While surgery is the mainstay of treatment of almost all colorectal cancers, a multidisciplinary team approach is especially important in the management of rectal cancer.

Affecting 150,000 people annually, colorectal cancer is the fourth most common cancer (after breast, lung and prostate) and the second leading cause of cancer death (after lung cancer) in the United States. Prevention through polyp screening is key in making inroads in lowering the incidence of this all too common affliction. Early diagnosis of already established disease can lead to cure in many cases. While technically the colon and rectal mucosae are the same cell types, rectal cancer is considered to be significantly more aggressive and difficult to manage.

ANATOMY - KEY TO UNDERSTANDING AGGRESSIVENESS.
The rectum is the last 15-20 centimeters of the colon, and ends at the beginning of the anus. The rectum is lined by the same glandular cell type as the rest of the colon but the surrounding wall differs in several aspects. The upper rectum is composed of four layers; the mucosa, submucosa, two complete muscular layers and visceral peritoneum. The lower rectum is similar, but there is no true visceral peritoneum below the peritoneal reflection. This lack of peritoneum plays a significant role in aggressiveness of mid and low rectal cancers, as there is no barrier to lateral growth or extension. Without this additional peritoneal barrier, cancers can extend into the pelvic sidewall, as well as the bladder, uterus, vagina or prostate. Cancer in the lower rectum may extend into the anal canal and sphincter complex, which complicates surgical resection options.

Importantly, the lymphatic drainage of the rectum differs from the rest of the colon. The lower rectal lymphatics drain viscerally to the liver and also systemically via inguinal pathways. This dual drainage system can allow rectal cancers to bypass the liver and spread directly to the lungs or other areas. Metastatic disease may be more common in rectal cancer, and directly affects survival rates.

DIAGNOSIS - EARLY DETECTION, KEY TO SURVIVAL.
Colonoscopy is critical in detecting colon and rectal cancers. It is recommended that screening begin at age 50 for average risk individuals (45 in African Americans). In individuals with first-degree relatives with colon or rectal cancer, screening should begin at 40 years of age, or 10 years prior to the age at which the family member was diagnosed, whichever is earlier. Given a recent trend in the presentation of colorectal cancer in younger individuals, diagnostic colonoscopy should be considered in any patient at any age with significant rectal...
bleeding, rectal pain, tenesmus or a change in stool caliber. Early detection allows for aggressive treatment, which can allow curative treatment of rectal cancers.

**STAGING – KEY TO CORRECT TREATMENT.**

As with many cancers, survival is mostly predicated on Tumor thickness, Nodal disease and Metastatic disease (TNM). Staging is determined by a combination of the TNM status as follows:

**Stage 1:** T1 or T2, N0, M0 (into the submucosa, or the muscularis; no other spread)

**Stage 2:** T3 or T4, N0, M0 (through the muscularis into surrounding tissue or structures; no other spread)

**Stage 3:** Any T depth, N1, M0 (any depth, but with involved lymph nodes)

**Stage 4:** Any T depth, any N status, M1 (any depth, any node status, but with distant spread)

For accurate rectal cancer staging, preoperative investigations involve a multimodality approach. Use of trans-anal rectal ultrasound or pelvic MRI helps in evaluating the tumor depth, lymph node status or invasion of surrounding structures. CT scans or PET scans of the chest, abdomen and pelvis will help evaluate for metastatic disease.

**TREATMENT – KEYS TO CURE.**

While surgery is the mainstay of treatment of almost all cancers, a multidisciplinary team approach is especially important in the management of rectal cancer. Upper rectal cancers are treated similarly to colon cancer and surgery is typically the first step in treatment. For stage 3 disease (cancers with lymph node spread), chemotherapy is administered after surgery. Radiation therapy is not indicated due to increased risk of damage to small bowel and radiation enteritis in this area.

Mid and distal rectal cancers (below the peritoneal reflection) are treated differently depending on the TNM stage:

**Stage 1** mid/low rectal cancers are treated surgically with a mesorectal dissection. This approach involves a complete resection of the mesenteric envelope of the rectum and has been associated with decreased positive resection margins and local recurrence. Robotic surgery has improved the technical aspect of pelvic surgery with improved visualization and improved outcomes, even in a narrow, deep pelvis. Recovery times are usually faster when a robotic approach is undertaken, as the small operative extraction incision can be placed low on the abdomen.

**Stage 2** mid/low rectal cancers may be treated with preoperative combination chemotherapy and radiation therapy for at least six weeks, followed by a “rest” period and a subsequent mesorectal surgical excision. This “neoadjuvant” approach is somewhat unsettled and many surgeons only give neoadjuvant therapy for bulkier stage 2 rectal cancer in order to improve the margin clearance and increase successful sphincter preserving resections.

While stage 2 disease has no involvement of lymph nodes, there is a higher risk of radial margin involvement due to the lack of a peritoneal layer. Trans-anal rectal ultrasound and MRI are excellent for lymph node staging, but can have a 20% false negative lymph node diagnosis.

**Stage 3** mid/low rectal cancer (those with lymph node involvement) are treated with pre-operative chemotherapy (5-FU based) and radiation for six weeks, followed by a 6-10 week rest period after which a mesorectal surgical resection is performed. Neoadjuvant therapy has been shown to be superior in decreasing local recurrence, increasing disease free survival and possibly increasing overall survival. Furthermore, as compared to post-operative chemoradiation, preoperative treatment avoids radiation damage to the neorectum (the newly created rectum) thereby improving functional outcomes. Down-staging of the original tumor and increased ability to obtain a clear distal margin has also improved our ability to perform sphincter saving operations and decrease the need for a permanent colostomy. However, if the anorectal sphincter complex is involved preoperatively, an abdominopерineal resection with a permanent colostomy will still be recommended, as the sphincter complex will need to be resected in order to obtain true clear distal and radial margins.

**Stage 4** mid/low rectal cancers, which, by definition involve the presence of distant metastasis (liver/lung), are treated initially with aggressive chemotherapy, as a rectal resection will not affect overall survival. If metastatic disease can be reduced or eradicated, then surgical intervention of both the metastatic lesion and the primary rectal lesion may be considered with curative intent. Radiation therapy is typically not employed, as it only treats local disease, and is used in cases of local recurrence following surgery.

**SPECIAL CONSIDERATIONS – KEY FOCUS ON THE PATIENT.**

Low-lying T1 or T2 node negative lesions can be resected with a transanal approach. Lesions with favorable features (mobile, well differentiated, < 3 cm, no perineural invasion) may be resected with a variety of transanal techniques, thereby avoiding the morbidity associated with transabdominal resection. If post-operative pathology is less favorable than anticipated, then post-operative chemoradiation therapy has shown good overall results. This treatment approach must be discussed with the patient, as this limited operation may have a higher recurrence rate when compared with the standard abdominal surgical approach.

Elderly patients or patients with poor functional reserve and significant comorbidities may be treated with surgery alone if life expectancy is considered to be less than 5 years. Local disease control and quality of life should be in the forefront of discussions with such patients.

Complete pathologic response has been shown to occur in 16-27% of patients with stage 2 and 3 disease who have undergone neoadjuvant therapy prior to a planned surgical resection. This has raised the question of forgoing surgical resection in patients who show a complete pathologic response, thus avoiding the morbidity associated with surgery. This approach is still under investigation and not considered standard of care. However, some studies have shown promising results with this approach. Obviously, close observation is undertaken in those patients who do not undergo an operative procedure following neoadjuvant treatment.

Bulky tumors with invasion of nearby organs may be amenable to pelvic exenteration; whereby the rectum and involved organs (bladder, prostate or uterus) are removed en-bloc. Careful selection of patients is critical in order to obtain a margin free resection, as this surgery carries significant morbidity and mortality.

**THE KEY TO SUCCESS? EDUCATION, PREVENTION AND A KNOWLEDGEABLE TREATMENT TEAM.**