



COLLOQUIUM

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Vakgroep: Technische Stromingsleer

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Koen Snijders

een voordracht houden getiteld:

Patient-related Vacuum Technology

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In the last decades the use of medical technology in hospitals has increased, the success of medical treatment becoming more and more dependent on the performance of medical technology, as for example patient-related vacuum technology. It is used in the treatment of patients for removing body fluids from e.g. wounds, cavities and the respiratory tract. The main applications are endotracheal suctioning, thoracic drainage and negative pressure wound therapy. Part A of the present study was focused on the quality assurance of the different vacuum applications in the hospital by investigating the optimal settings. The actual state of the vacuum technology in the hospital was reviewed with respect to guidelines and earlier research, by the performance of an inventory and a HFMEA risk analysis. The results showed that considerable differences exist between the optimal use according to literature and current practice in the hospital. Suggestions have been formulated for improvement of this situation.

One of the outcomes of part A was that the international guidelines for endotracheal suction are not unambiguously defined. Therefore, an experiment was performed, described in part B, to investigate the influence of the main parameters in endotracheal suctioning: Catheter diameter, endotracheal tube diameter, the suction pressure, type of (mechanical) ventilation, level of Positive End-Expiratory Pressure (PEEP) during mechanical ventilation, and the type of suction system. An experimental set-up was designed which enables to simulate endotracheal suctioning in the intensive care unit setting during spontaneous breathing, Pressure Controlled Ventilation (PCV) and Pressure Supported Ventilation (PSV). The tracheal pressure and lung volume were recorded during the experiments, because they are frequently mentioned as predictors for the development of complications of endotracheal suctioning in patients. From the investigated parameters, the area ratio (percentage of occlusion from the endotracheal tube by the suction catheter) and the applied suction pressure showed the largest influence on tracheal pressure and lung volume. Besides this, a limited influence was found of the PEEP setting on the resulting tracheal pressure. The findings of this experiment were used to advice the intensive care unit of Gelre Ziekenhuizen concerning the optimal settings for endotracheal suctioning.

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