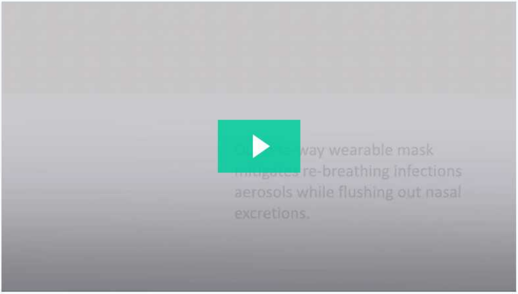
RespirVent

Hardware Technology PBC and B Corps Social Impact Medical Device

One-Way Mask Acts as Pathogen Extractor to Reduce Replication Rates

RESPIRVENT.COM MINNEAPOLIS MINNESOTA


way wearable mask
re-breathing infections
aerosols while flushing out nasal
excretions.

> *We all were unprepared for this pandemic. Viral infections and deaths have been trending for years. Social distancing and stay at home orders have their socio-economic drawbacks. We hope our one-way mask will save lives, time, and money.*
>
> **Michael Doyle** President | CEO @ RespirVent

Why you may want to support us...

1. Aims to Treat COVID-19 / Respiratory Infections and Diseases. Prevent & Possibly Diagnose COVID-19
2. Save Lives; Help Mitigate Social Distancing, Respiratory Pandemics and Recessions
3. Maximize Impact Now by Offering Configurations of Existing Components and Custom Adapter Kits
4. Clinically Trial a Simple, Easy Medical Device that's Used in the Onset of Symptoms or Preventively
5. Develop Scalable Equipment to Serve Multiple Patients with A Single Machine in a Hospital or Stadium
6. Develop an Affordable, Wearable Device for the Masses
7. Sustainable, Recyclable, and Low-GHG Emission Life Cycles Throughout Our Product Families
8. Respirvent is a Public Benefit Corp, like WeFunder - Maximizing Shareholder and Stakeholder Value

Our Team

AND OUR MAJOR ACCOMPLISHMENTS

Michael Doyle

President | CEO

Two Certificates of Commendation from MN Governor Mark Dayton for National Competitions in Entrepreneurship and Engineering Technology Design. Nanoscience Technologist. Manufacturing Engineer. Advocate of Higher Education and Undergraduate Research.

Peter Flaherty

Designer

Started Successful Rapid Prototyping Businesses since the 1990's. Designs and makes mechanical solutions that would take much longer for other companies to realize if at all.

In the news

Eventbrite

Walleye Tank: COVID-19 Showcase

Please join us virtually for a special edition of a lifescience startup tradition with Walleye Tank: COVID-19 showcase. We will be highlighting Minnesota innovators and community leaders stepping up to conquer

May 12, 2020 @ eventbrite.com

tech.mn - Walleye Tank Announces Spring 2020 Lineup for Pitch Night

The spring 2020 Walleye Tank has official found its school of fish. The life science pitch competition (from the University of Minnesota and the Mayo Clinic officially announced the 15 applicants that have been

May 8, 2020 @ tech.mn

The Story of RespirVent (TM)

April 2020 - In the Beginning of the MN Stay at Home Order

In response to this pandemic, we (Michael Doyle and Peter Flaherty) halted the operations of our other company R&D LABS - postponing its independent developments of sustainable technologies.
We decided to identify the challenges and problems with COVID-19 and see what we could come up with.

The aim was to design a mechanical solution that could make a positive impact on this pandemic under the FDA's emergency use authorizations.

We have been conceptualizing, modeling, and developing our IP portfolio since April 2020.

There were many iterations with various technology readiness levels:

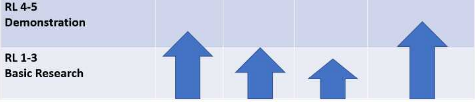
- Ventilator Pump Iterations

- Aerosol Disinfecting Chamber Iterations

- Other Potential Inventions

- Now this Viral Extractor (TM)

Readiness Level	Iteration 1	Iteration 2	Other Iterations	Current Iteration
RL 8-9 **Industrial Competitiveness**				
RL 6-7 **Pilot**				



RL 4-5
Demonstration

RL 1-3
Basic Research

May 2020 - Thus, RespirVent (TM) was Born

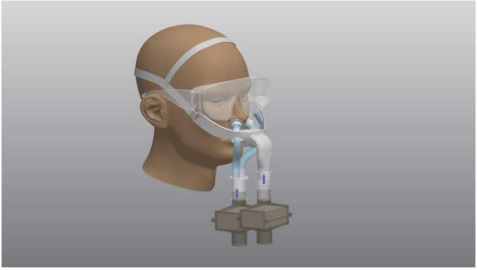
RespirVent SBC was co-founded in May 2020 as a MN specific benefit corporation to maximize shareholder and stakeholder value in the context of our specific benefit:

"Defining Problems and Solutions Regarding Challenges to Respiratory Systems"

We need your help to respond to this pandemic, validate the concept, maximize our positive impact for all stakeholders, and implement our first product.

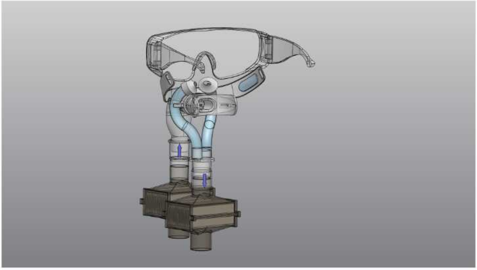
The RespirVent (TM) Pathogen Extractor (TM) aims to reduce replications rates in the onset to mitigate infection and disease, recover faster, stay safe, and possibly help diagnose diseases, like COVID-19.

Our claims are patent pending under US Provisional No 63/025172



Integrator Business Model Archetype

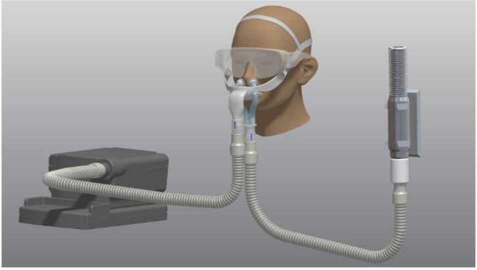
The initial integrator business model of RespirVent (TM) combines existing, commercially-available partial-products with custom adapters into our Pathogenic Extractor (TM) one-way mask.



Eventually our business would evolve into a vertical integrator throughout all levels of the supply chain to make our device compact, feel good to wear, look good, and more efficient.

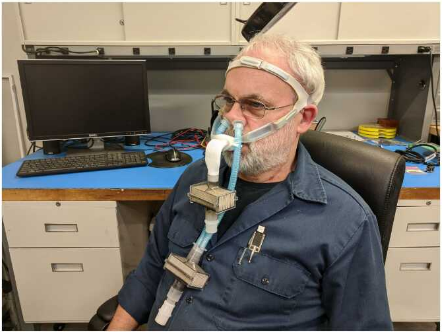
Early Treatment Method for COVID-19

The relatively affordable RespirVent (TM) Viral Extractor (TM) system aims to reduce replication rates and recovery times in the onset of symptoms to prevent transmission or the need for conventional ventilators in limited supply. It requires no electricity and behaves as a one-way mask to extract, isolate, and contain pathogens from the aerosols we breathe.



Protect Yourself from SARS-CoV-2

If you haven't been tested for COVID-19 and are either asymptomatic or you haven't been infected yet, then the RespirVent (TM) Pathogen Extractor (TM) could be a means to mitigate future infection. Viral tests can't detect less than 50 to 400 copies of SARS-CoV-2 per mL, so there is a chance for false negatives, but it is relatively low due to the replication rate.

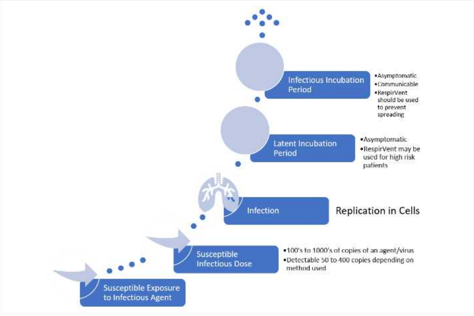


Potentially Diagnose COVID-19

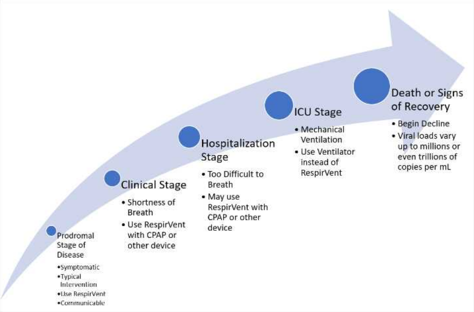
There is a possibility that the RespirVent (TM) Pathogen Extractor (TM) will be able to diagnose COVID-19 by using monitoring ports on both HME (heat & moisture exchange) filters. The varying pressure and rate of breathing can be monitored as well as the difference in oxygen concentration when inhaling vs exhaling. If the difference in oxygen concentration decreases, then a corresponding low blood oxygen level may indicate the COVID-19 disease.

Stages for the RespirVent (TM) Pathogen Extractor (TM)

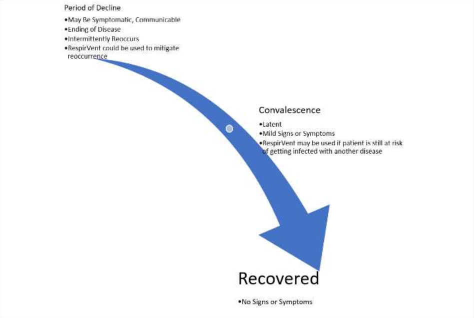
Infectious Stage


Infectious Incubation Period
•Asymptomatic
•Communicable
•RespirVent should be used to prevent spreading
Latent Incubation Period
•Asymptomatic
•RespirVent may be used for high risk patients
Infection
Replication in Cells
Susceptible Infectious Dose
•100's to 1000's of copies of an agent/virus
•Detectable 50 to 400 copies depending on method used
Susceptible Exposure to Infectious Agent

Disease Stage


Prodromal Stage of Disease
•Symptomatic
•Typical Intervention
•Use RespirVent
•Communicable
Clinical Stage
• Shortness of Breath
• Use RespirVent with CPAP or other device
Hospitalization Stage
• Too Difficult to Breath
• May use RespirVent with CPAP or other device
ICU Stage
• Mechanical Ventilation
• Use Ventilator instead of RespirVent
Death or Signs of Recovery
• Begin Decline
• Viral loads vary up to millions or even trillions of copies per mL

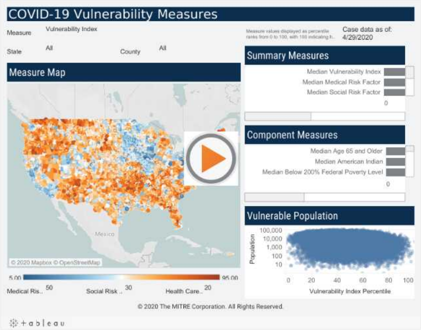
Disease Decline Stage


Period of Decline
•May Be Symptomatic, Communicable
•Ending of Disease
•Intermittently Reoccurs
•RespirVent could be used to mitigate reoccurrence
Convalescence
•Latent
•Mild Signs or Symptoms
•RespirVent may be used if patient is still at risk of getting infected with another disease
Recovered
•No Signs or Symptoms

Make a Positive Impact on this Pandemic

One of the goals of the RespirVent (TM) Pathogen Extractor (TM) is to be used by those with pre-existing conditions, because COVID-19 threatens their lives the most. However, some people aren't aware of their pre-existing condition(s), so we hope that anyone who tests positive or is symptomatic will be able to use this device in their home let alone in the hospital.

See the Vulnerability Index Dashboard Below:



COVID-19 Vulnerability Measures
Measure
Vulnerability Index
State
All
County
All
Measure values displayed as percentile ranks from 0 to 100, with 100 indicating h...
Case data as of:
4/29/2020
Measure Map
Mexico
© 2020 Mapbox © OpenStreetMap
5.00
95.00
Medical Ris..
50
Social Risk ..
30
Health Care..
20
Summary Measures
Median Vulnerability Index
Median Medical Risk Factor
Median Social Risk Factor
0
Component Measures
Median Age 65 and Older
Median American Indian
Median Below 200% Federal Poverty Level
0
Vulnerable Population
Population
100,000
10,000
1,000
100
10
0
20
40
60
80
100
Vulnerability Index Percentile
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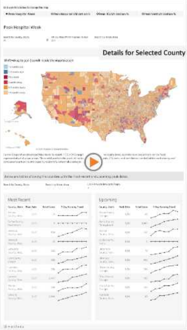
https://public.tableau.com/views/COVID-19VulnerabilityMeasures_15865329791440/COVID-19VulnerabilityM...

Reduce Hospital Peak Usage of Beds and Ventilators

If our device is proven to reduce replication rates, and RespirVent(TM) distributes Pathogen Extractors(TM) to those with COVID-19, then that will decrease viral loads, recovery times, and increasing demand for hospital beds let alone ventilators.

The projected peak of COVID-19 isn't until fall of 2020. Let's work to flatten the curve.



Peak Hospital Week
Details for Selected County
Most Recent
Upcoming

https://public.tableau.com/profile/cerner.healtheintent#!/vizhome/COVID19Explorer_15877416895060/Cer...

We All Get Out What We Put In

This pandemic could be a lot worse let alone the next one. Let's be prepared for the next wave, the next pathogen, the next respiratory threat. If what we have developed doesn't pan out, we will continue to improve, iterate, adapt, and evolve our response to respiratory challenges.

> *This is a photo of R&D LABS on the left where RespirVent is currently located.*

Investor Q&A

– COLLAPSE ALL

What does your company do?

Respirvent aims to supply a one-way mask that treats and prevents pathogenic respiratory illnesses, like the flu and cold.

Where will your company be in 5 years?

We hope to 1) Help clean the polluted or contaminated air, which may eradicate deaths from acute or chronic respiratory infections and disease internationally. 2) Cooperate with healthcare, government systems, and sustainable technologies. 3) Invent one of the largest IP portfolios of respiratory technologies and sell wearable one-way masks that are the size of pacifiers with nose buds. 4) Develop profitable IOT sensors, automated blockchains, smart contracts, bots, machine learning, AI code.

Why did you choose this idea?

We all were unprepared for this pandemic. Viral infections and deaths have been trending for years. Social distancing and stay at home orders have their socio-economic drawbacks. We hope our one-way mask will save lives, time, and money.

How far along are you? What's your biggest obstacle?

Several Solidworks 3D models, procurement of medical components, 3D printed adapters, prototypes, a few domains, and email. RespirVent was registered in the state of MN as a specific benefit corporation. Applied to MN Cup. Taking Launch MN/MIN-CORPS Value Prop Design course. A pitch deck has been evolving along with the business model canvas and value proposition canvas. Our biggest obstacle is figuring out what's wrong with our invention. Other large obstacles include protecting our inventions and brand with a portfolio of intellectual property, and scaling up during an economic recession with limited supply and high demand for medical supplies.

Who competes with you? What do you understand that they don't?

Philips, 3M, and Medtronic to name a few. We understand agile and lean R&D, how to use a first-principled approach, and keeping things simple.

How will you make money?

At first we will make money from configurable adapters and kits. Some configurations may sell out quicker than others depending on availability and lead times.

We will also be pursuing Minnesota SBIR (Small Business Innovation Research) and STTR (Small Business Technology Transfer) funding to develop an FDA breakthrough medical device, go through clinical trials, engineer, manufacture, and distribute them. The aim is a one-way mask with value-added options and adapters to hook it up to other equipment.

Other developments may proceed in parallel, staggered, or serially depending on projected demand, product life cycles, marketing plans, regulations, etc.

What are the biggest risks? If you fail, what would be the reason? What has to go right for you to succeed?

We need to verify that we can sell these kits and/or adapters under an FDA (Food and Drug Administration) EUA (Emergency Us Authorization). Assumptions are also risky - we need to verify as much as practical. Will our product-market fit justify a seed round of funding? Will we recruit the necessary team members to take this to the next level? Will our invention(s) and prototypes make as much of an impact as we project? Is our IP portfolio strong enough to defend itself in litigation? How soon can we start making sustainable revenue? When can we break even and start profiting from our investments of time and money?

Join **593,253** investors who funded **377** startups with over **$134.5 million**

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