

Coronavirus Disease 2019 Intermediate Care Units: Containing Escalation of ICUs

To the Editor:

According to the recent publications of Sauro et al (1) and Co I, Hyzy (2) in *Critical Care Medicine*, a crucial moment in the care of severely ill patients is the transition from the ICUs to ordinary hospitalization wards, as significant complications are still frequent. This has become apparent as ICUs have become overwhelmed during the severe acute respiratory syndrome coronavirus 2 pandemic. In this setting, we believe that intermediate care units (IMCUs) might play a significant role in a safer transition of patients to ordinary ward.

With over 25,000 deceased—probably thousands more, considering the patients who have died without a proper diagnosis, in their households or in residencies—Spain has been severely hit by the coronavirus disease 2019 (COVID-19) outbreak. In Castile and Leon region, with a total population of 2,388,548 inhabitants, there are over 16,993 confirmed cases; 8,010 patients have been hospitalized, 536 of them to ICUs (90% under mechanical ventilation), and 1,770 patients have died establishing a mortality rate over 10%. In order to face this challenging situation, we also transformed our hospitals, working teams, and organization adapting operating rooms and postanesthesia care units into ICUs in record time (3). Our ICUs doubled bed capacity—from 216 to 527 beds—and their occupation increased by 163% with respect to their regular maximum capacity (Fig. 1).

To deal with the shortness of ICUs capacity effectively, our regional healthcare system further put in place COVID-19 IMCUs infrastructures consisting of a 24-hour healthcare multidisciplinary team with capacity to perform noninvasive mechanical ventilation in monitored beds (4). This COVID-19 IMCUs were implemented with two major objectives: 1) avoiding overwhelmed of ICUs, concentrating and taking care of candidate patients to ICU and 2) favoring and incrementing “step-down” from the ICUs. To date, two COVID-19 IMCUs are fully implemented and working: one at the University Hospital of Salamanca, a tertiary public hospital with 933 beds and 96-extended-bed ICU capacity and the second at Hospital Santa Barbara of Soria, a secondary public hospital with 271 beds and 24-extended-bed ICU capacity.

In our experience, these COVID-19 IMCUs can significantly reduce mortality when perfectly coordinated with the ICU team. We have identified several scenarios in which these units can be of great value. First, there are certain patients—usually at the early stages of the disease—with apparent clinical stability, but with signs of potential severe disease at admission as significant radiological anomalies or mild organ failure in the laboratory analysis. To our

knowledge, COVID-19 can be a rapidly progressing disease, and patients might worsen within hours. In these cases, close monitoring helped us in the early identification of patients who needed to be transferred to the ICU for mechanical ventilation. Second, some patients who presented clinical deterioration and were candidates for invasive ventilatory support were also transferred to our COVID-19 IMCUs. This allows continuous monitoring and frequent evaluation by the ICU team, reducing the delay of the intubation and transfer to the ICU when needed. Third, these units are an alternative to patients whose ICU admission has been initially discarded. Some of these patients might benefit from noninvasive mechanical ventilation, as it provides further time for recovery. Finally, a very interesting clinical scenario for these units is for patients who have been recently discharged from ICUs who—in all cases—still need close monitoring. Furthermore, in our experience, this last scenario reduced the assistance burden in ICUs, as some patients could be discharged earlier when this kind of assistance was provided, generating extra ICUs capacity.

With the COVID-19 curve flattening, the creation of COVID-19 IMCUs has allowed us to build up hospital assistance capacity for severely ill patients, either in tertiary or secondary hospitals. Further to act as a “step-up” or “step-down” between the general ward and the ICU, we have used these units to provide assistance to patients whose ICU admissions were not prioritized. In our opinion, COVID-19 IMCUs organization should be encouraged in all hospitals as a response to the emerging challenges of this pandemic.

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REFERENCES

1. Sauro KM, Soo A, de Groot C, et al: Adverse Events After Transition From ICU to Hospital Ward: A Multicenter Cohort Study. *Crit Care Med* 2020; 48:946–953
2. Co I, Hyzy RC: Lost in Transition: A Call to Arms for Better Transition From ICU to Hospital Ward. *Crit Care Med* 2020; 48:1075–1076
3. Solberg BC, Dirksen CD, Nieman FH, et al: Introducing an integrated intermediate care unit improves ICU utilization: A prospective intervention study. *BMC Anesthesiol* 2014; 14:76
4. Capuzzo M, Volta C, Tassinati T, et al; Working Group on Health Economics of the European Society of Intensive Care Medicine: Hospital mortality of adults admitted to intensive care units in hospitals with and without intermediate care units: A multicentre European cohort study. *Crit Care* 2014; 18:551

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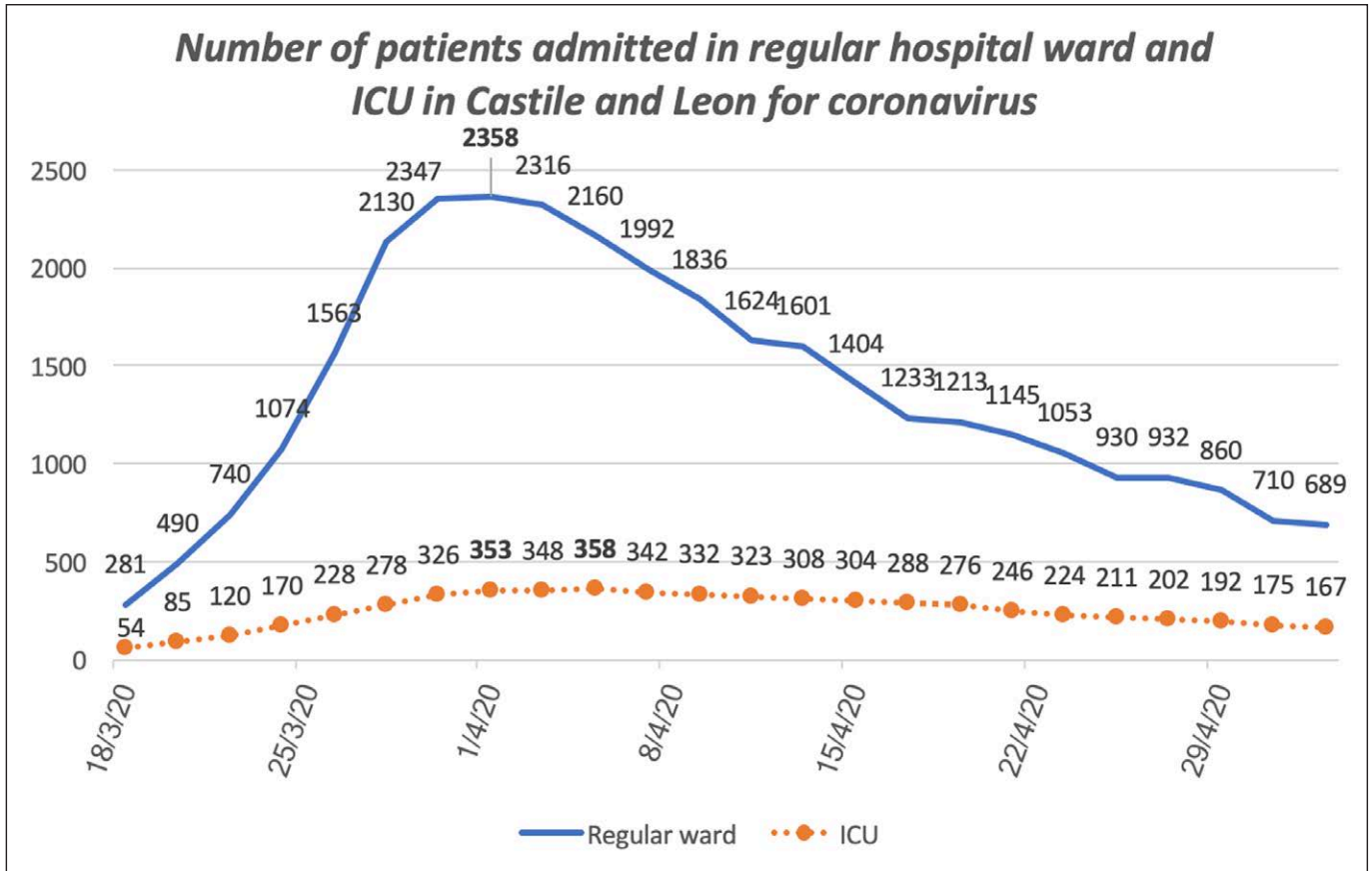


Figure 1. ICUs doubled bed capacity and their occupation increased by 163% with respect to their regular maximum capacity.