Evidence-Based Practice in Diagnostic Radiology Executive Summary

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July 22, 2025

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The mission of providing high-quality healthcare is ongoing in many healthcare settings. Radiology is a unique but innovative setting with many sub-specialties. Evidence-based practice is an important topic and is linked to quality care. Evidence-based practice (EBP) uses the most current research along with the provider's clinical skill set, and patient values and wishes **(**Brunt & Morris, 2023). Radiology settings have variable use of EBP, which influences practice. A Quality Improvement (QI) project was conducted in the diagnostic sub-specialty of an outpatient radiology clinic in North Carolina to facilitate the use of EBP through practice guidelines and involve radiology staff.

Main Points

- Evidence-based practice is an essential topic in healthcare and should be used in healthcare settings, including radiology.
- Radiology practice can be influenced by organizational trends and traditions, with varying use of evidence-based practice.
- Procedural manuals (i.e., clinical tools) and practice guidelines can improve healthcare quality and standardization within organizations.
- Implementation of a clinical tool or practice guidelines should include an educational component.
- Surveys are an effective way to collect data and identify trends when implementing a quality improvement project that involves a clinical tool.

Background and Purpose

An outpatient radiology setting was the site of interest, and the problem identified was a lack of clinical policies for diagnostic radiological procedures supported by using evidence-

based practice. Diagnostics was the area of focus in this Doctor of Nursing (DNP) project. A diagnostic procedural manual was created and implemented in the clinical setting, and procedures were supported by evidence. The procedural manual included guidelines for diagnostic procedures, including gastrointestinal, genitourinary, musculoskeletal, and pulmonary systems. Before the manual's release, a literature review and synthesis were conducted involving the use of evidence-based practice in radiology and introducing a clinical tool. The review of research yielded low-level studies with limited research in radiology, and the search was expanded beyond radiology with studies from level VI to level II. The American College of Radiology (ACR) guidelines were utilized as a guide to create the manual.

The purpose of the project was to strengthen the use and knowledge of evidence-based practice in the clinical radiology setting by implementing a diagnostic procedural manual. The procedural manual is purposed to promote quality care and facilitate a culture of informed practice. The project is significant because it will provide a research-based clinical tool in the radiology setting and create an environment for standardizing care across the organization. The study included clinical staff: diagnostic radiographers, registered nurses, advanced practice providers, and physicians who were current employees and worked at the clinical site in the past year.

Methodology

The project was implemented for 12 weeks following the assimilation of a project team. A physical copy (booklet) and electronic version of the manual were released at the beginning of implementation. Research indicates that a combination of approaches, such as an educational component, should be included when creating evidence-based or quality improvement initiatives. (Ballengee et al., 2022; Cassidy et al., 2024). Huddles were conducted during the first 8 weeks of

implementation and included education regarding evidence-based practice and the diagnostic procedural manual. Data was collected, including huddle attendance and feedback about the procedural manual and the educational huddles.

The operational framework used for the project was the Six Sigma Framework. Six Sigma uses a process called DMAIC, which has five steps for quality improvement: Define (problem), Measure (status of the process), Analyze (collected data), improve (make changes as needed), and Control (develop a plan for the intervention to be consistent) (Conrad et al., 2024). Six Sigma focuses on quality improvement and problem-solving. The framework facilitates goals to provide an evidence-based resource in the clinical setting. It also encourages researchers to include a plan to make the change consistent.

The DMAIC process addresses the problem (need for evidence-based procedural manual), Measure (implementation methods such as an educational component), Analyze (identifying barriers to implementation and successful huddles), Improve (identifying that more education was need and what data collection methods can be used, and Control (reviewing he procedural manual every one to two years). The use of the Six Sigma process was a success for the project.

Results

During weeks 8 to 12 of implementation, a Qualtrics survey was released to 19 study participants to collect data about the diagnostic procedural manual, education huddles about EBP, and the implementation process. Eighteen participants completed the survey and the manual review and were included in survey questions about the manual. Trends were collected following a review of survey results. Diagnostic radiographers were the largest group of participants and had 100% participation. Among diagnostic radiographers, resistance to change was identified as

a barrier when making practice changes. Concerning evidence-based practice, 47% of participants reported being *"knowledgeable"* of the concept before project implementation, while 42% reported they had *"moderate knowledge."*

Two versions of the procedure manual were released, and 50% of participants reported they preferred both versions of the manual, while 33% reported the electronic version of the manual was preferred, and 17% reported preferring the physical manual. Ninety-five percent of participants reviewed the clinical tool one to five times during the implementation period. All groups responded with positive feedback regarding use of the manual and the format of the manual.

The education huddles were successful with 100% of participants stating that the huddles were effective. The goal was that 50% of subjects had positive feedback about the manual, including the format, access, and improved knowledge. Physicians did not receive education due to barriers in time and location. Study participants were asked about their willingness to change in clinical practice. Fifty-six percent of participants responded *"maybe"* when asked about making change in practice, 33% responded *"yes"*, and 11% answered *"no"*. Advanced practice providers and physicians identified *"time"* as a barrier to implementing research projects. Overall, the study yielded positive results from the study participants.

Strengths

Implementation tools (e.g., diagnostic procedural manual and huddle presentations) were developed before the first day of implementation, which facilitated the project's timeline. There were also multiple versions of the diagnostic procedural manual which facilitated review. The support of the stakeholders, including the practice site, practice site leadership, and information technology (IT) was also a strength in the project. Access to the practice site allowed for frequent

clinical visits and time with study participants, strengthening implementation. Lastly, familiarity with the clinical responsibilities of the study participants facilitated the project.

Limitations

The study was conducted at one clinical site within one sub-specialty; therefore, the sample size was small. Physician interest and participation was limited due to time and a high-paced clinical environment. The study was implemented for 12 weeks, which limited time to assess extensive organizational improvements. One method of data collection (email or mobile link to the survey) was offered, which could have posed limitations for the participants who did not participate.

Implications

The study promotes the use of evidence-based practice in the clinical setting. The study also offers a current assessment of practice guidelines in radiology. The organization can distribute the clinical tool among the various practice sites and facilitate a culture of standardization of care, which impacts the community, a triple aim goal. The study also addresses other goals of the triple aim by promoting quality care (patient needs) and clarifies the implications for diagnostic studies (reducing healthcare costs) (Institute for Healthcare Improvement, n.d.).

Conclusion

Evidence-based practice has an integral role in healthcare. There needs to be consistent use of EBP in the radiology setting as many barriers exist concerning research-based practice guideline initiatives. Although research in radiology is limited, studies that use evidence to create clinical tools and implement practice guidelines can be completed. The studies should include education tools to facilitate implementation and change in practice. Organizations can promote

quality care and standardize care by remaining knowledgeable of the current state of literature within the specialty. Recommendations for completing a study of this nature include formatting clinical tools prior to implementation, offering various methods for distributing data collection tools (e.g., paper, and electronic), offering flexibility, and including an educational component that targets study participants' needs.

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