

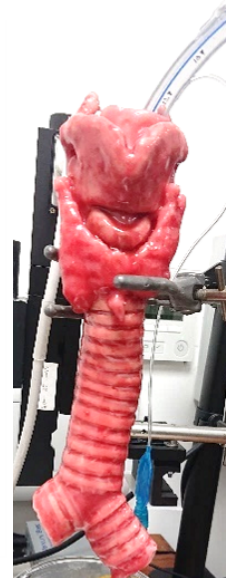
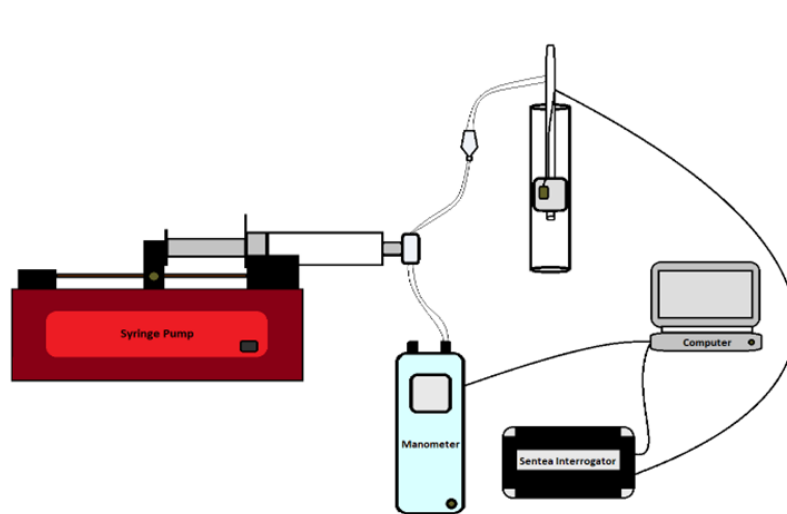
Spring
2024

Optics & Photonics Group Lunchtime Seminar Series

University of Nottingham

Optical Fibre Sensing for Tracheal Intubation

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13:30 Wednesday 5 June 2024

Life Sciences - B3



**OPTICS &
PHOTONICS**
UNIVERSITY OF NOTTINGHAM



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Agbiki
Tamaralayefa

Optical Fibre Sensing for Tracheal Intubation

Intubation is a vital part of anaesthesia as it provides assisted breathing for patients in critical conditions. There are certain challenges associated with the intubation process such as an underinflation or overinflation of the tracheal tube cuff, which often leads to leakage of secretions (biofilms) to the lungs or injury to the tracheal walls respectively. The passage of secretions to the lungs increases the risk of Ventilator-associated pneumonia, which is the leading cause of death relating to infection in the Intensive care unit with a mortality rate of up to 76%. More can be done to assist clinicians in making decisions thereby enabling a better patient experience both during and post intubation.

In this talk, I would present results obtained from different Endotracheal tube (ETT) cuff modifications. These modifications are aimed at converting the normal ETT into a smart ETT that can be used to monitor different parameters during the intubation process. The changes suggested employ the use of optical fibre-based techniques to enhance the capability of the cuff enabling clinicians to observe when in contact with the trachea. Observing contact would provide a good indication of when a seal is established between the cuff and the tracheal wall and having a good seal would aid in reducing leakage of secretions to the lungs. Confirming contact would also help in preventing an overinflation of the cuff which would reduce the risk of tracheal injury during intubation. The ISO bench test method for cuff leakage (EN ISO 5361:2023) is also included in the talk, alongside carbon dioxide monitoring to enable correct placement of the ETT for intubation.

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All are welcome



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