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Best Practices to Improve Workflow Efficiency and Quality in fURS Procedures

As a global market leader in urology, Boston Scientific has a unique window into clinical-care practices all over the world—both those proven by the test of time and those at the leading edge of quality-driven medicine. Knowing this, our customers routinely ask us to share the best of what we've seen, with an eye toward helping them improve the efficiency and quality of care that they provide their own patients.

Through our engagement with HealthEast St. Joseph Hospital & Kidney Stone Institute, which is part of Minneapolis-based Fairview Health Services, we have found that there is much to learn from their perioperative processes around flexible ureteroscopy procedures. We asked the head of KSI, Andrew Portis, MD, and key members of his OR team, Barb Olson, RN, and Suzanne Neises, RN MA CPHQ,t to share some of their knowledge and insights with us. They prepared the following paper—a wealth of best practices for clinicians seeking to provide the most efficient, best-quality patient care possible.

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Introduction

The goal of the Institute for Healthcare Improvement's "Triple Aim" framework is to optimize the performance of the US healthcare system by improving population health, patient experience during care and per-capita healthcare costs. It can be daunting to operationalize these high-level aims into project-level measures for tackling systematic inefficiencies. It is important for institutions and individual departments to avoid getting bogged down by ingrained habits and the day-to-day challenges of patient medical needs. Healthcare workers may become confused that quality and efficiency are at odds. In fact, efficiency is the necessary foundation for sustainable quality.

HealthEast Kidney Stone Institute (KSI) is an example that quality and efficiency actually go hand in hand. In this article, we will share:

- The impetus that led us to embark on our quality initiatives
- Our unique view of the interconnected domains that drive efficiency in a department
- Some general wisdom, learned from the trenches, about how to approach an efficiency initiative
- Concrete examples of how we have dramatically reduced wasted time and resources, all with the central goal of improving patient care

Patient Care and Workflow Efficiency: Two Sides of the Same Coin

KSI is centered in a 250-bed hospital in partnership with two similar hospitals within a large metropolitan healthcare system in St. Paul, Minnesota. We perform approximately 700 kidney stone procedures per year.

Early in our evolution, we encountered a situation that fundamentally altered the way we approach the relationship between efficiency and quality patient care. The Minneapolis-St. Paul metropolitan region is home to a large population of Laotian immigrants, the Hmong, who were highly influential in our program development. Based on their cultural beliefs, practices and experiences, they were reluctant healthcare consumers who firmly expected that a single medical procedure should be effective. While consistent with their tradition of animist rituals, this perspective was clearly inconsistent with community standards for management of stone disease where staged and multiple treatments were common. It was challenging to earn their confidence for an initial procedure and too often, they would not return if stone clearance was incomplete or if there were complications, occasionally with dire consequences.

We had to develop methods specifically for this population by meeting them where they were, culturally and procedurally. The onus was on us to have reliable techniques that could be performed efficiently every time, with no room or tolerance for avoidable errors. Rising to this challenge with enthusiastic support and participation from our staff and hospital, we proactively sought out and reduced potential errors, waste and inefficiency, while being more mindful, more purposeful, and improving our presence with patients. We believed then—and we know now—that we could improve quality of care, outcomes and patient satisfaction by attacking inefficiencies at every level of the process. Adapting to their appropriate expectations was the impetus that started our journey to establish the first-in-nation Joint Commission Disease-Specific Care certification in stone disease.

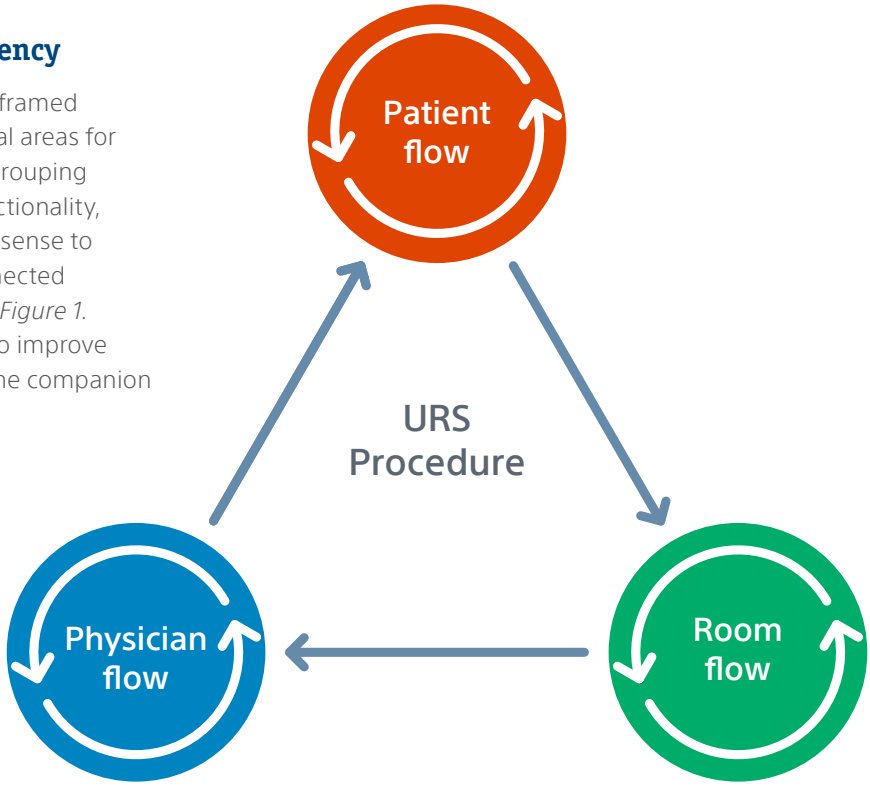
Our proof is in our numbers: Based on a recent multi-center perioperative workflow audit, KSI's typical flexible ureteroscopy (fURS) patient is admitted 1.5 hours before their procedure begins, wheels-in to wheels-out time in the OR averages 49.4 minutes, actual case duration is 21.4 minutes, and recovery (in PACU and SAU) lasts approximately 1.75 to 2 hours. Approximate total patient time in the facility, per case, is 4.07 to 4.32 hours. Efficiency efforts extend beyond the OR and re-operative rates are reported as a core performance measure of our Disease-Specific Care certification.

This resulting improvement happened over time. Similar to many medical procedures, efficiency comes with a learning curve, and our team has become more agile at improving our efficiency over time. In this article, we will share some of the key considerations we learned as we improved our work. It is paramount for readers to understand that the benefit of improved efficiency creates a foundation for meaningful, measurable improvements in the entire care of the patient.

As we have worked together on these improvements, we have seen a sense of individual ownership and accountability to improve outcomes and sustain improvement within the department. All work is done within the context of a team and where all members are valued. Beyond improved metrics on a quality measures scorecard, in our opinion, the positive human factors are what ensure lasting and continual improvement.

The Three Domains of Clinical Efficiency

A key point to our success has been how we framed the problem. When we assessed our potential areas for improvement, we realized that, rather than grouping them arbitrarily according to a particular functionality, department, team or location, it made more sense to focus on the management of three interconnected workflow domains, summarized here and in *Figure 1*. A comprehensive look at our best practices to improve workflow in these domains are provided in the companion guide at the end of this article.



Patient flow

Encompasses every staff member, activity and event that intersects the patient's path from the moment they are admitted to the moment of discharge, including all steps in admission, preoperative assessments, nursing activities, and transfers to the OR, anesthesia, the procedure, charting, recovery and discharge.

Room flow

Focuses on the OR suite itself—how the physical layout of the suite and room(s), as well as standardized systems for stocking, storing, cleaning and sterilization of supplies and equipment, can affect the flow of patients, staff and the physician through one procedure and into the next one.

Physician flow

Focuses on how the surgeon moves through the day while managing patient, family and staff interaction, performing procedures and charting.

Figure 1

Pearls for Successful Planning and Implementation

When embarking on an efficiency initiative, it can be tempting to suddenly notice problems at every turn and quickly become overwhelmed. The fundamental key is to view every step of the process through the lens of unremitting commitment to patient care and satisfaction.

Start with obvious "dissatisfiers," such as consistent delays in scheduling or unavailability of common supplies in the OR. Start small and focus on one or two improvement opportunities, removing waste that affects stakeholders or resources and does not provide value to the customer.

Measurement and standardization are essential. Determine an appropriate metric of the area targeted for improvement (e.g., elapsed time, percent of procedures started on time), and determine baseline measurement. Measures set the direction for improvement and track progress toward the goal. Standardization is the means by which we get there. Determine the set of actions to eliminate waste and improve the process. Through standardization and measurement can the team reassess to see if something is working (or not) and make adjustments.

These steps cannot be performed without commitment from leadership and empowering the people who operate the process. This will sustain lasting improvement and continue a culture of improvement.

KSI has experienced success from cross-training of staff; for example, our preoperative Surgical Assessment Unit (SAU) and Post-Anesthesia Care Unit (PACU) nurses are trained to work in both units and typically rotate through both, so they know where the bottlenecks are and associated challenges of each, and how they can contribute to maintaining flow when their counterparts are temporarily overextended. Over time, our team has developed an esprit de corps that breaks down functional and hierarchical silos. It is part of everyone's responsibilities to keep the process moving smoothly and to prevent delays in moving the process forward.

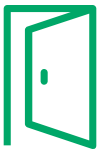
Summary and Conclusions

Quality and efficiency improvements like the ones we've undertaken at KSI are an iterative process. In our practice, we have spent 10 years making slow, steady and—importantly—cumulative progress toward our goal of eliminating wasted time and delivering value to our customers. Although every institution, team and patient population is different, the suggestions outlined here are reasonably universal and can be adapted to virtually any practice.

Workflow Best Practices

The following are specific practices we have developed, based on our iterative process of efficiency improvement, to streamline workflows for fURS patients.

Patient Flow



Room Flow

Physician Flow

1. Surgical Admissions Unit (SAU)

- Patients are admitted and discharged from the SAU.
- Most cases are scheduled as outpatients within a week of decision for surgery.
- Urgent cases, from ED or clinic, are frequently added on to the surgical schedule and are typically managed as outpatients.
- Scheduled patients receive a pre-op reminder call one business day prior to procedure.
- Patients arrive 1.5 hours prior to surgery (earlier if complexity is anticipated).
- SAU charge nurse manages flow of patients and works with OR charge nurse and OR circulating nurse to tweak the days schedule as needed for emerging issues.
- Anesthesiologist and surgeon discuss any specific case concerns early in the day.
- Patient meets with anesthesiologist, CRNA and surgeon to confirm preoperative assessments and counseling.
- OR circulating nurse wheels patient from SAU to OR.

2. Operating Room

- Each day prior to first surgery, the laser tech picks up the day's "surgical scorecards," a standardized summary of key instructions for each case compiled by surgeon (see Physician Flow section). The laser tech distributes copies to all team members and mounts additional copies in each OR.
- For each case, scrub tech ensures disposables and durable equipment are available and sterile while waiting for patient.
- Prior to procedure, OR circulating nurse and scrub tech review equipment and supplies and confirm that anticipated resources are available.
- CRNA prepares the patient for induction and a circulating anesthesiologist, who may be covering several rooms, is present for induction and awakening.
- Following sedation, the circulating nurse preps and positions the patient for surgery.
- Scrub tech assists with patient transfer, positioning, draping, clamps lines, light cord, camera cord and irrigation devices.
- Briefing: Surgeon, circulating nurse and staff review to confirm correct patient and correct surgery.
- Formal time out: OR team members recite procedure out loud to reinforce common understanding and team communication.
- During the procedure, the scrub tech manages disposables and operates basket for stone retrieval.
- Laser tech (RN or CST) ensures laser can be safely fired and adjusts settings as needed during the procedure. As laser is actually in use for brief period, the laser tech is typically available to assist with room efficiency.
- Circulating nurse is able to perform charting in EHR in real time during surgery.
- When two ORs are in use, room-one nurse notifies room-two nurse to bring next patient from SAU when surgeon is confident that room-one procedure is approaching conclusion (typically near completion of fragment clearance).
- Just prior to closing, the circulating nurse calls to alert PACU and request recovery bay.
- Circulating OR nurse and CRNA escort patient to PACU and hand off to the PACU nurse.
- Scrub tech helps with room cleanup and resets room for the next procedure.

3. Recovery in PACU

- Patients recover in the PACU before returning to the SAU for Phase 2 and discharge.
- Anesthesiology leaves existing orders for nurses to follow in recovery and is available as needed for further issues.
- PACU nurses monitor the status board and prepare for patients coming from OR.
- Patients typically stay in the PACU 45 to 60 minutes. For some patients without pain/nausea, it can be as short as 30 minutes.
- As they are cross-trained, PACU nurses can complete Phase 2 of recovery through discharge if necessary.

4. Discharge from SAU

- Phase 2 takes place in SAU and lasts approximately 1 hour.
- Patients are scored on a 12-point scale and can be discharged at 10 points.
  - Blood pressure near baseline, 2 points
  - Oxygen levels near baseline, 2 points
  - Pain controlled, 2 points
  - Ambulation, 2 points
  - Fluid intake, 2 points
  - Urinary comfort, 1 point
  - Voiding bladder, 1 point
- Pain and nausea management is continued and proactive.
- Patients receive detailed printed discharge instructions as well as verbal education regarding common side effects (such as blood in urine), when to call surgeon for side effects, and scheduling the follow-up visit.
- One business day after surgery, an SAU nurse follows up by phone to review pain levels and management, escalate problems to nursing management, and remind patients to schedule a follow-up appointment with surgeon.

1. Room Setup

- Two ORs are typically used for fURS cases and allow identical setup.
- Flexible ureteroscopy cases are performed on an operating table capable of holding patients weighing up to 500 pounds in the Trendelenburg position.
- OR setup is consistent for all cases. Lights, camera and irrigation cables are secured at patient's right leg; C-arm is operated from patient's left-hand side; and laser is close to patient's right leg.
- Additional ORs can be rapidly set up and serviced with mobile equipment and supply cart.

2. Patient Positioning

- Patients are in the Trendelenburg position.
- The patient's right arm is abducted and the left arm and hand are tucked to facilitate c-arm positioning.

3. Disposables

- Locating disposables and instruments in close proximity to the OR reduces staff time to retrieve the items.
- Disposables are not opened until they are needed. Common disposables are pulled using a preference card for each case and kept on a supply table just behind the surgeon. Less common disposables are kept in a supply room just outside the OR.
- A single-use flexible digital ureteroscope is available for more difficult cases that may damage a reusable scope, such as a harder stone requiring more laser use and more physical manipulation.

4. Instruments

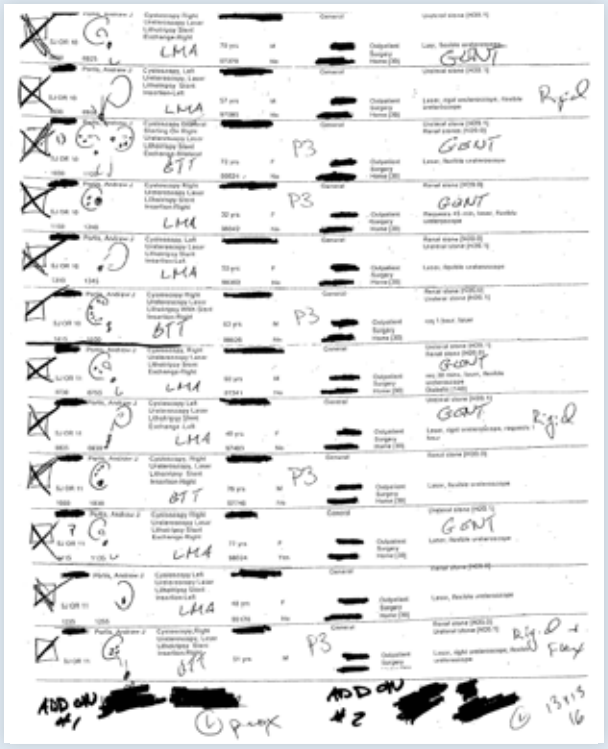
- Instruments are stored just outside the two primary ORs used for fURS cases, along with supplies.
- Both rigid and flexible scopes are available but aren't opened until surgeon is completely certain what he needs.
- A total of 13 flexible ureteroscopes and 4 rigid ureteroscopes are available to allow for continuous turnaround without rushing.
- Initial cleaning is initiated in the OR at the conclusion of a case. Instruments are then moved to a soil room and the sterile processing department (SPD) team is notified for pickup of all reusable scopes. In accordance with HealthEast policy, cleaning begins within one hour of the case.
- Scopes are cleaned according to IFUs and then sterilized in the STERRAD gas plasma system.
- The fastest possible turnaround for instruments according to policy is 3 hours.
- The sterile process management (SPM) system uses barcoding, STERRAD pass/fail indicator and biological markers to ensure proper sterilization technique and tracking.
- Cleaned reusables are stored in plastic trays, wrapped and sterilized, and transported to their storage area outside the OR on a covered cart.
- The materials manager pulls a needs report every day from the EMR to understand what instrumentation is needed for the next day.

5. Housekeeping

- AORN guidelines for proper OR cleaning are followed.
- The goal for room turnover (wheels-out to wheels-in) is 22 minutes for fURS cases.
- Current turnover is about 28 min, down from 36. Overall hospital OR turnover is 54 min.

1. Preoperative

- In advance of the operative day, the surgeon prepares a "scorecard" (Figure 2). Scorecards outline case details, stone location, anesthesia preferences, preferred equipment and disposables, etc.
- The scorecard is a template to guide the entire team's efforts, enables extremely efficient communication between all personnel, and highlights contrasts between routine and unusual or important aspects of each case.



(see "Figure 2 - Dr. Portis's Scorecard" on page 10)

- Expected course of procedure is discussed during the OR briefing, and "oddball" cases are discussed with appropriate personnel before the patient is transferred to the OR.
- On the day of surgery, surgeon meets with patients briefly to confirm procedure understanding, answer questions, and remind the family of anticipated procedure time.

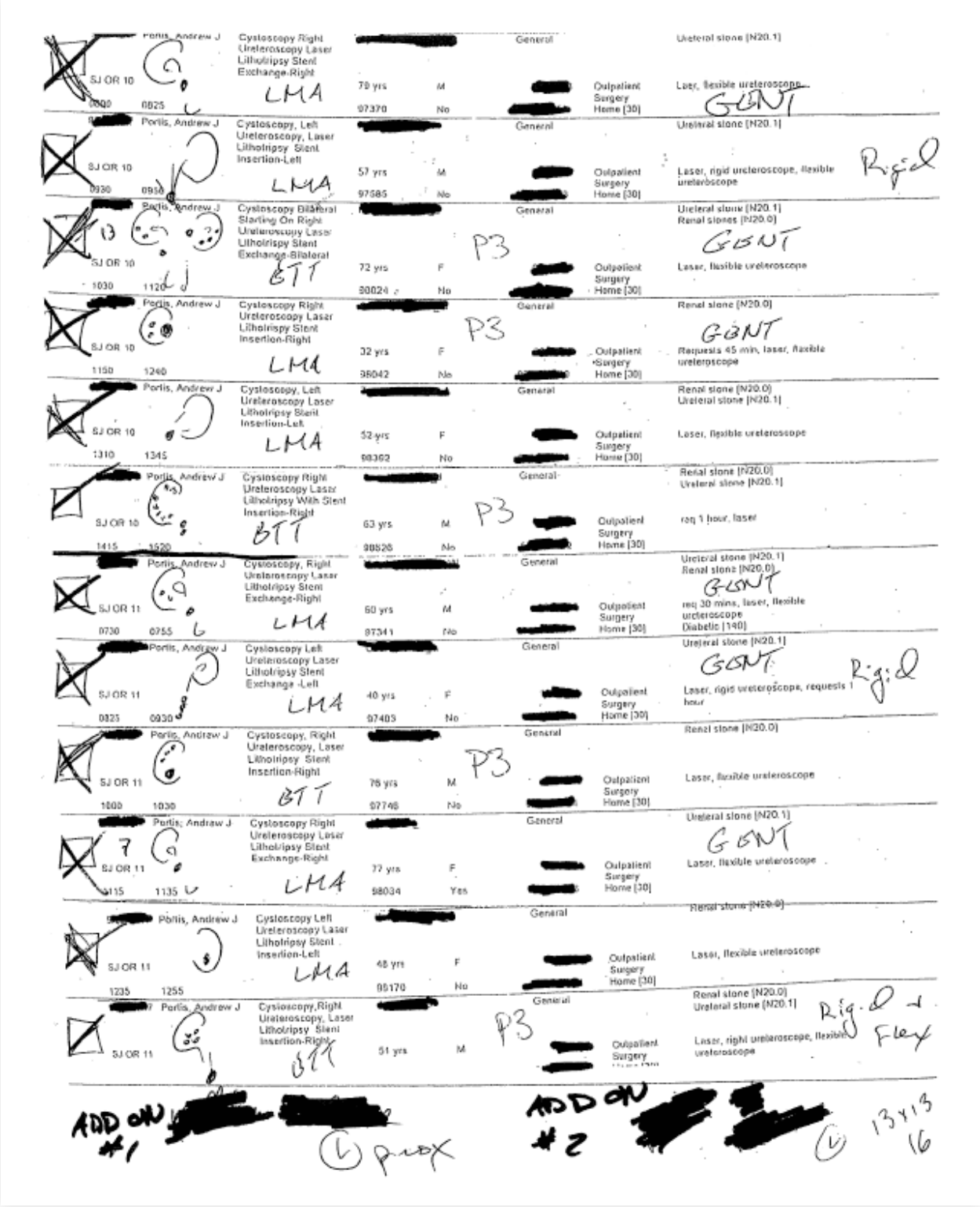
2. Intraoperative

- New cases start every half an hour, so an efficient, standard routine for preoperative visits, procedures and charting is essential. The first three patients are typically available before the first case starts. After the first procedure he then charts his notes, orders and prescriptions for the first case and talks to family. He then sees the fourth or the fifth patient, performs the second case and so on.
- Efficient charting is made possible by templated notes in the EMR for most standard cases.
- High-quality video is essential to efficient fURS procedures. We have transitioned from analog to digital reusable ureteroscopes. The LithoVue™ Single-Use Digital Flexible Ureteroscope is available at our center for "scope killer" cases. For less extreme volume centers, the LithoVue device provides an option for high-quality, digital visualization without the up-front capital outlay.
- We are able to efficiently fragment and extract complex stone burdens. Complete clearance is central to our commitment to avoid unnecessary repeat surgery.

3. Postoperative

- Surgeon debriefs the patient's family and does not typically see the patient prior to discharge.
- Patients return to the clinic at 1 to 2 weeks for follow-up appointment and stent removal, and again in 1 month post-op imaging, if indicated.
- Education for risk reduction to discuss preventing future occurrences is done in a redundant fashion with various clinic staff members, including Surgeon.

Figure 2 - Dr. Portis's Scorecard



IMPORTANT INFORMATION: These materials are intended to describe common clinical considerations and procedural steps for the use of referenced technologies but may not be appropriate for every patient or case. Decisions surrounding patient care depend on the physician's professional judgment in consideration of all available information for each individual case at hand.

Results from case studies are not necessarily predictive of results in other cases. Results in other cases may vary.

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