**Project Plan - Non-Invasive Face Mask Mar 27, 2020**

**Team Members**

GDLSC

1. Wes Rhiger – Leadership & Project Mgmt
2. Joe Nugent – Innovation Area Manager
3. Bethany Brasser – Innovation Lead, Project Mgmt
4. Derek Wilson – Innovation mindset, hands-on innovation
5. Kipp Eaton – Innovation mindset, hands-on innovation, scuba knowledge
6. Ray Szeto – Research analyst, 3DP knowledge
7. Tyler Finlayson – Innovation mindset
8. James Fernandez – Innovation mindset
9. Darren Ballantyne – CAD Lead
10. Mike Pette – Manufacturing Lead
11. TBD – SCM Lead

External

1. Tarek Loubani – Lead of Emergency Medical Equipment group – London Health Sciences Center
2. Azad Mashari – Anesthesia expertise, access to top clinical and research ventilation experts – University of Toronto
3. TBD medical and regulatory SME’s

**Objective**

To design, prototype, validate, and produce a non-invasive ventilation mask to be used in a hospital environment for emergency pre-treatment of COVID-19 patients.

**Schedule**

* Project kickoff – Mar 30th
* 2 prototypes within 7 days of project kickoff
* Enough masks to cover London hospital needs within 3 weeks (TBC) of project kickoff
* Enough masks to cover Ontario hospital needs within 2 months (TBC) of project kickoff



**Roles and Responsibilities**

GDLSC Responsibilities

* Project Management, Design, Manufacture, Supply Chain, Requirements Compliance

External Medical Partners

* Requirements definition, Regulatory Approvals, Medical Ventilation Expertise, Filtration expertise, Validation, Application Feedback

**References**

<https://www.3mscott.com/products/av-3000-with-sureseal-facepiece/#overview>

<https://www.youtube.com/watch?v=Gkq5fLQiMcU>

<https://www.youtube.com/watch?v=Gkq5fLQiMcU>

<http://procrastineering.blogspot.com/2020/03/low-cost-open-source-ventilator-ish.html>

<https://www.isinnova.it/easy-covid19-eng/>

<https://www.medline.com/product/HEPA-Filters-by-Tri-Anim-Health/HMEs-and-Filters/Z05-PF40513>

<https://www.3m.com/3M/en_US/worker-health-safety-us/all-stories/full-story-detail/?storyid=8855304f-01cb-4af2-8937-83096cdb4113>

**Ground Rules and Assumptions**

* This design will be open source and made freely available, world-wide.
* GDLS will pay for their own labour contributions and material prototyping for this initiative.
* LHSC will provide to GDLSC, representative non-invasive ventilator and associated hoses/adapters for interface and testing purposes
* LHSC will provide performance and interface requirements
* Funding for low-rate and full production is TBD.

**Questions and Research/Information Required**

1. What features and benefits of a CPAP machine can we leverage?
2. Are we looking to procure and existing face mask and then modify it for our purposes? If so, we need to locate best options with available supply.
3. Are we trying to meet a target cost/budget per mask?
4. Need to make a determination quickly on whether using a CO2 scrubbing (i.e. rebreather) truly closed-loop design, or more of a filter N95 venting based design
5. Is there an existing source of N95, or equivalent, family of filter cartridges that is certified for this sort of application?
6. Do we have to meet any specific safety/cleanliness requirements for assembly/manufacture of these masks?
7. We will need some form of requirements from medical team.
8. A basic diagram of all key components and their interfaces would be useful to ensure common understanding and to help breakdown the problem - Ventilator, hose, one-way valve in, mask, person, one way value out, filter/scrubber, loopback if required).