

ADDRESSING INFORMATION GAPS IN INTERVENTIONAL RADIOLOGY - TIPS PROCEDURES

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Introduction: Transjugular intrahepatic portosystemic shunt (TIPS) is a difficult, but lifesaving procedure in interventional radiology. During this procedure the interventional radiologist (IR) intends to treat the complications of portal hypertension by creating an intrahepatic shunt between the portal vein and the hepatic vein. Currently, the procedure may take two to four (sometimes even six) hours comprising multiple punctures with potential failure of the intervention. One successful puncture would significantly reduce intervention time and success. The aim of this study was to address the information lack regarding the intrahepatic puncture. The findings will serve as an input for future system improvement and puncture improvement.

Methods: Ethnographic studies were applied in the Netherlands. Furthermore, individual generative sessions were conducted, to obtain physicians' explicit and tacit knowledge about TIPS procedures. The sessions were held with six IRs from four different hospitals in the Netherlands and Belgium.

Results: The sessions showed that, in the procedure, several micro steps can be recognized. Micro steps are defined as the elementary cognitive actions a physician has to make. From the results, 64 different micro steps could be revealed. In 38 of these, no information or insufficient information is available. For example, current image guidance does not provide information about the location of the target vein, the blood flow in a thrombosed vein, or how to shape or position the catheter. Participants emphasized the need for three-dimensional and real-time information about the anatomy and instruments (also mentioned in literature). The most urgent main problems are: limited ability to create and maintain proper situation awareness, to predict the consequence of actions, and having limited information to build on previous attempts. Due to insufficient information, physicians are forced to mainly rely on previous experiences and base many decisions on trial and error.

Conclusion: The study showed that the IRs work with systems which involve a lot of shortcomings. There is an urgent need for improvement of these systems such as presenting the appropriate information for each micro step, improve the user interface (e.g., provide control of information selection). Developers and physicians are called to work together and improve the current situation of IRs in TIPS and design systems which provide the required information.