SUPPLEMENTARY MATERIAL

Patient Management Assisted By A Neural Network Reduces Mortatlity In An Intermediate Care Unit

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Supplementary Table 1. Cut-off values for every variable according to the Youden J index.

Variable	Cut-off	Sensibility	Specificity
AGE	63.8	0.909	0.185
SBP	104	0.182	0.891
DBP	65.5	0.485	0.658
T	36.1	0.212	0.865
RR	24.5	0.212	0.962
LEUCOS	3.23	0.182	0.989
Hb	10.5	0.515	0.725
PL	267	0.788	0.375
CREA	1.48	0.303	0.853
NA	140	0.697	0.412
K	3.68	0.970	0.155
PH	7.33	0.606	0.593
PC02	103	0.091	0.961
P02	68.0	0.667	0.494
BE	6.35	0.788	0.359
SBC	26.4	0.545	0.651

Supplementary Table 2. Univariate logistic regression analysis.

Variable	OR	(IC 95%)	P
AGE >63.8	2.265	(0.802, 9.485)	0.134
SBP >104	0.581	(0.253, 1.570)	0.261
DBP >65.5	0.553	(0.277, 1.112)	0.096
T >36	0.580	(0.263, 1.461)	0.230
RR >24.5	6.764	(2.636, 15.30)	0.000

LEUCOS >3.23	0.052	(0.020, 0.150)	0.000
Hb >10.4	0.356	(0.177, 0.714)	0.004
PL >266	0.450	(0.179, 0.986)	0.046
CREA >1.48	2.514	(1.133, 5.196)	0.025
NA >140	0.908	(0.411, 1.867)	0.799
K >3.68	5.856	(1.253, 104.4)	0.019
PH >7.33	0.510	(0.246, 1.021)	0.057
PC02 >103	2.443	(0.577, 7.056)	0.195
P02 >68	0.547	(0.254, 1.111)	0.096
BE >6.35	0.481	(0.191, 1.055)	0.069
SBC >26.4	0.464	(0.229, 0.925)	0.029

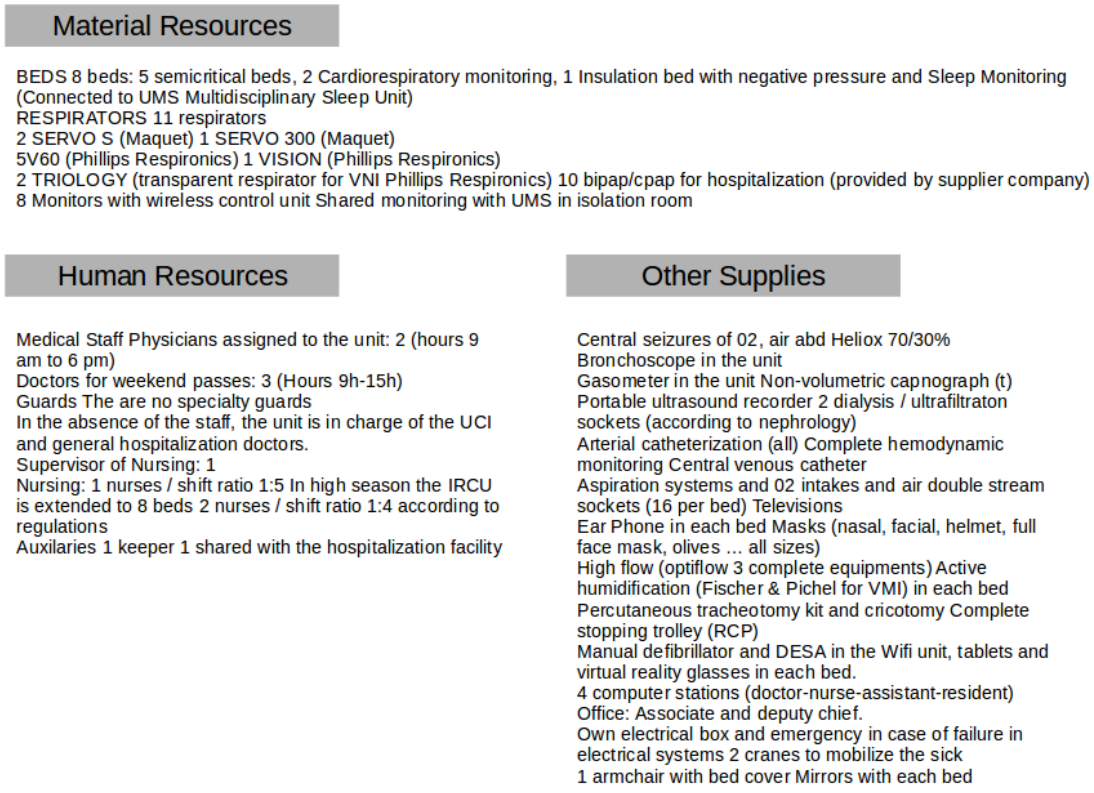
Supplementary Table 3. Global profile of the second cohort analysed. NIV means Non Invasive Ventilation; HFO means High Flow Oxygen treatment.

Features	**Threshold**
Months of study	11
Number of patients	230
Mortality rate (%)	1.30
Failure rate (%) (n=3)	1.73
Age (mean)	69± 15
Gender ratio (male %/female %)	52/48
NIV treatment (%)	65
HFO treatment (%)	12
Weaning procedures (%)	23
Vasoactive drugs (%)	26

Supplementary Table 4. Description of the variables and their values from patients in the second cohort. Percentage of NAs (Not Available value) indicates the missing values of every variable.

Variable	**Mean**	**SD**	**%NA**
SBP	130.2	22.7	0
DBP	68.1	13.3	0
T	36.7	0.5	0
RR	23.8	5.1	0
LEUCOS	11.5	7.1	0
Hb	11.9	2.6	0
PL	265	126.8	0

INR	1.5	1.3	20.69
CREA	0.91	0.71	0.43
NA	137.3	9.78	0
K	4.1	0.75	0.43
PH	7.3	0.49	0
PCO2	52.8	19.87	0
PO2	84.1	31.1	0
BE	4.8	6.05	0.86



Supplementary Figure 1. Description of the material and human ressources of the unit.

Current Admission Criteria

1. Acute hypoxemic or hypercapnic respiratory failure requiring ventilatory support
2. Exacerbation of chronic respiratory failure requiring NIV with /without hemodynamic support
3. Need for sedation to adapt to NIV
4. Serious uncontrolled OSAS, in respiratory acidosis or with abnormally high levels of CO_2 or failure in respirator Interaction.
5. Pulmonary thromboembolism with severe respiratory deterioration
6. Severe ARF in high-flow oxygen therapy or NIV or Helmet
7. Laryngospasm in post extubation of resuscitation (heliox, vmni)
8. Weaning of complex patients of multidisciplinary origin (from ICU)
9. Decanulation protected by tracheal ring in weaning of tracheotomized multidisciplinary patients (from ICU)
10. Postoperative of risky thoracic surgery or postoperative acute respiratory failure
11. Postoperative of any origin if it requires support of NIV, if it is not subsidiary of admission to the ICU.
12. Need for ventilatory support in respiratory failure of neuromuscular origin, Complete and partial weaning. Algorithms
13. Cannulation with support of NIV in the operating room of the non-intubable neuromuscular patient (infrequent 7 cases this year)
14. Risk bronchoscopy (coordinated with ICU)
15. Pneumonia of the immunosuppressed (coordinated with ICU)
16. Control of pulmonary hypertension, right catheterization and vasodilator test, hemodynamic optimization

Supplementary Figure 2. Description of the Admission criteria to the HU-FJD's IRCU.

General Characteristics of Patients Classified by Diagnosis (DRG)

Description	Average Weight (GRD)	Disease Level	Mortality Level
COPD	1,22	3,38	3,48
Traqueostomy with MV96+ hours with extensive or ECMO procedure	14,36	3,85	3,70
Other pneumonia	1,38	3,47	3,21
Heart failure	1,35	3,38	3,56
Pulmonary interstitial and alveolar disease	1,39	3,23	3,00
Pulmonary edema and respiratory failure	1,13	3,00	3,45
Respiratory Diseases with assisted ventilation of more than 96 hours	4,90	3,64	3,45
Septicemia and disseminated infections	2,50	3,80	3,90
Tracheostostomy with MV96+ hours without extensive procedure	8,93	3,50	3,40
Others	3,3	3,4	3,3

Supplementary Figure 3. Grouping by GRD of the patients, levels of disease and mortality. Each episode is grouped into an APR with four possible levels of severity (1: moderate, 2: minor, 3: major and 4: extreme). Each of these levels has an increasing weight value (expression of resource consumption) that increases from level 1 to level 4. These weights are calculated annually in the United States. The levels of severity and probability of dying are automatically assigned by the 3M grouper (Grupper) according to the coding of the episodes. The greater the number of secondary diagnoses of complications of these patients, the grouper will signify the episode at a higher level of severity and probability of dying.