4 Way Ventilator Splitter

Proposal Stage	Proposal
Tags	
Created Date	16/3/19
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Slack Channel	#project-4-way-ventilator

🗒️ Idea in brief: Question to be resolved and why

💥 Problem: CoVid-19 causes respiratory problems which need ventilators for some people to help them through the illness. There may not be enough around to cope with the increase in demand

👨🔬Hypothesis: 4 way attachments can be designed and printed to fit onto ventilators to increase the capacity, these would be low cost and easy to manufacture.

🤔 Assumptions: Hospitals would be willing to split ventilators 4 ways. The ventilator can cope with doing it for 4 people. Ventilator hosing is standardized enough for a master design (or a few) to work.

💻Implementation Suggestion

V1

Create a functional 4 way ventilator splitter

What it is

We would design and test a part made in plastic to split a ventilator input manifoldly 4 ways. Testing if the output can sustain 4 humans and if such a part is easily printable. Also the fit on the machine would need to be tested to ensure there is no leakage.

17/03/2020 - Could the design include a valve on each outlet to manipulate flow rate to each outlet of the divider? It is possible, feel free to design a part, i will post this idea to slack.

What it is not

Building an entire ventilator as these are complex machines that have to be perfectly made to avoid death

Design

Like the one I this article
https://www.google.com/amp/s/3dprint.com/45352/3d-printed-ventilator-manifold/amp/

Hopefully it is possible to get the CAD file, if not it would be designed and may look like this:
https://3dprint.com/wp-content/uploads/2015/02/Image-6.jpg

UPDATE 17/03/2020: CAD Files can now be found here: 4 way ventilator

Data/Experiments

Trialing would need to be done on a hospital ventilator and we could get the opinion of intensive care nurses and doctors about whether this would work. Data should be collected about the flow from a normal ventilator and compared to the flow after it went through the 4 way splitter and see if it can still sustain life. (Sorry this has not been done yet I only saw this slack channel at 7pm Monday GMT)

V2 would be an iteration on the original design as it is improved from the feedback and testing of the first version until we have a part we are happy with and can manufacture through decentralised 3d printer manufacturing using all the volunteers we have. I would expect with in a month we could have a working system especially if the pre existing model can be found that this: https://m.scirp.org/papers/49209 paper talks about.

💪 Impact of Potential Solution

This would allow many lives to be saved as hospitals in poorer regions would be able to have more people on ventilators at once. This increases capacity without having to acquire expensive ventilators which need specialty nurses to use them. The device would allow one nurse to look after more patients.

🙌 Criteria for Success

Have a working 4 way ventilator system that performs well enough to keep 4 people alive by having a flow rate similar to that of which one person receives on a ventilator.

Enabling hospitals to provide ventilator treatment to all who need it.

😅 Possible Issues

If the flow scale is adjustable the rate being / 4 may be too low for some patients so only patients needing a low L/min may be able to use this but it is all down to how testing goes

Testing required to determine if a consistent flow rate exists across 4 outlets. Could the design include a valve to manipulate flow rate to each outlet of the divider? Yep, designing is being suggested in the slack

✔️ "I've read this" section

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Jamie	Creator
Eric Rowe	Read
Wilson Szeto	Read
Ross Tieman	Read
Anthony Cardinali	Read
Daniel Levi	Read
Steven McCulloch	Read
Vladimir Atanasov	Read
Alexandre Guerreiro	Read