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GEDI WISE: Identification Of Seniors At Risk Score (ISAR) To Predict Inpatient Admission And Near Term Adverse Outcomes Among Geriatric ED Patients

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Introduction

- Geriatric visits remain an increasing proportion of US ED care nationwide.
- A lower threshold to admit elderly ED patients exists for fear of adverse outcomes
- **ISAR (Identification of Seniors at Risk)** is a validated brief 6-item query to predict adverse outcome for ED patients >=65 years of age that **assigns one point each for**: a) presence of home help, b) increased need for home help, c) hospitalization in prior 6mo, d) impaired memory, e) impaired vision, and f) 3 or more daily medications.
- ISAR score 2 or greater is considered high risk

Objectives

- Compare ISAR score with standard triage categorization (Emergency Severity Index-ESI) for prediction of inpatient care (observation or admission)
- Report diagnostic performance of ISAR for:
  ICU care within 24hr, and
  death within 30d.

Methods

Study design: Prospective observational cohort study in a primarily adult urban ED with 85k visits/year. IRB approved. One year starting April 1, 2013.

Inclusion criteria: All ED visits with age>=65.

Exclusion criteria: patients who left without being seen, or left the ED against medical advice, had missing ISAR or ESI scores.

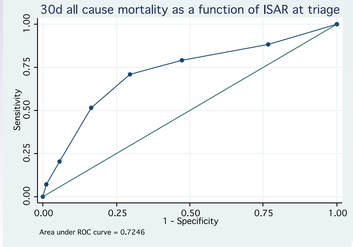
Measurements: As part of a Geriatric standard care initiative(GEDIWISE), all patients had ISAR calculated at triage by standard care nurses and included in the electronic medical record (EMR). For the outcome of inpatient care we included both admission or observation

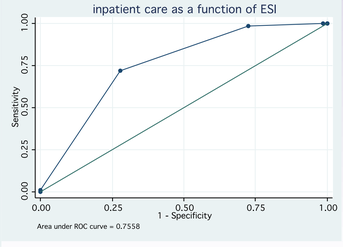
Results

- 16,540 patients 65 yrs and older seen in one year
- 188 excluded for ED death or left AMA from ED
- 897 for missing ISAR; 17 excluded for missing ESI

Description of the overall sample (n=15,438)		95% CI or SD or IQR
Mean age	76 yr	+/- 8 yr (SD)
Female	58%	57% to 59%
ISAR >=2	47.8%	47.0% to 48.6%
Inpatient care (admission or observation)	61.6%	60.9% to 62.4%
ICU care within 24 hours	7.3%	6.9% to 7.7%
30d mortality	1.9%	1.%7 to 2.1%
Discharge to non-home setting	8.4%	8.0% to 8.8%
Median inpatient length of stay for inpatient care. (n=9515)	63 hr	31-118 hr (25^{th}-75^{th} IQR)
Median total charges for patients discharged (n=9515)	$3605	$2089 to $5406 ($25^{th}$-$75^{th}$ IQR)
Median total charges for inpatients (n=9515)	$22,215	$13,880 to $41,445 ($25^{th}$-$75^{th}$ IQR)

	Outcome	AUC	(95%CI)
ISAR	Inpatient care	0.659	0.651 – 0.666
ESI	Inpatient care	0.756	0.749 – 0.762
ISAR	ICU care in24 hr	0.585	0.567 – 0.604
ESI	ICU care in24 hr	0.714	0.704 – 0.723
ISAR	30 day all cause mortality	0.725	0.692 – 0.757
ESI	30 day all cause mortality	0.676	0.656 – 0.696





Results

FOR PREDICTION OF EVENTUAL INPATIENT CARE (observation or admission)

ESI Cutpoint	Sensitivity	Specificity	Correctly classified	LR+	LR-
5 or less	100%	0	61.6%	1.0	
4 or less	99.9%	1.5%	62.2%	1.0	0.04
3 or less	98.4%	27.5%	71.2%	1.4	0.06
2 or less	72.1%	72.2%	72.1%	2.6	0.39
1	1.3%	99.9%	39.2%	38.6	0.99

FOR PREDICTION OF 30d ALL CAUSE MORTALITY

ISAR Cutpoint	Sensitivity	Specificity	Correctly classified	LR+	LR-
>=1	88.3%	23.2%	24.4%	1.1	0.5
>=2	79.0%	52.8%	53.2%	1.7	0.4
>=3	71.0%	70.3%	70.3%	2.4	0.4
>=4	51.7%	83.7%	83.1%	3.2	0.6
>=5	20.7%	94.4%	93.0%	3.7	0.84
>=6	7.2%	98.8%	97.1%	6.0	0.94

Conclusions

We successfully trained standard care triage nurses to administer the 6 item ISAR at triage in over 95% of geriatric ED encounters.

ESI provided superior diagnostic accuracy than ISAR for the prediction of eventual inpatient care from the ED as well as ICU care in 24 hours.

ISAR had slightly better diagnostic accuracy than ESI in predicting all cause 30d mortality.

Limitations:

Death was detected by EMR and SSN death index search. Accuracy of ISAR scores was not checked against another source such as the EMR.

The project described was supported by Grant Number 1C1CMS331055 the Department of Health and Human Services, Centers for Medicare & Medicaid Services.
Its contents are solely the responsibility of the authors and have not been approved by the Department of Health and Human Services, Centers for Medicare & Medicaid Services.