COVID-19 and Intensive Care:

Learnings from the Region of Southern Denmark

Data is crucial in the fight against COVID-19. Information on disease characteristics and the effectiveness of treatment will change the game on how we respond to the pandemic.

From the initial outbreak in the Chinese city of Wuhan, COVID-19 has rapidly developed into an unprecedented global health crisis. The world was caught off-guard by this aggressive disease and has suffered tremendous loss of life and economic damage. The virus is unique in that there is almost no immunity against it. Coupled with its highly infectious nature and long incubation period, COVID-19 has become one of the greatest challenges to our modern healthcare system.

Pic: Odense University Hospital is one of the leading hospitals in the Region of Southern Denmark

Preparing for a pandemic

Early reports from China indicate that close to one-third of hospitalised patients subsequently develop severe respiratory problems and other critical illnesses. More than 60% of the patients who became critically ill did not survive (1,2). These reports have, no doubt, placed a monumental pressure on frontline healthcare professionals.

As the public health sector scrambles to contain the disease, intensive care units are also challenged on multiple fronts, particularly in allocating the precious intensive care resources to ensure sufficient infection control and to maintain the protection of both patients and ICU staff. These efforts require great coordination and the ability to rapidly adapt to the evolving pandemic. The key here is the foresight to plan for disaster.

"Panic does not help, but planning is the key," according to Dr Thomas Strøm, Senior Consultant at the Department of Anesthesia and Intensive Care Medicine, Odense University Hospital, in his interview with Cambio.

"The general idea is to treat COVID-19 patients as we normally do but [also] have a plan for specific conditions," he said.

Pic: Dr Thomas Strøm is a senior consultant at the Department of Anesthesia and Intensive Care Medicine, Odense University Hospital

The disease could manifest aggressively in certain patient populations but appear mild in others. Although emerging evidence begins to shed light on specific risk factors that are associated with more severe outcomes(3), it is still very difficult to predict which patients will eventually need intensive care. Therefore, ICUs must have the flexibility to scale their capacity based on local conditions.

Supporting ICU surge capacity

At Odense University Hospital, each ICU bed is connected to the Cambio CIS system that stores high resolution, real-time patient information. The system is also connected to the postoperative unit where each bed has access to the same database and analytics features.

"We have the hardware to convert postoperative beds to ICU beds. In the case of a disaster, we could scale up very fast. By having CIS on every bed, we could treat patients as we normally do [in the ICU]. The system helps us to prepare for the peak if needed." Dr Strøm said.

"It helps us to gain control over the situation and prevent unequipped ICU beds to be used", he added.

Pic: Intensive care unit at Odense University Hospital

The CHEST Consensus Statement of ICU surge capacity recommends that ICUs should at least be equipped to expand immediately by at least 20% of the baseline capacity (4). The COVID-19 pandemic may necessitate an even higher surge in capacity, but fortunately, the worst-case scenario did not materialise in Denmark largely due to the early public health interventions. The infection rate and ICU admission rate remain manageable in the country (5).

Nevertheless, patients who recover from their critical illness should be discharged on time to the subsequent step-down care areas to optimise ICU utilisation. This means intensive care clinicians must have access to comprehensive and real-time patient information to make prompt and objective clinical judgements. For example, intensivists should know when a patient can be weaned off ventilation or sedation and free up the resources for other patients.

"CIS provides you with an overview of vital parameters and make sure you can put it into the right patient context. The system provides exact data [that] ICU doctors can evaluate every day to optimise treatments and avoid complications. By having these data, you could get the patient out [of the ICU] early in the treatment." according to Dr Strøm.

Conclusion

As COVID-19 is still ravaging many parts of the world, the situation places an extraordinary pressure on healthcare systems to plan, adapt, and implement measures that can safeguard the quality and availability of intensive care. While Denmark's actions have been swift and

effective in curbing the pandemic, we must never stop in thinking one step ahead so we can be better prepared for future pandemics.

For more information on Cambio CIS system, please visit our [Cambio website](#) or get in touch with Thomas Lynge, our Sales and Marketing Director, [here](#).

Disclaimer: The interview with Dr Thomas Strøm has been edited for clarity.

Reference:

1. Guan W, Ni Z, Hu Y, Liang W, Ou C, He J, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N Engl J Med. 2020 Apr 30;382(18):1708–20.
2. Yang X, Yu Y, Xu J, Shu H, Xia J, Liu H, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. Lancet Respir Med. 2020 May;8(5):475–81.
3. Zheng Z, Peng F, Xu B, Zhao J, Liu H, Peng J, et al. Risk factors of critical & mortal COVID-19 cases: A systematic literature review and meta-analysis. J Infect [Internet]. 2020 Apr 23 [cited 2020 Jun 12]; Available from: http://www.sciencedirect.com/science/article/pii/S0163445320302346
4. Hick JL, Einav S, Hanfling D, Kissoon N, Dichter JR, Devereaux AV, et al. Surge Capacity Principles. Chest. 2014 Oct;146(4):e1S-e16S.
5. COVID-19 update: statistics and charts [Internet]. [cited 2020 Jun 12]. Available from: https://www.sst.dk/da/corona-eng/covid-19-update_-statistics-and-charts