SUPPLEMENTAL MATERIAL

Table S1. Study definitions used to assign the SCAI Shock Classification.

Variable	Definition
HYPOTENSION / TACHYCARDIA ➢ **Defines stage B if present (in the absence of hypoperfusion)**	**1. Minimum SBP <90 mmHg** **2. Maximum heart rate >100 BPM** **3. Minimum MAP <65 mmHg** **4. Inotrope infusion** **5. Maximum shock index (maximum heart rate / minimum SBP) >=1 for any hour** **6. Mean shock index (mean heart rate / mean SBP) >=1 for any hour**
HYPOPERFUSION ➢ **Identifies the presence of SHOCK (including stage C, D & E) if present**	**1. Exam hypoperfusion** **2. Lactate >=2 mmol/L** **3. Vasopressor infusion or bolus vasopressors** **4. Any MCS** **5. ALT >200 IU/ml** **6. AKI (either of these criteria)** a. Urine output <120 ml over 4 hours *and* <240 ml over 8 hours b. Maximum creatinine during block >=0.3 mg/dl higher than either the first creatinine during block or most recent prior creatinine (even if in an earlier block)
DETERIORATION ➢ **Defines stage D if present (in the absence of criteria for refractory shock)**	**1. Rising # pressors (second 2 hours versus first 2 hours)** **2. Rising VIS (second 2 hours versus first 2 hours)** **3. Rising NEE (second 2 hours versus first 2 hours)** 4. **Maximum lactate during block higher than either first lactate during block or most recent prior lactate (even if in an earlier block)**
REFRACTORY ➢ **Defines stage E if present**	**1. Cardiac arrest** **2. Bolus vasopressors** **3. Lactate >=10 mmol/L** **4. Severe hypotension while on vasopressors (during either the first 2 hours or the second 2 hours of the 4-hour block)** a. Mean MAP <50 mmHg b. Mean SBP <80 mmHg **5. High-dose vasopressor infusion(s)** a. VIS >50 b. NEE >0.5 c. CVI >8 d. # vasopressors >2 e. # vasopressors >1 and MCS f. >1 MCS devices

Missing data were assumed to be normal per convention. Only data recorded or obtained during a given 4-hour CICU block were used to assign the SCAI Shock Stage in that 4-hour block except as otherwise specified.

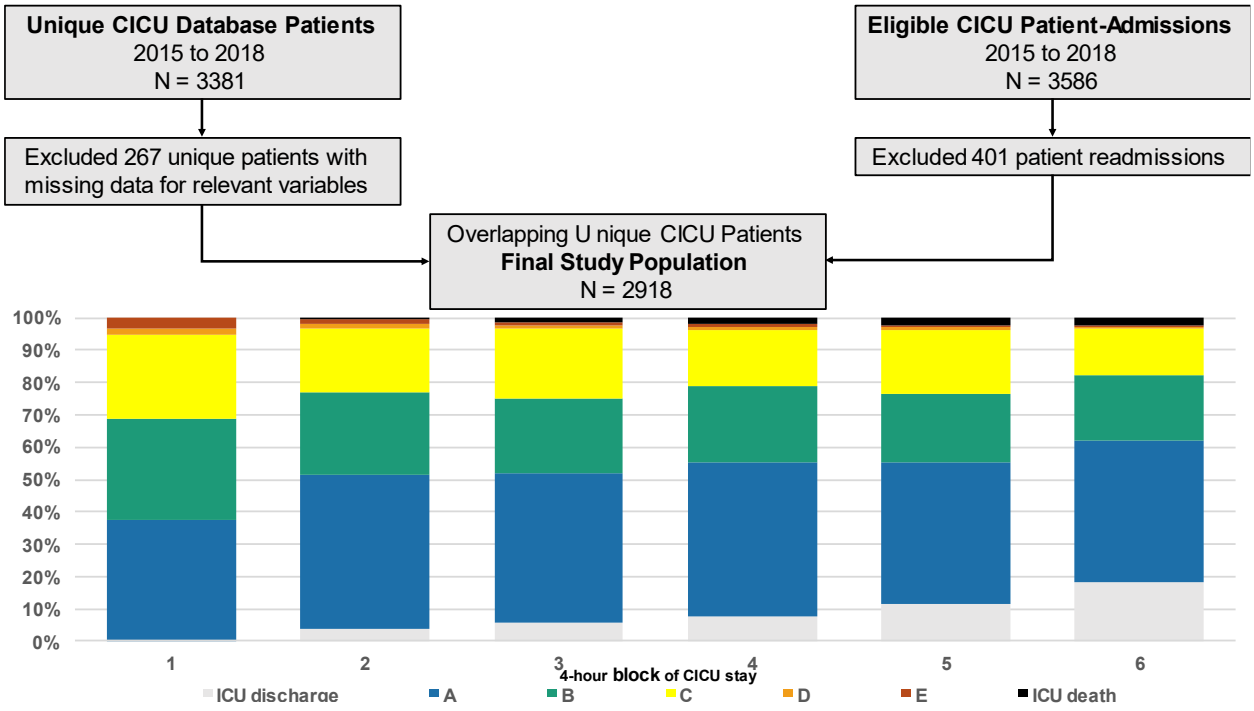
AKI, acute kidney injury; ALT, alanine aminotransferase; CICU, cardiac intensive care unit; CVI, Cumulative Vasopressor Index; MAP, mean arterial pressure; MCS, mechanical circulatory support; NEE, norepinephrine equivalent dose; SBP, systolic blood pressure; SCAI, Society for Cardiovascular Angiography and Interventions; VIS, Vasoactive-Inotropic Score

Table S2. Unadjusted logistic regression models for prediction of in-hospital mortality, including unit odds ratio (OR) values with 95% confidence intervals (CI) and area under the receiver-operator characteristic curve (AUC, C-statistic) according to admission diagnosis.

	ACS		*Heart failure*		*Cardiac arrest*	
Variable	**Unadjusted OR (95% CI)**	**AUC**	**Unadjusted OR (95% CI)**	**AUC**	**Unadjusted OR (95% CI)**	**AUC**
Any shock	7.07 (4.05-12.34)	0.69	4.67 (3.14-6.94)	0.65	1.82 (1.06-3.12)	0.56
Number of blocks with shock	1.51 (1.38-1.65)	0.76	1.39 (1.30-1.49)	0.71	1.13 (1.02-1.25)	0.58
Admission SCAI Shock Stage	2.24 (1.87-2.68)	0.72	1.94 (1.69-2.22)	0.68	1.54 (1.28-1.85)	0.64
Maximum SCAI Shock Stage	2.86 (2.35-3.50)	0.77	2.41 (2.07-2.81)	0.72	1.59 (1.30-1.94)	0.64
Minimum SCAI Shock Stage	3.10 (2.48-3.88)	0.72	2.46 (2.07-2.92)	0.67	2.04 (1.60-2.60)	0.67
Mean SCAI Shock Stage	4.77 3.65-6.24)	0.82	3.51 (2.88-4.27)	0.76	2.22 (1.72-2.88)	0.70

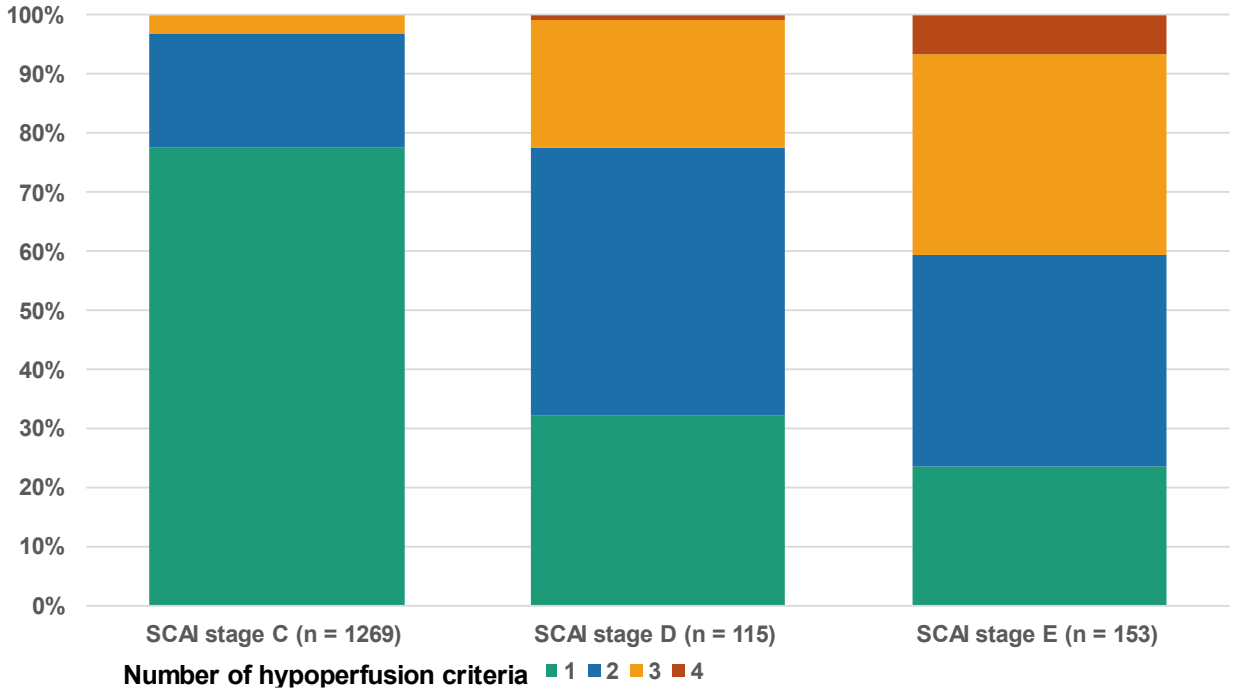
The SCAI Shock Classification was analyzed as a continuous variable to generate the unit OR value per each higher SCAI Shock Stage. Admission diagnoses are defined using ICD-10 codes documented within one day of CICU admission. ACS, acute coronary syndrome; ICD, International Classification of Diseases; SCAI, Society for Cardiovascular Angiography and Interventions.

Figure S1. Construction of the final study population, with the distribution SCAI shock stages in each CICU block, including patients who left the CICU during a prior block (CICU deaths and CICU discharges).



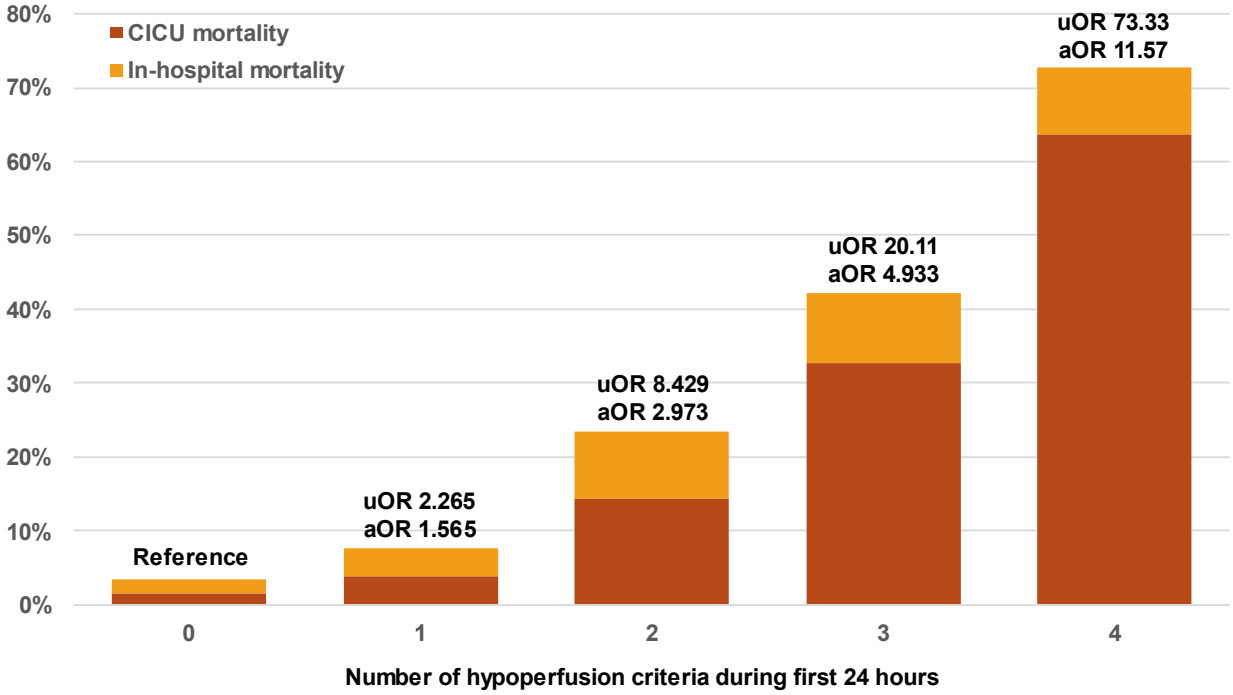
CICU, cardiac intensive care unit; SCAI, Society for Cardiovascular Angiography and Interventions.

Figure S2. Number of hypoperfusion criteria met (lactate >=2 mmol/L, vasopressors, temporary mechanical circulatory support, acute kidney injury) during the first 24 hours among patients with shock, according to maximum SCAI Shock stage.



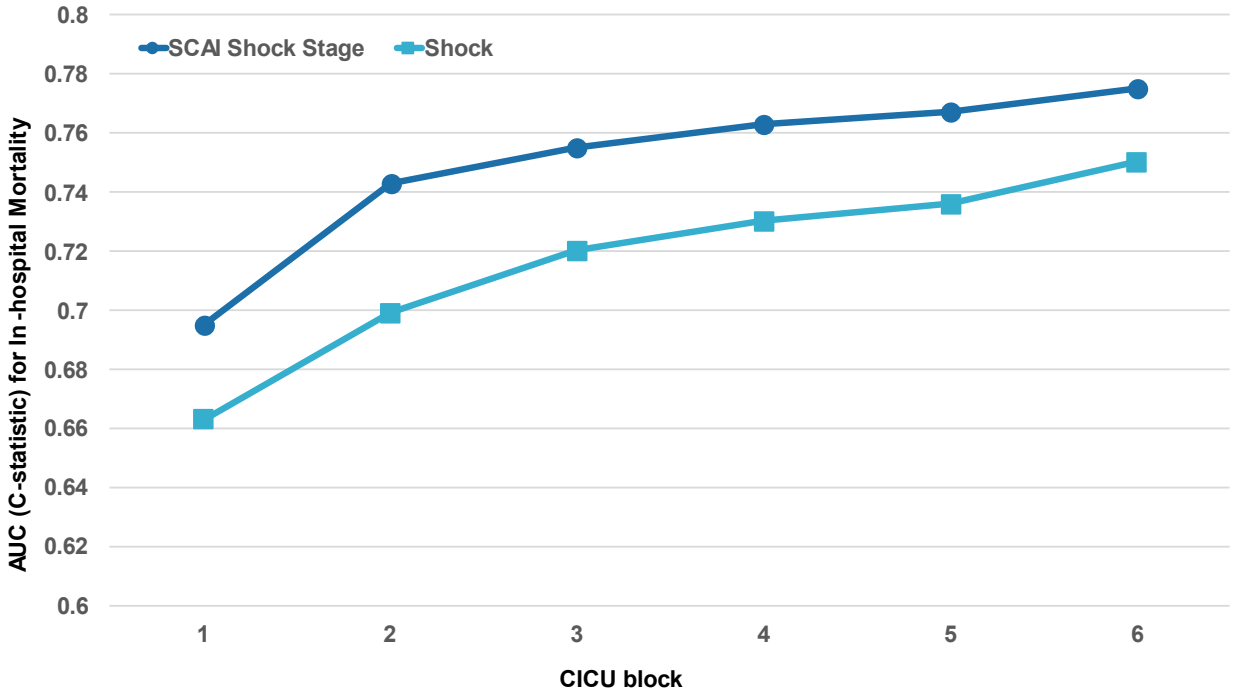
SCAI, Society for Cardiovascular Angiography and Interventions.

Figure S3. CICU and in-hospital mortality according to the number of hypoperfusion criteria met (lactate >=2 mmol/L, vasopressors, temporary mechanical circulatory support, acute kidney injury) during the first 24 hours.



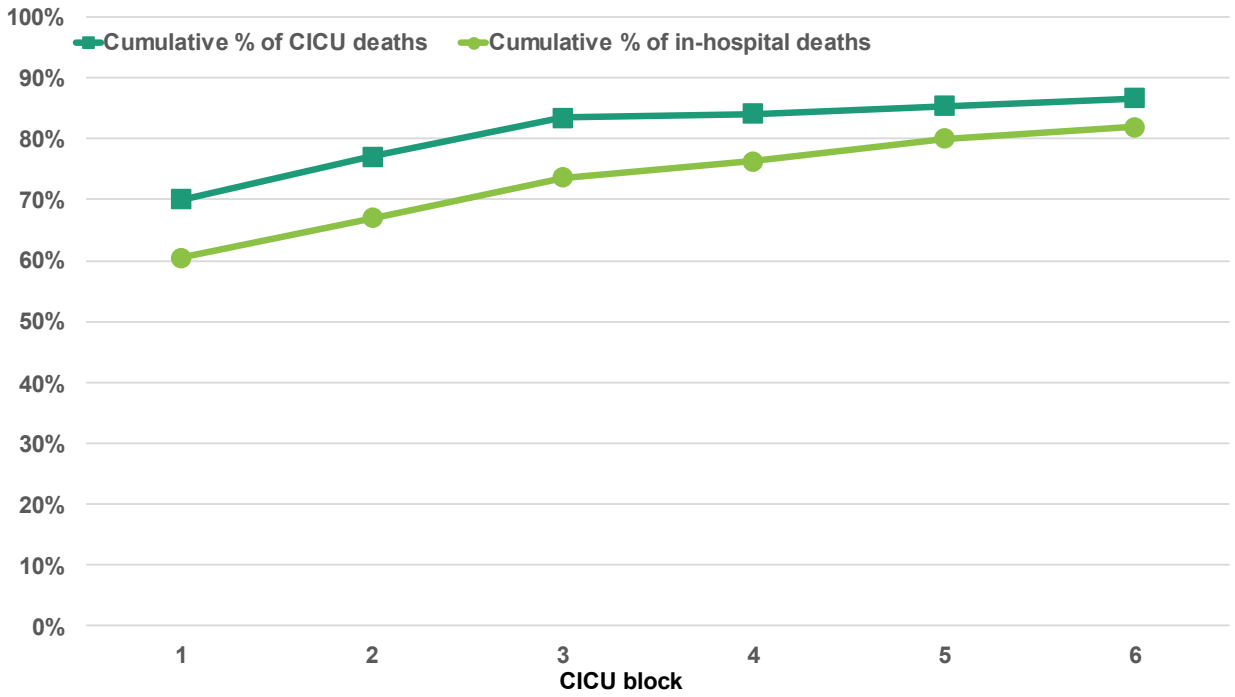
All hypoperfusion groups p <0.05 compared with the no hypoperfusion group for prediction of in-hospital mortality before and after multivariable adjustment. aOR, adjusted odds ratio; CICU, cardiac intensive care unit; uOR, unadjusted odds ratio

Figure S4. Area under the receiver-operator characteristic curve (AUC, C-statistic) values for discrimination of in-hospital mortality by serial evaluation of the presence of shock and the SCAI Shock Classification in each subsequent CICU block.



CICU, cardiac intensive care unit; SCAI, Society for Cardiovascular Angiography and Interventions.

Figure S5. Cumulative percentage of all CICU and in-hospital deaths (i.e., sensitivity) identified by shock (using the SCAI definition) in each CICU block.



CICU, cardiac intensive care unit; SCAI, Society for Cardiovascular Angiography and Interventions.