2) length of hospital stay (≤ mean vs. > mean, ar referral to pediatric intensive care (yes vs. no). We further compared priority ratings with selected diagnoses procedure codes at discharge.

Results: Six thousand three hundred sixty-eight children were included in the study. All analyses were perfo the entire population and separately in pediatric sub-disciplines, medicine ($n = 4741$) and surgery (general ar neurosurgery) ($n = 1306$). In the entire population and the sub-disciplines, a high priority rate was significantl associated with hospitalization to wards, a longer hospital stay and referral to the pediatric intensive care un compared to patients with low priority. We observed a dose-response relationship between increased triage level and indicators of more severe disease (p-trend < 0.001). For the same three proxy variables, the sensitiv 54, 61 and 83%, respectively, and the specificity 66, 62 and 57%, respectively. Subgroup analyzes within the m common complaints, demonstrated that more severe conditions were higher prioritized than less severe cor for both medical and surgical patients. Overall, children with surgical diagnoses attained lower priority rating children with medical diagnoses.

Conclusions: RETTS-p priority ratings varies among a broad spectrum of pediatric conditions and mirror me urgency in both medical and surgical disciplines. RETTS-p is a valid triage system for children as used in a ur hospital setting.

Keywords: Triage, RETTS-p, Validity, Pediatric emergency care



Vielen Dank für Ihre Aufmerksamkeit!

Contact: Maria Frånlund
+46 703 387241
maria.franlund@predicare.se

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