



*250 years of EXCELLENCE  
in medical education,  
research & innovation and  
healthcare*

# Clinical Management of COVID-19 Patients at Semmelweis University

Veronika Müller

Semmelweis University

Department of Pulmonology

08. October 2020

UNICA

Semmelweis University  
<http://semmelweis.hu/>

Department of Pulmonology

# SARS-CoV-2 in Hungary



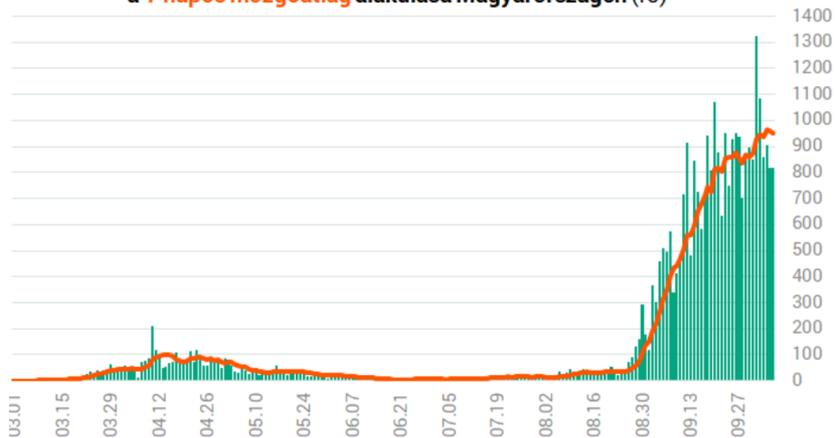
03.04. first case

03.14. first causality (614 deaths till 25/08, 877 deaths till 07/10)



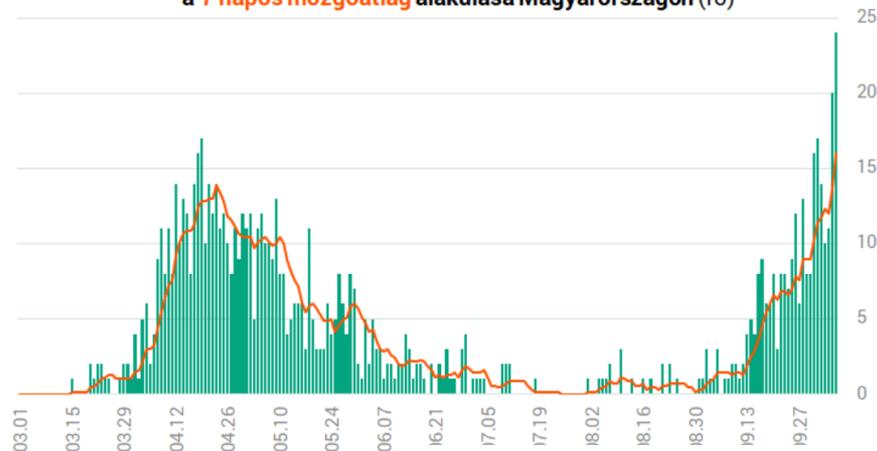
Second wave from September 2020

A napi\* új igazolt koronavírusos megbetegedések és a 7 napos mozgóátlag alakulása Magyarországon (fő)



Cases 07/10/2020

A napi\* új igazolt koronavírusos elhunytak és a 7 napos mozgóátlag alakulása Magyarországon (fő)



Forrás: koronavirus.gov.hu, Portfólio

Deaths



# COVID-19 and the lungs

↪ SARS-CoV2 infection results in the disease: **coronavirus disease 2019**, COVID-19

↪ COVID-19 clinical manifestations:

↳ ~80% no symptoms / mild upper airway infections

↳ ~20% pneumonia

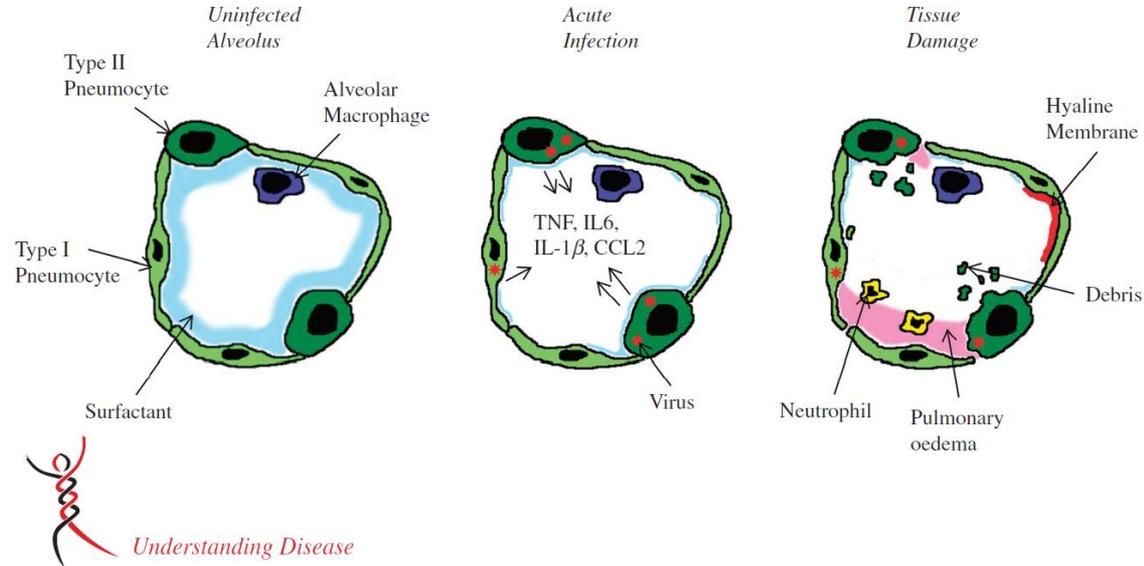
↳ ~ 5% severe pneumonia (severe acute respiratory syndrome –SARS)

↪ Publications focus mainly on severes cases needing hospitalization. Data on mild disease are scarce.

WHO. WHO Statement regarding cluster of pneumonia cases in Wuhan, China. Gorbalenya, A.E., et al., Severe acute respiratory syndrome-related coronavirus: The species and its viruses – a statement of the Coronavirus Study Group. 2020: p. 2020.02.07.937862. Johns Hopkins University. COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. Miniszterelnöki Kabinetiroda. Kormányzati tájékoztató oldal a koronavírusról. : <https://koronavirus.gov.hu/>. Wu, Z. and J.M. McGoogan, Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. JAMA, 2020. **323**(13): p. 1239-1242.

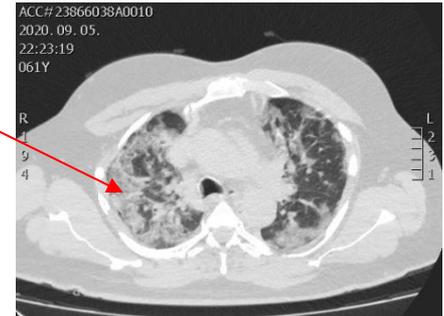
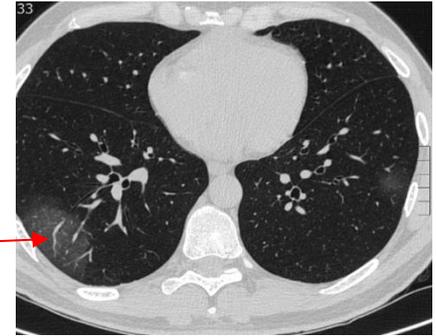
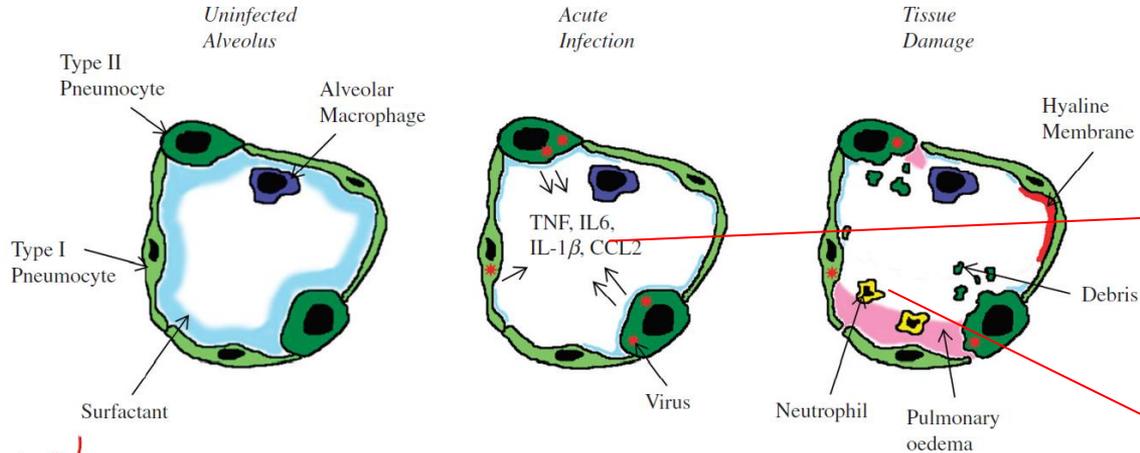


# SARS-CoV alveolar infection



Gralinski LE, Baric RS. Molecular pathology of emerging coronavirus infections. J Pathol. 2015 Jan;235(2):185-95.

# SARS-CoV alveolar infection



Gralinski LE, Baric RS. Molecular pathology of emerging coronavirus infections. J Pathol. 2015 Jan;235(2):185-95.

# COVID-19: Semmelweis University

- ↪ 2019 December: Wuhan
- ↪ first case in Hungary 4th March 2020
- ↪ Semmelweis University Department of Pulmonology first case: 11th March → NNK → DPC
- ↪ Already in use the **escalation plan of the Semmelweis University**
  - ↪ Check points at entry, strict regulations for hand hygiene and PPE
  - ↪ Central patient entry via Emergency Department
  - ↪ IMD (25th March) in the central University Department (internal and surgical discipline based medical personnel)
  - ↪ Semmelweis University adapted to Hungarian situation: **COVID Department** with central management and supervision was opened 9th April 2020

WHO. *WHO Statement regarding cluster of pneumonia cases in Wuhan, China*. Gorbalenya, A.E., et al., *Severe acute respiratory syndrome-related coronavirus: The species and its viruses – a statement of the Coronavirus Study Group*. 2020: p. 2020.02.07.937862. Johns Hopkins University. *COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University*. Miniszterelnöki Kabinetiroda. *Kormányzati tájékoztató oldal a koronavírusról*. : <https://koronavirus.gov.hu/>. Wu, Z. and J.M. McGoogan, *Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention*. JAMA, 2020. **323**(13): p. 1239-1242.



# Semmelweis University COVID management plan handbook

Eljárásrend – COVID-19 2020.04.06.

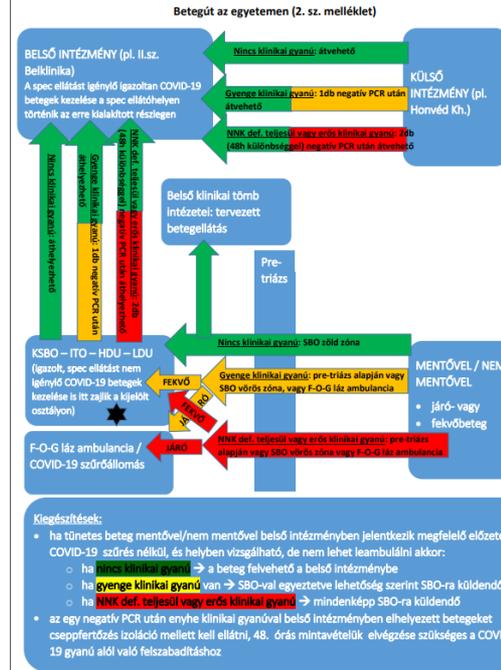
Semmelweis Egyetem

## Eljárásrend a 2020. évben azonosított új koronavírussal kapcsolatban (követendő járványügyi és infektókontroll szabályok)<sup>1</sup>

ELŐSZÓ.....	2
1. KÖRÖKOZÓ .....	2
2. A FERTŐZÉS FORRÁSA .....	2
3. A TERJEDÉS MÓDJJA .....	2
4. LAPPANGÁSI IDŐ .....	2
5. FERTŐZŐKÉPESÉG TARTAMA .....	2
6. FONTOSABB TÜNETEK ÉS KOCKÁZATI CSOPORTOK .....	2
7. TEENDŐK A BETEGGEL .....	3
7.1. BETEGEK IRÁNYÍTÁSA, BETEGÜTVONALAK AZ EGYETEMEN – LD. 2., 7., 8., 11., MELLÉKLET .....	3
7.2. JELENTÉS .....	3
7.2.1. Jelentés a járványügyi intézkedések céljából .....	3
7.2.2. Egyedi esetek és nosocomialis járvány gyanú bejelentése .....	3
7.2.3. Napi jelentés az NNK Járványügyi és Infektókontroll Főosztályának .....	3
7.2.4. Járványügyi intézkedés alatti egészségügyi dolgozók jelentése .....	3
7.2.5. Coronavirus Register .....	3
7.3. ESETEK ORSZÁVIZGÁLÁSA LD. 1. SZ. MELLÉKLET .....	3
7.3.1. Gyanús eset / Kvizizsgálat alatt álló eset .....	3
7.3.2. Valószínűsített eset .....	4
7.3.3. Megerősített eset .....	4
7.4. ELŐLÉNYTES .....	4
7.4.1. Gyanús, kvizizsgálat alatt álló beteg .....	4
7.4.2. Laboratóriumi vizsgálattal megerősített COVID-19 betegek .....	4
7.5. DIAGNOSZTIKUS ÉS EGYÉB CÉLÚL VÉGZENDŐ MIKROBIOLÓGIAI VIZSGÁLATOK .....	4
7.5.1. ....	4
7.5.2. A gyűjtött beteg elbocsátása / karanténból való felszabadítás .....	5
7.6. INFÉKCIÓKONTROLL ÖVÉ-VEDŐ RENDSZEREK ÉS BETEGELLÁTÁS SOKNÁ .....	5
7.7. BETEGEK SZÜKSÉGES INTÉZMÉNYBE TÖRTÉNŐ BELÉPÉS ELŐTT .....	5
7.8. BETEGÜT AZ EGYETEMEN LD. 2., 5., 6., 7., 8., 11. SZ. MELLÉKLET .....	5
7.9. ÉLŐ DOLGOZÓ ESETÉN FELMERÜLŐ FERTŐZÉS .....	5
8. TEENDŐK A BETEG KÖRNYEZETÉBEN .....	5
8.1. A BETEGGEL KONTAKTUSBA KERÜLT SZEMÉLYEK FELKUTATÁSA .....	5
8.2. JÁRVÁNYÜGYI ÉRDEKBŐL VÉGZETT MIKROBIOLÓGIAI SZŰRVIZSGÁLAT .....	5
8.3. JÁRVÁNYÜGYI MEGFIGYELÉS ÉS JÁRLAT .....	5
EGYÉB FONTOS EGYETEMI INFORMÁCIÓFORRÁSOK .....	6
LÁBÍJEGYZETEK .....	6
1. FORRÁS: .....	6
2. KONTAKTUSOK MÉRÉSÉRE .....	6

Eljárásrend – COVID-19 2020.04.06.

Semmelweis Egyetem



# Semmelweis University COVID Department staff

- ↪ 24 nurses 12 hours 6/shifts + 1 physiotherapist
- ↪ Physicians: 12 hour shifts (3-5 specialists and 8 residents/months)
  - ↪ Specialists (10 during the first 3 months):
    - 6 Pulmonary (8 FTE)
    - 2 Internal medicine (4 FTE)
    - 2 Neurology (3 FTE)
  - ↪ MD (22 during the first 3 months)
    - Pulmonary Department 7
    - Internal Medicine Department 3
    - Neurology Department 2
    - Dermatology Department 3
    - Ophthalmology Department 2
    - Pediatric Department 2
    - Surgery Department 1
    - Urology Department 1
    - Radiology Department 1



# COVID-19 teams



# Continuous education and team-work



# Semmelweis University COVID Department infrastructure



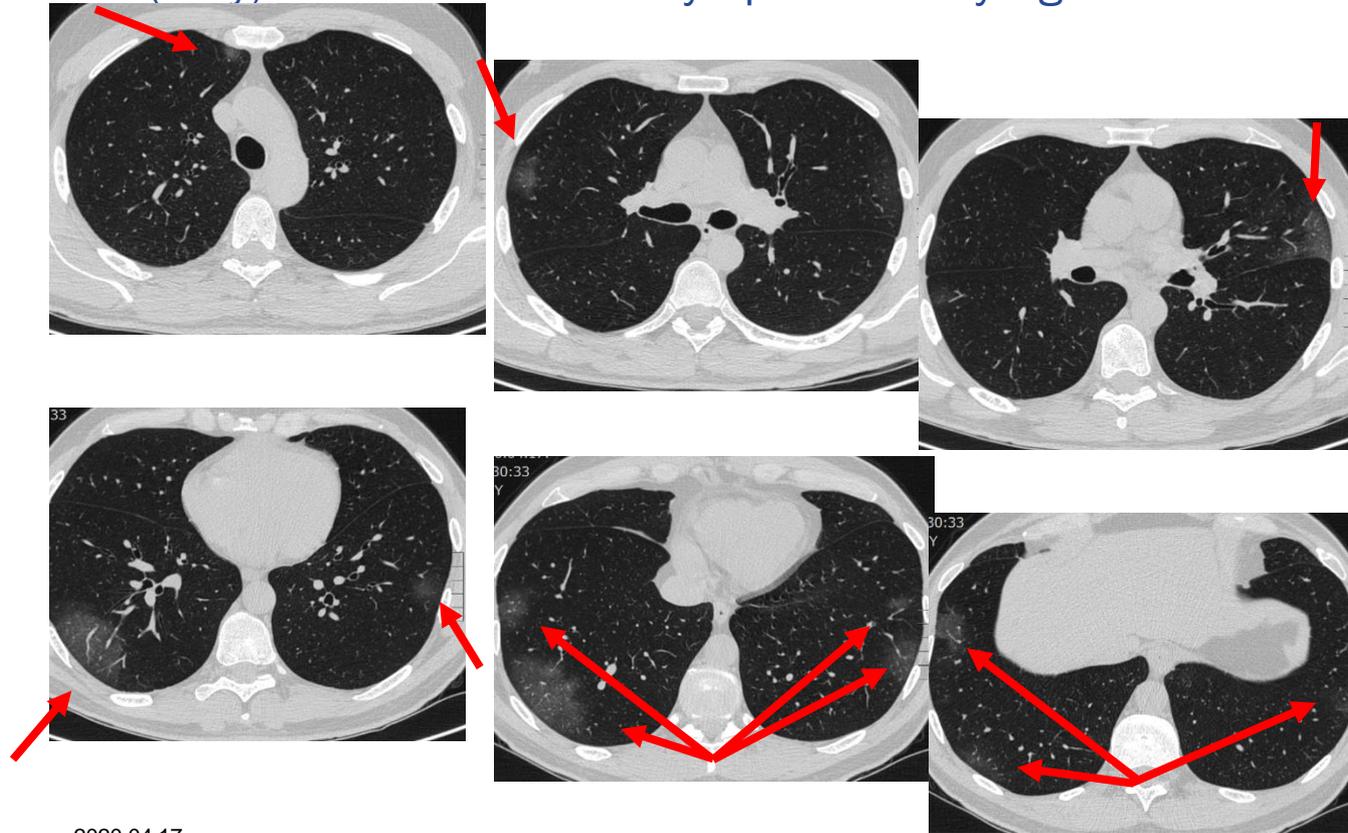
# COVID department patient management

- ↪ At admission broad microbial sampling:
  - ↳ Haemoculture, Streptococcus & Legionella urine antigen, Influenza-RSV PCR, sputum culture, urine culture
- ↪ Lung involvement: low dose chest CT
- ↪ Regular clinical parameter monitoring: twice/shift (NEWS score)
- ↪ Regular consultation with infectology specialists



Hard work in full PPE

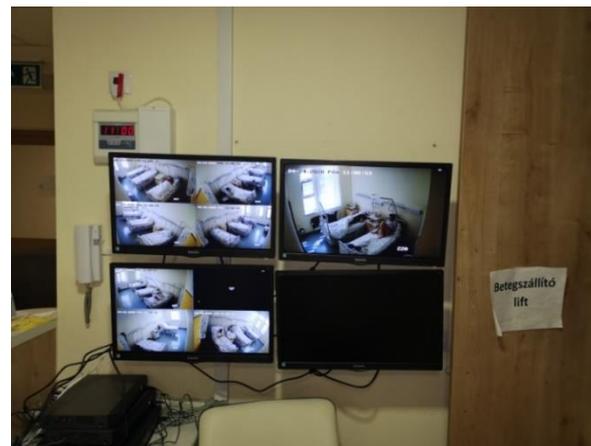
# Male (53 y) wiht classic COVID symptoms: early signs on HRCT



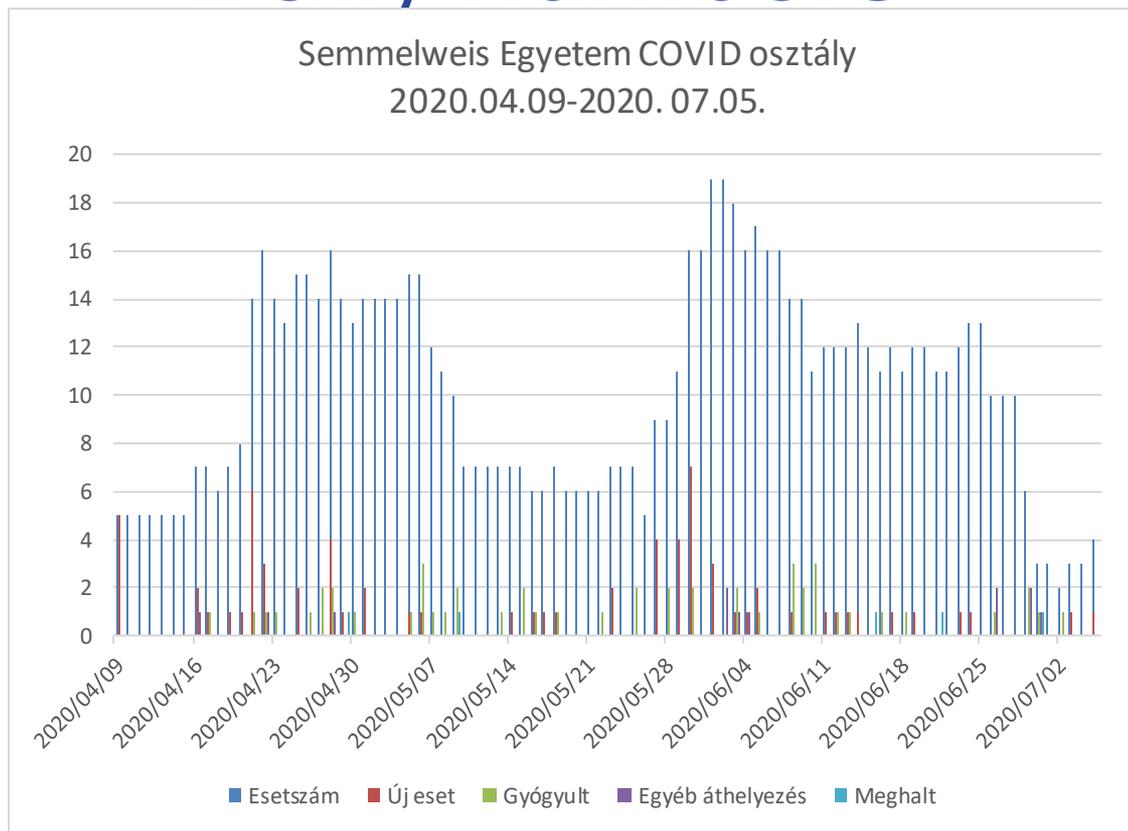
2020.04.17

# Patients

- ↪ 09 April-05 July: 74 cases, 70 patients
  - ↳ 4 cases: second hospitalization due to recidive PCR positivity
- ↪ 2 posztoperative observation
- ↪ 5 deaths
  - ↳ all >70 years of age (mean 82,5 years)
  - ↳ Severe comorbidities



# Daily numbers



# COVID department therapies (April-July 2020)

## ↳ Anivirals

↳ Hydroxychloroquine

↳ Lopinavir/ritonavir

↳ Favipiravir

↳ Convalescent plasma

## ↳ Therapy:

↳ Infectology consultation

↳ Comorbidities and drug interactions



# Patients

Sex	40 men (57%) / 30 women (43%)
Age (years)	65,2 ±18,4 [19-94]
PCR positivity (days)	10,1 ± 11,6 [1-52]
Hospitalisation (days)	13,13 ± 9,7 [1-58]
Severe comorbidities	65 [90,3%]
COVID pneumonia	45 [62,5%]
Other infections	23 [31,9%]

Mean ± SD [min-max]



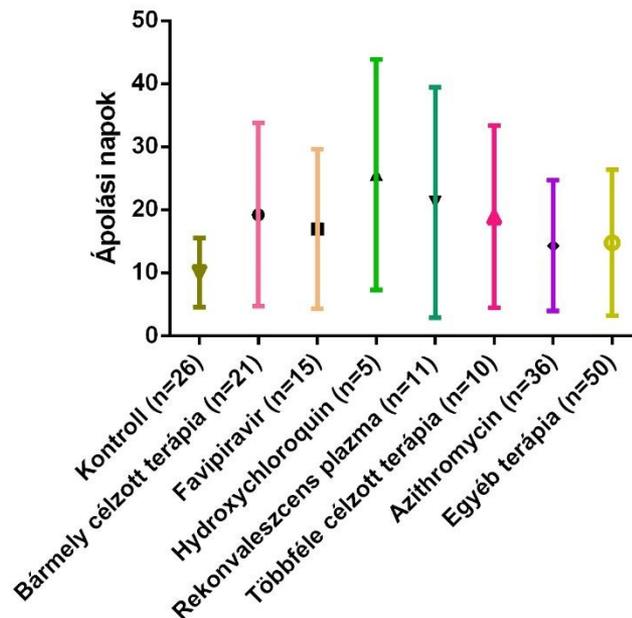
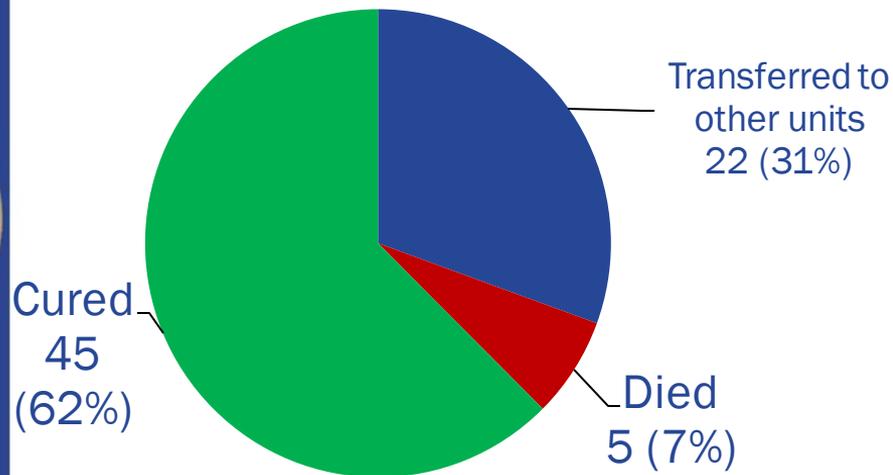
# Therapy

		N (%)
Target COVID-therapies		21 (29.2)
All *		
	Favipiravir	15 (20.8)
	Hydroxychloroquin	5 (6.9)
	Convalescent plasma	11 (15.3)
Azithromycin		36 (50.0)
Other antimicrobial therapy		50 (69.4)

\*10 patients recieved multiple therapies



# Outcome and hospital stay according therapy



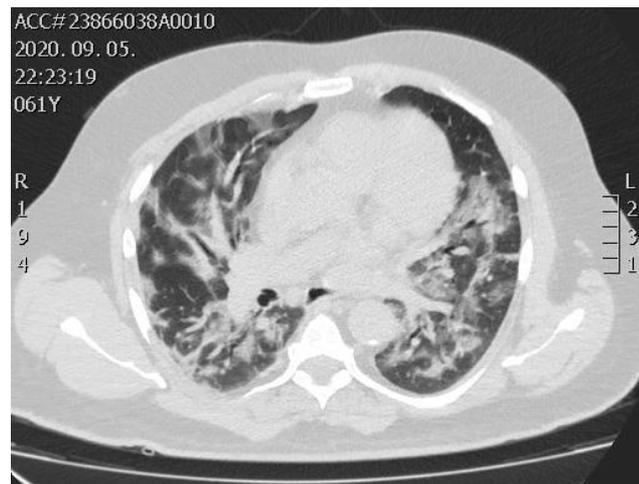
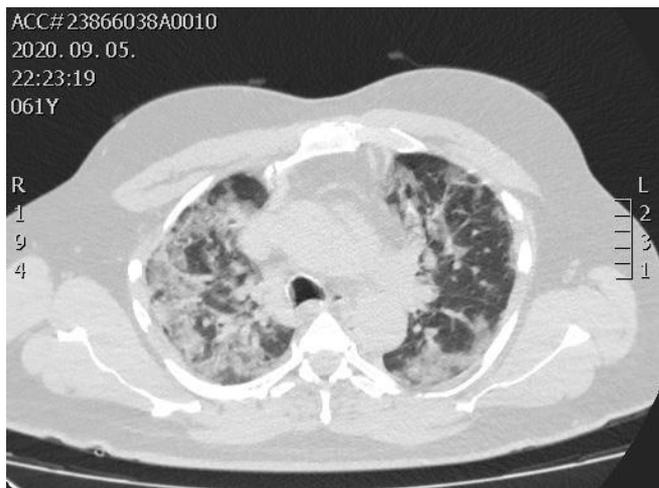
# Case 1

- ↪ 61 years old male Pt
- ↪ history: kidney transplantation (2006)
- ↪ Sep.04.2020 – admission to ED:
  - ↪ 7 days history of cough, dyspnea, low grade fever



# Chest CT scan on admission (day 2)

↪ consolidation with GGO, involving ~50-75% of lung parenchyma

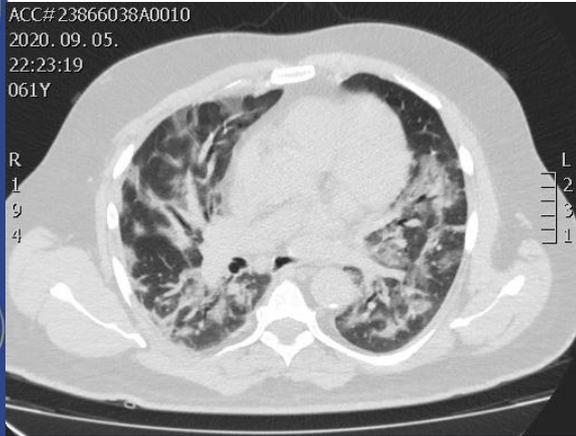
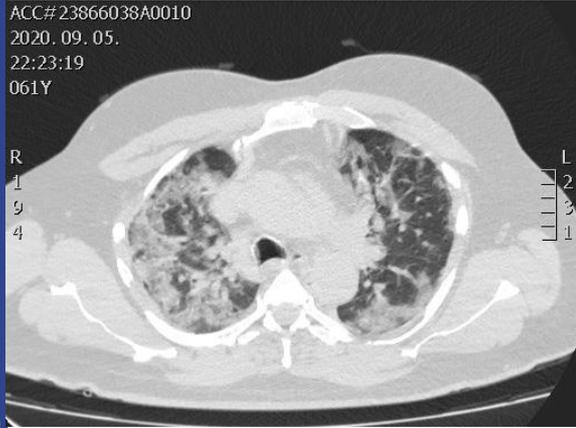


# Treatment at the Semmelweis University COVID Department

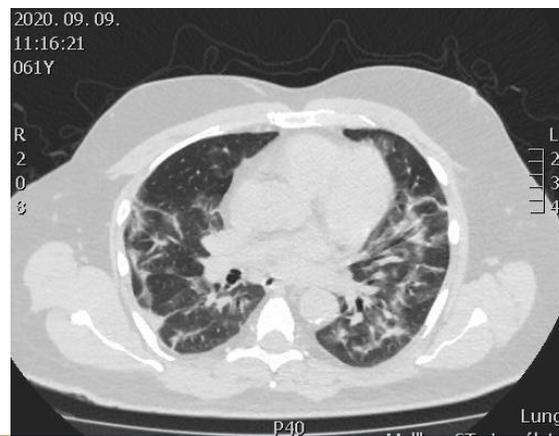
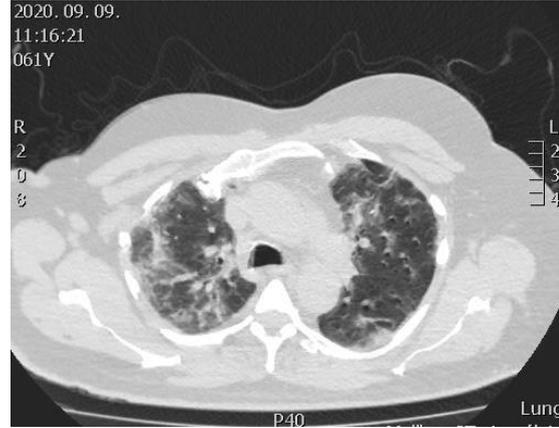
- ↪ favipiravir
- ↪ low dose methylprednisolone
- ↪ convalescent plasma
- ↪ immunosuppression (due to TX):
  - ↳ tacrolimus: continue
  - ↳ mycophenolate: discontinue
- ↪ Additive treatment: LMWH, O<sub>2</sub>



# Day 2



# Day 6



- Chest CT scan on day 6: significant improvement: GGO with decreasing intensity
- Day 8, 9 and 10: COVID-PCR still positive
- Day 11: discharge to home quarantine

# Semmelweis University COVID Department



Grateful thanks to all Semmelweis University co-workers ☺

