Materials and Methods: Outpatients in the UCSD Radiology Department waiting room received surveys to assess patient familiarity with and impression of IR, preference of MIIP versus open surgery, and familiarity with IR physician expertise (N=80; 53% females, 29% males, 19% no response; aged 53.1 ± 18.3 years, 19% no response).

Results: Only 35% of patients surveyed were familiar with IR; of them, 57% had a positive impression and 39% had a neutral or no impression of IR. Of the 11% of patients presenting for an IR procedure, 63% had a positive impression of IR. Of the 84% of patients presenting for imaging procedures, only 17% had a positive impression of IR and 77% had a neutral or no impression of IR. Information about IR physician training made 71% of all patients more confident in their expertise. Moreover, 75% of all patients would consider a MIIP if recommended by their primary physician.

Conclusion: Despite a general lack of awareness of IR and MIIP options, most patients in our study would prefer MIIP to surgery, especially if recommended by their primary physician. These data suggest that efforts to increase public awareness about IR could improve patient access to MIIP.

5:09 PM Abstract No. 163

Smartphone-based interventional radiology peer review system utilized during daily board rounds

S. Berkowitz, S. Faintuch, F. Collares, A. Sarwar, I. Brenn na, M. Ahmed, C. Yam, O.R. Brook; Radiology, Beth Israel Deaconess Medical Center, Boston, MA

Purpose: Existing diagnostic radiology peer review systems focus on diagnostic accuracy, rather than on procedural technique, and are therefore unable to assess the full spectrum of interventional radiology (IR) practice. Additionally, existing data capture tools do not fit into the workflow of interventional radiologists who already perform peer review as part of daily board rounds. We hypothesized that a smartphone-based, IR-tailored, peer review tool would capture more IR cases compared with a traditional peer review system.

Materials and Methods: We designed a mobile web application optimized for touch screen devices. During daily case review, a single attending submitted a consensus opinion on appropriateness of clinical and procedural decision making graded on a 3-point scale (agree, acceptable alternative, inappropriate). Complications were categorized using SIR guidelines. Cases were further categorized as near miss, technically successful, or learning opportunity. Free text could also be entered.

Results: Over a 6 month period, 200 cases were entered into the IR peer review system. Technical success was achieved in 181/200 (90.5%) procedures. 15 minor, and 2 major complications were recorded (7.5% and 1.0% complication rate). 7/200 (3.5%) cases were graded as acceptable alternative for technical and 2/200 (1%) cases were graded as acceptable alternative for clinical management. There were no cases of inappropriate clinical or procedural decision making. 1 near miss (0.5%) and 5 learning opportunities (2.5%) were entered. During the same time period 1 year ago, 7 IR attending staff entered a total of 101 cases into the department’s peer review system with only 13 (13%) representing IR procedures; these were all rated as complete agreement.

Conclusion: The field of IR lends itself to continuous practice improvement through daily peer review at morning rounds. We suggest an IR-tailored peer review tool to capture outcomes and clinical practice variation. Bycoupling this tool with a custom mobile application for smartphones, we collected peer review data without disturbing IR daily workflow.

5:18 PM Abstract No. 164

Readability of online patient education materials related to interventional radiology

G.E. McEntegart, M. Naeem, S.H. Ahn, J.D. Kuban, G.M. Soares, T. Murphy; Brown University/ Rhode Island Hospital, Providence, RI

Purpose: To assess the readability of Online Patient Education Materials (OPEMs) related to procedures and conditions treated by interventional radiologists.

Materials and Methods: Readability scores of patient education materials for the six most common interventional diseases/treatments were calculated and compared for the following Web sites: the Society of Interventional Radiology (SIR), Cardiovascular and Interventional Radiological Society of Europe (CIRSE), the National Library of Medicine (NLM), RadiologyInfo (RI), Mayo Clinic (MC), WebMD, and Wikipedia. The diseases/treatments included Peripheral Arterial Disease (PAD), Venous Access Catheters (VAC), Varicose Vein (VAR), Uterine Artery Embolization (UAE), Vertebral Plasty (Vert), Transjugular Intrahepatic Portosystemic Shunt (TIPS), and Deep Vein Thrombosis (DVT). Well-validated regression algorithms such as the Flesch-Kincaid Grade Formula (FKGL), Flesch Reading Ease Score (FRES), Gunning Flesch (GFG), Simple Measure of Gobbledygook (SMOG), and Coleman-Liau Index (CLI) were utilized to quantitatively evaluate and compare the readability levels. Data were analyzed using PROC GLIMMIX/SAS Software 9.3 for Windows (SAS Institute, Inc., Cary, NC).

Results: On average, online sources that required post-high school readability were Wikipedia (15.0 [13.9, 16.1]), SIR (14.2 [13.1, 15.2]), and RADINFO (12.4 [11.2, 13.6]) and that required a high school-level readability were CIRSE (11.3 [10.2, 12.4]), Mayo (11.0 [9.6, 12.5]), WebMD (10.6 [9.3, 11.8]), and NLM (9.0 [7.9, 10.2]). Wikipedia consistently required the highest-grade level readability. On average, UAE, Vert, VAR, and PAD all required higher readability (12.5 [11.2, 13.7], 12.3 [11.2, 13.5], 12.3 [11.0, 13.6], and 12.2 [11.1, 13.3], respectively). However, TIPS, DVT, and VAC required slightly less than a senior grade level readability (11.7 [10.6, 12.9], 11.3 [10.3, 12.4], 11.1 [10.0, 12.2], respectively).

Conclusion: The online interventional radiology material assessed in this study is written at a reading grade level that exceeds the recommended 6th grade level and may be too difficult to understand by patients.

5:27 PM Abstract No. 165

Major contributors to operating cost variation for common interventional radiology procedures

R.A. Charale1, R.S. Winokur1, J. Jo2, A.S. Amorosso1, B.B. Pua3; 1Radiology, NewYork-Presbyterian-Weill Cornell Medical Center, New York, NY; 2Weill Cornell Medical College, New York, NY
Purpose: A recent report has identified equipment as the single largest contributor to transarterial chemoembolization operating costs. Here, we identify major contributors to operating cost variation for common interventional radiology procedures. We hope that such information may help identify new strategies for improved cost efficiency and overall value (successful outcome/cost).

Materials and Methods: All total equipment and procedure suite costs for consecutive successful primary percutaneous nephrostomy tube (PCN) (25 cases), chest wall port (117 cases) and inferior vena cava (IVC) filter (41 cases) placements were analyzed over a three-month period, as part of division quality improvement efforts. Actual procedure suite costs were estimated with a conservative cost of $600/hour. Cost variation was analyzed per procedure and per provider to identify major contributing factors.

Results: For PCN, chest wall port and IVC filter placements, the average patient time in procedure suite was 131 min, 112 min, and 127 min, respectively. The average total cost per procedure per provider varied as much as 100% ($1126-2251) for PCN placements, 41% ($1374-1934) for chest wall ports and 22% ($2185-2681) for IVC filters. The equipment cost varied as much as 88% ($249-466), 20% ($491-591) and 27% ($1065-1358) respectively, between different providers. However, the largest contributing factor to cost variation was total procedure suite time, which accounted for 79% ($1373/1732), 67% ($1127/1672) or 53% ($1306/2482) of the total cost, respectively. Thus, despite large variations in equipment cost, ultimately total costs correlated more closely with total procedure suite time.

Conclusion: Despite vast differences in equipment cost between different operators for these common procedures within the same department, the largest contributor to overall cost remains patient in procedure suite time despite utilizing a conservative, low estimate for actual cost to operate a procedure suite. These findings suggest that utilization of equipment, which allows for expedient procedure resolution, regardless of cost, may be paradoxically more cost effective overall for select routine procedures.

Reducing delays and eliminating waste in vascular interventional radiology

M. Guimaraes, S. Brady, R. Yamada, M.B. Anderson, J.D., Adams C. Hannegan, C. Schonholz, B. Selby, Jr.; Interventional Radiology, Medical University of South Carolina, Mt. Pleasant, SC, SC

Purpose: The goal is to present the Performance Improvement project of a VIR Division, the methodology, analysis by process, how the recommendations were implemented and the project results. Initially only 20% of patients were “tabled” at their originally scheduled time which resulted in decreased accessibility, increased patient dissatisfaction, higher hospital costs, and inefficient patient workflow.

Materials and Methods: Assigning each patient a Patient Workflow Form, which required the staff to document a time stamp at each patient interaction as well as analysis by process concluded that the majority of the patients were not being “tabled” at their scheduled time. Interviews and survey results indicated that patients were dissatisfied and staff was working overtime hours to finish procedures. Inefficiencies and wasteful tasks were also identified. The strategy was to review and design more efficient workflow processes using MUSC’s IMPROVE℠ methodology which is based on Lean and Six Sigma principles. By using the IMPROVE℠ Dashboard, team members and leadership were able to measure and analyze patient cycle and lead times, percent room utilization, percent scheduled table times met, and patient/staff satisfaction.

Results: By introducing the IMPROVE℠ culture in VIR in February 2014, the “table on time” improved from 20%