



Singapore Healthcare Management 2018

The Novel Mask Connector

Optimizing The Efficacy Of Nebulization For Tracheostomy Patient (Patent Pending)



Changi General Hospital
SingHealth

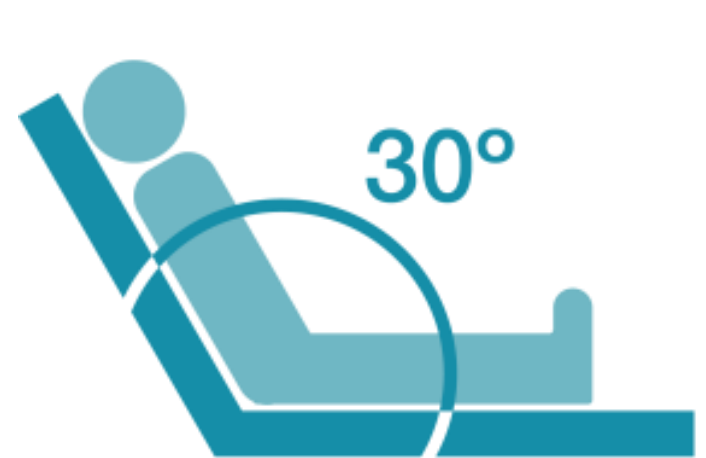
ANC Lim Jia Yan, NC Ma Chongyan, SSN Tang Hongyan, NM Qin Jing, SRT Odilio Asuncion, Vernon Chen, ADN Neo Soon Keow (Facilitator)

BACKGROUND

A common challenge faced by nurses while performing nebulizer administration is difficulty in keeping the nebulization chamber in an upright position when connected to the tracheostomy mask. The compromised medication delivery could result in the blockage of tracheostomy tube due to the inability to alleviate thick secretions. In view of the issue with the angulation to keep the nebulization chamber upright, the team collaborated with counterparts from Changi General Hospital (CGH) Centre for Innovation (CFI) to design a Mask Connector that is able to maintain the nebulization chamber in the optimal angulation for effective medication delivery. The project team leveraged on CFI's quick prototyping capability using 3D Printing Technology and had tested on a total of eight iterations of the Mask Connector before deriving the final design.

METHODS

Preliminary proof-of-concept study comparing the current medication delivery method and the use of the novel Mask Connector was conducted. The aim of the trial was to determine the efficacy of the medication delivery with minimum residue at the end of the nebulization treatment.



Reclined at 30°



5 Minutes



Oxygen at 6L/min



2ml Normal Saline

CURRENT METHOD



Nebulization Chamber Connected Directly To Tracheostomy Mask.

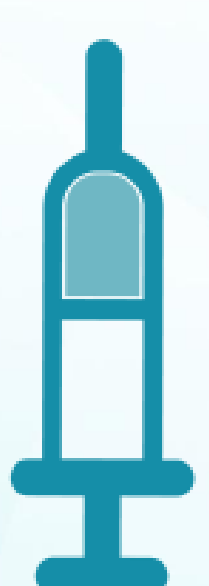
PROTOTYPES



3D Printed Prototypes For The Study Of Optimum Angle.

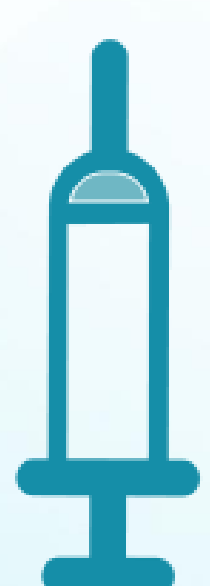
RESULTS

More mist was delivered with the use of the Mask Connector. The residue of 0.2ml of normal saline was observed in the chamber with the use of the Mask Connector as compared to the residue of 0.8ml with the current method (without the use of Mask Connector).



0.8ml

Residue Observed With Current Method



0.2ml

Residue Observed With Proposed Method

PROPOSED METHOD



Nebulization Chamber Connected With The Novel Mask Connector.

CONCLUSION

With the usage of the Mask Connector, the efficacy of nebulization delivery for tracheostomy patient has been significantly enhanced. A patent application has been filed for the Mask Connector. Moving forward, the Mask Connector prototype will be optimised for production and clinical trial.