



Original Article

Utility of REMS (Rapid Emergency Medicine Score) In Predicting 30 Days Outcome in Non-Surgical Patients Presenting to ED

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ABSTRACT

Introduction: The Rapid Emergency Medicine Score (REMS) was developed as a rapid, non-invasive alternative to APACHE II for emergency department (ED) risk stratification. While traditional scoring systems require laboratory values that delay assessment, REMS leverages six readily available vital signs and clinical parameters - age, heart rate, respiratory rate, mean arterial pressure, Glasgow Coma Scale (GCS), and oxygen saturation that can be assessed within minutes of ED presentation. Risk stratification for optimal resource allocation and treatment are crucial, yet limited data exists on REMS application in nonsurgical ED populations. Purpose To evaluate the predictive value of Rapid Emergency Medicine Score (REMS) in determining 30-day mortality and clinical outcomes of non-trauma, non-surgical patients presenting to the Emergency Department of a tertiary care hospital. **Materials and Methods:** A prospective observational cohort study was conducted on non-trauma emergency department patients at MGM Medical College and MYH Hospital Indore, over a period of 1 month from February 2026 to March 2026. In 70 patients REMS score was calculated within 15 minutes of ED arrival (range 0–26), categorizing patients according to risk. Clinical outcomes included 30-day mortality, ICU admission rates, length of hospital stay (LOS), and clinical disposition patterns. **Results:** Mortality demonstrated strong correlation with REMS category: low-risk patients experienced 0%, while moderate-risk and high-risk patients experienced 9.1% and 66.7% 30-day mortality, respectively. High-risk REMS patients had significantly higher ICU admission rates (89% vs. 7.1% in low-risk patients). Regression analysis revealed age increased REMS score by 11% per year ($p<0.001$), heart rate by 3% ($p=0.02$), and respiratory rate by 5% ($p=0.001$), while oxygen saturation decreased REMS by 12% ($p<0.001$) and GCS by 22% ($p=0.008$). Hospital length of stay increased 12% per REMS point ($p=0.001$), with high-risk patients averaging 12.4 ± 4.8 days versus 3.8 ± 2.1 days for low-risk patients. **Conclusion:** REMS demonstrates strong predictive validity and discriminatory power for 30-day mortality in ED patients. This score simplicity requires only physiologic parameters and enables rapid bedside risk assessment and reliable triage decisions. It effectively identified patients requiring ICU admission and intensive intervention, validating its incorporation into routine ED protocols for optimized patient risk stratification and clinical resource allocation.

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Keywords: Rapid Emergency Medicine Score (REMS); Risk Stratification; 30-Day Mortality; Intensive Care Unit; Non-Surgical Patients.

INTRODUCTION

Outcomes of patients presenting to Emergency Department depend on early risk stratification and severity assessment. Traditional scoring systems like APACHE-II require laboratory parameters, making them time-consuming for ED use. The **REMS score** is a validated physiological scoring system developed by **Olsson et al. (2004)** to predict **in-hospital mortality** in emergency patients REMS offers rapid bedside assessment using readily available physiological parameters REMS incorporates age, vital signs, GCS, and oxygen saturation for comprehensive risk assessment.

OBJECTIVES

Primary Objective-To assess the accuracy of REMS in predicting 30-day outcomes in non-surgical ED patients

Secondary Objectives

- To identify predictive components of REMS
- To evaluate hospital complications according to risk category
- To correlate REMS with length of hospital stay

METHODOLOGY

- **Study Design:** Prospective observational, single centre, cross-sectional study
- **Setting:** Emergency Medicine Department, M.G.M Medical College and MY Hospital, Indore
- **Sample Size:** Initial enrollment: 75 patients; Final analysis: **70 patients** (7% dropout)

Gender Distribution: Males: 37 , Females: 33

Inclusion Criteria

Adult patients (≥ 18 years) presenting to Emergency Department

Non-trauma, non-surgical emergency medical admissions

Patients with complete vital sign documentation within 15-20 minutes of arrival

Patients willing to participate with informed consent obtained

Exclusion Criteria

Patients with traumatic injuries

Patients planned for immediate surgical intervention

Cardiac arrest patients unresponsive to cardiopulmonary resuscitation

Patients transferred from other hospitals

Procedure

REMS parameters recorded by trained emergency medicine resident within 15- 20 minutes of ED arrival

Variables assessed: Age, HR, RR, MAP, GCS, SpO₂, body temperature

Patients stratified into low, moderate, and high-risk categories based on REMS

30-day outcomes monitored: mortality, hospital complications, discharge status, length of stay

REMS SCORING SYSTEM

Variable	0	1	2	3	4	5	6
Age (yrs)	<45	-	45-54	55-64	-	65-74	≥ 75
MAP (mmHg)	70-109	-	110-29 / 50-69	130-159	>159	-	≤ 49
Heart rate (/min)	70-109	-	110-139 / 55-69	140-179 / 40-54	>179	-	≤ 39
Respiratory rate (/min)	12-24	25-34 / 10-11	35- 49 / 6-9	-	>49	-	≤ 5
SpO ₂ (%)	>89	86-89	-	75-85	<75	-	-
GCS	14-15	11-13	8-10	5-7	3- 4	-	-

Total Score Range: **0-26 points**

Risk Stratification:

- Low (<6)
- Moderate (6-13)
- High (>13)

RESULTS

Study Population (n=70)

Mean Age: **59.2 $\pm$ 19.9 years**

(Range: 18-95 years)

Gender distribution shows near-equal representation with slight male predominance, **37 (52.9%) vs 33(47.1%)**

Mean REMS: **4.5 $\pm$ 3.3**

Gender Distribution



Figure 1: Gender Distribution of Study Population

Table 1: REMS Risk Category Distribution

Risk Category	REMS Score	n (%)
Low Risk	<6	28 (40%)
Moderate Risk	6-13	33 (47%)
High Risk	>13	9 (13%)

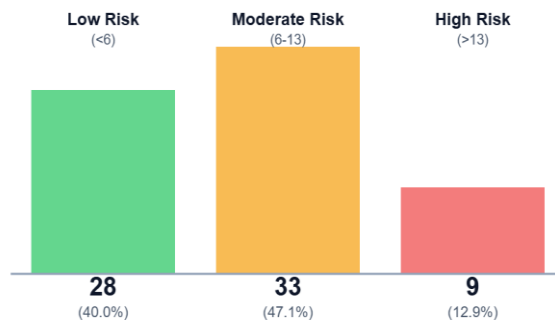


Figure 2: REMS Risk Category Distribution

Table 2: REMS vs 30-Day Mortality Outcomes

REMS Category	Total (n)	Deaths	Mortality	Survivors	Mean LOS $\pm$ SD
Low (<6)	28	0	0%	28 (100%)	2.1 $\pm$ 1.2 days
Moderate (6-13)	33	3	9.1%	30 (90.9%)	5.8 $\pm$ 3.4 days
High (>13)	9	6	66.7%	3 (33.3%)	8.9 $\pm$ 4.1 days
Total	70	9	12.9%	61 (87.1%)	5.2 $\pm$ 3.8 days

Table 3: Comprehensive Clinical Outcomes by REMS Risk Category

Clinical Outcome	Low Risk (n=28)	Moderate Risk (n=33)	High Risk (n=9)	Total (n=70)
Hospital Admission	24 (86%)	32 (97%)	9 (100%)	65 (93%)
ICU Admission	2 (7%)	12 (36%)	8 (89%)	22 (31%)
Mechanical Ventilation	0 (0%)	4 (12%)	6 (67%)	10 (14%)
Acute Complications	1 (3.6%)	8 (24%)	7 (78%)	16 (23%)
Discharge with Full Recovery	28 (100%)	30 (91%)	3 (33%)	61 (87%)

Table 4: Regression Analysis - Predictors of REMS and Outcomes

Variable	Effect on REMS (%)	Beta Coefficient	p-value
Age (per year increase)	+11%	0.11	<0.001
Heart Rate (per bpm increase)	+3%	0.035	0.02
Respiratory Rate (per breath/min increase)	+5%	0.05	0.001
SpO ₂ (per % increase)	-12%	-0.12	<0.001
GCS (per point increase)	-22%	-0.22	0.008
Hospital Length of Stay Predictors	% Increase	Beta	p-value
Age (per year)	+5%	0.05	0.01
Heart Rate (per bpm)	+4%	0.041	0.02
REMS Score (per point)	+12%	0.12	0.001

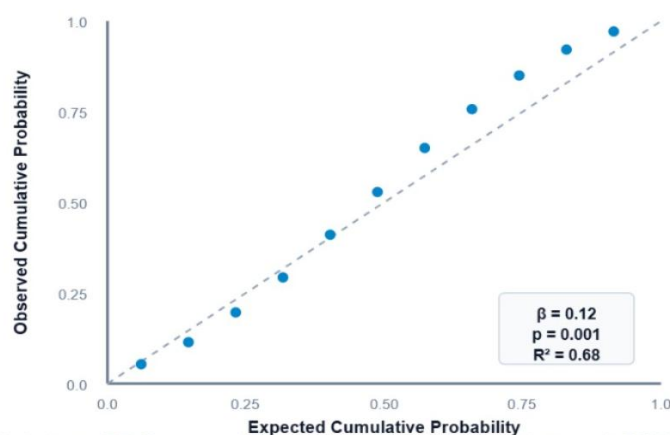


Figure 5: Regression p-p Plot - REMS Effect on Hospital Length of Stay

Strong linear relationship between REMS score and hospital length of stay.

Each unit increase in REMS prolongs hospitalization by 12% ($p=0.001$).

DISCUSSION

REMS demonstrated significant predictive value for 30-day mortality in non-trauma ED patients with an overall mortality of 12.9%. **Strong risk stratification:** Low-risk (0% mortality), Moderate-risk (9.1%), High-risk (66.7%) with $p<0.001$. **Strong correlation between REMS score and 30-day mortality demonstrated;** low-risk patients had 0% mortality vs 66.7% in the high-risk group. Progressive mortality escalation across risk categories supports REMS as a **reliable triage tool** in ED setting. High-risk REMS patients had significantly higher ICU admission rates (89% vs 7% in low-risk), validating **clinical decision-making**

Hospital Resource Allocation: Length of stay directly correlated with REMS category; high-risk patients required prolonged hospitalisation (8.9 ± 4.1 days). Age, heart rate, and respiratory rate positively correlated with REMS, while SpO₂ and GCS showed a negative correlation

Clinical Complications: 78% of high-risk patients experienced acute complications vs 3.6% in the low-risk group. Each unit increase in REMS is associated with a **progressive increment in adverse outcomes and mortality**. **Clinical Implications:** REMS score should guide admission decisions, resource allocation, and early therapeutic interventions in non-trauma ED patients

REFERENCES

1. Olsson T, Terent A, Lind L. Rapid emergency medicine score: a new prognostic tool for in-hospital mortality in nonsurgical emergency department patients. *J Intern Med.* 2004;255(5):579-587.
2. Ala A, Shams Vahdati S, Jalali M, Parsay S. Rapid Emergency Medicine Score as a Predictive Value for 30-day Outcome of Nonsurgical Patients Referred to the Emergency Department. *Indian J Crit Care Med.* 2020;24(6):418-422.
3. Goodacre S, Turner J, Nicholl J. Prediction of mortality among emergency medical admissions. *Emerg Med J.* 2006;23(5):372-375.
4. Imhoff BF, Thompson NJ, Hastings MA, et al. Rapid emergency medicine score (REMS) in the trauma population: a retrospective study. *BMJ Open.* 2014;4(5):e004738.
5. Ghaffarzad A, et al. The Accuracy of Rapid Emergency Medicine Score in Predicting Mortality: A Systematic Review and Meta-Analysis. *Indian J Crit Care Med.* 2022;26(3):362-367.
6. Ha DT, Dang TQ, Tran NV, et al. Prognostic performance of the rapid emergency medicine score (REMS) and worthing physiological scoring system (WPS) in emergency department. *Int J Emerg Med.* 2015;8(1):18.