NOVEL APPLICATION OF AN AUTOMATED-MACHINE LEARNING DEVELOPMENT TOOL FOR PREDICTING BURN SEPSIS: PROOF OF CONCEPT

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Figure S1. Flow Diagram

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┌─────────────────┐        ┌──────────────────────────────────┐
│   Enrollment    │        │ Assessed for eligibility (n= 1,133) │
└─────────────────┘        └──────────────────────────────────┘
                                         │
                                         │          ┌──────────────────────────────────────────┐
                                         │          │ Excluded (n= 922)                          │
                                         ├─────────▶│  ◆ Not meeting inclusion criteria (n= 894) │
                                         │          │  ◆ Declined to participate (n= 21)         │
                                         │          │  ◆ Other reasons (n= 7)                    │
                                         │          └──────────────────────────────────────────┘
                                         ▼
                              ┌──────────────────────┐
                              │ Randomized (n= 211)   │
                              └──────────────────────┘
                                         │
              ┌──────────────────────────┴──────────────────────────┐
              ▼                                                      ▼
┌──────────────────────────┐  ┌─────────────────┐  ┌──────────────────────────────┐
│ Allocated to PCR Group   │  │   Allocation    │  │ Allocated to Control Group    │
│ intervention (n= 92)     │  └─────────────────┘  │ intervention (n= 119)         │
└──────────────────────────┘                       └──────────────────────────────┘
              │                                                      │
              ▼                                                      ▼
┌──────────────────────────┐  ┌─────────────────┐  ┌──────────────────────────────┐
│ Lost to follow-up (n= 0) │  │ Daily Follow-Up │  │ Lost to follow-up (n= 0)      │
│                          │  │ During ICU Stay │  │                               │
│ Discontinued intervention│  └─────────────────┘  │ Discontinued intervention     │
│ (n= 0)                   │                       │ (n= 0)                        │
└──────────────────────────┘                       └──────────────────────────────┘
              │                                                      │
              ▼                                                      ▼
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│ Analysed (n= 92)         │  │    Analysis     │  │ Analysed (n= 119)             │
└──────────────────────────┘  └─────────────────┘  └──────────────────────────────┘
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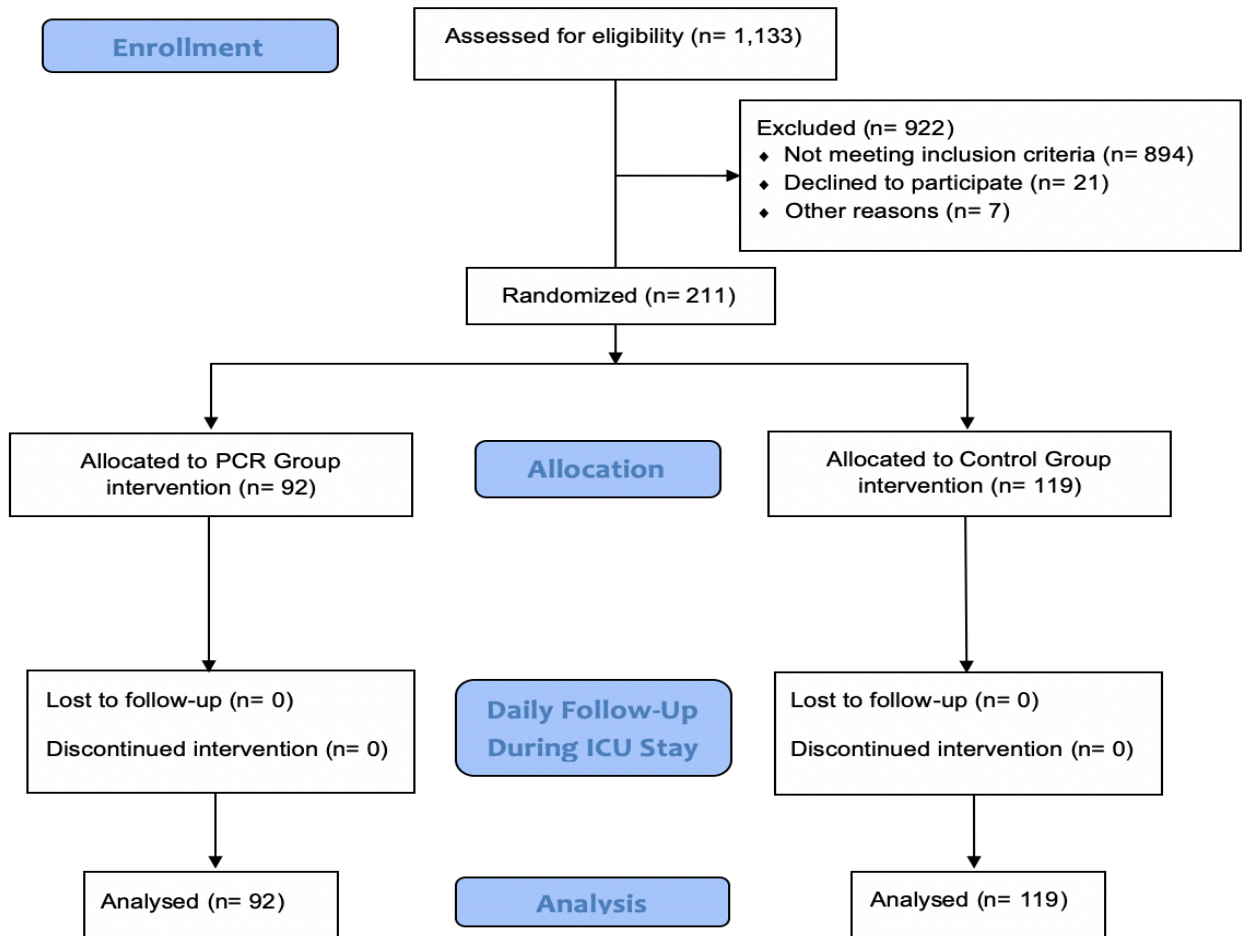
Table S1. Comparison of our Non-automated versus Automated machine learning

	Our Non-Automated ML Approach	Our Automated ML (MILO) Approach
Algorithms*	KNN, LR, SVM, DNN and RF	KNN, LR, SVM, DNN, RF, NB and GBM
Scaler(s) used	Standard scaler	standard scaler, Min/max, and no scaler
Feature Selector and/or transformers used	ANOVA F Value Select percentile (10% increments)	- ANOVA F Value Select percentile (25% increments) - Random Forest Feature Importances (25% increments) and - principal component analysis
Hyperparameter Searchers	Grid search	- Grid search and - Random Search x2
Scorer(s) used in the training/initial validation phase	Accuracy	- Accuracy - ROC-AUC - F1
Model Assessments	Generalization assessment performed on best accuracy model	Generalization assessment on all pipelines

Table S2. Number of Models Generated by MILO for Sepsis Data

Algorithm	Search	Scalers	Feature Selectors	(Hyperparameter Search count x k-fold of 10) + 3 scorers	Total
GBM	Grid	3	9	(30 x 10) + 3	8181
GBM	Random 1	3	9	(100 x 10) + 3	27081
GBM	Random 2	3	9	(100 x 10) + 3	27081
KNN	Grid	3	9	(56 x10) + 3	15201
KNN	Random 1	3	9	(100 x 10) + 3	27081
KNN	Random 2	3	9	(100 x 10) + 3	27081
LR	Grid	3	9	(27 x 10) + 3	7371
LR	Random 1	3	9	(100 x 10) + 3	27081
LR	Random 2	3	9	(100 x 10) + 3	27081
DNN	Grid	3	9	(72 x 10) + 3	19521
DNN	Random 1	3	9	(100 x 10) + 3	27081
DNN	Random 2	3	9	(100 x 10) + 3	27081
NB	Grid	3	9	(1 x 10) + 3	351
NB	Random 1	3	9	(1 x10) + 3	351
NB	Random 2	3	9	(1 x10) + 3	351
RF	Grid	3	9	(45 x10) + 3	12231
RF	Random 1	3	9	(100 x 10) + 3	27081
RF	Random 2	3	9	(100 x 10) + 3	27081
SVM	Grid	2	9	(40 x10) + 3	7254
SVM	Random 1	2	9	(10 x 10) + 3	1854
SVM	Random 2	2	9	(10 x 10) + 3	1854
					345330