DAVID D. THIEL: Mayo Clinic treats a high volume of complex testicular cancer, muscle invasive bladder cancer, and kidney cancer patients.

BRADLEY C. LEIBOVICH: There's going to be not just a specialist, but a super-subspecialist taking care of them-- and not just in one discipline, but in all disciplines, whether it's surgery, whether it's pathology, diagnostic radiology, medical oncology-- there's people that are super-subspecialized in these rare cancers. Testicular cancer is actually pretty rare. There's about three out of 100,000 men in the United States that will be diagnosed with testicular cancer, which makes for about eight to 10,000 cases per year.

BRIAN A. COSTELLO: Although testis cancer is a highly curable cancer, there's still approximately 400 men per year in the US who will die of testis cancer. And when these cases get complex, they get very complex.

BRADLEY C. LEIBOVICH: Most often, testicular cancer spreads around the great vessels-- the aorta, the vena cava, involving the renal vessels, involving the ureters, often the kidneys-- it can affect the bowel, it can affect other structures in the retroperitoneum, and of course often spreads into the thoracic area.

BRIAN A. COSTELLO: Testicular cancer cells will spread through the lymph channels up into the retroperitoneum. So if it's a left-sided testis cancer, usually you will see, if it spread, a left-sided retroperitoneal lymph node mass. And the same thing goes for the right side.

BRADLEY C. LEIBOVICH: A retroperitoneal lymph node dissection is a complex operation. We have to move the great vessels out of the way. We have to move the ureters out of the way, the kidneys out of the way, the renal vasculature out of the way, and you have to assure that you get every last bit of tissue in the retroperitoneum removed in order to assure a long-term outcome.

DAVID D. THIEL: Dr. Castle at Mayo Clinic Arizona is one of the pioneers in developing the robotic-assisted laparoscopic retroperitoneal lymph node dissection for testicular cancer. Robotic-assisted surgery allows us to do complex surgeries through small incisions in the abdomen, which translates into less hospital stay, improve recovery, and even less blood loss for most of our complex oncology cases.

ERIK CASTLE: The benefits of it are pretty simple-- what we would expect with any minimally invasive

surgery-- which is less blood loss, shorter recovery-- with respect to patients being discharged home the very next day.

BRADLEY C. LEIBOVICH: Testicular cancer affects young men, mostly in the teens to the mid-30s, but there is a second peak in the 50s and 60s. The majority of patients are curable, even those patients with advanced disease, as long as it's done right the first time. There's lots of considerations other than just curing testicular cancer for these young men. So we do want to preserve their ability to have children long term. That includes sperm banking prior to treatment and includes making sure that we address their fertility issues after treatment.

BRIAN A. COSTELLO: Sometimes we elect to not do surgery or, for example, not do chemotherapy. So the real goal here is to get a man as much treatment as he needs but not too much.

BRADLEY C. LEIBOVICH: Bladder cancer is typically a disease of older men. It has multiple known risk factors, and the biggest one there is tobacco exposure. For patients with lower stage disease, we can often manage bladder cancer with simply endoscopic techniques within the bladder. For patients with muscle invasive and locally advanced disease, then most patients need a cysectomy.

DAVID D. THIEL: Muscle invasive bladder cancer is an aggressive cancer that affects about 20,000 Americans per year. It affects both men and women, and its cure requires a complex multidisciplinary approach. The trend now in muscle invasive bladder cancer is to offer neoadjuvant chemotherapy or chemotherapy prior to surgery, as it has demonstrated survival benefit.

BRIAN A. COSTELLO: If they're not eligible for Cisplatin, they need to go directly to surgery if they're considered a candidate for a cysectomy. Another option would be for patients who choose not to have a cysectomy, or who are deemed not to be a surgical candidate-- would be to have so-called trimodality therapy, which entails a transurethral resection of the bladder tumor through a cystoscope, followed by radiotherapy and radio sensitizing chemotherapy. That allows the patient to have bladder preservation-- that they can urinate normally, and they do not have to go through a big operation to remove the bladder.

DAVID D. THIEL: Surgeons at Mayo Clinic offer complex urinary diversions following bladder removal. An example of this would be a neobladder. This would allow the patient to urinate normally through the urethra following bladder removal.

BRADLEY C. LEIBOVICH: Unlike bladder cancer, there are not major risk factors for kidney cancer. Kidney cancer affects about 60,000 people in the United States per year, slightly more men than women. Kidney

cancer affects people in their 50s, 60s, and 70s for the most part but can occur in younger patients.

BRIAN A. COSTELLO: The classical triad of hematuria, flank pain, and a palpable renal mass only accounts for a very small number of presentations of kidney cancer anymore. Previously called the internist's tumor, only about 9% of those patients were present in that way. Approximately 50% of patients now present with an incidental finding on either an ultrasound, a CT, or an MRI done for some other reason.

DAVID D. THIEL: Renal cell carcinoma can be an extremely aggressive disease. Its incidence is increasing. It affects men and women equally.

BRADLEY C. LEIBOVICH: And it has a predilection for invading the renal vein, growing up the renal vein into the vena cava, often even into the right atrium. One of the things that's great about working here as a surgeon is the fact that I have colleagues in cardiac surgery, vascular surgery, who can help me with these very complex resections. On occasion, we need to do an en bloc resection of liver, pancreas, the spleen, the head of the pancreas, and even do a Whipple in conjunction with an atherectomy.

BRIAN A. COSTELLO: At Mayo Clinic, we have expertise across the board in genitourinary cancers, and we work very closely as a multidisciplinary group, particularly on those types of cancers whereby we need to have many different specialists involved.