

Supplementary Table 1. Inclusion flowcharts for Stanford Medical Center, Oroville Hospital, Bakersfield Heart Hospital, and Cape Regional Medical Center.

	Stanford	Oroville	BHH	CRMC
Total encounters	521,040	1,200	5,681	4,637
Inpatients Only	441,208	1,200	5,305	4,631
Patients Aged ≥ 18	358,017	1,150	5,272	4,510
Patients with ≥ 1 observation of each required measurement*	239,767	1,140	2,231	4,295
Patients with prediction time between 7 and 2000 hours	239,767	1,140	2,231	4,295

*required measurements include heart rate, respiratory rate, peripheral oxygen saturation (SpO₂), temperature, systolic blood pressure, and diastolic blood pressure.

Supplementary Table 2. Demographic information for Stanford Medical Center, Oroville Hospital, Bakersfield Heart Hospital, and Cape Regional Medical Center.

Demographic Overview	Characteristic	Stanford (%)	Oroville (%)	BHH (%)	CRMC (%)
Gender	Female	53.91	54.87	45.94	52.30
	Male	46.09	45.13	54.06	47.70
Age Median Ages Stanford: 53 UCSF: 55 BIDMC: 65 Oroville: 61 BHH: 60 CRMC: 68	18-29	16.75	7.74	8.54	3.93
	30-39	13.28	9.22	10.52	4.90
	40-49	14.50	10.43	12.79	8.28
	50-59	18.20	19.39	17.53	15.75
	60-69	17.71	20.96	18.47	20.55
	70+	19.56	32.26	32.15	46.60
Length of Stay (days)	0-2	71.51	97.33	63.42	21.42
	3-5	15.53	34.17	11.07	7.17
	6-8	5.53	6.667	4.80	2.37
	9+	7.43	8.50	20.71	69.03
Death During Hospital Stay	Yes	1.91	N/A	N/A	1.21
	No	98.09	N/A	N/A	98.79

Supplementary Table 3. Confusion matrix of ten-fold cross validation results, using all features. Values in the table represent averages \pm standard deviations.

Sepsis:

	Predicted Positive	Predicted Negative
Actual Positive	17109 \pm 424	774 \pm 424
Actual Negative	30 \pm 2	110 \pm 2

Severe Sepsis:

	Predicted Positive	Predicted Negative
Actual Positive	15322 \pm 369	2531 \pm 369
Actual Negative	48 \pm 4	171 \pm 4

Septic Shock:

	Predicted Positive	Predicted Negative
Actual Positive	18801 \pm 9	19 \pm 9
Actual Negative	67 \pm 3	265 \pm 3

Supplementary Table 4. Confusion matrix of ten-fold cross validation results, with gold standard definition associated inputs removed. Values in the table represent averages \pm standard deviations.

Sepsis:

	Predicted Positive	Predicted Negative
Actual Positive	13655 \pm 488	4231 \pm 488
Actual Negative	34 \pm 3	120 \pm 3

Severe Sepsis:

	Predicted Positive	Predicted Negative
Actual Positive	13855 \pm 2381	4015 \pm 2381
Actual Negative	72 \pm 25	147 \pm 25

Septic Shock:

	Predicted Positive	Predicted Negative
Actual Positive	17972 \pm 320	878 \pm 320
Actual Negative	66 \pm 0	260 \pm 0

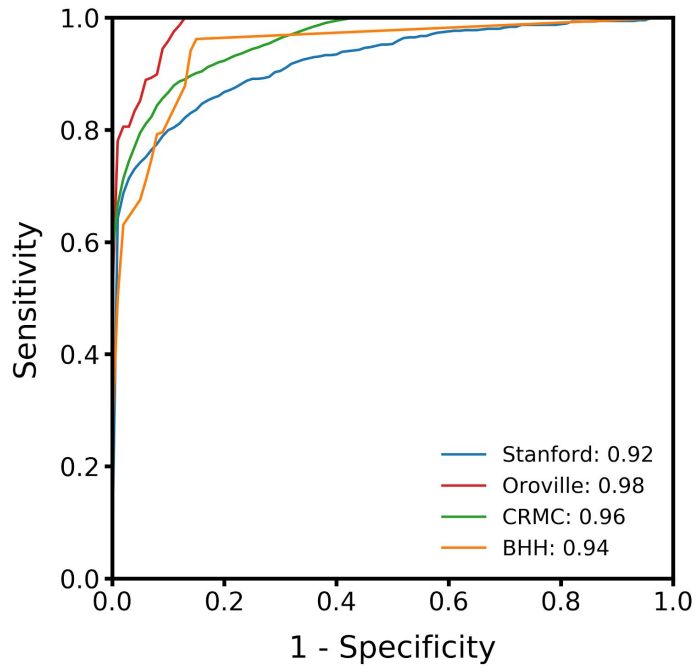
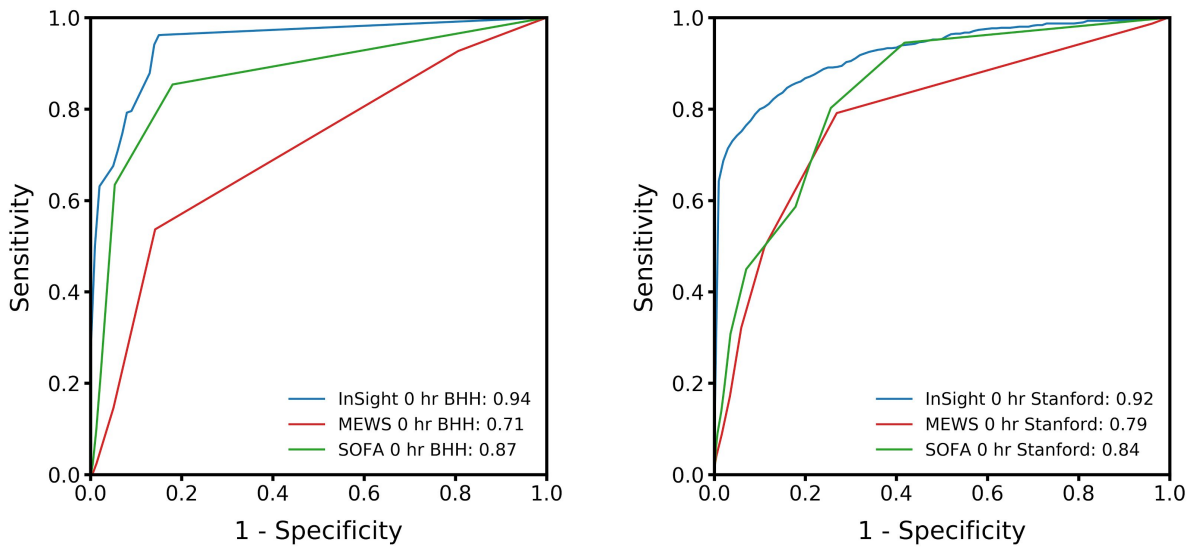


Figure 1. ROC curves for *InSight* at time of severe sepsis onset on data from Stanford, Oroville, Cape Regional Medical Center (CRMC), and Bakersfield Heart Hospital (BHH).



Supplementary Figure 2. ROC curves for *InSight*, MEWS, and SOFA applied to severe sepsis detection at time of onset, on data from Bakersfield Heart Hospital (BHH, left) and Stanford Medical Center (right).

Supplementary Table 5. Comparison of performance metrics for *InSight* and rules-based methods for severe sepsis detection at time of onset on data from Stanford Medical Center. LR: Likelihood ratio; SIRS: Systemic Inflammatory Response Syndrome; MEWS: Modified Early Warning Score; SOFA: Sequential (Sepsis-Related) Organ Failure Assessment; qSOFA: Quick SOFA.

Stanford	<i>InSight</i>	SIRS	MEWS	SOFA	qSOFA
AUROC	0.924	0.710	0.786	0.836	0.836
Sensitivity	0.798	0.798	0.791	0.802	0.802
Specitivity	0.901	0.901	0.731	0.744	0.744
Accuracy	0.900	0.900	0.885	0.789	0.789
LR+	8.253	8.253	2.940	3.133	3.133
LR-	0.224	0.224	0.286	0.266	0.266

Supplementary Table 6. Comparison of performance metrics for *InSight* and rules-based methods for severe sepsis detection at time of onset on data from Bakersfield Heart Hospital (BHH). LR: Likelihood ratio; SIRS: Systemic Inflammatory Response Syndrome; MEWS: Modified Early Warning Score; SOFA: Sequential (Sepsis-Related) Organ Failure Assessment; qSOFA: Quick SOFA.

BHH	<i>InSight</i>	SIRS	MEWS	SOFA	qSOFA
AUROC	0.945	0.678	0.707	0.869	0.665
Sensitivity	0.875	0.561	0.927	0.854	0.366
Specitivity	0.940	0.764	0.194	0.820	0.964
Accuracy	0.963	0.957	0.851	0.940	0.977
LR+	58.94	2.373	1.150	4.736	10.27
LR-	0.129	0.574	0.378	0.179	0.658

Supplementary Table 7. Comparison of performance metrics for *InSight* and rules-based methods for severe sepsis detection at time of onset on data from Oroville Hospital. LR: Likelihood ratio; SIRS: Systemic Inflammatory Response Syndrome; MEWS: Modified Early Warning Score; SOFA: Sequential (Sepsis-Related) Organ Failure Assessment; qSOFA: Quick SOFA.

Oroville	<i>InSight</i>	SIRS	MEWS	SOFA	qSOFA
AUROC	0.983	0.708	0.792	0.938	0.731
Sensitivity	0.806	0.602	0.685	0.778	0.537
Specitivity	0.989	0.757	0.811	0.926	0.921
Accuracy	0.971	0.909	0.883	0.917	0.914
LR+	77.92	2.476	3.616	10.52	6.836
LR-	0.197	0.526	0.388	0.240	0.502

Supplementary Table 8. Comparison of performance metrics for *InSight* and rules-based methods for severe sepsis detection at time of onset on data from Cape Regional Medical Center (CRMC). LR: Likelihood ratio; SIRS: Systemic Inflammatory Response Syndrome; MEWS: Modified Early Warning Score; SOFA: Sequential (Sepsis-Related) Organ Failure Assessment; qSOFA: Quick SOFA.

CRMC	<i>InSight</i>	SIRS	MEWS	SOFA	qSOFA
AUROC	0.960	0.732	0.554	0.749	0.560
Sensitivity	0.802	0.591	0.478	0.631	0.155
Specitivity	0.946	0.864	0.567	0.831	0.965
Accuracy	0.931	0.860	0.826	0.866	0.855
LR+	16.85	4.346	1.104	3.739	4.470
LR-	0.210	0.473	0.921	0.444	0.875

