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Clinical Risk Assessment for Testicular Torsion in the Emergency Department

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Quality Improvement Abstract Title

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IRB Number (if applicable): STUDY00000908

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):

Primary Investigator

Problem Statement/Question, Background/Project Intent (Aim Statement), Methods (include PDSA cycles), Results, Conclusions limited to 500 words

Problem Statement/Question:

Can implementation of TWIST scores improve the clinical risk assessment of testicular torsion and decrease healthcare costs while maintaining the timely management of testicular torsion that has previously been achieved at Children's Mercy Hospital?

Background/Project Intent (Aim Statement):

Testicular torsion is a surgical emergency with an incidence of 3.8 per 100,000 pediatric patients. Efficient diagnosis with rapid operative repair reduces the risk of testicular loss. Previous work at our institution effectively improved timely management of testicular torsion from emergency department (ED) arrival to the operating room (OR). Relying on ultrasound findings for the diagnosis of testicular may increase time to the OR and healthcare costs. The TWIST (Testicular Workup for Ischemia and Suspected Torsion) clinical score is a risk assessment tool that serves to direct the history and physical examination specifically for the evaluation of acute scrotal pain to include key factors predictive of testicular torsion. The score includes 5 components – testicular swelling, hard testicle, absent cremasteric reflex, high-riding testicle, and nausea/vomiting with a total score range of 0-7. Higher scores (≥ 5) are associated with torsion, though cutoffs vary between studies. The TWIST score has been studied since 2013, but not widely implemented in the ED setting.

For this pilot phase, we aimed to increase the utilization and documentation of the TWIST score by clinicians in their evaluation of patients with testicular torsion from less than 5% to 50%. For the next phase of this project, we plan to reduce the number of ultrasonography studies in patients with a high-risk TWIST score.

Methods (include PDSA cycles):

After IRB approval, we initiated this work in April 2019 at 2 pediatric emergency departments (PED) with a combined census of 125,000/year. Our team includes urologists, PED physicians and nurse practitioners. We used QI methodology to implement the scoring system (Figure 1). We provided education to the staff and made changes to the electronic medical record. We performed monthly chart reviews on patients with a final diagnosis of torsion. Control charts were used to analyze the data and PDSA cycles used where appropriate.

Results:

Eight months following initiation, the clinical risk assessment of the 5 elements increased in patients with testicular torsion (4.55% vs 70.37%, n = 27, p <0.0001). Among the individual elements, a statistically significant increase in documentation occurred for 3 of the 5: hard testicle (p<0.0001), cremasteric reflex (p= 0.0129), and high-riding testicle (p=0.0014). ED to OR time for these patients decreased (Figure 2, 159 min to 140 min).

Conclusions:

The documentation of TWIST scores improved using QI methods. ED to OR time decreased slightly. Our next steps are analyzing and improving TWIST documentation for all patients presenting with acute scrotal pain and reducing the use of ultrasonography for patients with a high-risk TWIST score. Local factors and implementation methods will need to be considered for generalizability.

Figure 1. Process Map, Patients with Acute Scrotal Pain

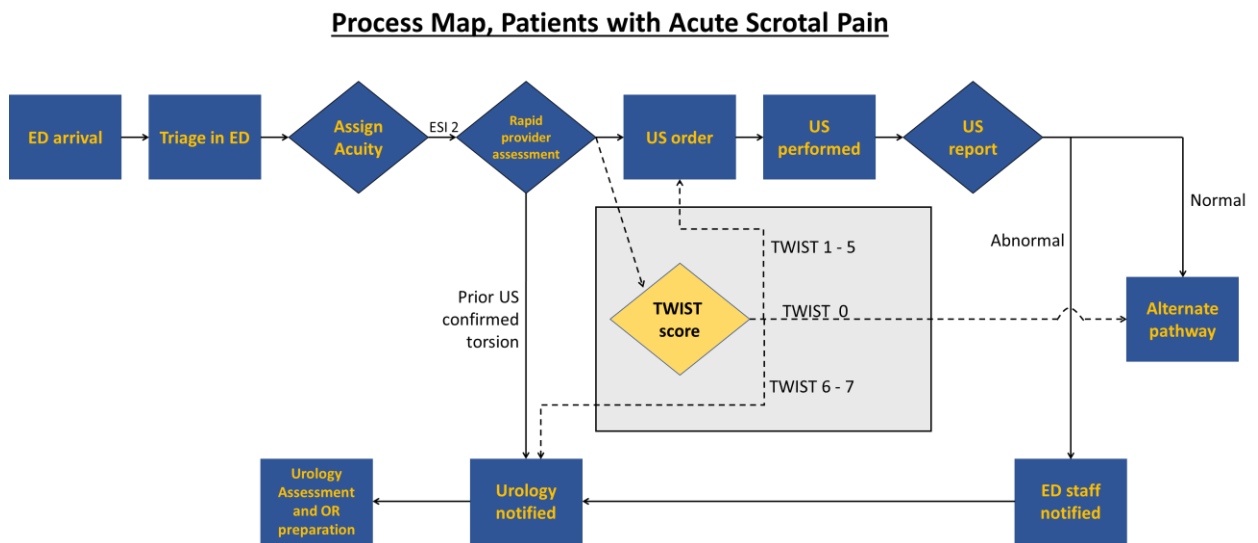


Figure 2. XbarS Chart, ED Arrival to OR time

