Prediction of respiratory decompensation in Covid-19 patients using machine learning: The READY trial.

(https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7410013/pdf/main.pdf

Last year, Burdick et al. Performed a clinical essay in which they assesed the possibility of predicting COVID-19 patients' possibility of needing mechanical ventilation according to their

The machine learning model that was used in this study is based on Gradient Boosting, which consists on combinating multiple decision tres in order to créate prediction scores. In these trees, patients are split in smaller groups following whether or not they present the features that are sequentially demanded, with the consequence that new groups are smaller and smaller.

Datasets used for training were different to those used for testing. This is an important point, as it is necessary to ensure that all data used is comparable. The algorithm developed was compared with MEWS, a health index based on body temperature, respiratory and heart rates, etc., which is useful to predict the future need for increased medical attention. On the other hand, the machine learning algorithm was built following these same values (as well as some other ones that were available).

The results of the algorithm built by machine learning were promising: it had a better sensitivity and specificity than MEWS when it came to predicting ventilation necessities in this group of patients, with its predicting capability being a 16% better than MEWS'.

All things considered, it is possible to conclude that the general use of this models offers a path to reduce false negatives and false positives. One possible problem is the lack of some values, as they were taken from real patients, but they are not considered to affect the outcome, as researchers state these lacks may have been due to the fact that missing datasets were not important and thus they were not worth measuring. However, there are two limitations that must be taken into account: the sample used was small (only a small fraction of the total patients did require artificial ventilation) and was only composed by COVID-19 patients, so the model might not be as accurate when being applied to other disorders that require assisted ventilation, so this is another example of ML limitations in some circumstances where data is not abundant.

1. Burdick H, Lam C, Mataraso S, Siefkas A, Braden G, Dellinger RP, et al. Prediction of respiratory decompensation in Covid-19 patients using machine learning: The READY trial. Comput Biol Med. septiembre de 2020;124:103949.