COVID-19 PNEUMONIA: DISABILITY, REHABILITATION AND AGING

THE ITALIAN EXPERIENCE

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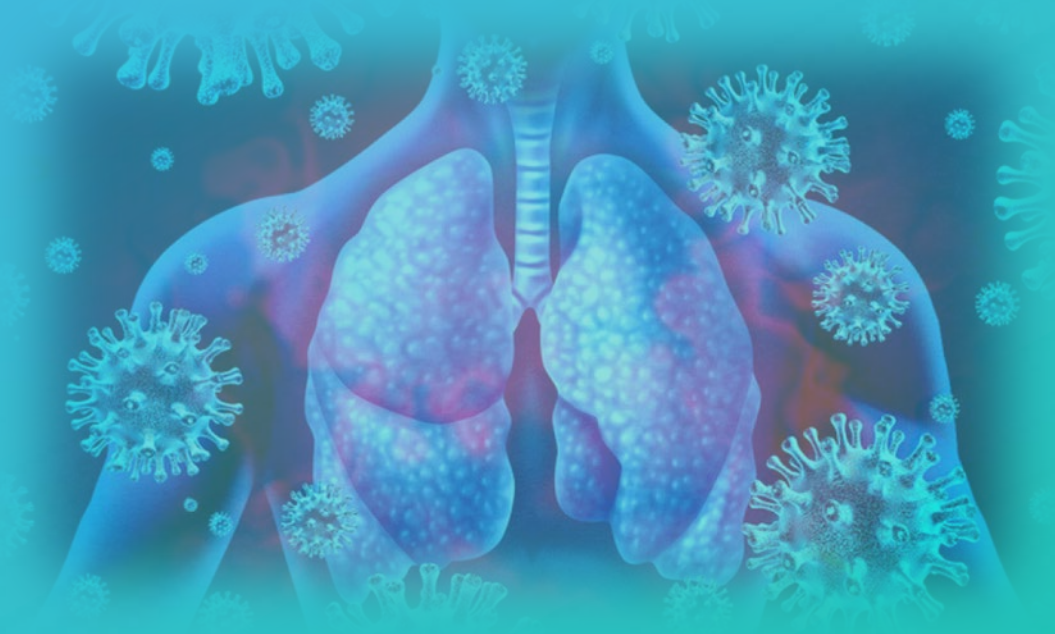
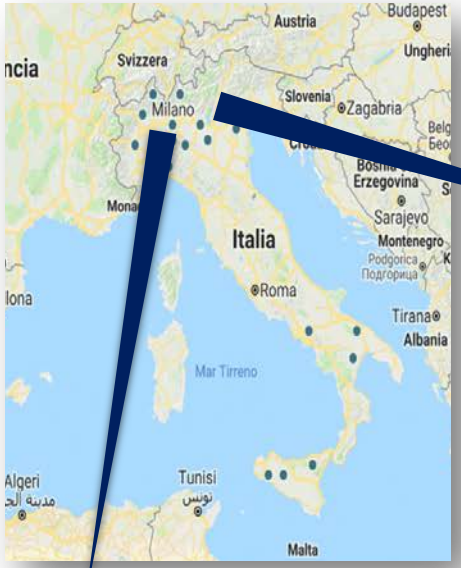




Lumezzane (BS)

Headquarter
Pavia

Istituti Clinici Scientifici Maugeri

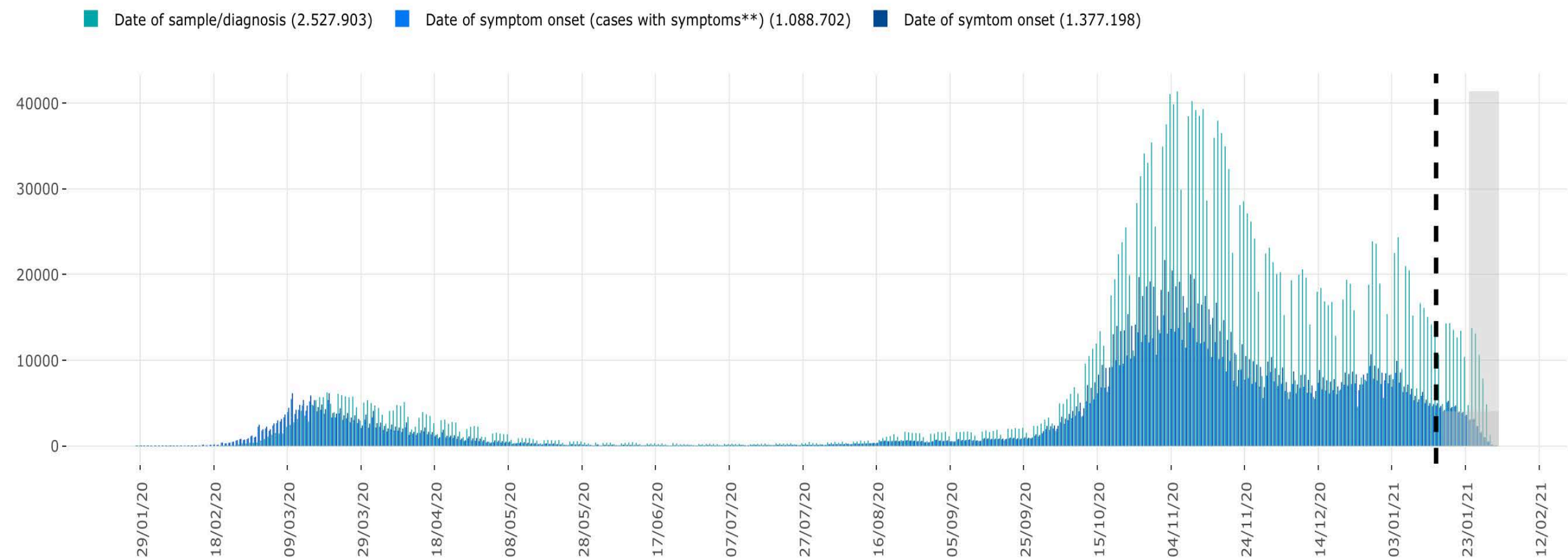
UNIVERSITÀ di VERONA

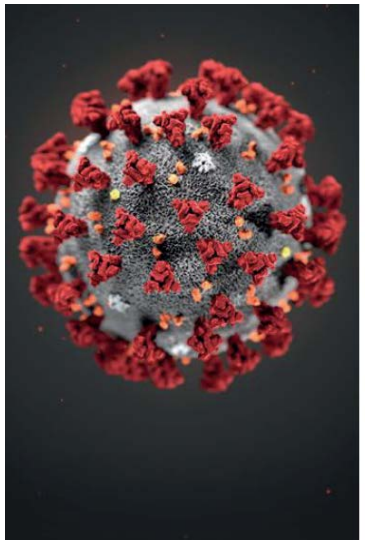
Department of NEUROSCIENCES, BIOMEDICINE AND MOVEMENT SCIENCES

2,531,515	108,194	48 years	48.4% | 51.6%	86,761 (3.4%)	1,814,795
Cases***	Cases among healthcare workers*	Median age of cases	Males (%) | Females (%)	Deaths (Case-Fatality Rate)	Recovered

Cases of confirmed SARS-CoV-2 infection reported in Italy, by date of sample/diagnosis (green) and by date of symptom onset (blue)

Note: more recent data (grey squares) should be interpreted with caution due to the possible reporting delay of more recently diagnosed cases and to the possibility that cases with date of onset within the reporting period may have not yet been diagnosed.





RACCOMANDAZIONI DI ETICA CLINICA PER L'AMMISSIONE A TRATTAMENTI INTENSIVI E PER LA LORO SOSPENSIONE, IN CONDIZIONI ECCEZIONALI DI SQUILIBRIO TRA NECESSITÀ E RISORSE DISPONIBILI

Gruppo di lavoro
Marco Vergano, Guido Bertolini, Alberto Giannini, Giuseppe Gristina, Sergio Livigni, Giovanni Mistraletti, Flavia Petrini

SIAARTI
PRO VITA CONTRA DOLOREM SEMPER

Recommendations of Italian Intensivists

<< Access to Intensive Care Unit >>

Privilege the patients with the greatest chance of success

- Enter Criteria :
  - **Severity of Covid-19 pneumonia**
  - **Comorbilities**
  - **Multi-organ failure**
  - **Chance of reversibility**

Original Investigation

July 15, 2020

Risk Factors Associated With Mortality Among Patients With COVID-19 in Intensive Care Units in Lombardy, Italy

Giacomo Grasselli, MD[1,2]; Massimiliano Greco, MD[3,4]; Alberto Zanella, MD[1,2]; et al

» Author Affiliations | Article Information

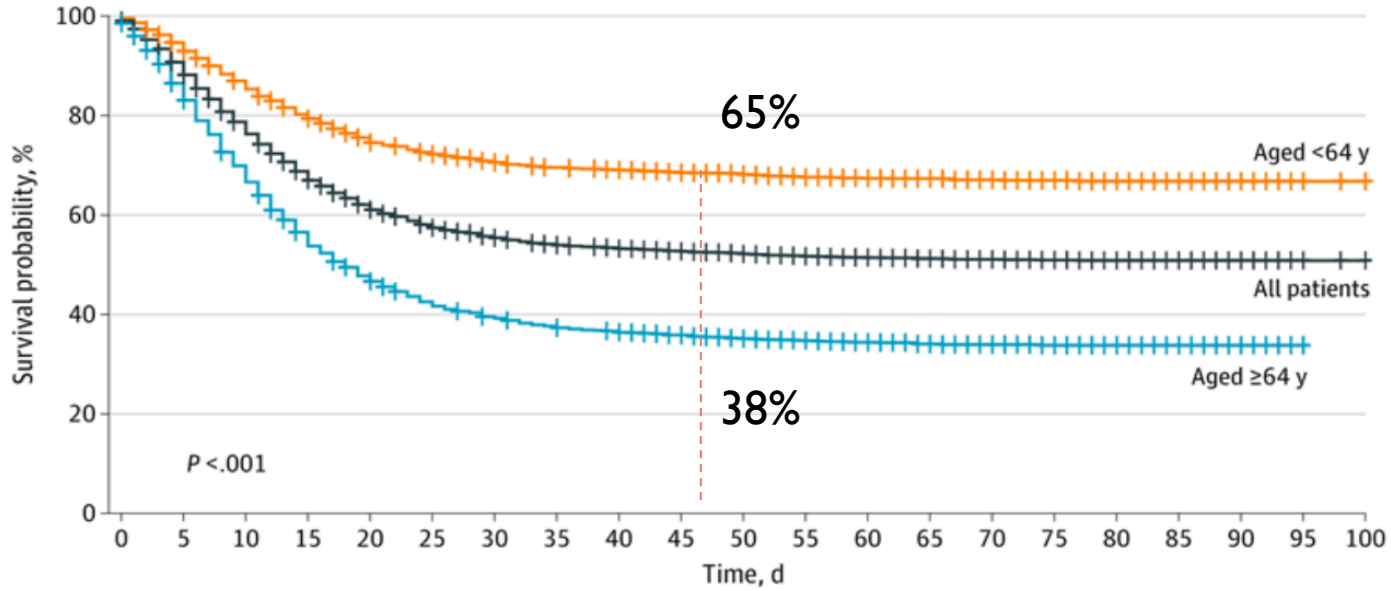
JAMA Intern Med. 2020;180(10):1345-1355. doi:10.1001/jamainternmed.2020.3539

JAMA Internal Medicine

Age was 63 (IQR 56-69) yo
The follow-up was 44 (IQR 11-69) days

In the subgroup of the first 1715 patients as of May 30, 2020
915 patients (53.4%) died in the hospital

Figure. Kaplan-Meier Analysis of Survival of Patients Admitted to the Intensive Care Unit



No. at risk

All patients	3988	3609	3118	2716	2443	2274	2168	2102	2057	1987	1885	1730	1542	1275	976	669	423	225	67	18	1
Aged <64 y	2059	1945	1776	1635	1532	1467	1423	1393	1371	1334	1284	1205	1092	924	696	471	290	149	40	9	1
Aged ≥64 y	1929	1664	1342	1081	911	807	745	709	686	653	601	525	450	351	280	198	133	76	27	9	0

Monaldi Archives for Chest Disease 2020; volume 90:1085

How the COVID-19 infection tsunami revolutionized the work of respiratory physiotherapists: an experience from Northern Italy

Carla Simonelli[1], Mara Paneroni[2*], Aubin Georges Fokom[1], Manuela Saleri[1], Ilaria Speltoni[2], Irene Favero[2], Francesca Garofali[2], Simonetta Scalvini[2], Michele Vitacca[1]

[1]Cardiac Rehabilitation, ICS Maugeri IRCCS, Institute of Lumezzane (BS); [2]Pulmonary Rehabilitation, ICS Maugeri IRCCS, Institute of Lumezzane (BS), Italy

7/7 days
16 h/ days

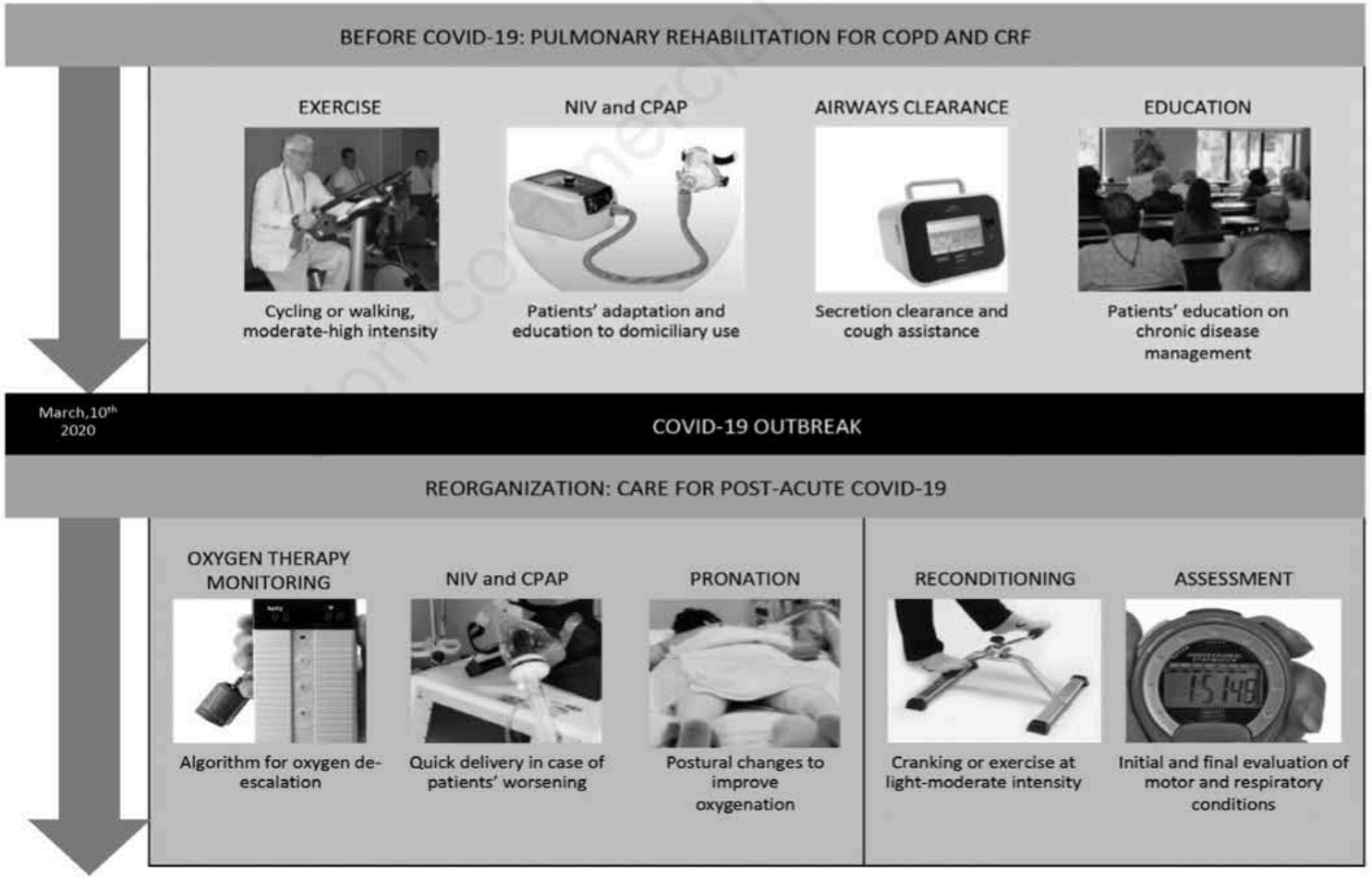


Figure 1. Respiratory physiotherapist's activities in post-acute COVID-19. COPD, chronic obstructive pulmonary disease; CRF, chronic respiratory failure; NIV, non invasive ventilation; CPAP, continuous positive airways pressure.

Table 1. Time sheet of the RPT in two duties in a typical working day with 90 hospitalized patients.

Task	N. of performances
SpO_2 monitoring	89
Oxygen de-escalation	7
Oxygen increase	5
CPAP or NIV application and monitoring	4
Pronation exercises	2
PEP prescription and monitoring	5
Reconditioning exercises	29
Short Physical Performance Battle test	6
1 minute Sit-to-Stand test	5

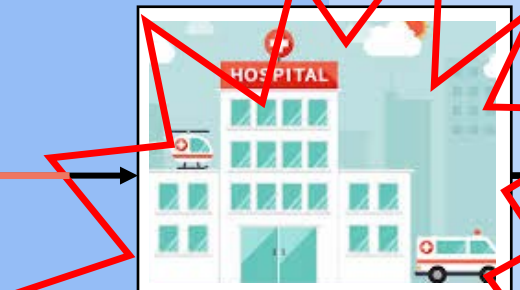
MY DATA

Acute Phase

Post-acute phase

Rehabilitative or post-COVID

Emergency room



Covid department

Intensive Care Unit

Other clinical condition plus COVID+

Home

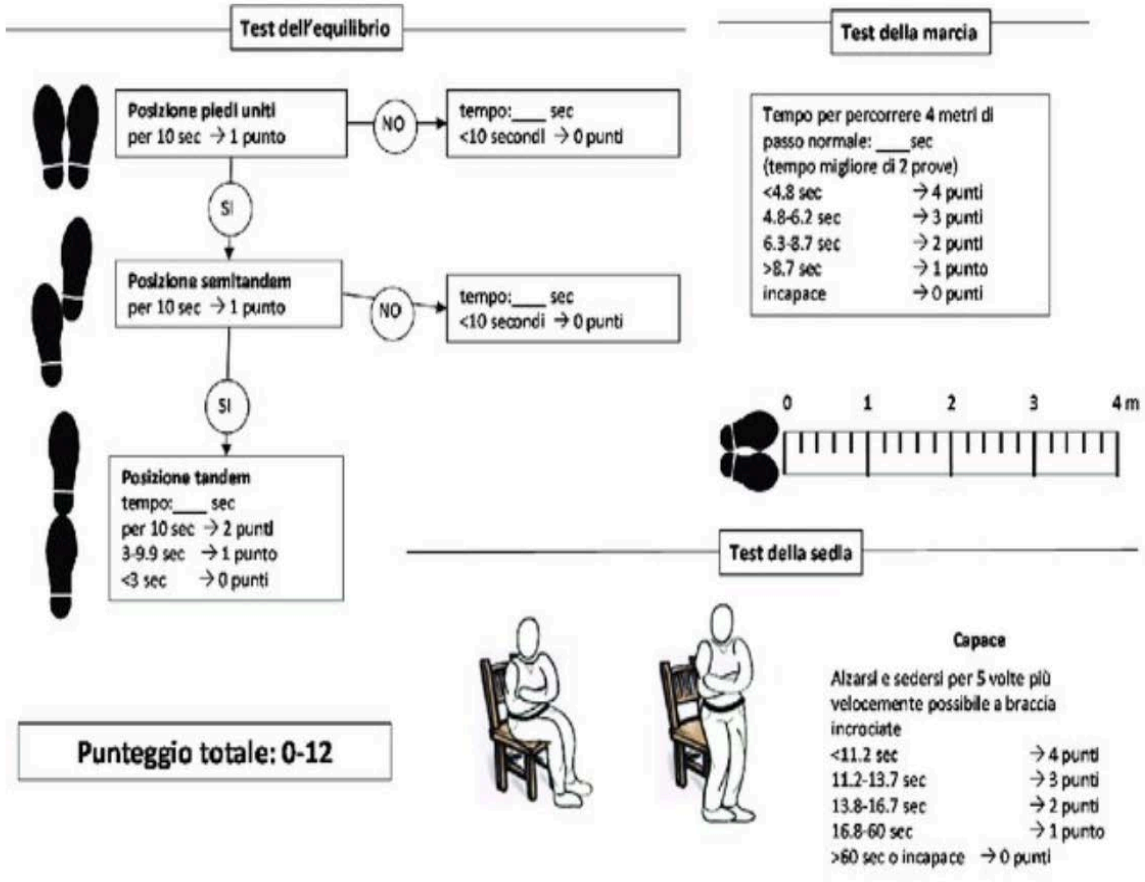
Rehabilitation ward

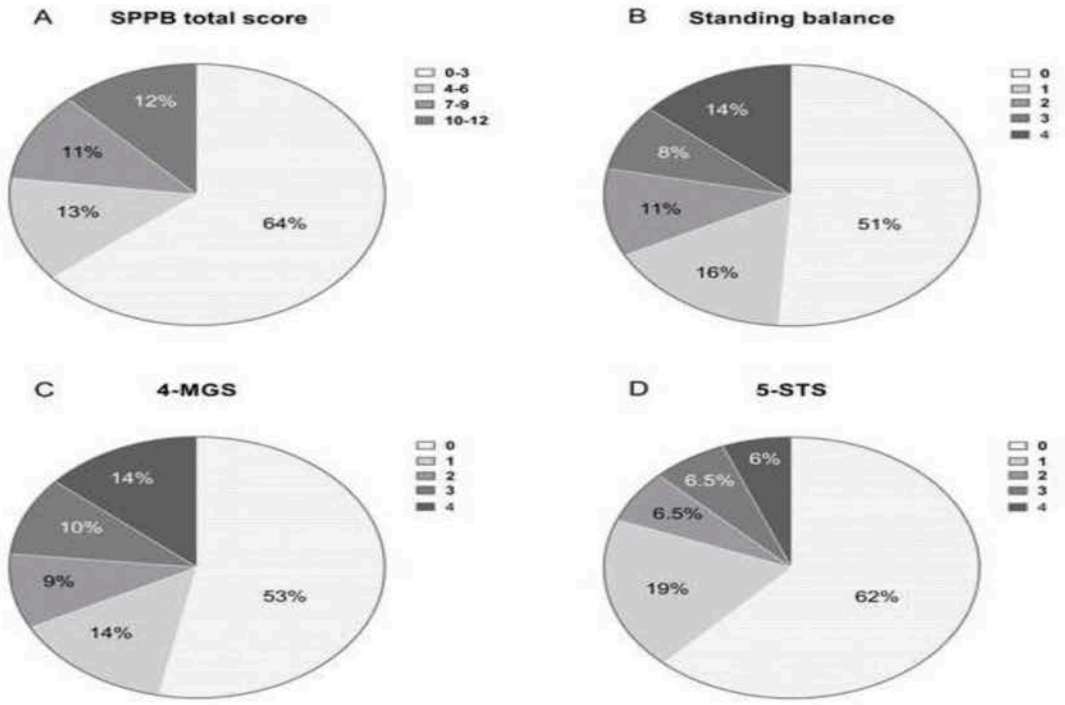
Nursing home

PREDICTORS OF LOW PHYSICAL FUNCTION IN PATIENTS WITH COVID-19 WITH ACUTE RESPIRATORY FAILURE ADMITTED TO A SUB-ACUTE UNIT

Mara Paneroni, MSc, Ioannis Vogiatzis, PhD FERS, Carla Simonelli, PT, Laura Bertacchini, PT Michele Vitacca, MD

At Admission





In press

PREDICTORS OF LOW PHYSICAL FUNCTION IN PATIENTS WITH COVID-19 WITH ACUTE RESPIRATORY FAILURE ADMITTED TO A SUB-ACUTE UNIT

Mara Paneroni, MSc, Ioannis Vogiatzis, PhD FERS, Carla Simonelli, PT, Laura Bertacchini, PT Michele Vitacca, MD

Variables	All (n=184)	SPPB ≤3.0 (n=118)	SPPB > 3.0 (n=66)	p
Male, %	51.63	46.61	60.61	0.068
Age, years	74±12	78±11	69±11	0.001
Patients with age < 60 years, %	11.96	22.73	5.93	0.001
Patients with age > 85 years , %	17.39	25.42	3.03	0.001
CIRS score	3.44±2.16	4.08±2.35	2.29±1.75	0.001
BMI score	26.24±4.80	26.23±5.10	26.27±4.36	0.9601
Absence of any comorbidities, %	8.15	5.93	12.12	0.001
More than 2 comorbidities, %	43.48	57.63	18.18	0.001
Previous disability, %	32.61	44.07	12.12	0.001
Cognitive deficits, %	10.87	16.10	1.52	0.002
Length of acute hospital stay, days	14 ±10	15±11	13±8	0.096
Tracheotomy, % of patients	4.35	5.93	1.52	0.159
Only NIV/CPAP, % of patients	21.74	23.73	18.18	0.382
NIV + IMV, % of patients	8.70	11.02	4.55	0.135
FiO_2, %	28.5±11.72	28.39±12.46	26..68±10.35	0.875
SpO_2, %	94.97±2.17	94.76±2.22	95.35±2.06	0.079
SPO_2/FiO_2	370±98	372±99	365±97	0.627

In press

AMERICAN JOURNAL OF
Physical Medicine & Rehabilitation

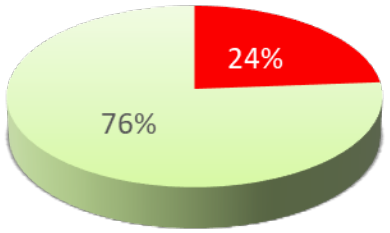
BRIEF REPORT: PDF ONLY

Muscle strength and physical performance in patients without previous disabilities recovering from COVID-19 pneumonia

Paneroni, M[1]; Simonelli, C[1]; Saleri, M[1]; Bertacchini, L[1]; Venturelli, M[2]; Troosters, T[3]; Ambrosino, N[4]; Vitacca, M[1] Author Information

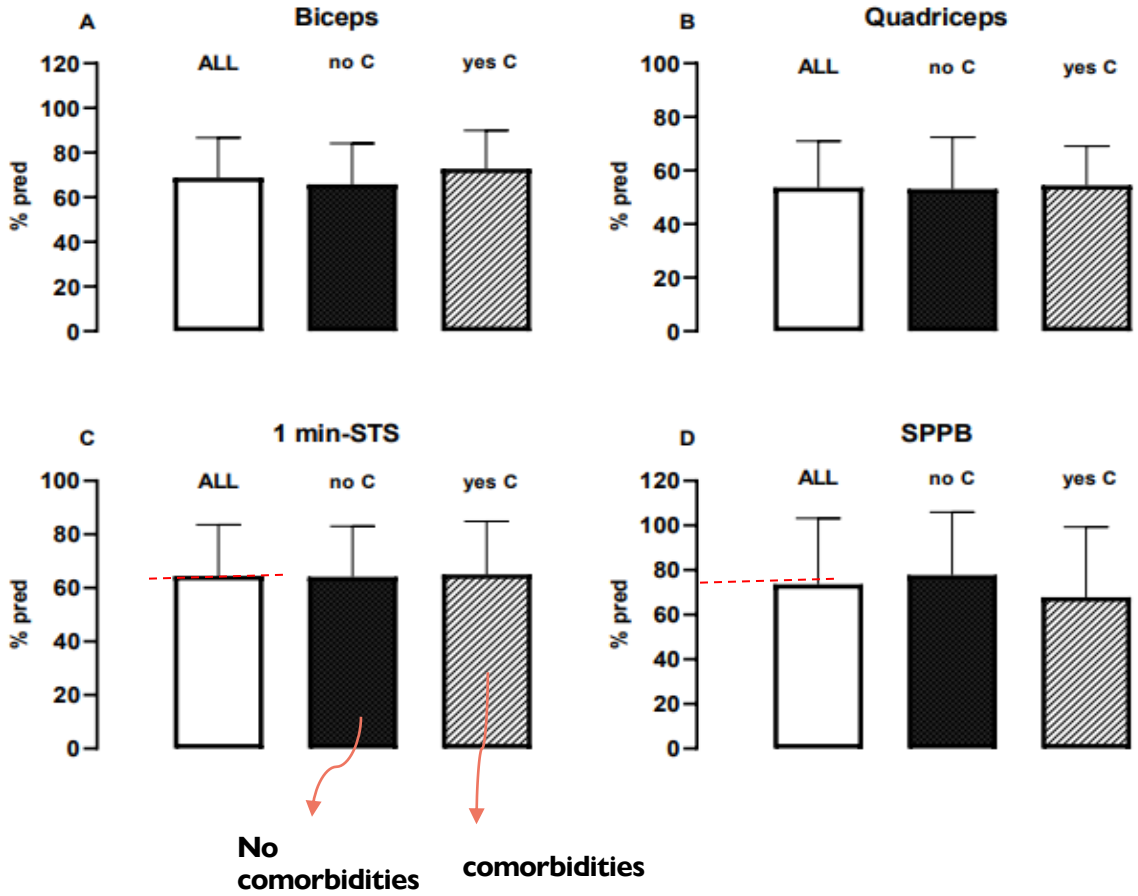
At Disharge

N = 41
20 days of LOS
No ICU, no previous disabilities



■ DESATURATORI ■ NO. DESATURATORI

% DESATURATION at 1MSTS



Inverse relationship between biceps strength and age (R=-0.33, p=0.0324)

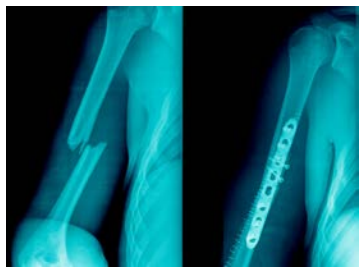
MY DATA

Acute Phase

Post-acute phase

Rehabilitative or post-COVID phase

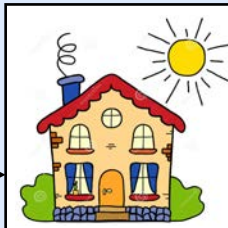
Emergency room



Other clinical condition plus COVID+

Covid department

Intensive Care Unit



Home

Rehabilitation ward

Nursing home

pagepress

Monaldi Archives for Chest Disease 2020; volume 90:1444

An Italian consensus on pulmonary rehabilitation in COVID-19 patients recovering from acute respiratory failure: results of a Delphi process

Michele Vitacca[1], Marta Lazzeri[2,3], Enrico Guffanti[4], Pamela Frigerio[5], Francesco D'Abrosca[3], Silvia Gianola[6], Mauro Carone[1], Mara Paneroni[1,3], Piero Ceriana[1], Franco Pasqua[7], Paolo Banfi[8], Francesco Gigliotti[9], Carla Simonelli[1], Serena Cirio[1], Veronica Rossi[10], Chiara G. Beccaluva[11], Mariangela Retucci[12], Martina Santambrogio[3,12], Andrea Lanza[3,13], Francesca Gallo[12], Alessia Fumagalli[4], Marco Mantero[12,14], Greta Castellini[6], Mariaconsiglia Calabrese[15,16], Giorgio Castellana[1], Eleonora Volpato[8], Marina Ciriello[16,17], Marina Garofano[16], Enrico Clini[18], Nicolino Ambrosino[1] *on behalf of AIPO (Associazione Italiana Pneumologi Ospedalieri), ARIR (Associazione Riabilitatori dell'Insufficienza Respiratoria), SIP (Società Italiana di Pneumologia) AIFI (Associazione Italiana Fisioterapisti) and SIFIR (Società Italiana di Fisioterapia e Riabilitazione)*

Topics and recommendations	Level of concordance Low ↓	Unclear ⇄	High ↑	
22. When and what kind of re-assessment is recommended? When a multidisciplinary follow-up is required? In which setting?				
22.1 The reassessment should be performed at the end of the post-acute phase, before the transfer to another location (rehabilitation institute for intensive respiratory rehabilitation or home) and therefore every 3 months for 1 year in more severe cases	0.0%	0.0%	100.0%	Approved
22.2 The setting after the post-acute phase have should be chosen based on the characteristics of the patients. A hospital setting (rehabilitation institute for intensive rehabilitation) can be indicated in patients with 1) tracheostomy, CPAP or BIPAP therapy, oxygen therapy at rest 2) extra-pulmonary comorbidities or severe disability with lack of autonomy in the activities of daily life. A home setting can be indicated in patients with sufficient autonomy, adequate home support, mild disability, one or no comorbidity, no need for monitoring	0.0%	11.8%	88.2%	Approved
22.3 Follow-up by a multidisciplinary team is recommended in patients with critical and severe disease, extrapulmonary manifestations of COVID-19 and in those with past disabilities, in order to evaluate their evolution over time	0.0%	5.9%	94.1%	Approved
23. What are the risks and benefits of exercise training in COVID-19 patients with cardiovascular complications?	↓	⇄	↑	
23.1 During exercise training ECG, automatic blood pressure and SpO2 monitoring is recommended	5.7%	16.6%	77.7%	Approved
23.2 Supplementary monitoring for symptom check (BORG for dyspnea and Rate of Perceived Exertion scale RPE) are useful	0.0%	6.3%	93.8%	Approved
23.3 Effort tolerance, strength measurements, ADL, inflammatory indices are useful outcomes parameters	0.0%	0.0%	100.0%	Approved
23.4 If home programs are proposed a hybrid administration where the evaluation is carried out in person, and supervision of the exercise training program remotely may be the optimal solution	0.0%	6.7%	93.3%	Approved

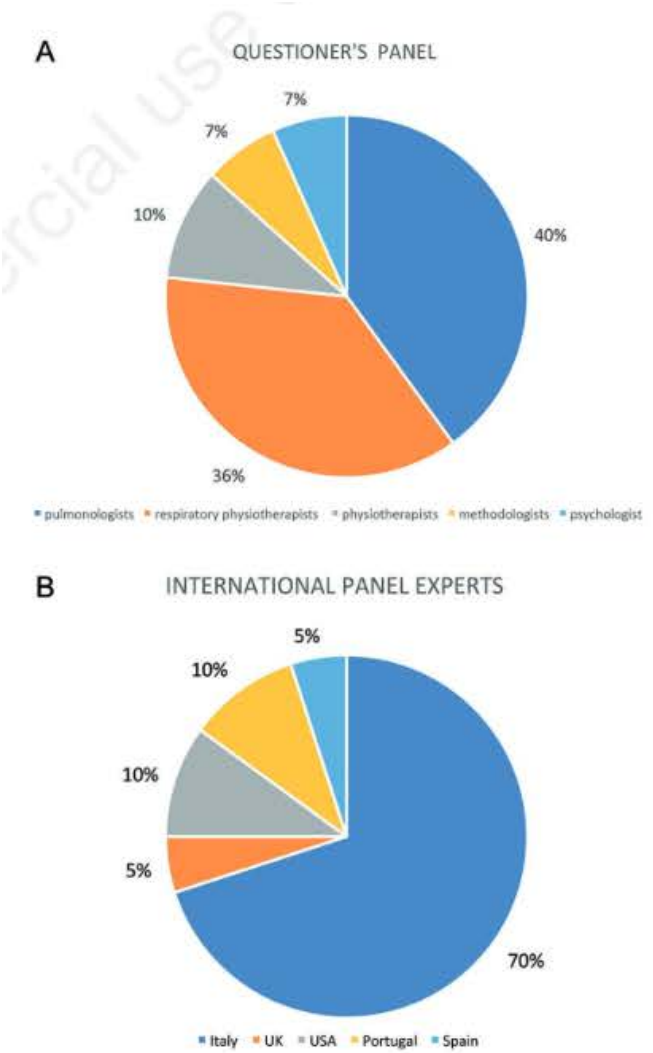
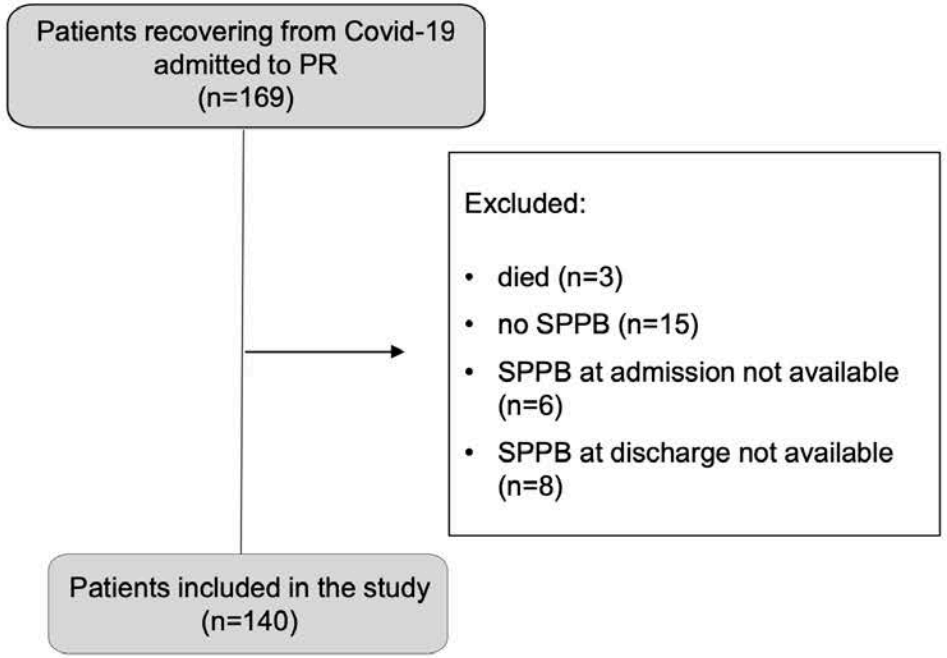


Figure 1. Distribution of steering committee authors (A) and pan-ellists (B).

Pulmonary rehabilitation in patients recovering from COVID-19

Zampogna E[a], Paneroni M[b], Belli S[c], Aliani M[d], Gandolfo A[e], Visca D[a,f], Bellanti MT[c], Ambrosino N[g], Vitacca M[b].

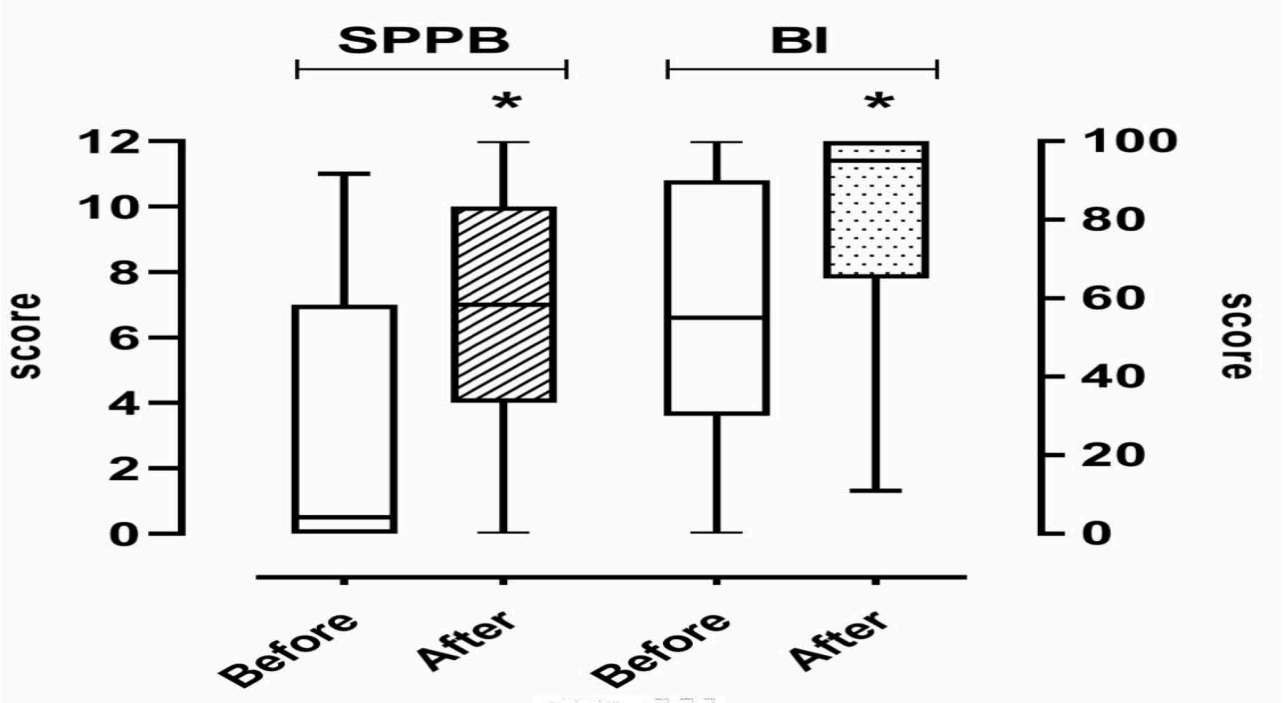
3 hospitals of Maugeri's network



Age, years	71.00 (61.50-78.00)
Male, n (%)	95 (67.85)
BMI, kg/m^2	25.25 (23.18-29.32)
LoS in acute Hospitals, days	47.00 (33.50-64.00)
Previuos Invasive ventilation, n, (%)	56 (40.00)
Previous NIV, n, (%)	70 (50.00)
Previous Oxygen need, n, (%)	117 (83.57)
PaO_2/FiO_2 (n = 130)	338.10 (310.48-371.43)
PaO_2, mmHg (n=130)	72.40 (67.10-84.00)
$PaCO_2$, mmHg (n=130)	37.80 (34.00-42.10)
pH (n=130)	7.43 (7.40-7.45)
CIRS SI, score	1.80 (1.60-2.10)
CIRS CI, score	4.00 (3.00-5.00)

6.20% patients still had a tracheostomy,
7.10% were still under NIV
23.80% still used oxygen supplementation
Length of stay in our institutions was 24.00 (19.00-34.00) days.

Respiration 2021, in press

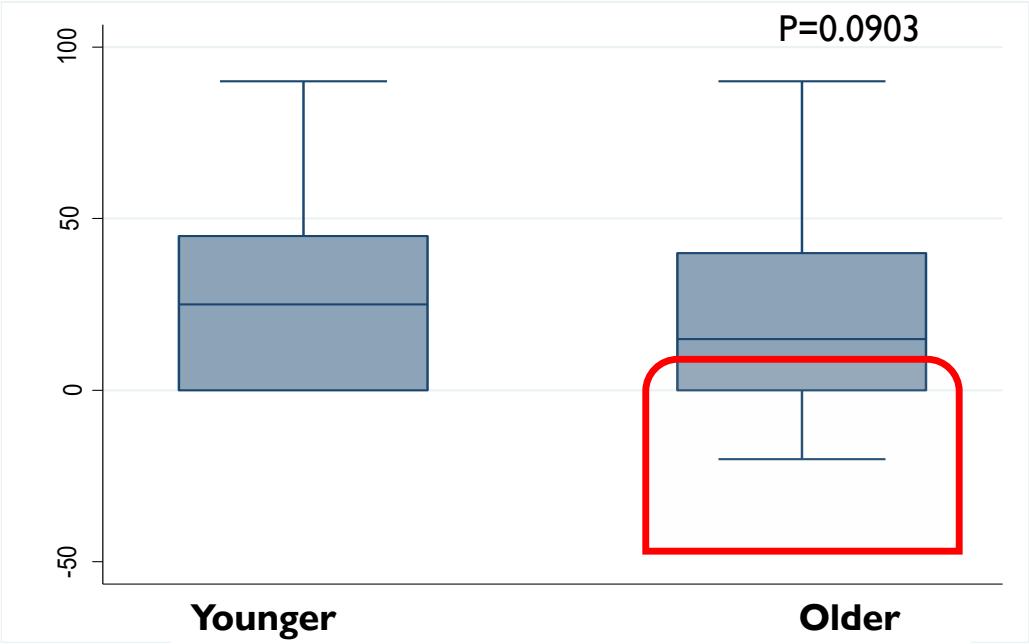


30 % of pts were able to perform 6MWT at admission, while 58% at discharge

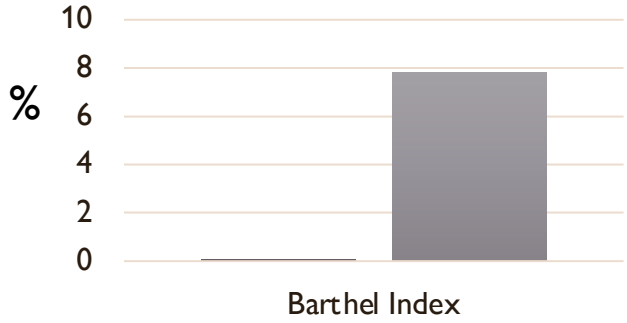
	Before	After	*P-Value*
6MWT, meters Median (IQR) Mean ± SD	 205.00 (160.00-280.00) 229.00 ±102.49	 295.00 (250.00-370.00) 327.93±97.78	 0.0000
6MWT, % predicted Median (IQR) Mean ± SD	 46.00 (32.00 -55.00) 47.71±18.94	 70.00 (56.75-75.25) 68.43±15.30	 0.000

Data are expressed as Median (IQR) and Mean ± SD and range
Legend: 6MWT-Six Minute Walking Test

Δ BARTHEL INDEX



Patients who got worse



PATIENT OLDER THAN 65 yo
N = 95

```
. regress deltabarthel   bartheladling   intensiv

      Source |       SS       df       MS              Number of obs =      84
-------------+------------------------------           F(  2,    81) =   30.19
       Model |  20508.7564     2  10254.3782            Prob > F      =  0.0000
    Residual |  27508.8031    81  339.614854            R-squared     =  0.4271
-------------+------------------------------           Adj R-squared =  0.4130
       Total |  48017.5595    83  578.524814            Root MSE      =  18.429

------------------------------------------------------------------------------
 deltabarthel |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
bartheladling |  -.3073838   .0685567    -4.48   0.000    -.4437901   -.1709775
    intensiv  |   22.08216   4.520554     4.88   0.000     13.08768    31.07665
        cons  |   31.82419   4.926008     6.46   0.000     22.02298    41.6254
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PREDICTIVE FACTORS RELATED TO BARTHEL INDEX IMPROVEMENT WERE a) TO HAVE LOWER BI SCORE AT ADMISSION AND b) TO BE TREATED IN ICU SETTING

PHYSIOTHERAPY INTERVENTION

- SPPB <6 SPPB

physiotherapist/patient ratio 1:1

- SPPB >6 SPPB

physiotherapist/ patient ratio 1:4-5

- SPPB > 10

+ cycle ergometer or treadmill

Mobilization

Active exercises and free walking

Peripheral limb muscle resistive training

Airway clearance techniques

Lung expansion technique

TAKE HOME MESSAGES

- The rate of disability of Covid-19 patients in acute hospital setting is very high, and the age is one of factors significantly related.
- Post Covid-19 patients improved after an inpatients rehabilitation and aged patients improved similarly to younger.
- Older patients seem experiment more fatigue and dispnea than younger ones during 6MWT. Factors involved need to be evalutated.