Original Article

Both acuity and long term prognosis are important Emergency Department metrics: comparison of mobility assessment with the Emergency Severity Index

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Abstract

Objective: To compare the SUHB mobility scale (i.e., stable(S), unstable gait(U), needing help to walk(H), or bedridden(B)) and the Emergency Severity Index (ESI) associations with admission and mortality outcomes.

Design: Post-hoc analysis of a prospective observational study including all consenting presenting to the ED over a period of 3 weeks. Odd ratios and AUCs were calculated to assess predictive performance of SUHB and compared with ESI.

Results: Out of 2422 patients, 65% presented with a stable gait, 45% with an ESI level 3. With increasing mobility impairment on the SUHB scale, the probability for admission and mortality increased. SUHB had a higher AUC than ESI for 1-year mortality.

Conclusion: SUHB was a better predictor than ESI of long-term mortality. The scale, which is rapid, requires little additional training, and no extra costs, could be used as a useful supplement to the triage process.

Keywords

mobility assessment, emergency department, mortality prediction

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Introduction

Background

With every patient encounter in the emergency department (ED) the probable diagnosis and the need for immediate treatment must be assessed as soon as possible. The purpose of triage is to rank patients according to how quickly they need to be attended to (i.e., to rank patient acuity). There is no gold standard metric of acuity, but most validation studies have used either the utilization of resources, such as ICU and hospital admission, or a patient outcome, such as mortality or hospital admission, as proxies.[1-5] Prognosis, such as the likely long-term mortality in the coming weeks and months, is also important to ensure appropriate and wise disposition decisions. Errors made in these assessments at the front door may have catastrophic consequences.[6]

Most triage processes are based on vital signs and chief complaints. The Emergency Severity Index (ESI), a standard triage process in many hospitals throughout the world, is a five-level triage algorithm to assess patient acuity (i.e., how quickly the patient needs attention) by severity of illness or injury and expected resource consumption.[7] However, this approach has shortcomings,[8] and normal and close to normal vital signs (temperature, respiration rate, heart rate, blood pressure) do not always accurately predict a good outcome.[9] Therefore, to improve risk stratification of ED patients, additional clinical features may have to be considered. Impaired mobility, defined as an unstable gait, has been proposed as an additional, easily assessable vital sign in acutely ill patients in the ED.[8, 10] It has shown both improved positive and negative predictive power regarding mortality in acutely ill patients, either independently or in combination with vital signs.[6, 8, 9] Impaired mobility was found to be an even more powerful predictor for 30-day mortality than age and co-morbidity.[10] In addition, a stable independent gait identifies hospitalized patients at low risk for mortality.[11]

The SUHB scale is a simple four-item mobility scale that grades patients according to whether they have a Stable gait, Unstable gait, need Help to walk or are Bedridden (i.e. SUHB scale).[12] The scale was developed for the global assessment of acutely ill patients,[13] which we have previously reported, correlates with age, nursing workload and severity illness and 30-day in-hospital mortality.[12] However, the scale's validity in consecutive ED patients has not been investigated.

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Goals of this Investigation

The aim of this study was to compare the ESI with the SUHB scale's rankings of mobility by the prediction of hospital admission, intensive care unit (ICU) admission as proxy measures of acuity, and mortality up to one year after ED presentation as a measure of prognosis. The study population was a large cohort of consecutive consenting patients presenting to our ED prior to assignment to any specific clinical department or care pathway.

Methods

Study Design and Setting

This is a post-hoc analysis of a prospective observational cohort study of consecutive patients presenting to the ED of the University Hospital of Basel. It is a single academic tertiary center in Switzerland with over 50,000 ED visits per year.[8] The ED cares for all emergency patients aged >15 years apart from ophthalmological, and obstetric patients who are treated in nearby specialist hospitals; many patients are self-referred and hence have not been assessed by a physician prior the ED presentation.

Ethics

The study was approved by the local ethic committee (http://eknz.ch, Ref. No 263/13). Written informed consent was not required, only patients who actively refused to participate were excluded. The study will be reported according to the STROBE[14] guidelines.

Participants

All consecutively presenting patients, including major trauma, presenting to the ED were eligible for inclusion, apart from patients immediately referred to other departments, left without being seen or were not able to be screened because of random intermittent shortage of study team capacity. As this study was part of a quality control process, re-presentations during the data collection in the ED were not excluded.

Data Collection

The data collected for this study was part of an ongoing quality-control process and ED staff assessing patients included in this study were not made unaware of the study's purpose. Patients were enrolled 24 hours a day, 7 days a week from 30th January 2017 to 19th February 2017. As a patient entered the ED, a report in the electronic health records database (ISMED ® by Protec-Data, Boswil, Switzerland) was opened. The German version of the ESI[15] and the SUHB scale were routinely used by an emergency physician or nurse to triage patients and assess mobility on all patients presenting to the ED. All patients were asked to give verbal consent to participate in the study.

Table 1. Patient characteristics. Data are shown as mean and standard deviation (SD) for continuous variables and as number and percentage for categorical variables. SUHB: Stable gait, Unstable Gait, Help needed Walking, Bedridden; SMD: standard mean difference; ESI: Emergency Severity Index.

	All	Lost to follow-up	Analyzed	SMD
Presentations, n	2523	101	2422	
Age, mean (SD), (y)	52.9 (22.0)	38.5 (15.5)	53.5 (22.0)	0.789
Female sex, n (%)	1233 (49.6)	32 (31.7)	1201 (49.6)	0.371
SUHB level, n (%)				0.229
Stable gait	1647 (65.3)	70 (69.3)	1577 (65.1)	
Unstable gait	107 (4.2)	3 (3.0)	104 (4.3)	
Help walking	227 (9.0)	4 (4.0)	223 (9.2)	
Bedridden	542 (21.5)	24 (23.7)	518 (21.4)	
ESI level, n (%)				0.132
1	79 (3.1)	3 (3.0)	76 (3.1)	
2	516 (20.5)	22 (21.8)	494 (20.4)	
3	1119 (44.4)	39 (38.6)	1080 (44.6)	
4	755 (29.9)	35 (34.6)	720 (29.7)	
5	54 (2.1)	2 (2.0)	52 (2.2)	

The ESI is a five-level triage algorithm with 5 decision points (A-D) and categorizes ED patients by acuity and needed resources. ESI level 1 is the highest acuity level, indicating the need of an immediate life-saving intervention such as airway management or breathing support (decision point A). ESI level 2 indicates a high-risk situation in which patients should not wait (e.g. dyspnea), decision point B. Patients with normal vital signs who need more than one resource are assigned ESI level 3 (number of resources, decision point C). These patients will have respiratory rate, saturation and heart rate recorded. If these vital signs are outside predefined limits, an upgrade towards ESI 2 is suggested (decision point D). Patients in need of one resource are assigned a level 4 and patients in need of no resources are assigned a level 5.

A pictograph of mobility (Figure S1) was provided to assist and standardize mobility assessment. If a patient entered the ED via the Emergency Medical Services (EMS), the paramedics who first saw the patient were asked to use the pictograph to define the patient's mobility by observing how the patient moved onto the stretcher.

Patient follow-up

Demographic data such as gender, age and disposition were transferred directly from the electronic health records database. The 30-day, 100-day and 1-year follow-up was performed with standardized telephone calls with the patient, relatives and/or

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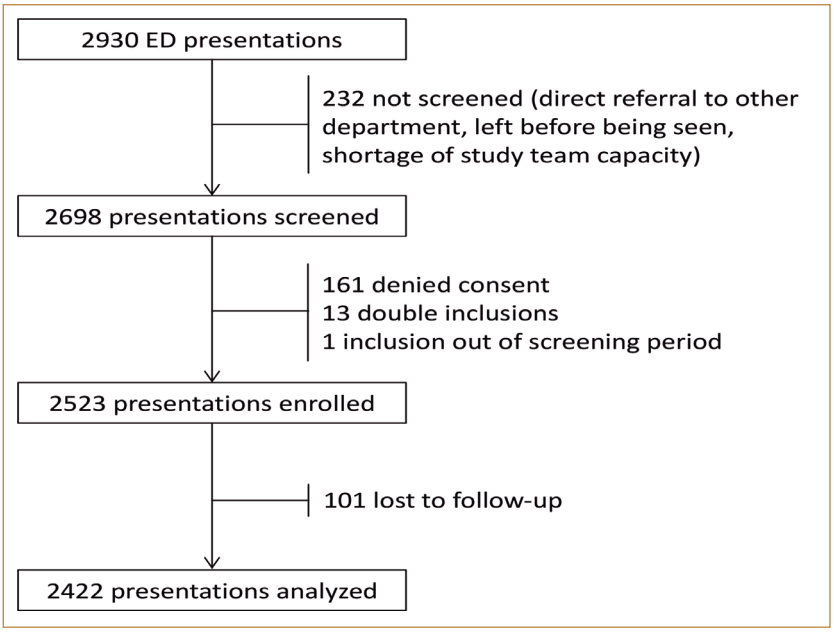

Figure 1. Flow of patient inclusion process

general practitioner. For further information, (i.e., date of death), the electronic health records database or resident's registration office was consulted.

Missing data

101 (4%) patients were lost to follow-up. All patients had complete sets of ESI and mobility data.

Outcomes

The primary outcome was 1-year mortality.

Secondary outcomes were hospital and ICU admission, and length-of-stay in hospital, in-hospital and 30-day mortality.

Transfer to an ICU, intermediate care unit or stroke unit was defined as ICU admission. Deaths at 30, 100, or 365 days and in-hospital mortality were timed from the date of the initial ED presentation. Hospitalization was defined as admission to the hospital from the ED to any hospital ward. Length-of-stay was defined as the time between the presentation to the ED and discharge from the hospital in days.

Statistical Analysis

For descriptive statistics, categorical variables are presented in counts and frequencies; metric variables are shown as mean with standard deviation (SD). Numeric variable comparisons were done using Student's t-test and categorical variables were compared using Chi-square test or exact Fisher test when appropriate.

Receiver operating characteristic (ROC) curves showing the discrimination of SUHB and ESI for 30-day, 100-day, 1-year and in-hospital mortality, admission to ICU and hospitalization. The area under the curves (AUC) were calculated and compared according to the method of Hanley and McNeil.[16] Internal validations of the predictive performance estimates were done by bootstrapping as implemented in the 'rms' package in R Studios with 400 repetitions.[17] Sensitivity and specificity were calculated for the outcomes of the SUHB subgroups.

Multivariate logistic regressions to correct for age and gender calculated odds ratios (OR), 95% Confidence Intervals (CI) and p-values for the outcomes. Presentations with a stable gait were considered as reference group.

Kaplan-Meier curves for survival up to 1-year for patients presenting with a stable gait, an unstable gait, needing help and bedridden, were compared using the Log-Rank test. To provide a better visualization, the graph was cropped on the x-axis. P-values below 0.05 were defined as significant. All analysis were performed using the R Studios software (Version 4.1.2[18]).

Results

Characteristics of Study Subjects

From 2,930 unselected adult ED presentations 2,523 were enrolled of whom 101 (4%) were lost to follow-up, leaving a final study population of 2,422 ED presentations with complete ESI and SUHB data and 100% follow-up for 1 year after presentation (Figure 1). Those lost to follow-up were younger and less likely to be female, but the ESI and SUHB scale were not significantly different (Table S1).

Baseline characteristics with the SUHB scale distribution of the final study population are shown in Table 2. Most patients presented with a stable gait (n = 1,577, 65.1%), 104 (4.3%) had an unstable gait, and the remaining patients either needed help to walk (n = 223, 9.2%) or were bedridden (n = 518, 21.4%). The mean age was 53.5 years (SD 22 years), 1,201 (49.6%) were female and 44.6% had an ESI triage level of 3; 40.3% of bedridden patients were triaged to have high acuity (i.e., ESI level 1 or 2), and 43.8% of patients with a stable gait were triaged as low acuity (i.e., ESI level 4 or 5).

Main Results

With each increase of mobility impairment on the SUHB scale, the probability of 30-day, 100-day and 1-year mortality, hospitalization and admission to ICU increased (Table 2). On average, patients who were bedridden on presentation were older, were more likely to be admitted to hospital and to ICU and, if admitted, had a longer length of hospital stay. Most of the bedridden (71.4%) and with help walking (52.5%) presentations were hospitalized (Table 2).

The differences between the discrimination of the SUHB scale and ESI levels varied between different outcomes (Figure 2). The AUC for the SUHB scale for all mortality outcomes was above 0.80, whereas the only

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Table 2. Table 2. Outcomes of unselected adult ED patients, stratified by SUHB
Data are shown as mean and standard deviation for continuous variables and as number and percentage for categorical variables.

	All (n = 2422)	Stable gait (n = 1577)	Unstable gait (n = 104)	Help walking (n = 223)	Bedridden (n = 518)	SMD
Age, mean (SD), (y)	53.5 (22.0)	46.6 (19.2)	64.3 (22.3)	63.9 (21.1)	68.1 (20.1)	0.531
Females, n (%)	1201 (49.6)	758 (48.1)	55 (52.9)	115 (51.6)	273 (52.7)	0.052
ESI, n (%)						0.765
1	76 (3.1)	7 (0.4)	0	3 (1.3)	66 (12.7)	
2	494 (20.4)	263 (16.7)	14 (13.5)	74 (33.2)	143 (27.6)	
3	1080 (44.6)	616 (39.1)	54 (51.9)	115 (51.6)	295 (56.9)	
4	720 (29.7)	642 (40.7)	34 (32.7)	31 (13.9)	13 (2.5)	
5	52 (2.1)	49 (3.1)	2 (1.9)	0	1 (0.2)	
30-day mortality, n (%)	62 (2.6)	5 (0.3)	1 (1)	9 (4)	47 (9.1)	0.257
100-day mortality, n (%)	100 (4.1)	10 (0.6)	2 (1.9)	13 (5.8)	75 (14.5)	0.320
1-year mortality, n (%)	161 (6.6)	22 (1.4)	6 (5.8)	22 (9.9)	111 (21.4)	0.370
In-hospital mortality, n (%)	37 (1.5)	3 (0.2)	0	5 (2.2)	29 (5.6)	0.218
Admission to hospital, n (%)	833 (34.4)	306 (19.4)	40 (38.5)	117 (52.5)	370 (71.4)	0.629
Admission to ICU, n (%)	136 (5.6)	33 (2.1)	4 (3.8)	11 (4.9)	88 (17.0)	0.278
Length-of-stay, mean (median), n (days)	8.4 (6)	6.7 (5)	9.5 (8)	8.7 (7)	9.6 (7)	0.233

AUC of ESI that reached this level was for in-hospital mortality (0.818, CI 0.752-0.885). Compared with the ESI, SUHB had a significantly higher AUC for 100-day and 1-year mortality, and a statistically equivalent AUC for in-hospital mortality. However, ESI had a higher discrimination for admission to ICU and hospitalization, compared to the SUHB (Table S2).

The other metrics of the SUHB scale's performance also varied according to outcome and with the grade of gait selected. A stable gait had the highest sensitivity and lowest specificity, lowest positive and negative likelihood ratios for all outcomes. However, the sensitivity and negative likelihood ratios for in-hospital mortality were the same for both a stable and unstable gait (Table S3).

Female sex was significantly associated with lower risk of 30-day, 100-day and 1-year mortality, hospitalization, and ICU admission, and with a shorter length-of-stay. Bedridden, corrected for age and gender, was significantly associated with the risk for 30-day mortality (OR 12.65, CI 5.25-37.75), 100-day mortality (OR 11.14, CI 5.76-23.78), 1-year mortality (OR 8.09, CI 4.98-13.64), hospitalization (OR 5.93, CI 4.63-7.61), admission to ICU (OR 7.55, CI 4.84-12.01) and length-of-stay (OR 2.48, CI 1.28-3.68 [days]). After adjustment for age and sex, no statistical association could be shown between the small number of presentations with an unstable gait and 30-day, 100-day, 1-year and in-hospital mortality, or hospital and ICU admission and length-of-stay. Also, there was no association between needing help walking and ICU admission and length-of-stay (Table 3).

Kaplan-Meier curves showed patients with a stable gait had the highest 1-year survival, followed by those with an unstable gait, those who needed help to walk, and those who were bedridden had the lowest survival. All the curves for the different gait grades were statistically different (Figure 3).

Discussion

Main Findings

This is the first prospective study to assess mortality with degrees of immobility as ranked by the SUHB scale in a large cohort of consecutively presenting adult ED patients. Whilst the prognostic value of impaired mobility might be obvious, the degree and duration of its value may not be appreciated. We found the SUHB scale predicts mortality with a higher level of discrimination than ESI, which was maintained up to 1 year after ED presentation. Although resource use is central to the ESI assessment, it was only as a little better than SUHB at predicting the resource use proxies of hospital and ICU admission.

A patient's prognosis depends not only on age, primary diagnosis, severity of illness and other co-morbidities but also on functional capacity.[6] Our results show that compared with a low ESI acuity level, patients with a stable gait are less likely to die within 30 days and, therefore, safer to discharge if other issues are not identified during their ED evaluation. Mobility is an important part of the functional capacity and the ability to perform activities of the daily living,[19] and the association between impaired mobility and mortality is well established.[8,10-12,20-22]

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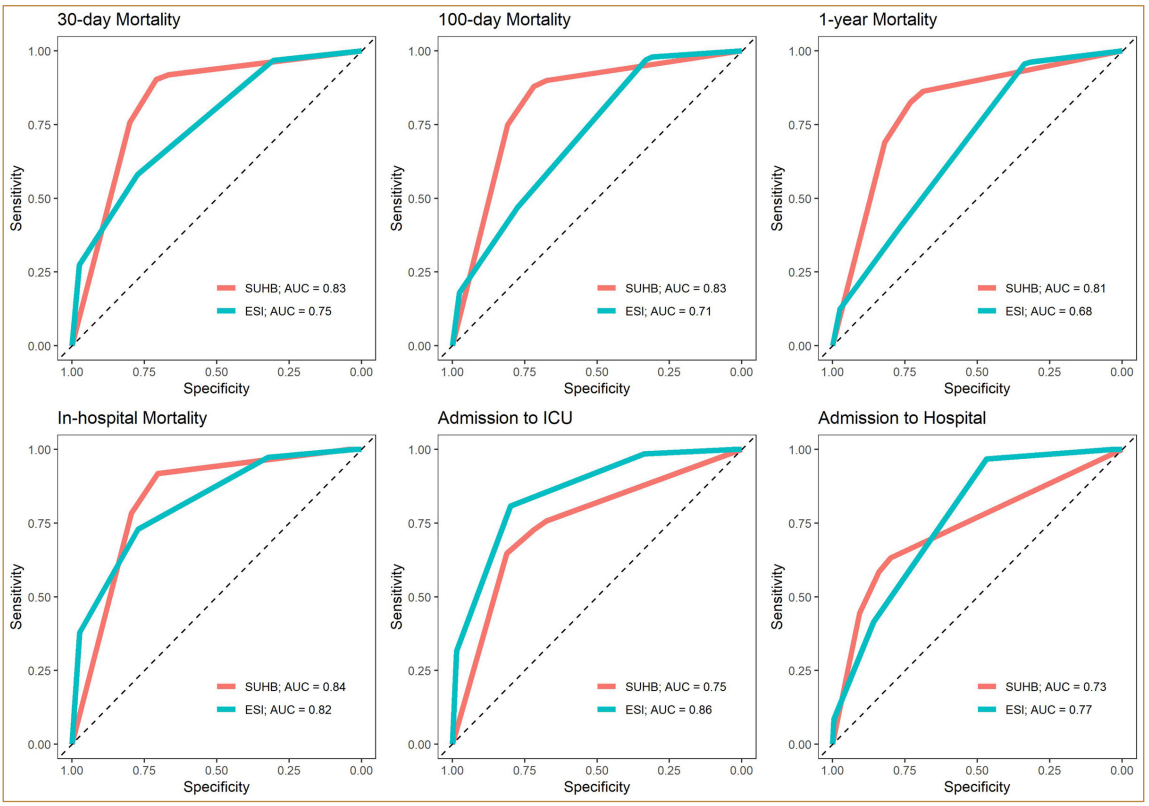

Figure 2. ROC Curves for the SUHB Scale and ESI. ROC: Receiver Operating Characteristic; AUC: Area Under the Curve; SUHB: Stable gait, Unstable Gait, Help needed Walking, Bedridden; ESI: Emergency Severity Index; ICU: Intensive Care Unit

Mobility assessment gives information about the patient's outcome well into the future and, therefore, might lead to a better clinical and shared decision making.[23] Brabrand et al. proposed that vital sign changes only reflect adaptions to the patient's current stress and, unlike impaired mobility, are not a proxy measure for the physiological reserves required to cope with challenges likely to subsequently occur later in a patient's illness.[10] Mobility assessment may provide an early clue that a patient's reserve is limited and

Table 3. Odds ratios for outcomes for age, sex and SUHB scale; SUHB variables were adjusted for age and sex

	30-day mortality		100-day mortality		1-year mortality		In-hospital mortality		Admission to hospital		Admission to ICU		Length-of-stay (days)	
Unadjusted	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Age, (per year)	1.16	1.04-1.08	1.06	1.04-1.08	1.06	1.05-1.07	1.04	1.02-1.06	1.04	1.04-1.05	1.01	1.01-1.02	0.04	0.02-0.17
Female sex	0.49	0.28-0.85	0.45	0.29-0.71	0.49	0.34-0.70	0.52*	0.25-1.02	0.78	0.64-0.96	0.49	0.34-0.72	-1.72	-2.76 -0.69
SUHB														
Adjusted for age and sex	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Stable gait	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unstable gait	1.31*	0.06-8.45	1.32*	0.20-5.25	1.82*	0.64-4.49	†	†	1.38*	0.87-2.16	1.52*	0.44-3.98	2.06*	-0.46 -4.59
Help walking	5.90	1.96-19.86	4.37	1.84-10.63	3.45	1.81-6.56	6.83	1.60-34.53	2.72	1.98-3.74	1.94*	0.91-3.97	1.44*	-0.21 -3.08
Bedridden	12.65	5.25-37.75	11.14	5.76-23.78	8.09	4.98-13.64	16.33	5.39-71.14	5.93	4.63-7.61	7.55	4.84-12.01	2.48	1.28-3.68

Male sex and the SUHB group S were the reference categories. Odds ratios for SUHB variables were adjusted for age and sex.
OR: Odds Ratio; CI: Confidence Interval; SUHB: Stable gait, Unstable Gait, Help needed Walking, Bedridden; ICU: Intensive Care Unit
*Statistically not significant ($p > 0.05$)
†Since no event occurred, testing was not applicable.

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that targeted interventions, possibly after hospital discharge, are needed to prevent adverse outcomes.

Assessing both acuity and prognosis should be key functions of ED triage. Whilst the ESI provides an adequate assessment of acuity, it may require the measurement of vital signs that need equipment, time and expertise.[12] Moreover, prognostically valuable information such as patient age or comorbidity have been suggested.[24] However, comorbidities might not be instantly available. In contrast, the SUHB scale assessment of mobility provides a rapid and valid estimate of long-term prognosis and only requires a single look at the patient. The SUHB scale could also be a practical method of monitoring patient mobility while in hospital, and help ensure that de-conditioning and loss of mobility did not occur unnoticed during hospitalization.[20]

We have previously shown that the ESI combined with mobility – evaluated dichotomously as either normal or impaired – improves risk stratification of ED patients.[8] In this study, we show the additional prognostic values of the SUHB scale's four rankings of mobility in consecutive patients presenting to our ED who were followed up for 1 year. It is well established that the risk of death is related to many factors such as age and comorbidity. However, this study demonstrates the prognostic value of mobility, which endures for up to a year after ED presentation. Further studies are required to test interrater reliability of the SUHB scale as well as performance of the scale compared to other mobility scales and compared with other triage scales.

Limitations

This was a single-centre study during 3 weeks from January to February in 2017 in an academic tertiary care centre in Switzerland. Therefore, its findings may not be generalizable to different settings and seasons. Also, rates for admission may vary substantially from hospital to hospital, and indications for ICU/vs. IMC treatment differ among various setting. As the data collected for this study were part of an anonymized quality control process, patients who possibly presented more than once during data collection could not be excluded. Therefore, a small number of patients may have presented to the ED more than once. Length-of-stay was only captured for hospitalization in the study-center. If a patient was admitted to a different hospital or rehabilitation center, length-of-stay could not be determined.

Unfortunately, we did not record whether the mobility impairment was acute, transient, or permanent. Therefore, patients with impaired mobility may have had a temporary trivial impairment in mobility, such as ankle sprain. However, such patients usually do not need help to maintain stability and nearly all can maintain their independence. Therefore, in practice there was no difficulty in identifying patients who had a stable independent gait and did not require assistance to mobilize. Conversely, patients with chronic impaired mobility are likely to become more impaired if they become acutely ill. Although, the SUHB scale has been shown to be associated with pressure sores and cognitive impairment,[12] the effect of frailty[25] and/or disabilities as potential confounders were not recorded and therefore analysis could not be corrected for them.

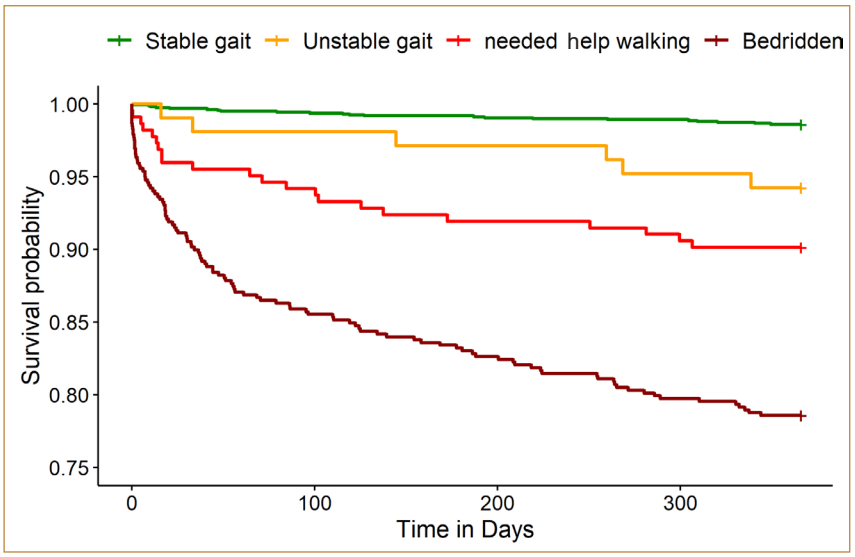

Figure 3. Kaplan Meier Curves for 1-year Mortality according to the SUHB Scale
Survival Curves for 1-year survival distributed by the SUHB scale. To improve readability, the graph was cropped on the y-axis (starting at 0.75). Log-Rank-Test: χ^2 (3) = 273, $p < 0.001$

The SUHB scale was derived from a population of acutely ill medical patients and was strongly correlated with 30-day in-hospital mortality, mental status, history of falls, manual handling requirements, and the presence of pressure sores, dementia, and incontinence.[12] The generalizability of these findings, however, to a larger population is limited.

As the SUHB scale was recorded by only one person at a time, no interrater reliability could be assessed. Studies showed a strong interrater reliability for measuring mobility in other settings.[26, 27] Interrater variability as a potential source of bias is subject of a current investigation.[28]

Conclusion

In the ED, accurate estimates long-term mortality prediction should ensure that appropriate and wise disposition decisions are made. This study shows that the SUHB scale predicts long-term mortality of all adult ED patients up to 1 year after presentation. Since the scale requires little additional time or training, and no extra costs, it could be a useful supplement to the triage process.

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Abbreviations

AUC: Area Under the Curve
ED: Emergency Department
EMS: Emergency Medical Services
ESI: Emergency Severity Index
ICU: Intensive Care Unit
LTFU: Lost to follow-up
ROC: Receiver Operation Characteristic

Author Contributions

Conceptualization: C.H.N. and J.K.; Formal analysis, I.A. and J.B.; Methodology, I.A., C.H.N. and R.B.; Project administration, R.B.; Supervision, T.K. and C.H.N; Writing—original draft, I.A., T.K., J.K., M.B. and C.H.N.; All authors have read and agreed to the published version of the manuscript.[3]

Conflicts of Interest Statements

John Kellett is founder and major shareholder of Tapa Healthcare DAC, a start-up medical software company. None of the other authors have any conflicts of interest to be declared.

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Supplementary Appendix

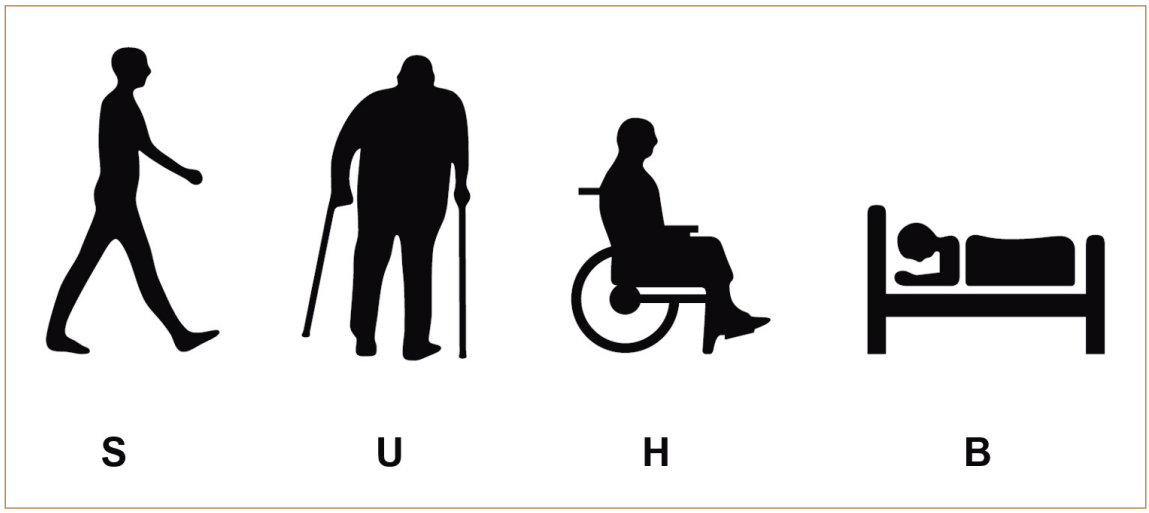

Figure S1. SUHB Pictograph

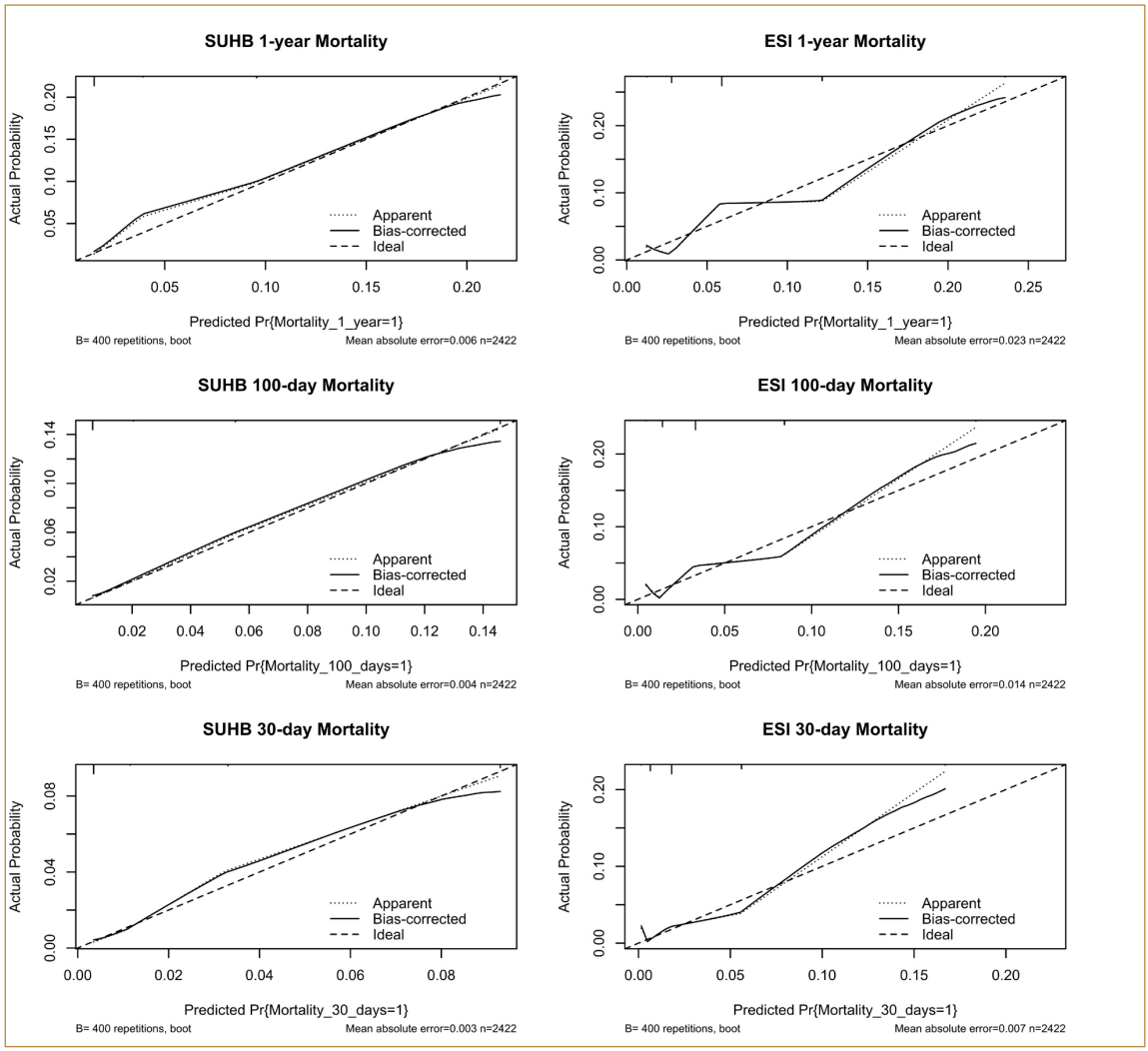

Figure S2. Tool Calibration for the Receiver operating Characteristics
Tool Calibrations using the R package 'rms' for bootstrapping, n = 400. SUHB: Stable gait, Unstable Gait, Help needed Walking, Bedridden; ICU: Intensive Care Unit, ESI: Emergency Severity Index

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Both acuity and long term prognosis are important Emergency Department metrics: comparison of mobility assessment with the Emergency Severity Index

Table S1. Comparison of the lost to follow-up (LTFU) and analyzed group

Variable	p-Value
Age	< 0.001
Sex	< 0.001
ESI	
Chi2	0.79
Fisher's Exact Test	0.77
SUHB	
Chi2	0.27
Fisher's Exact Test	0.27

SUHB: Stable gait, Unstable Gait, Help needed Walking, Bedridden

Table S2. Discrimination of the Areas under the ROC Curves

	AUC SUHB (95% CI)	AUC ESI (95% CI)	p-Value
30-day Mortality	0.830 (0.789-0.871)	0.753 (0.696-0.809)	0.11
100-day Mortality	0.826 (0.791-0.860)	0.714 (0.673-0.756)	0.004
1-year Mortality	0.807 (0.776-0.838)	0.679 (0.646-0.713)	< 0.001
In-hospital Mortality	0.835 (0.786-0.884)	0.818 (0.752-0.885)	0.77
Admission to hospital	0.733 (0.713-0.752)	0.765 (0.749-0.782)	0.02
Admission to ICU	0.751 (0.709-0.792)	0.856 (0.827-0.885)	0.03

ROC: Receiver Operating Characteristic; AUC: Area Under the Curve, CI: Confidence Interval, ICU: Intensive Care Unit, ESI: Emergency Severity Index

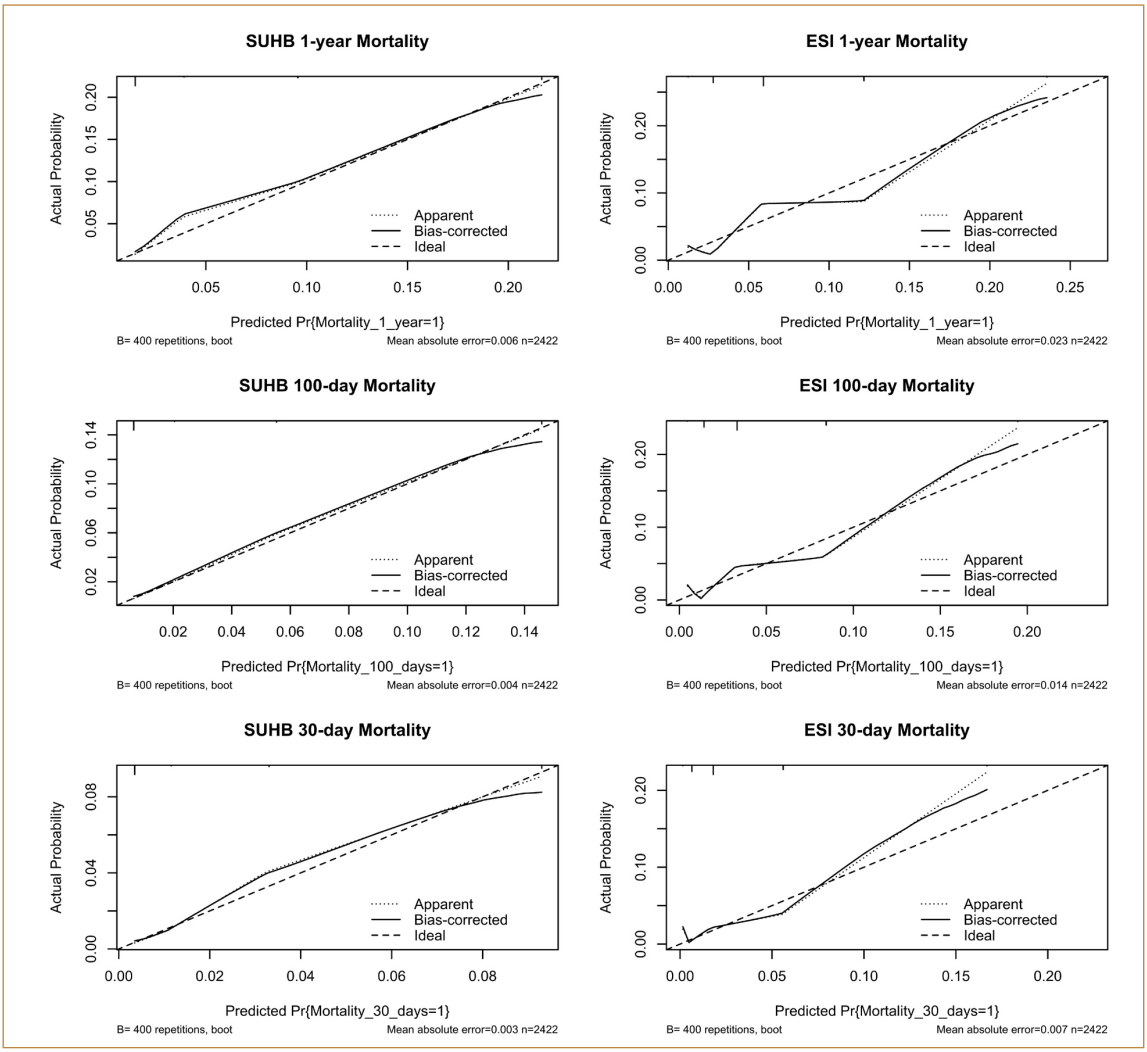

Figure S2. Tool Calibration for the Receiver operating Characteristics
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Table S3. Predictive characteristics of the SUHB Scale

Outcomes	Sensitivity % (95% CI)	Specificity % (95% CI)	Positive Likelihood Ratio (95% CI)	Negative Likelihood Ratio (95% CI)
30-day Mortality				
S vs UHB	92 (0.82-0.97)	67 (0.65-0.69)	2.75 (2.51-3.02)	0.12 (0.05-0.28)
SU vs HB	90 (0.80-0.96)	71 (0.69-0.73)	3.11 (2.81-3.45)	0.14 (0.06-0.29)
SUH vs B	76 (0.63-0.86)	80 (0.78-0.82)	3.80 (3.23-4.47)	0.30 (0.19-0.47)
100-day Mortality				
S vs UHB	90 (0.82-0.95)	67 (0.66-0.69)	2.77 (2.54-3.02)	0.15 (0.08-0.27)
SU vs HB	88 (0.80-0.94)	72 (0.70-0.74)	3.13 (2.84-3.45)	0.17 (0.10-0.28)
SUH vs B	75 (0.65-0.83)	81 (0.79-0.83)	3.93 (3.41-4.53)	0.31 (0.22-0.43)
1-year Mortality				
S vs UHB	86 (0.80-0.91)	69 (0.67-0.71)	2.76 (2.54-3.02)	0.20 (0.13-0.29)
SU vs HB	83 (0.76-0.88)	73 (0.71-0.75)	3.07 (2.78-3.39)	0.24 (0.17-0.33)
SUH vs B	69 (0.61-0.76)	82 (0.80-0.84)	3.83 (3.34-4.39)	0.38 (0.30-0.48)
In-hospital Mortality				
S vs UHB	92 (0.78-0.98)	66 (0.64-0.68)	2.70 (2.42-3.02)	0.12 (0.04-0.36)
SU vs HB	92 (0.78-0.98)	70 (0.68-0.72)	3.10 (2.77-3.47)	0.12 (0.04-0.34)
SUH vs B	78 (0.62-0.90)	79 (0.78-0.81)	3.82 (3.17-4.61)	0.27 (0.15-0.50)
Admission to hospital				
S vs UHB	63 (0.60-0.67)	80 (0.78-0.82)	3.16 (2.83-3.53)	0.46 (0.42-0.50)
SU vs HB	58 (0.55-0.62)	84 (0.82-0.86)	3.66 (3.22-4.15)	0.49 (0.45-0.54)
SUH vs B	44 (0.41-0.48)	91 (0.89-0.92)	4.77 (4.02-5.66)	0.61 (0.58-0.65)
Admission to ICU				
S vs UHB	76 (0.68-0.83)	68 (0.66-0.69)	2.33 (2.09-2.61)	0.36 (0.27-0.48)
SU vs HB	73 (0.65-0.80)	72 (0.70-0.74)	2.59 (2.29-2.93)	0.38 (0.29-0.50)
SUH vs B	65 (0.56-0.73)	81 (0.80-0.83)	3.44 (2.96-4.00)	0.43 (0.35-0.55)

SUHB: Stable gait, Unstable Gait, Help needed Walking, Bedridden; CI: Confidence Interval, ICU: Intensive Care Unit

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