

Background

- COVID 19 has had a disproportionate increase of deaths and hospitalization in the elderly population.
- Covid-19 has been shown to cause affects that last beyond the initial illness and recovery

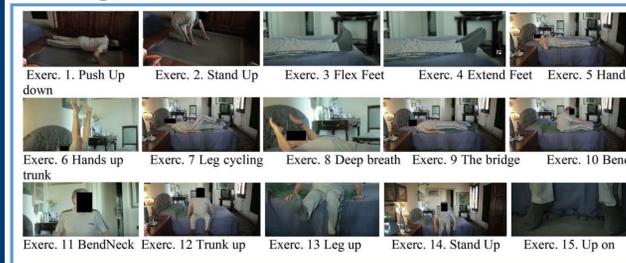
Purpose

- To examine long term deficits caused by Covid-19 and Covid-19 recovery in the elderly population
- Identify Factors that increase and decrease the risk and severity of these deficits
- Identify limitations of current research in these deficits

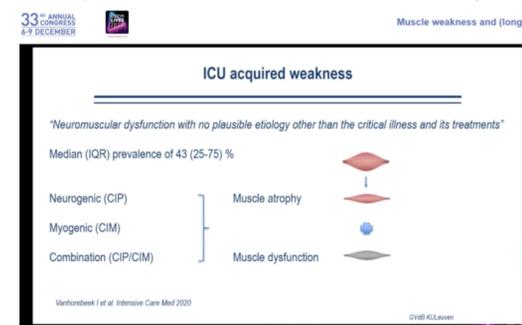
Musculoskeletal deficits

- The elderly population is more at risk for developing MSK weakness and atrophy due to bedrest
 - four to six weeks of bed rest caused muscle wasting, loss of 6% to 40% muscle force generation capacity, and changes in contractile proteins (muscle protein turnover) among others¹
 - Early and ongoing intervention, in the hospital¹ and during post-hospital at-home bedrest², improves outcome
 - Early strength resistance exercises in bed
 - Neuromuscular electrical stimulation

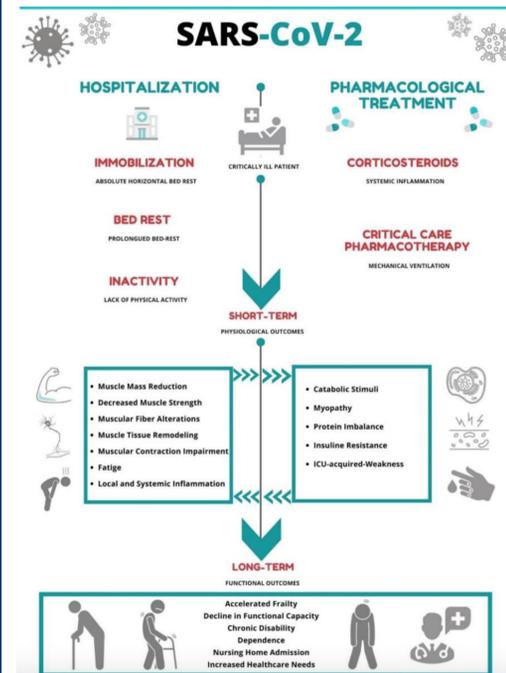
MSK Figure 1



- pharmaceutical drugs present adverse effects which can exacerbate muscle atrophy¹
 - **B-adrenergic vasoactive agents**
 - **neuromuscular blocking agents** -mechanical ventilation
 - **corticosteroids** and **glucocorticoids**
 - Covid-19 patients treated with >10mg/day glucocorticoids few weeks
- The elderly population at risk to develop “ICU acquired weakness” independent of other MSK deficits³
 - Increased Risk factors:
 - Risk increased with age
 - Elderly COVID patients with hyperglycemia lasting for more than 3 days
 - Insulin therapy lowered risk
 - patients on mechanical ventilation >5 days



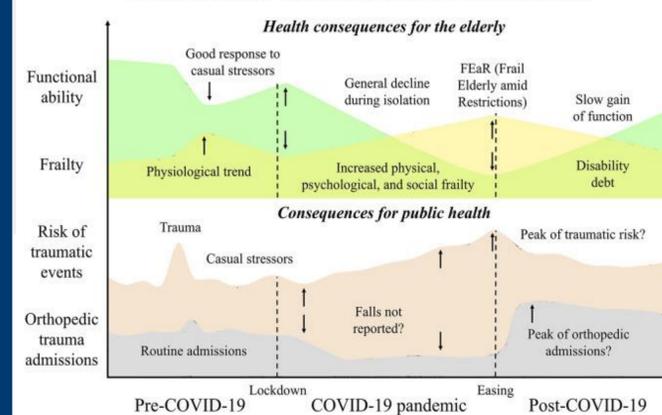
MSK Figure 2



Psychiatric Deficits

- **Pre-illness:** Reports have shown that the elderly population has an increased levels of depression, anxiety, hyperarousal, and avoidant compared to the other age groups before and during illness.
 - Due to Social Isolation, social media propaganda, and reduction of financial income

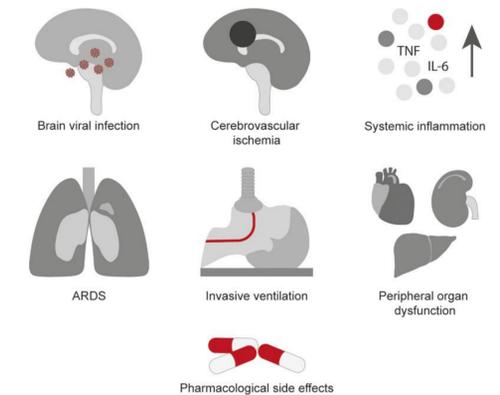
Consequences for the Elderly after COVID-19 Isolation



- **Post-illness:** Elderly population has shown lower levels of psychological distress compared to the other age groups
 - Factors:
 - lesser burden of financial/ career responsibility
 - Less internalization of trauma
 - Elation at surviving after social media told them they would most likely die.

Neurological Deficits

- neuro-inflammation caused delirium during acute Covid-19 infection, and increased degeneration post-illness¹⁰
- indication of increased amnesia in the elderly⁹
 - especially those who have had or are at risk from psychiatric deficits
 - amnesia is a complication of sedation and ventilation
- ischemic strokes, and resulting neurological deficits, occur at a proportionally higher rate in the elderly while hospitalized with Covid-19¹¹
- Few long-term neurological deficits in the geriatric population have been studied⁸



Aknowlegements

1. Dr. Liris Benjamin
2. Dr. Connolly, and the Ross Research Committee
3. Ross Academic Research Society

Conclusions

- These long-term deficits must be considered during acute treatment of Covid-19
- Early treatment for presenting deficits is important to minimize their duration and severity
- Future studies are needed to clarify the duration of effects, and correlation between Covid-19 and the indicated deficits

References

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