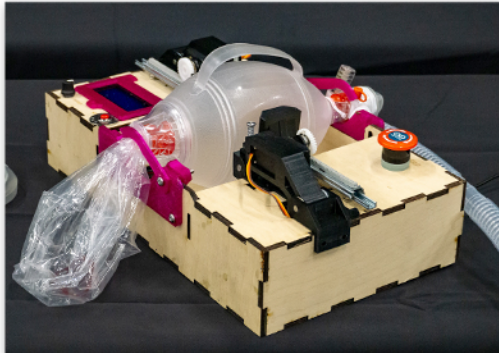
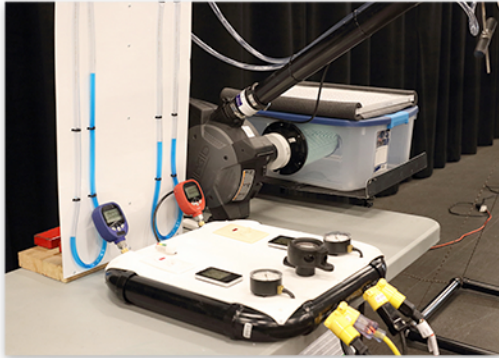




COSMIC MEDICAL

Collective Open Source Medical Innovations for COVID-19

cosmicmedical.ca



JULY 2020 MEDIA KIT

COSMIC MEDICAL BACKGROUND



When the World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, Dr. Christopher Nguan, a Kidney Transplant Surgeon and Urologist at Vancouver General Hospital, found himself with unexpected time on his hands as surgeries were canceled to augment capacity at the hospital in the event of a COVID surge. Dr. Nguan leveraged his longstanding research collaboration with UBC engineering sciences and issued a call-to-action with former students, Dr. Philip Edgcumbe, a UBC radiology resident and biomedical engineer, and Alex Waslen, a UBC engineering student, to come up with an idea for a low-cost ventilator to address the anticipated worldwide shortage. In less than six weeks, COSMIC Medical, (formerly known as UBC SOS eVent), designed a ventilator prototype. The Gravity Ventilator – or gVent – was awarded the \$100,000 Roche Canada COVID-19 Innovation Challenge based on its unique inverted piston and water seal design; an affordable, mechanically simple and resilient design optimized for disaster relief.

COSMIC currently registers more than 150 volunteers, including doctors, engineers and designers ranging from students to professionals. In addition to gVent, COSMIC has designed other novel devices such as the Clinical Respiratory Support System, the Bubble Helmet, the Snorkel Mask, and a Bag Valve Mask with Mechanical Ventilation.

Our mission is to create access to respiratory support equipment and Personal Protective Equipment (PPE) for healthcare professionals and COVID patients in need and we believe one of the best ways to do this is to share our work as widely as possible. COSMIC's current multipronged strategy is to continue work on both current and new devices in the fight against COVID-19, certify and widely disseminate our open-source designs, and connect with teams in developing countries experiencing a surge of Covid-19 cases, particularly those in communities with limited resources.

PROJECT TIMELINE

March 2020



March 11th

World Health Organization declared Covid-19 a global pandemic

March 13th

In response to contingency planning at Vancouver General Hospital for a potential ventilator shortage, COSMIC Medical is founded by Dr. Christopher Nguan, Dr. Philip Edgcumbe, and Mr. Alexander Waslen (B.A.Sc Candidate)

March 14th

Initial COSMIC "project brief" google document is shared with strategic contacts via email and social media by Philip, Alex and Chris

March 16th

Due to COVID19, the Faculty of Medicine at UBC pulls out all students out from hospital rotations. This gave a significant boost to manpower of COSMIC because medical students are able to shift to working on COSMIC full time

March 21st

The Canada Asian Pacific Business Association (CAPBA) makes the first donation to COSMIC

March 23rd

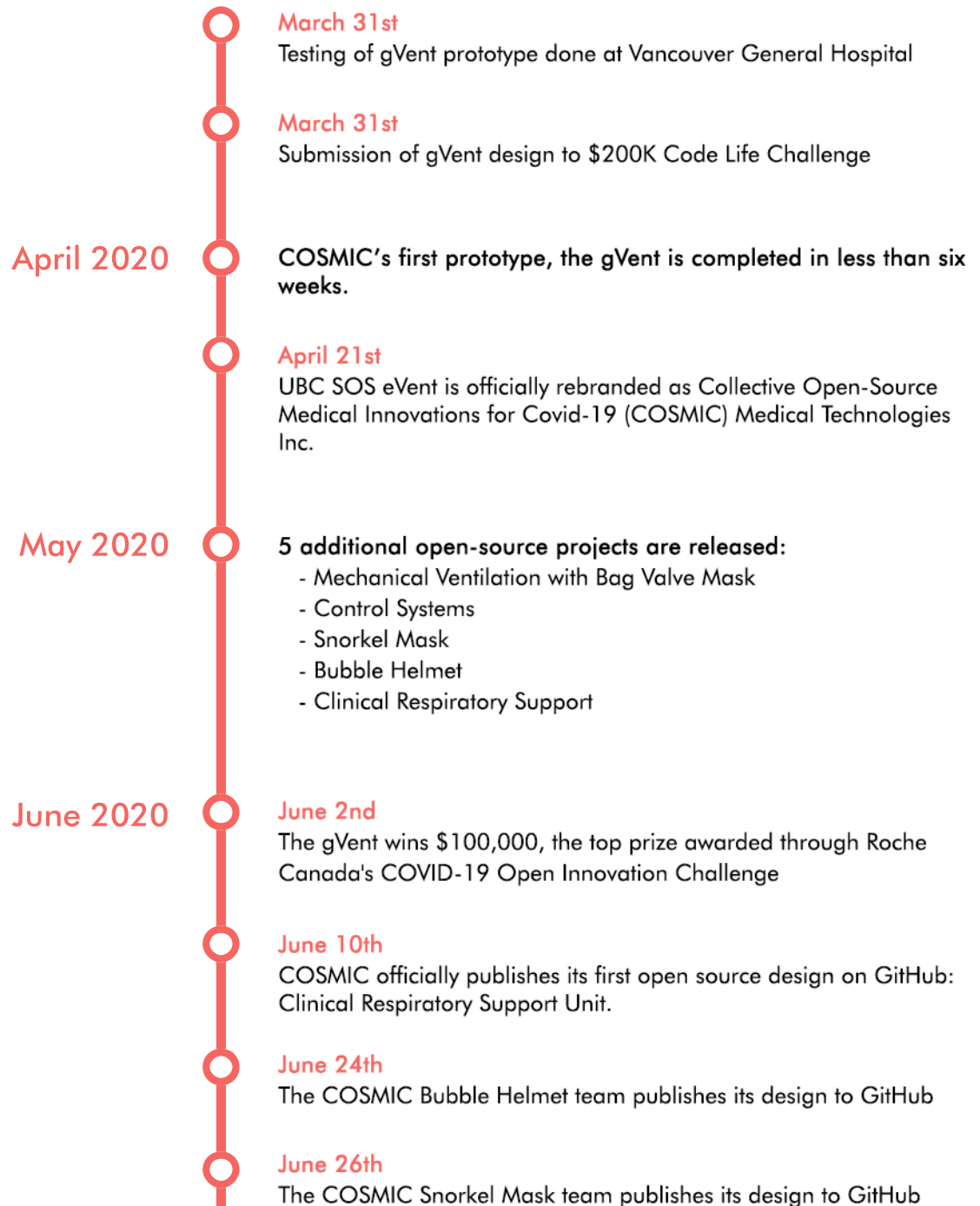
Chase Chrisfeld posts first demo video of gVent (https://youtu.be/5TQjyEI_psg)

March 27th


First weekly project/design review with invited experts

March 30th

gVent prototype built by Doug Smith, Paul Lalli and Chase Chrisfeld at Iron Mountain



Currently..



COSMIC's current multipronged strategy is to continue work on both current and new devices in the fight against Covid-19, certify and widely disseminate our open-source designs, and connect with teams in developing countries experiencing a surge of Covid-19 cases, particularly those in communities with limited resources.

We are working quickly to publish the rest of COSMIC's devices to GitHub so that teams around the world can build COSMIC devices for their own communities as soon as possible.

Our outreach team continues to field ongoing requests for our devices from LMIC including India, Pakistan, Brazil, and Mexico amongst others

We are actively engaged with local development and manufacturing partners on the ground in these locales to provide solutions and deliver our products to areas of greatest need.

CO-FOUNDERS



Dr. Chris Nguan (MD)

Dr. Nguan is a transplant surgeon at Vancouver General Hospital and has been involved in planning our local response to the COVID-19. He is also the director of the Surgical Technologies Experimental Laboratory and Advanced Robotics (STELLAR) facility.



Alexander Waslen

Alexander is a 4th year mechanical engineering student specializing in mechatronics at UBC. He is interested in the intersection between engineering and medicine and how advancements in technology can improve healthcare outcomes.



Dr. Philip Edgcumbe (BASc)

Philip is medical student (UBC MDPHD 2020), an entrepreneur, a biomedical engineer, and a Singularity University Canada faculty member. He speaks internationally on the topics of disruptive technology and the future of healthcare.



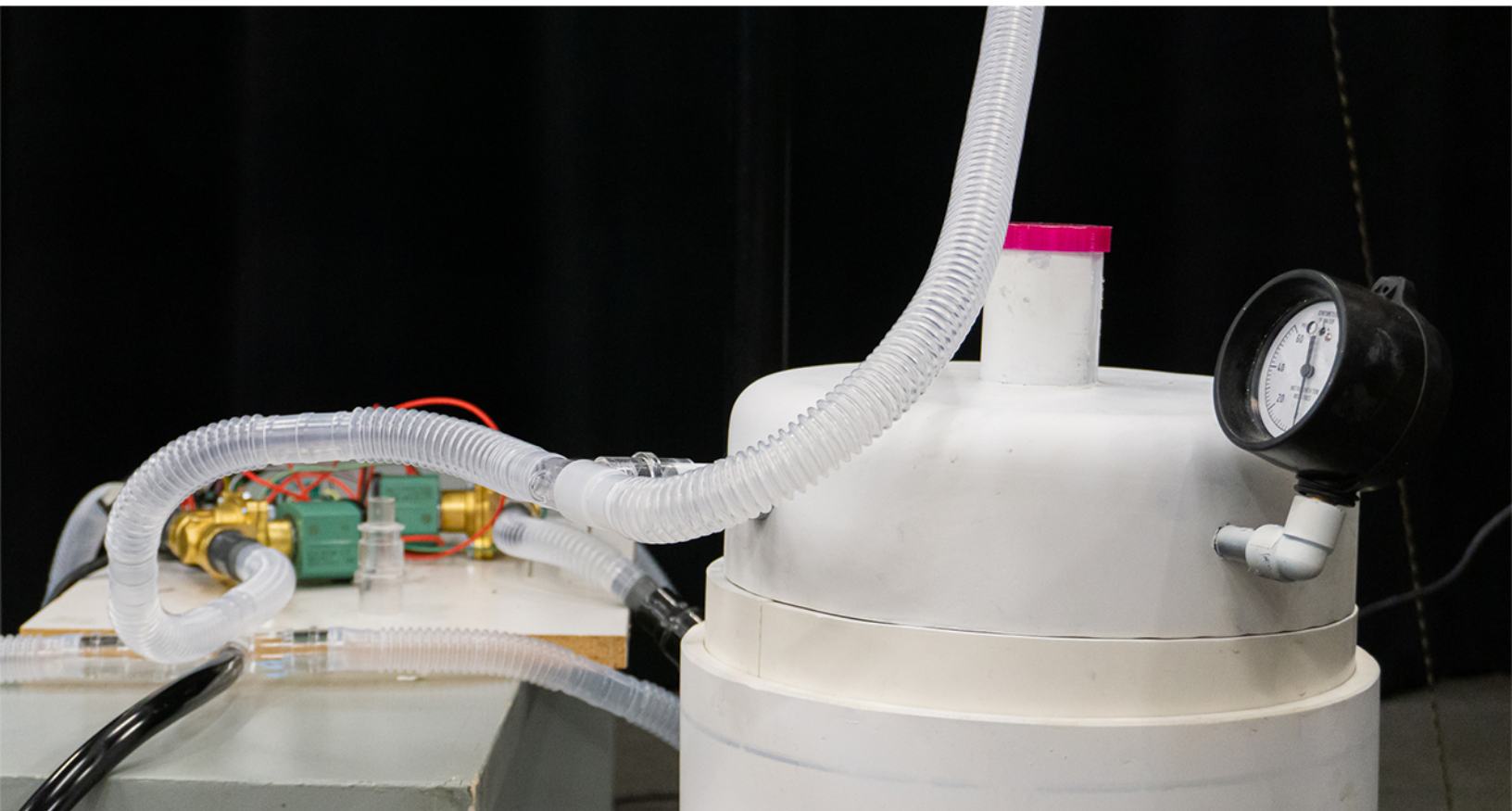
Brad Bycraft

Brad is an entrepreneur and engineer. He brings industry knowledge to COSMIC as he has worked on four different medical devices and built companies from the ground up. He is passionate about saving lives and bringing new technologies to market.

PROJECT SUMMARY

gVent (Gravity Ventilator)

A novel ventilator design based on **gravity, water, and two cylindrical vessels** fitted together to create a pressurized system, which is able to give **constant inspiratory pressures**. It is low cost, easy to assemble and can reliably deliver positive pressure ventilation. Currently in the process of improving failsafe mechanisms and clinician interface with the help of professional engineers given the invasive nature of ventilators and associated risk analysis to ensure the safety of patients.



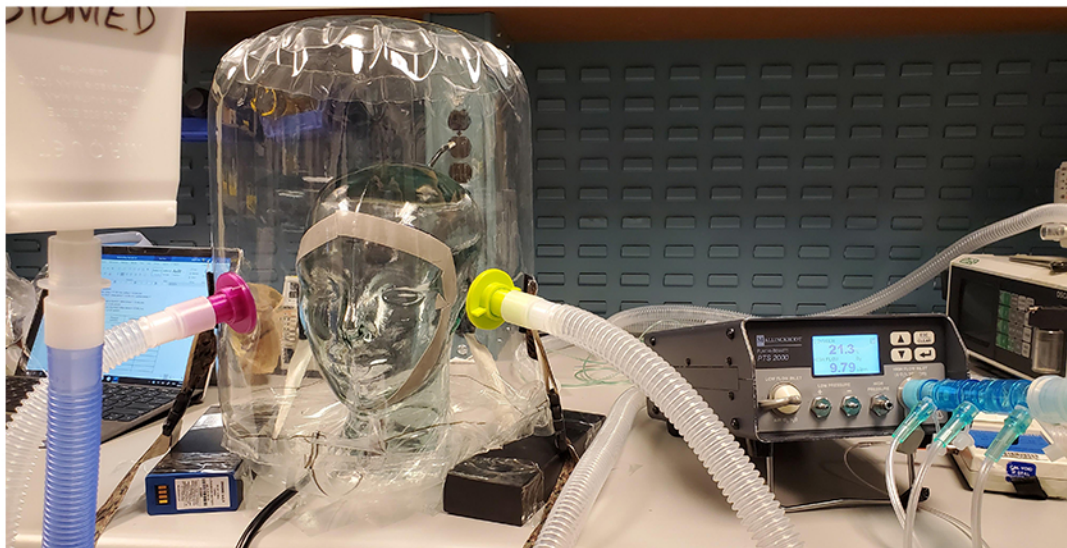
Snorkel Mask

PPE alternative to healthcare providers (N95 + faceshields) in cases where access to FDA-approved medical PPE is lacking. The snorkel mask is fitted with a 3D printed adapter that would allow a HEPA filter to be attached to filter particulates. It is available for anyone to use with a disclaimer waiver. More work is to be done to address the use case of the mask with prescription glasses, and communication issues through a microphone.



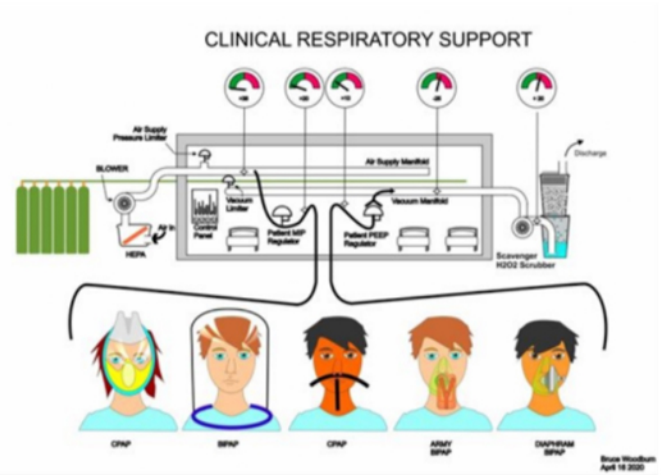
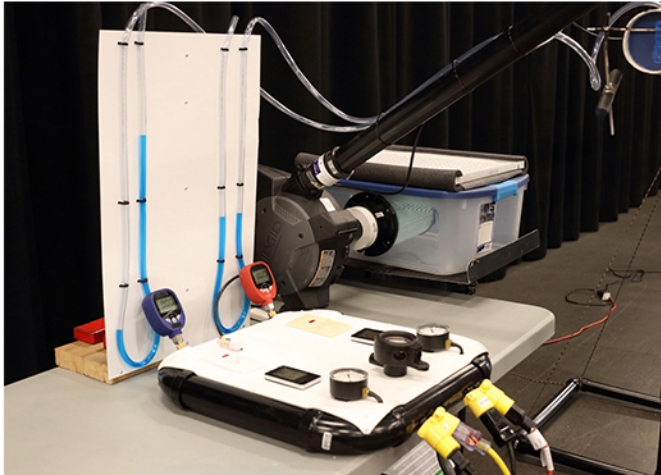
Bubble Helmet

A transparent hood that covers the entire head of the patient with a soft collar neck seal, providing superior delivery of positive airway pressure with little air leak, substantially reducing the risk of aerosolization while maintaining patient's comfort by eliminating pressure points on the patient's face commonly experienced with CPAP/BiPAP masks. According to a recent study conducted by UChicago published in JAMA, only 18% of patients with acute respiratory distress syndrome (ARDS-commonly seen in COVID-19 patients) using the helmet required an intubation while 61.5% of the traditional mask patients required intubation. Currently working through manufacturers within Canada and the United States to obtain Health Canada Interim Order and FDA Emergency Use Authorization to be used in the two countries. Available elsewhere for anyone to use with a disclaimer waiver.



Clinical Respiratory Support

CRS (aka multi-patient manifold) - pressurized high-flow air supply capable of providing HEPA-filtered pressurized air as well as an aerosol mitigation system. A single unit costs approximately \$1500 CAD and serves 25 patients at once, providing at least 35L/min of oxygen-enriched air at 10cm H₂O PEEP. It is scalable, manufacturable with readily available components, and can be assembled within a day.



Fluidics BIPAP (Bilevel Positive Airway Pressure)

COSMIC Medical has developed the Clinical Respiratory System which will deliver clean filtered air at a continuous positive pressure and scavenge the return air through PEEP valves and a suction plus filter system. A bilevel positive airway pressure (BIPAP) system may benefit certain patients. In this system the pressure at the patient's mask is cycled between the higher supply pressure on the inhale and drops to the lower PEEP pressure upon exhale. The Fluidics BIPAP Valve project is developing a single piece 3D printed valve that will cycle between an inhale PIP of 20cmH₂O and a exhale PEEP of between 5-10cmH₂O with a breathing rate of 12-16 breaths per minute and 8 litres/minute airflow. The valve in use will have no moving operational parts and the breathing rate is tunable by two adjustment screws.


PRESS COVERAGE

THE GLOBE AND MAIL CORONAVIRUS INFORMATION
The Zero Covid Project provides resources to help you make the most of staying home.
Visit The Club

Performing arts companies are finding creative ways to help during the COVID-19 crisis

MAKIMA LESSEMAN
PUBLISHED MAY 15, 2020

1 COMMENT 46 SHARE



After weeks of darkness, the Arts Club Theatre Company's Goldcorp Stage at the BMO Theatre Centre is alive again with activity. But the physically distanced teams of workers are not building sets; they're setting up stretchers and cots, ventilators and other medical equipment – a mock field hospital. The Vancouver theatre company has donated the large black box space to a local multidisciplinary medical start-up to help showcase its inventions: low-cost respiratory support equipment for the COVID-19 crisis.

It's one of the most dramatic examples of ways Canada's performing arts companies, suddenly dark, have been playing their part during the pandemic – mobilizing to offer supplies, space, expertise and creativity.

"There's an honour in being able to contribute to this fight," says Ashlie Crocovan, artistic director of the Arts Club, whose wardrobe department has also been making masks and scrub caps and donating them to local medical and care facilities.

TRENDING


- At least 47 children in Canada investigated for inflammatory syndrome linked to COVID-19
- OPINION: Together, the Meng trial and the pandemic offer Canada a golden opportunity
LYNETTE ONG
- What the Meng 'murder homer' means, and how it could have gone the other way
- Ex-sqlite 'murder homer' found in Langley, B.C., prompting fears for rest of Western Canada
- CIBC profit drops 7% as loan loss provisions surge

The Globe and Mail
Published May 15, 2020

Global NEWS BC Change Location News & Radio Programs Newscasts, Radio, and Videos

Coronavirus World Canada Local Politics Lifestyle Money Entertainment Health Video Podcast Trending More

GLOBAL NEWS HOUR AT 6 BC March 30 2020 10:40pm 02:02



UBC-based team race against time to design, build, test and distribute low-cost emergency ventilators

Global News
Published March 30, 2020

VANCOUVER SUN

Business Sports Arts & Life Homes Travel Driving Healthing The GrowthOp Books

News / Health

Arts Club theatre being turned into 'field hospital' for new COVID-19 equipment

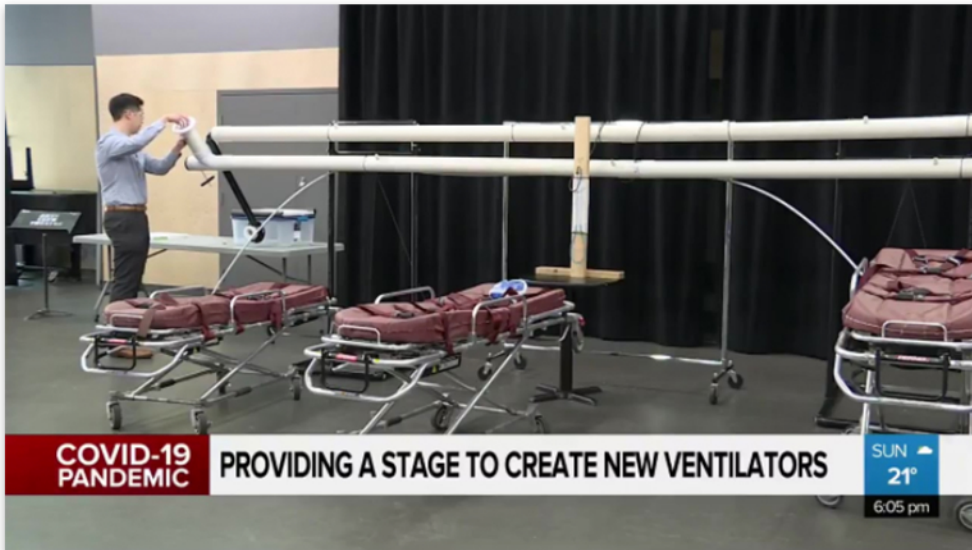
Kevin Griffin
May 6, 2020 • 3 minute read



Vancouver Sun
Published May 6, 2020

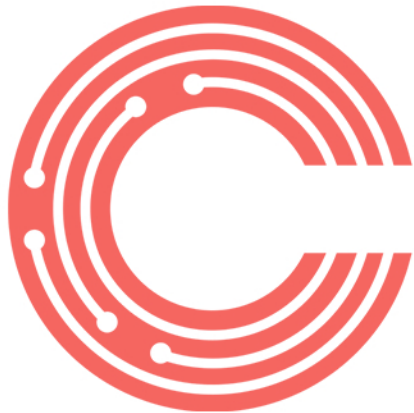


Roche Award
Announced June 2, 2020



CityTV
Aired May 10, 2020

DIGITAL
ARTWORK

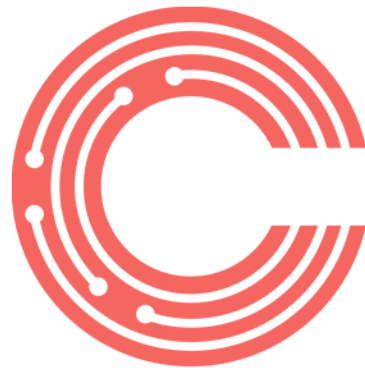


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#f56661

#484848

2020-03-13

Chris Nguan

Hey all.

4:26 PM

Chris Nguan

I'm sure you are all aware of covid and the effect on the healthcare system and the population globally as well as its imminent impact on BC and Vancouver

4:26 PM

Chris Nguan

I was kicking around an idea and pitched it to Caitlin and wanted to see who was interested in the idea of hacking together a super low cost ventilatory support machine for if/when the time comes the system is overwhelmed and we can offer something to save lives

4:28 PM

And the rest is history.

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