

**Task Analysis for Rigid Scope Natural Orifice Translumenal
Endoscopic Surgery (NOTES) Cholecystectomy**

by

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ABSTRACT

Natural Orifice Transluminal Endoscopic Surgery is a new surgical technique that allows surgeons to use natural orifices, such as oral, vaginal, or anal openings to perform various abdominal surgeries. This access technique is an alternative to traditional laparoscopic approaches. Several advantages such as lower post-operative pain, reduced abdominal adhesions, and reduced complications have sparked great interest for the access technique in the laparoscopic surgical community. Since this is a relatively new technique, a thorough tasks analysis is required to determine the critical components that comprise this technique.

The purpose of this study is to perform task analysis on a rigid scope transvaginal NOTES cholecystectomy to determine important tasks for surgical evaluation, which will ultimately be used in the Virtual Transluminal Endoscopic Surgery Trainer (VTESTTM). This includes a hierarchical task analysis (HTA) followed by several Modeling and Cognitive Modeling Diagrams (MCMDs) for the new tasks associated with the rigid scope transvaginal NOTES cholecystectomy. Next, time series analysis was conducted to evaluate performance regarding individual tasks for both rigid scope transvaginal NOTES and traditional laparoscopic cholecystectomy procedures. Through this analysis, we establish certain tasks as being critical for performance evaluation. Results also indicate which subtasks require the most amount of time for completion. Error analysis for a specific component of the cholecystectomy procedure (electrosurgery) was also conducted to determine the frequency of errors during this task.