

There has been a pressing need for an expansion of the ventilator capacity in response to the recent COVID19 pandemic. To help address this need, A patient-specific airflow simulation was developed to support clinical decision making for efficacious and safe splitting of a ventilator between two or more patients with varying lung compliances and tidal volume requirements. The computational model provides guidance regarding how to split a ventilator between two or more patients with differing respiratory physiologies. There was a need to simulate hundreds of millions of different clinically relevant parameter combinations in a short time. This task, driven by the dire circumstances, presented unique computational and research challenges. In order to support FDA submission, a large-scale and robust cloud instance was designed and deployed within 24 hours and 800,000 compute hours were utilized in a 72 hour period.