

STEM

Catheterization Lab: Staffing Decision Support Model

Student researchers: Meredith Shannon and Jon Harrell, Juniors

In a catheterization laboratory (CATH Lab), a variety of procedures are performed on the heart in order to diagnose a patient or intervene with an existing condition. Common procedures include heart stints, defect assessment, and blood-flow observations of the heart. Patient procedures frequently require different levels of staffing, completion time, and scheduling time that vary from one day to the next. Inefficient staffing in places such as a CATH Lab creates unnecessary expenses and potential risk to patients. Large overhauls in staffing numbers do not appear to be needed; however, scheduling staff more effectively may save money and reduce patient risk. The current system relies on experienced nursing knowledge to schedule staff. A decision support model can effectively aid in the placement of nurses in procedures. A model using Microsoft Excel, an existing software tool available within the hospital, incorporates historical procedural data, statistical modeling, and observation of the environment. A factor of safety along with adjustable patient severity has been included in the code of the model to emulate the realities of the environment. This model estimates staffing needs for future CATH Lab procedures and has the potential to facilitate effective

procedure scheduling. The process used to construct the Excel program for the CATH Lab can be applicable to other areas of the hospital and useful in other facilities where staffing needs vary.

Research advisor Sara McComb writes, "This project provided Meredith Shannon and Jon Harrell with the opportunity to demonstrate the utility of applying industrial engineering tools within the healthcare context. The model they developed has the potential to streamline the staffing process in the CATH Lab as well as other areas of the hospital."



A look inside a CATH Lab (photo courtesy of iStockphoto).

Shannon, M., & Harrell, J. (2015). Catheterization lab: Staffing decision support model. *Journal of Purdue Undergraduate Research*, 5, 95. <http://dx.doi.org/10.5703/1288284315673>