**ASHE Workshop: Quality Improvement Work is Scholarly Activity**

**Quality Improvement Case Study**

Vascular surgery is involved in the care of dialysis and CKD (chronic kidney disease) patients with pending renal failure for the purpose of creating and maintaining dialysis access. This means that we are tasked with creating AV (Arteriovenous) fistulas, AV grafts and placement of tunneled dialysis catheters for patients who are pending/undergoing dialysis. For those patients already on dialysis with an AV fistula or AV graft we are often tasked with performing maintenance vs emergent procedures to keep these functional. These procedures include fistulagram/plasty (an endovascular procedure to treat areas of narrowing) for fistula stenosis, open thrombectomy for fistula/graft thrombosis, revision for aneurysmal fistula and any other necessary procedures to maintain patency/functionality of their life sustaining dialysis access.

These patients are referred to us primarily from the Nephrology service either in preparation for pending dialysis vs urgently/emergently when their current access becomes non functional.

For patients who are referred to us for preemptively for creation of dialysis access they are seen in the Vascular surgery clinic by an attending provider with concurrent noninvasive vascular lab studies for vein mapping. The procedure that is recommended based on the patients anatomy is then discussed with the patient in detail as well as any possible concerns or complications that can be reasonably predicted.

The patient is then scheduled for surgery. The vascular MA will give the patient a written instruction sheet that includes a list of medications to be held, modified or continued on the day of surgery. This also includes things as basic as the date of their procedure and instructions about how their time will be assigned and who will call them vs when/where they should call for these times. The vascular APC then places preoperative orders for the scheduled case to include preoperative labs, insulin, as needed, INR (international normalized ratio for patients on long term anticoagulation on warfarin) as needed, etc. based on the attending H&P and chart review.

Problem:
When these patients present to SDS they are often not entirely sure what procedure they are having. They are a complicated patient population with multiple comorbidities and difficulty managing them. It is not uncommon for them to present having taken ALL of their normal home medications or NONE of their home medications, which can affect the anesthesia plan. Additionally, they will present without a ride, having eaten or late. That is when they present at all, as there is a frequent no show rate.

For those patients who are already on dialysis, it is a problem that they present on their regularly scheduled day of dialysis without having presented for an extra dialysis session, or having just skipped dialysis, or also having actually attended dialysis however, pre operative labs demonstrate hyperkalemia.

All of these things combined result in multi-step complications for the patient as well as the surgical staff.

From the patient standpoint if they present with hyperkalemia this can frequently result in cancellation vs delay of their procedure. Depending on the level of their hyperkalemia it sometimes results in emergent admission to MICU for placement of Shiley (temporary dialysis line) and emergent dialysis.
When they present having eaten their case is cancelled and has to be rescheduled. This requires having to set up transport as well as time away from work/dialysis etc. again. Not to mention that they are now further delayed in having durable dialysis access.

From an OR/surgical standpoint these problems can result in not only delays in that patient case but in all subsequent cases. Also, when the patient doesn't show and we don't have other inpatient cases that we can move forward with it results in an OR sitting empty and all the staff (RN, scrub, anesthesiologist, etc.) sitting around doing nothing. The exact opposite can occur when we are delayed by having to deal with other medical issues in that we go over time and into the afternoon when the OR has less staffing resulting in various staff (RN, scrubs, IR tech) being held over, called in or similar.

Historically, we (the vascular surgery group) have made attempts to schedule all dialysis patients on their non-dialysis days. When this is not possible we have communicated to them directly that they will need to have dialysis the day before. Sometimes, when time allows our NP in clinic will call the dialysis center directly or have an MA do so however, time and resources limit this. Patients are given written pre-operative instructions about preparing for their surgery but this is not specific to dialysis patients nor does it include any additional information about fistulas/dialysis as we had been under the belief that this is discussed in the Nephrology clinic.

With the restrictions of COVID-19 and the OR transitioning to a urgent/emergent only case load we were given a unique opportunity to take a more active roll in preparation of these patients given the need to have preoperative COVID-19 testing prior to presenting to the hospital. To this end a patient list that was categorized by urgency of need for dialysis access was created and was managed by Dr Kraiss. He worked closely with our MA staff who did not have to manage clinic to contact patients prior to surgery, give them specific instructions about their COVID-19 testing, answer additional questions as well as closely following to ensure the COVID-19 testing was done and negative. During this time we had almost no cancellations, no shows or patients presenting unprepared for surgery. We did still have some hyperkalemia however this is likely a result of their disease status and adequacy of their dialysis access, particularly in the patients with AV fistula stenosis.

**Patient Perspective**

I am a patient whose kidney function is declining. I have been seeing my regular doctor who I have known for a long time. She lives in my community and speaks Spanish, as I do. She told me I need to go and see a kidney doctor at the University to talk about what is next. She gave me the phone number to call and told me to make an appointment.

I am at my appointment with the kidney doctor. The office is very busy, and no one speaks Spanish. I brought my daughter to translate and they are going to get a translator for the doctor. The doctor tells me that my kidneys do not work anymore, and I need something called dialysis. The doctor asks if I have questions, but I don't know what to ask. The doctor tells me I need to see a different doctor to make the dialysis work. They tell me to come back to the University on a different day, then they give me a stack of papers and send me home.

I come back to the University for an appointment with a different doctor. I am late because I use Trax to come to the hospital. No one can come with me today because my family is all at work. The new doctor looks at my arms and tells me that I need dialysis and they will fix it for me. They tell me I need to come back on another day to get the dialysis surgery. They say someone will call and tell me when.

The nurse calls and tells me I have surgery next week and someone will call me the night before. When someone calls the night before, they use a translator and explain what will happen. They tell me not to eat or drink and they tell me to take some medicines but not others. It was a confusing list and I am not sure about my diabetes medicine. They said I need a ride for after surgery. I will have to find someone who can drive me, or I will take a taxi. They ask a lot of other questions but it is a lot of information and I am sure everything is all prepared from the other doctors that I saw so I do not mention the new pain in my chest that I sometimes have when I walk to the store. They tell me to come at 6 am for my surgery at 7:30 am. I will do my best

I come for surgery, but I am late. The train broke down, so I do not arrive until 7:30 am. I am glad I did not miss the 7:30 am surgery time though. I did not take any medicines including my diabetes medicine so that I do not mix up the list. I hope my friend can pick me up after, but I will call them when I am done. If not, I will take the train like I usually do for my appointments.
I know I need the dialysis because my legs are very swollen, and I am tired.

The nurse sees me and takes my blood and then a new doctor comes to see me. They are very worried about my chest pain and swollen legs and keep saying I need dialysis now. I am confused because this is why I am here. They say I am not getting surgery today and I need to come in the hospital. They are also upset about my blood sugar and keep asking where my family is. I am confused. I know I need dialysis that is why I am here today.