

# AirBridge

## Wipro Chitra – Emergency Breathing Assist System



Millions of people worldwide have been affected by the COVID-19 pandemic. In India, the devastating nature of the illness called for the immediate indigenous development of ventilators and prudent utilization of available mechanical ventilators for the care of critically ill COVID-19 patients in intensive care units. The non-availability of sufficient number of ventilators to meet such an unprecedented situation meant that alternatives had to be found immediately to provide respiratory assistance to patients waiting for ventilators to be available in ICUs. There was an unmet need to rapidly develop an easy-to-operate, emergency breathing assist devices for such a scenario.

- Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), Trivandrum, an Institute of National Importance under the Department of Science and Technology, Govt of India, developed an Emergency Breathing Assist System (EBAS), to meet this need. The device is not a replacement for a mechanical ventilator but works as a bridge for a few hours to few days before conventional mechanical ventilation can be provided. The device has all the essential features to perform this function and is compliant with national/international standards and guidelines. It is manufactured using components sourced from established supply chains within the country. A team of engineers , Mr Sarath S Nair, Mr Vinod and Mr Nagesh from

the Department of Medical Devices Engineering and Prof Thomas Koshy and Prof Manikantan from the department of anesthesia of SCTIMST developed the specifications and technology. The knowhow and design of the Emergency Breathing Assist System (EBAS) were transferred to Wipro 3D in April 2020 for further joint development. The product is now ready for commercial production under the brand name AirBridge and will be jointly launched by SCTIMST and Wipro 3D Bangalore on July 7<sup>th</sup> through video conference. Dr VK Saraswat, President of SCTIMST will launch the product in the presence of Dr Rajiv Tayal, Head (AI) DST, Dr Asha Kishore, Director, SCTIMST, Mr Pratik Kumar- CEO- Wipro Infrastructure Engineering and Mr Ajay Parikh, Vice President ,Wipro 3D.

The Wipro-Chitra EBAS, AirBridge, provides positive pressure and volume-controlled ventilation through automatic, cyclical, inflation and deflation of a Bag Valve Mask (BVM) system. The essential parameters of ventilation such as tidal volume, breaths per minute, inspiration to expiration (I:E) ratio can be adjusted by the operator. The device computes and displays some of the important parameters in use. There are built-in alarms for out- of- range and SOS operations. For clinical application, the device will have to be used along with standard consumables like breathing tubes, PEEP valve and bacterial- viral filters before connecting to the patient. The device is portable, battery-operated, has low running costs is user-friendly and does not need an intensive care specialist to operate it. It requires very little training to operate the equipment and nurse or paramedic can operate it. AirBridge can be used for ventilator support in COVID 19 related or Non-COVID 19 related emergency situations in hospital wards and during transportation of patients in ambulances till conventional mechanical ventilation can be provided in an ICU. It can also be used in small hospitals without central oxygen supply system using oxygen cylinders in emergency situations.

Based on the available features, around 25 anesthesiologists from across India gave their feedback on the potential uses of the Airbridge in COVID and Non Covid scenarios. These are

- a) Support breathing in COVID 19 patients with moderate to severe respiratory distress while waiting for the conventional mechanical ventilator to be available.
- b) Support ventilation during transport of COVID 19 patients in ambulances to tertiary care centre.

- c) For short-term ventilator support in hospitals with limited ICU facilities if a patient cannot be transported due to various reasons.
- d) Other indications: emergency ventilation in mass casualties due to accidents, natural disasters like fire, floods, earthquake etc.
- e) It can be stationed in public places like malls, airports, etc. for emergencies like cardio-respiratory arrest. Airbridge can be used to support breathing in the place of mouth-to-mouth breathing along with cardiac massage until the person is shifted to an ICU.