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Adjustable and Life-Like Laryngoscopy Simulator

Technology description

Summary

When undertaken by an expert practitioner, laryngoscopy results in successful intubation in 99.9 percent of patients. Achieving that degree of expertise requires considerable practice. Students need to perform between 20-80 endotracheal intubations to develop a 90 percent success rate in patients. Expertise, equated to greater than 99 percent success, as well as skill with difficult patients will require a much greater practice base. While students can practice with the currently available airway simulators, these existing trainers are stiffer than actual patients. Furthermore, the skills developed with the current patient trainers are specific to each model, generalizing poorly to other anatomies. Thus, realistic, adjustable mannequin trainers would be a great aid in teaching laryngoscopy.

Description

Anesthesiologists and mechanical engineers from UC San Diego have teamed up to build a new generation of laryngoscopy training mannequin that features a greater degree of adjustability and realism. The size and range of motion of key anatomic features (e.g. head, jaw, cervical spine, tongue, stabilizing ligaments, vocal cords, and trachea) can be varied over the normal range of human anatomy to provide the student with experience in different patient sizes and shapes. Stiffness of the laryngoscopy-training mannequin roughly matched the stiffness measured in patients. This invention further incorporates force and motion sensors to provide feedback on how well the trainee is performing the procedure.

The dimensions, proportions, and range of motion in this life-size training mannequin are realistic, founded on extensive comparisons with human cephalometric data and orthopedic measurements. The engineering design of the joints and sliding parts allows adjustment of face and jaw length, spine and mouth range of motion, laryngeal position, size and compliance of the tongue, and the size and angle of the teeth.

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