

Table 1: ROC curve analysis of baseline parameters to predict failure of NIV

Variable	Cut off point	AUC (95% CI)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)	P value
Age (years)	>62	1.0 (0.971-1.0)	100	100	100	100	100	<0.0001
Respiratory rate (cpm)	>35	0.985 (0.945-0.998)	93.6	92.4	88.0	96.1	93	<0.0001
Patrick scale	>1	0.974 (0.928-0.994)	93.6	96.2	93.6	96.2	94.9	<0.0001
APACHE II score	>23	0.978 (0.934-0.996)	93.6	88.6	83.0	95.9	91.1	<0.0001
SaO ₂ (%)	≤77	0.659 (0.569-0.741)	31.9	92.4	71.4	69.5	62.2	0.002
P/F ratio	≤88	0.659 (0.569-0.741)	31.9	92.4	71.4	69.5	62.2	0.002
Creatinine (mg/dl)	>1.1	0.663 (0.573-0.744)	48.9	77.22	56.1	71.8	63.1	0.001
CRP (mg/dl)	>82	0.761 (0.677-0.833)	68.1	74.7	61.5	79.7	71.4	<0.0001

SaO₂: Oxygen saturation of arterial blood

cpm: Cycle per minute

APACHE II: Acute physiology and chronic health evaluation type II score

CI: Confidence interval

AUC: Area under ROC curve

ROC: Receiver operating characteristic curve

P/F ratio: Ratio of pressure of O₂ in arterial blood PaO₂ to fraction of inspiratory oxygen concentration FiO₂

PPV: Positive predictive value

NPV: Negative predictive value

Table 2: Predictors (Odds ratios) of NIV failure by different significant baseline parameters

Variable	Odds ratio (95% CI)	P value
Respiratory rate >35 cpm	178.44 (42.47-749.78)	<0.0001
Patrick scale >1	371.56 (71.87-1920.82)	<0.0001
APACHE II score >23	114.07 (29.28-444.44)	<0.0001
SaO ₂ ≤77 %	5.70 (2.03-16.04)	0.001
P/F ratio ≤88	5.70 (2.03-16.04)	0.001
Creatinine >1.1 mg/dl	3.25 (1.49-7.06)	0.001
CRP >82 mg/dl	6.29 (2.83-13.95)	<0.0001

SaO₂: Oxygen saturation of arterial blood

APACHE II: Acute physiology and chronic health evaluation type II score

AUC: Area under ROC curve

CI: Confidence interval

P/F ratio: Ratio of pressure of O₂ in arterial blood PaO₂ to fraction of inspiratory oxygen concentration (FiO₂)

SaO₂: Oxygen saturation of arterial blood

APACHE II: Acute physiology and chronic health evaluation type II score

AUC: Area under ROC curve

ROC: Receiver operating characteristic curve

Variable	Cut off point	AUC (95% CI)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)	P value
Respiratory rate (cpm)	>32	0.987 (0.948-0.999)	93.6	100	100	96.3	96.8	<0.0001
Patrick scale	>1	1.0 (0.971-1.0)	100	100	100	100	100.0	<0.0001
SaO ₂ (%)	≤93	0.963 (0.913-0.988)	83.0	96.2	92.9	90.5	89.6	<0.0001
P/F ratio	≤107	0.939 (0.881-0.974)	78.7	96.2	92.5	88.4	87.5	<0.0001
PEEP (cmH ₂ O)	>11	0.839 (0.763-0.898)	72.3	78.5	66.7	82.7	75.4	<0.0001
PS (cmH ₂ O)	>9	0.942 (0.885-0.976)	93.6	93.7	89.8	96.1	93.7	<0.0001
PIP (cmH ₂ O)	>22	0.985 (0.946-0.998)	95.7	96.2	93.8	97.4	96.0	<0.0001
V _T (ml/kg PBW)	≤6.8	0.918 (0.855-0.959)	74.5	93.7	87.5	86.0	84.1	<0.0001
Ṁ _E (L/min)	>12	1.0 (0.971-1.0)	100	100	100	100	100.0	<0.0001
T _i /T _{tot}	>0.37	1.0 (0.971-1.0)	100	100	100	100	100.0	<0.0001

CI: Confidence interval

P/F ratio: Ratio of pressure of O₂ in arterial blood PaO₂ to fraction of inspiratory oxygen concentration FiO₂

PPV: Positive predictive value

NPV: Negative predictive value

PEEP: Positive end expiratory pressure

PS: Pressure support

VT: Tidal volume

Ṁ_E: Minute ventilation

PIP: Peak inspiratory pressure

Ti/Ttot: Inspiratory time to total cycle time

PBW: Predicted body weight

Table 4: Predictors (Odds ratios) of NIV failure by different parameters (1 hr after NIV)

Variable	Odds ratio (95% CI)	P value
SaO ₂ ≤93%	123.5 (31.01-491.85)	<0.0001
P/F ratio ≤150	93.73 (24.33-361.10)	<0.0001
PEEP >11 cmH ₂ O	9.54 (4.14-21.97)	<0.0001
PS > cmH ₂ O	217.07 (49.45-952.79)	<0.0001
PIP >22 cmH ₂ O	570 (91.73-3541.89)	<0.0001
V _T ≤6.8 ml/kg PBW	43.17 (14.11-132.04)	<0.0001

SaO₂: Oxygen saturation of arterial blood

P/F ratio: Ratio of pressure of O₂ in arterial blood PaO₂ to fraction of inspiratory oxygen concentration FiO₂

PS: Pressure s

V_T: Tidal volume

PIP: Peak inspiratory pressure

PEEP: Positive end expiratory pressure

PBW: Predicted body weight

Table 5: ROC curve analysis GCS, vital signs, blood gases and NIV settings parameters (24 hrs after NIV) to predict failure of NIV

Variable	Cut off point	AUC (95% CI)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)	P value
Respiratory rate (cpm)	>24	1.0 (0.959-1.0)	100	100	100	100	100	<0.0001
Patrick scale	>0	1.0 (0.959-1.0)	100	100	100	100	100	<0.0001
SaO ₂ (%)	≤94	0.975 (0.917-0.996)	90	100	100	98.7	95.0	<0.0001
P/F ratio	≤170	1.0 (0.959-1.0)	100	100	100	100	100	<0.0001
PEEP (cmH ₂ O)	>14	1.0 (0.959-1.0)	100	100	100	100	100	<0.0001
PS (cmH ₂ O)	>12	1.0 (0.959-1.0)	100	100	100	100	100	<0.0001
PIP (cmH ₂ O)	>24	1.0 (0.959-1.0)	100	100	100	100	100.0	<0.0001
V _T (ml/kg PBW)	≤6.8	0.997 (0.953-1.0)	100	96.2	76.9	100	98.1	<0.0001
Ṡ _E (L/min)	>12	1.0 (0.959-1.0)	100	100	100	100	100.0	<0.0001
T _i /T _{tot}	>0.31	1.0 (0.959-1.0)	100	100	100	100	100.0	<0.0001

SaO₂: Oxygen saturation of arterial blood

I: Confidence interval

APACHE II: Acute physiology and chronic health evaluation type II score

AUC: Area under ROC curve

ROC: Receiver operating characteristic curve

P/F ratio: Ratio of pressure of O₂ in arterial blood PaO₂ to fraction of inspiratory oxygen concentration FiO₂

PPV: Positive predictive value

NPV: Negative predictive value

PEEP: Positive end expiratory pressure

PS: Pressure support

VT: Tidal volume

Ṡ_E: Minute ventilation

PIP: Peak inspiratory pressure

Ti/Ttot: Inspiratory time to total cycle time