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IIT Ropar builds first power-free CPAP device 'Jivan Vayu'

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Indian Institute of Technology, Ropar has developed a device ‘Jivan Vayu’ which can be used as a substitute for CPAP machine. The device functions even without electricity and is adapted to both kinds of oxygen generation units like O2 cylinders and oxygen pipelines in hospitals. These provisions are not available in otherwise existing CPAP machines.

Fulfilling all the medically required parameters, this leak-proof, low-cost CPAP delivery system, Jivan Vayu is designed for a 22mm CPAP closed-circuit tube. It can even be customised as per the size of the tube. Since it can run during power failures, this can be used to safely transport a patient.

“This was the need of the hour during the present covid pandemic when the power supply is the key concern for saving lives of those on medical equipment such as ventilators and oxygen concentrators,” said Dr Khushboo Rakha, Assistant Professor, Metallurgical and Materials Engineering, who has developed the device at the Advanced Materials and Design Lab of IIT Ropar.

“It has an inbuilt viral filter at the air entrainment end which has a viral efficacy of 99.99 per cent”, assures Dr Rakha. The viral filter ensures that the air does not bring in any pathogens from the environment. The device has been manufactured using 3D printing and has also been tested mechanically.

‘Jivan Vayu’ can deliver high flow oxygen (20–60 LPM) while maintaining a continuous positive pressure of up to 20 cm H2O. The device is designed to maintain a FiO2 of above 40 per cent with a PEEP (positive end-expiratory pressure) of 5-20 cm H2O.

Dr Rakha and her team have collaborated with Suresh Chand, Faculty Incharge, Rapid Prototyping Lab, Siemens Centre of Excellence at Punjab Engineering College, Chandigarh for 3D printing of the device. The device is ready for medical testing and mass manufacturing.