Table 3: Top Predictors

Rank	Predictors	Feature Importance Score	AUC	AUC Increase
PH Persistence at Discharge*				
1	iNO	0.36	0.44	NA
2	Pharm Rx PDA	0.28	0.50	0.07
3	PDA	0.28	0.52	0.02
4	G 3-4 ICH	0.07	0.63	0.11
5	Early Onset Sepsis	0.00	0.63	0.00
PH Associated Mortality*				
1	Respiratory Support	0.28	0.67	NA
2	TR velocity	0.11	0.68	0.02
3	iNO	0.11	0.64	-0.04
4	Steroids for CLD	0.09	0.64	0.00
5	Eccentricity Index	0.04	0.57	-0.08
Pharm PH**				
1	iNO	0.21	0.76	NA
2	TR Jet	0.00	0.76	0.01
3	Highest FiO2	0.00	0.77	0.00
4	PMA at Diagnosis	0.00	0.74	-0.03
5	Early Onset Sepsis	0.00	0.74	0.00
Multi Agent PH***				
1	PMA at Diagnosis	0.44	0.33	NA
2	Highest FiO2	0.35	0.33	0.00
3	BW	0.21	0.56	0.23
4	Early Onset Sepsis	0.00	0.56	0.00
5	5 min Apgar	0.00	0.56	0.00

*XGBoost determines feature relevance by analyzing measures such as how frequently each feature is utilized in tree splits, the improvement in model accuracy provided by each feature, and the number of observations influenced by each feature across all decision trees in the model.

****Permutation Importance** is used to identify the top features in a top performing Histogram Boosting Classifier model by randomly shuffling each feature's values, as Histogram Boosting does not have a built-in feature importance method.

*****Decision Tree** determines feature relevance by calculating the total reduction in impurity (such as Gini impurity or entropy) caused by each feature across all splits in the tree.