



CORE CURRICULUM

FOR

COLON AND RECTAL SURGERY

RESIDENTS

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The intent of this document is to provide a comprehensive core curriculum to be used by program directors and residents in colorectal surgery for teaching and learning purposes.

CORE CURRICULUM FOR COLON AND RECTAL SURGERY RESIDENTS

The goal of the Colon & Rectal Surgery Residency Training Program is to train safe, competent, and confident surgeons who are experts in the field of colon and rectal surgery and are committed to ongoing learning through study and assessment of their outcomes. Graduates of the program will be committed to and capable of making significant contributions to the field of colon and rectal surgery through teaching, leadership, and scholarship.

PATIENT CARE

The competency of patient care is the foundation of a physician's education, as patient care is the basis for our profession. All the other competencies should improve patient care. Developing the skills, knowledge, and attitude that leads to excellence in clinical competency requires the trainee to assume personal responsibility for the care of the individual patient.

GOALS

Graduates of a colon and rectal surgery residency will be able to provide patient care that is compassionate, appropriate, and effective for the treatment of colorectal health problems and the promotion and maintenance of health.

OBJECTIVES

Following satisfactory completion of a residency in colon and rectal surgery, residents should be able to:

1. Perform a thorough and competent patient assessment.
2. Make decisions about diagnostic and therapeutic interventions based on current scientific evidence, patient **information and preferences**, and clinical judgment.
3. Develop and carry out outpatient management plans.
4. Counsel and educate patients and their families using effective communication skills in a caring and inclusive manner.
5. Articulate the rationale for approaches, decisions, and judgments to patients **and their families** as well as other healthcare providers.
6. Competently perform all medical management and invasive procedures considered essential in the field of colon and rectal surgery, including abdominopelvic and anorectal operative procedures, diagnostic and therapeutic colonoscopy, anorectal ultrasound, and anorectal physiology testing and its interpretation.
7. Demonstrate competence in the application of clinical and basic science knowledge to make sound pre-operative and intra-operative decisions **and to cope with unexpected findings or developments in the operating room independently.**
8. In conjunction with the program and faculty, actively participate in patient safety systems and contribute to a culture of safety.

9. Provide safe and competent perioperative care, including the timely recognition of surgical complications.
10. Demonstrate competence in the application of knowledge to provide sound solutions in the management of unexpected surgical complications.
11. Know their role and responsibilities and how to report patient safety events including adverse events, and close calls (near misses) through the appropriate preferred system (Culture of Safety).
12. Work effectively with healthcare professionals from a broad spectrum of other disciplines to provide patient-focused safe, interprofessional team-based care.
13. Provide healthcare services aimed at preventing health problems **and maintaining health**.
14. Understand the circumstances that supervision of a trainee is needed for safe patient care. Both direct (attending physician present) or indirect (attending physician immediately available) are acceptable and should be available to the resident. Progressive authority and responsibility with conditional independence are strongly encouraged. (Culture of Safety).

Examples of specific activities which may be used to improve patient care skills and to evaluate the resident's progress may include but are not limited to (elements in bold are required by the ACGME):

1. Allowing the resident to meet with patients and their families in the outpatient clinic to discuss the reason for their consultation and the appropriate surgical and non-surgical treatment options.
2. Having the resident participate in the formulation of a care plan for the patient with the supervision of the attending surgeon, including a discussion of risks, benefits and alternatives of proposed treatments, and obtaining informed consent for proposed surgical and endoscopic procedures.
3. Having the resident perform a wide variety of abdominal, anorectal and endoscopic procedures either as the surgeon or as the first assistant. All procedures are performed under the direct supervision of an attending physician who ensures that the resident is functioning in a skillful and safe manner. Patient safety is paramount at all times.
4. Allowing the resident to participate with the attending surgeon in formulating a postoperative care plan, and to communicate this to the patient.
5. Having the resident see patients on rounds in the hospital with faculty and discuss progress with patients and their families.

6. Having the resident file a “near miss” event through the preferred system that aggregates all adverse event or close calls.
7. Involving the resident in multidisciplinary discussions with the patient, family, nurses, dietitians, social workers, and other healthcare personnel as appropriate.
8. Having the resident follow the patient in the clinic after discharge from the hospital to ensure that the postoperative plans have been implemented and remain effective.
9. Supporting the resident’s participation in the preparation and presentation of educational conferences, such as Journal Club and Morbidity and Mortality Conference, which provide the resident the opportunity to review scientific evidence relating to the treatment of patient problems and to improve his/her own practice based on appropriately gathered data and feedback.
10. Encouraging the completion of evaluations by non-physician healthcare personnel who have had sufficient opportunities interacting with the resident to evaluate his/her patient care skills and respectful treatment of patients and co-workers. Patients and family members are in a unique position to evaluate resident interpersonal and communication skills.
11. Include the resident in the program evaluation committee to provide input on ways to improve resident education and patient care for future trainees.
12. Receive formal educational activities that promote patient safety-related goals, tools and techniques.
13. Receive formal education of when supervision of patient care activities is needed. Colorectal surgery residents are fully trained general surgeons; however, training should be provided to increase awareness that supervision is needed and is critical for safe patient care (Culture of Safety). Training will improve the perception the resident has on receiving adequate supervision and having the required assistance when needed. In similar fashion faculty members, patients, patient families and other health workers need to have a perception of adequate supervision of the resident. Each patient should have an attending physician that is responsible for supervising the resident. Both the resident and attending must inform the patient of their respective role when providing direct patient care.

Examples of tools that may be used to assess patient care skills include, but are not limited to:

1. CARSEP or CARSITE
2. Chart-stimulated recall
3. Checklist
4. Direct observation of resident practice
5. Mock oral examination
6. Objective Structured Clinical Examination (OSCE)
7. Portfolios
8. Procedure and case logs
9. Record review
10. Monitor adequate supervision of resident
11. Simulations and models
12. Standardized patients
13. 360-degree global evaluation

PROFESSIONALISM

Colorectal surgery residents should demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. It is important to recognize that deficits in patient care, medical knowledge, practice based learning, interpersonal communication skills, and system based practice reflect a lack of professional commitment.

GOALS

Following satisfactory completion of a residency in colon and rectal surgery, residents should be able to:

1. Define patient welfare, patient autonomy and social justice and provide examples of how the primacy of these principles shapes the practice of colon and rectal surgery. Showing respect to diversity in gender, age, culture, race, religion, disability and sexual orientation.
2. Deliver superior quality care while demonstrating and modeling core professional behaviors in all professional activities, showing accountability to patients, society and profession.
3. Practice medicine ethically consistent with all the obligations of a physician. Showing compassion, integrity and respect for others.
4. Define the essential attributes of professionalism and describe how they apply to the practice of colon and rectal surgery. Showing responsiveness that supersedes self-interest.
5. Identify gaps in professional behavior through self-reflection, seek constructive feedback regarding professional behavior, and identify means to correct deficiencies in professionalism.
6. Show respect for patient privacy and autonomy.
7. Being able to identify signs of fatigue and implement measures to provide safe patient care and avoid burn out (Well-Being).

OBJECTIVES

Following completion of a residency in colon and rectal surgery, the resident should be able to describe, define, or demonstrate the following for each of the core professional behaviors or attributes listed here:

1. Understand the ACGME Definition of Professionalism Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. Residents are expected to:
 - a. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and ongoing professional development.
 - b. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.
 - c. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, sexual orientation and disabilities.
2. Demonstrate a commitment to competence:
 - a. Describe and participate in the process for professional certification and continued certification in colon and rectal surgery.
 - b. Define the scope of practice of the specialty of colon and rectal surgery.
 - c. Describe and abide by the process for training and adding privileges for new technology.
 - d. Commitment to lifelong learning by:
 - i. monitoring patient care performance improvement indicators
 - ii. accurate reporting of clinical and educational work hours, patient outcomes, and clinical experience data
 - e. Maintain high level clinical and team skills in the care of the patient.
 - f. Demonstrate the ability to self-reflect and incorporate past experiences into improvement of current practice.
3. Demonstrate a commitment to altruism in which patient's needs supersede self-interest:
 - a. Secure effective continuity of care for patients within the context of duty hour restrictions.
4. Demonstrate a commitment to morality and ethics:
 - a. Disclose potential conflicts of interest (financial, personal, professional) and manage potential conflicts of interest appropriately.
 - b. Respect appropriate boundaries in personal interactions with patients, trainees, students, and other healthcare providers, and avoid exploiting them for any purpose.
 - c. Appropriately disclose advertising and public relations releases.
 - d. Support and participate in ethics review processes on research involving human subjects.

- e. Engage in one's own moral development and encourage the moral development of others.
 - f. Recognize threats to professional behavior, including industry incentives, increased regulatory changes, and loss of physician autonomy.
5. Demonstrate a commitment to Integrity and honesty:
- a. Disclose appropriately to patients and family members therapeutic options, including risks, benefits, and alternative treatments; explain the consequences of non-treatment.
 - b. Disclose adverse events and medical errors fully, even if the errors did not result in actual harm.
 - c. Know and abide by Health Insurance Portability and Accountability Act (HIPAA) regulations. Specifically, understand and demonstrate a commitment to patient confidentiality, including:
 - i. Safeguarding patient information.
 - ii. Avoidance of patient-related discussions in public.
 - iii. Encrypting and protecting electronic patient records.
 - iv. Informing patients of the intention to release clinical information to appropriate authorities in special circumstances when harm may come to the patient or others.
 - v. Avoid disclosure of identifiable medical information to any person or entity without proper authorization from the patient or his/her guardian or power of attorney, as appropriate.
 - d. Be able to identify unprofessional behavior by oneself and others.
 - e. Foster and promote professional behavior by colleagues, co-workers, trainees, and students, utilizing appropriate resources.
6. Demonstrate a commitment to self-regulation:
- a. Maintain the highest standards of practice based on current scientific evidence.
 - b. Maintain timely and complete medical records.
 - c. Demonstrate punctuality and respect deadlines.
 - d. Demonstrate the ability to reflect on one's own practice and draw insightful conclusions.
 - e. Demonstrate the ability to maintain personal and professional balance to ensure personal health and optimal patient care.
 - f. Demonstrate the ability to maintain professional working relationships with colleagues, trainees, and other medical professionals.

7. Demonstrate a commitment to be rested and fit while managing fatigue and avoiding burnout (Well-Being):
 - a. Accurately report work hours.
 - b. Attend lecture and/or webinar education of fatigue and burn out signs and strategies to properly resolve or prevent.
 - c. Be aware of institutional policies for fatigue management and mitigation, and for transition of patient care due to excessive fatigue or illness, or family emergency.
 - d. Help with monitoring of fatigue and assist other colleagues if help is needed.
 - e. Self-care is important component of professionalism and is a skill that can be taught.
 - f. Understand that the resident has the opportunity to attend mental health or dental appointments including those scheduled during working hours without retribution by the program.

8. Demonstrate a commitment to responsibility to society and to the profession:
 - a. Support the specialty board responsibility to ensure that all its members are competent.
 - b. Describe individual physician responsibilities regarding proper disclosure of and remediation for impaired/incompetent physicians/colleagues.
 - c. Balance commitment to patient confidentiality with overriding public interest considerations, as when patients endanger others.
 - d. Understand the role and responsibilities of colorectal surgeons in giving expert testimony in legal proceedings.
 - e. Actively engage in educating patients, trainees, students, and other healthcare professionals.
 - f. Understand and maintain a balance between society's expectations of the physician versus medicine's expectations of the physician.
 - g. Be able to recognize signs of physician fatigue and appropriately refrain from care of patients when physician fatigue may potentially endanger their care.
 - h. Understand the benefits and risks of social media, and if engaged in its use, abide by appropriate standards of patient confidentiality, and avoidance of solicitation.

9. Demonstrate a commitment to advocacy:
 - a. Work collaboratively with other professionals to reduce medical errors, increase patient safety, and minimize overuse of healthcare resources.
 - b. Ability to report unsafe conditions and adverse events.

- c. Participate in quality improvement initiatives to measure and improve individual and systems performance.
 - d. Recognize barriers to care based on education, laws, finances, geography, and social discrimination and discuss potential solutions.
 - e. Promote public health and preventive medicine.
 - f. Provide health care based on wise and cost-effective management of limited clinical resources (for example, avoiding ordering unnecessary tests and procedures.)
 - g. Implement a patient and family-centered culture into everyday practice.
10. Demonstrate a commitment to professional behavior:
- a. Demonstrate sensitivity and respect in all patient interactions, honoring patients' individual characteristics (for example: culture, age, gender, sexual orientation, disabilities); acknowledging and honoring the vulnerability of patients with colorectal problems; and acknowledging and honoring patients' psychological, social, cultural, and spiritual needs when dealing with issues such as body image alterations, ostomies, and diagnosis of terminal illness.
 - b. Embrace the colorectal surgeon's responsibility for providing comprehensive and continuous patient care through the preoperative diagnosis phase, during the operation, and during postoperative care.
 - c. Include in surgical care the needs of the terminally ill by identifying and discussing, as appropriate, the ethical issues surrounding end of life situations (such as Do Not Resuscitate/DNR, advanced directives, withdrawal of life support, withholding support/care and futile care).
 - d. Understand and demonstrate the multi-faceted role of colorectal surgeons, for example: consultant surgeon giving a second opinion; diagnostic consultant providing a service (transrectal ultrasound, anorectal physiology testing, colonoscopy); patient advocate addressing previous suboptimal care with patients, families, or responsible physician; patient advocate in managed care organizations; and integral member of multidisciplinary teams with nurses, ancillary services, and primary care physicians.
 - e. Understand that professionalism can be taught, and appropriate education is provided by the institution.
 - f. Follow professional guidelines when documenting in the chart.
 - g. Be aware of processes to report unprofessional behavior, mistreatment or unsafe conditions that have required an immediate deviation from usual practice at the clinical site.

- h. Understand that although the attending physician is ultimately responsible for the care of the patient, every physician shares in the responsibility and accountability for their efforts in the provision of care.

Examples of tools that may be used to assess professionalism skills include, but are not limited to (note: elements in bold are required by the ACGME):

- Direct observation of resident interactions.
- Discussion Seminar (e.g. complex psychosocial issues and ethical dilemmas in colorectal surgery patients).
- Role modeling.
- Provide the meaning that each resident finds in the experience of being a physician, including protecting time with patients, minimizing non-physician obligations, providing administrative support, promoting progressive autonomy and flexibility, and enhancing professional relationships.
- Provide appropriate tools for self-screening for burn out, depression, and substance abuse.
- Monitor fatigue recognition and implementation of mitigation strategies.
- Ensure adequate sleep facilities and safe transportation options for residents who may be too fatigued to safely return home.
- Ensure availability of lactation rooms
- Formal training in how to disclose adverse events to patients and families.
- Residents should have the opportunity to participate in the disclosure of patient safety events, real or simulated.
- Observation of or participation in an ethics review committee.
- On-line learning modules (e.g. multicultural awareness).
- Patient survey of resident interactions.
- 360° global evaluation.
- Assess whether the resident is aware of policies in regards to chart documentation, confidential reporting of and addressing unprofessional behavior or unsafe conditions.
- Videotaped session of resident interaction with patients or simulated patients.
- Self-assessments.

INTERPERSONAL AND COMMUNICATION SKILLS

GOALS

Residents should demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Following satisfactory completion of a residency in colon and rectal surgery, residents should be able to:

1. Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds.
2. Respect patient's right to privacy.
3. Communicate effectively with physicians, other health professionals, and health related agencies.
4. Transition care in a safe, consistent well-coordinated manner.
5. Work effectively as a member or leader of a health care team or other professional group.
6. Act in a consultative role to other physicians and health professionals.
7. Maintain comprehensive, timely, and legible medical records.

OBJECTIVES

The resident will create an environment supportive of communication for the patient and his/her family by:

1. Demonstrating caring and respectful behaviors, including greeting patients **with preferred pronouns and pronunciation of name**; gaining and maintaining an awareness and respect of cultural, religious, moral, and gender/sexual background of the patient and family; speaking on a similar physical level, e.g., both sitting or both standing
2. Eliciting the patient's perspective on **their** own illness; expressing a desire to work with the patient; showing interest in the patient as a person exclusive of **their** medical concern.
3. Using language that is understandable and demonstrates concern, and using non-verbal cues (including appropriate eye contact and hand shaking, postures, nodding) to acknowledge and affirm communication.
4. Eliciting patient-related information with effective interview skills, asking open ended questions as appropriate, and refrain from interrupting patients' sentences/thoughts

5. Discussion of management options with appropriate acknowledgement of patient preferences; identify one's own biases when advising patients.
6. Assess patient's understanding of encounter, summarize the encounter, and allow for follow-up questions for clarification as needed.
7. Obtain informed consent in language understandable to the patient, including the disease/diagnosis being treated, the treatment options and the treatment to be performed, and common and most relevant complications, **and utilize language interpretation when necessary.**
8. When giving bad news, the resident will introduce the topic in private, use empathetic and non-threatening verbal and non-verbal expressions, provide the news calmly and honestly, **describe** information leading to this point, allow patient/family to ask questions to ensure mutual understanding, respond empathetically, develop a prioritized plan, and identify sources of support.
9. Use all appropriate resources (i.e. translator, translating applications, and translating phone services) to effectively communicate with patients in their native language.

The resident will communicate with other professionals as a leader of the healthcare team by:

1. Providing appropriate information to direct interdisciplinary care, always acting in the best interest of the patient.
2. Providing thorough, yet succinct oral presentations regarding patient care, using appropriate terminology.
3. Providing transition or "hand-off" information that is orderly, timely, and written and contains pertinent diagnoses, procedures performed, and complications or other factors affecting care.
4. Maintain appropriate verbal and written correspondence with referring physicians.
5. Manage medical record-keeping in a timely and legible way, ensuring compliance with institutional policies and HIPAA regulations and protecting patient privacy at all times.
6. Work as an effective team member with nurses, **case managers, social workers,** residents, **advanced practice providers,** and attendings in a structure that promotes and provides safe, interprofessional, team-based best possible patient care.

The resident will assure safe care transition (Transition of care) by:

1. Receiving formal education on institution policies that optimize care transition including safety, frequency, and structure, and by participating in simulated or real time inter-professional training on care transition specific to the clinical site. Faculty members are encouraged to participate with the resident.
2. Engage in daily hand-off of care involving appropriate members of the team: other physicians, nursing, advanced practitioners, even patients and family member if appropriate.
3. Undergo periodic supervision of transfer care by a faculty member for quality control that ensures competency in communicating with team members in the hand-off process.
4. Receive feedback on his/her performance and apply changes to improve hand off of care.
5. Contribute in the appropriate communication and transition in care between the primary team and consultants. Furthermore, analyze patient safety reports on care transition in order to identify strategies to improve hand-off of care.
6. **Be aware of** schedules of attending physicians and residents currently responsible for care of patients.

Examples of tools that may be used to assess communication include, but are not limited to:

1. Education and testing via webinars
2. Direct observation of resident interactions.
3. Periodic monitoring of care transitions.
4. Role modeling
5. Self-assessment
6. Standardized patient evaluations
7. 360-degree global evaluation
8. Video/audio recording

PRACTICE-BASED LEARNING AND IMPROVEMENT

GOALS

At the completion of training in colon and rectal surgery, the resident should be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and develop tools to improve their patient care practices.

OBJECTIVES

Following completion of a residency in colon and rectal surgery, the resident should be able to:

1. Analyze practice experience and perform practice-based improvement activities using systematic methodology such as:
 - a. Participation in Journal Club and/or Evidence Based Reviews of Colon and Rectal Surgery to gain sufficient understanding of study design, statistical methods, quality of evidence, and interpretation of findings and outcomes to critically appraise information on diagnostic and therapeutic effectiveness.
 - b. Participation in Morbidity and Mortality Conference, SCIP, NSQIP, or other validated quality improvement initiative as available, and use the information and experience gained to modify his/her practice accordingly.

2. Attempt a research project to contribute to the development of new knowledge, being aware of the importance of peer review of research protocols, ethical considerations in basic and clinical research, and the limitations and obstacles that may be encountered in pursuing a research project.

The resident must demonstrate the knowledge to perform research and the ability to carry out scholarly activity.

During the 1 year of residency the resident should participate at least in one scholarly activity at the Divisional, Departmental, or Institutional level. It is paramount that the sponsoring program or institution provides vital facilities and services for the resident to be able to conduct research. The residents can pursue research spanning the full range of investigation from basic science to translational investigations, and clinical and outcomes-based research focused on disease of the colon and the rectum.

Furthermore, quality improvement projects offer the unique opportunity for improving quality of patient care and providing the basic structure for research activity. Appropriate didactics should inform the resident how research is conducted, evaluated, explained, and applied to patient care.

The resident should be able to initiate a project of their own (with faculty supervision) or become a member of the research team on an ongoing project focused in disease of the colon and rectum.

The resident is expected to perform scholarly activity by:

- a. Understanding how to formulate a study idea by establishing a hypothesis.
 - b. Having the resources to review the literature and collect background data to formulate a solid hypothesis that needs to be investigated. Having the ability to use the World Wide Web, library services, and **available** material to be able to acquire knowledge published by others. Design the methods to investigate the hypothesis.
 - c. Understanding how to design a project and acquire appropriate Institutional Board Review approval to proceed with the implementation of the research study.
 - d. Execute the study in order to obtain results and then analyze them and provide scientifically based results.
 - e. It is encouraged that all scholarly activity is presented to regional or national meetings and submitted for a peer review publication.
3. Engage in quality improvement educational activities:
- a. Participate in lectures that analyze quality improvement including the understanding of healthcare disparities, and describe the underuse, overuse, or
 - b. misuse in diagnosis and treatment of patients.
 - c. Receiving information on site specific patient safety challenges that need to be improved, including institution patient safety reports, and the pathway to system changes and improvement.
 - d. Receive clinical site quality metrics on a routine basis and observe or contribute to the analysis of them and measures taken to improve them.
 - e. Participate as team members in real and/or simulated interprofessional clinical patient safety activities, such as root cause analysis or other activities that include analysis, as well as formulation and implementation of actions.

4. Use information technology to manage information access quality on-line medical information, and support their own education, which may include:
 - a. Proficiency in use of on-line libraries for literature searches to locate and integrate information from a variety of sources.
 - b. Familiarity with practice parameters in the field of colon and rectal surgery as published by the ASCRS.
 - c. Familiarity and participation in CREST.
 - d. Familiarity with the core subjects in colon and rectal surgery.
 - e. Ability to subscribe and use the case Study List Serv to discuss challenging cases.
5. Facilitate and participate in the education of residents, students, and other healthcare professionals, which may include:
 - a. Supervising and educating medical students and/or general surgery residents in colorectal surgery.
 - b. Demonstrating the skills to educate colleagues, patients, families, and other health care professionals.
 - c. Presenting cases and lecturing.
6. Develop, implement, and monitor a personal strategy for continuing education, which may include:
 - a. Continuing Certification
 - b. Continuing Medical Education (CME) activities
 - c. Attendance at national meetings
 - d. Participation in Evidence Based Reviews (EBR) in colon and rectal surgery.
 - e. Regular reading of peer-reviewed journals
 - f. CARSEP review
 - g. Participation in didactic courses that enhance technical skills and assist with the implementation of new technology or techniques.
7. Incorporate formative evaluation feedback into daily practice in order to assist with the ability to identify strengths, deficiencies and limitations in one's knowledge and expertise.
 - a. Review personal outcomes and compare with divisional and national data.
 - b. Seek detailed answers to daily clinical problems that expose gaps to one's knowledge.

Examples of tools that may be used to assess practice-based learning skills include, but are not limited to:

- Active participation in Morbidity and Mortality conference.
- Active participation in Journal Club and Evidence Based Reviews in Colon and Rectal Surgery.
- Resident portfolios tracking learning improvement projects.
- Research projects or literature contributions in the field of colon and rectal surgery.
- Evaluation of resident presentations at conferences and grand rounds.
- Evaluation of resident teaching skills by medical students, residents, patients, and ancillary staff.
- Milestones reporting can be used to review resident performance and progress over the year.
- Successfully complete a quality improvement project.

SYSTEM BASED PRACTICE

GOALS

Residents should demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to effectively identify and utilize other resources in the system to provide optimal health care.

OBJECTIVES

Following completion of a residency in colon and rectal surgery, residents should be able to:

1. Provide efficient patient care in multiple settings and collaborate with other health professionals to optimize that care by being able to work in:
 - a. Outpatient **setting of an office or** clinic with nurses **and schedulers.**
 - b. Endoscopy setting **either on hospital grounds or outpatient endoscopy center.** Demonstrate safe and efficient endoscopic evaluation and troubleshoot technical equipment failure.
 - c. Inpatient setting **on the surgical ward, intensive care unit, or other ward.** Understand how to communicate with **nurses, advanced practitioners, care coordinators, floor managers, supporting staff in order to improve the patient experience and optimize care.**
 - d. In the operating room: in the inpatient or ambulatory setting.
2. Understand how their practice affects other healthcare professionals, the healthcare organization within which they work, and society at large, and how these elements of the healthcare system in turn affect their practice, by:
 - a. Incorporating cost and risk-benefit analysis in patient care.
 - b. Demonstrating an understanding of the role of different specialists and other health care professionals **in overall patient management** and recognizing the need for referral to other subspecialists as indicated.
 - c. Acknowledging resource limitations, including availability of the operating room, in managing the conflicting duty of providing both elective and emergency surgical care.
 - d. Understanding management fundamentals including triage, communication, manpower management, and resource conservation.

- e. Be able to discuss the impact of the Health Insurance Portability and Accountability Act (HIPAA) and Emergency Medical Treatment and Labor Act (EMTALA) regulations on the resources of various medical systems, including rules for transfer of patients to the hospital under HIPAA regulations.
 - f. **Correspond** with referring physicians.
 - g. Gather information about the community in which one works (e.g., demographics, and sociocultural beliefs and practices) that affect health and disease.
 - h. Providing a leadership role in the management of complex care plans.
3. Gain and demonstrate an understanding of how types of medical practice and delivery systems differ, including methods of controlling healthcare costs and allocating resources such as:
- a. The cost of doing business, involving such issues as insurance providers, physician contracts, and office expenses including equipment and personnel. An understanding of proper coding terminology, levels of care, and supporting evidence used in billing for medical services should be learned.
 - b. The discharge planning process, including end-of-life care, home healthcare services, medications, equipment, transportation, nutrition, rehabilitation services, therapy services, nursing home services, assisted living services and appropriate follow-up care.
 - c. Methods by which individuals or hospitals can be reimbursed, including fee-for-service, capitation and hospital DRGs.
4. Practice cost-effective healthcare with wise resource allocation that does not compromise quality of care with a knowledge of:
- a. Understanding, accessing, utilizing, and evaluating effectiveness of resources, providers, and systems to provide optimal emergency care.
 - b. The major causes of re-hospitalization and loss to follow up to determine possible approaches for remedying poor care transitions.
 - c. Cost effective treatment of colorectal surgical diseases in order to minimize waste of resources.
 - d. Consideration of the cost-effectiveness of new surgical technologies.
 - e. Applying systematic, evidence-based, cost conscious and cost-effective strategies to prevention, diagnosis, and treatment in a way that does not compromise quality of care.

5. Advocate for quality patient care within the system, assist patients in navigating the system to obtain resources, and be the patient's advocate in dealing with system complexities through activities such as:
 - a. Participation in interdisciplinary teams, particularly as it relates to quality of patient care and system issues.
 - b. Accepting the specialist's role to intervene on behalf of patients with respect to the social, economic and biologic factors that may impact on their health and the community health.
 - c. Observing and learning the complexities of processing a patient through initial registration, acquisition of third-party payer approval, interface with nursing personnel, the outpatient clinic visit, acquisition of test results, operative scheduling, admission to the post-anesthesia care area, and discharge.
 - d. Understanding the financial implications of surgical treatment, including hospital and physician charges, loss of employment time, outpatient chemotherapy, and nursing home care.

6. Know how to partner with healthcare managers and healthcare providers to assess, coordinate, and improve healthcare, and know how these activities can affect system performance by:
 - a. Participation in National Quality Assurance initiatives **such as the Joint Commission, core measures, and SCIP programs including but not limited to DVT prophylaxis, managing concentrated injectable medicines, assuring medication accuracy at transitions in care, communicating during patient handovers, improving hand hygiene to prevent infections associated with health care, and performing correct procedures at correct body sites.**
 - b. Understanding that working in interprofessional teams can improve patient safety and care quality.
 - c. Understanding the process of credentialing and hospital privileging.
 - d. Participation in multi-disciplinary teams **with nursing and allied health staff** to improve provider-to-provider and provider-to-patient communication in patient transitions of care, **including the critical elements of an effective discharge summary; improve sign-out rounds to enhance patient safety and reduce the risk of adverse outcomes; and conduct quality assurance reviews to improve patient safety.**
 - e. **Conducting quality reviews to improve patient safety.**

7. Identify and participate in reducing health care disparities relevant to the clinical site.

- a. Identify **and help define** the site priorities/strategies in addressing health care disparities.
 - b. Participate in initiatives by the institution to eliminate disparities.
8. Participate in educational activities to achieve patient safety goals. They should:
- a. Receive patient safety summary information specific to the clinic site.
 - b. Engage in patient safety educational activities, proactive risk assessment, and collaborate with site specific safety officers **to reflect the site's reporting processes and mitigation systems.**
 - c. Contribute to the work of institutional committees or task forces that aim at improving patient safety.
9. Participate and contribute to a culture of safety.
- a. Support the organization's formal mechanisms to assess attitudes toward safety and improvement to identify areas requiring interventions.
 - b. Participate in patient safety activities, including root cause analysis, as well as formulation and implementation of actions.
 - c. Identify actions taken after the report of an adverse event.
 - d. Receive feedback after an adverse event.
 - e. Receive or provide emotional support if needed, after an adverse event.
 - f. Undergo training in how patient adverse events are disclosed to patients and families.
10. Participate in identifying system errors and implementing potential systems solutions including:
- a. Identification and implementation of solutions for systems issues related to medical errors.
 - b. Analysis of complex cases with unexpected outcome.
 - c. Discussion about 'near misses' and sentinel events.

Examples of tools that may be used to teach and assess systems-based practice skills include, but are not limited to:

- Structured morbidity and mortality conference.
- Participation in multidisciplinary tumor or inflammatory bowel disease boards.
- Committee appointments.
- Didactic lectures.
- Multidisciplinary patient care rounds.
- Office practice participation.
- Monitor knowledge of institutional policies on reporting safety events.
- Participation in Unit or Institutional committees that focus on patient safety.
- On-line learning modules (e.g. infection control, hand hygiene).
- Patient survey.
- 360° global rating.
- Participation in contract negotiations or cost control hospital committees.
- Practicing in different care settings (inpatient, outpatient, outreach clinic, emergency department, and operating room) in collaboration with other health care professionals.

MEDICAL KNOWLEDGE

GOALS

The goal of the Colon & Rectal Surgery Residency Training Program is to train safe, competent, and confident surgeons who are experts in the practice of colon and rectal surgery and are committed to ongoing learning through study and assessment of their outcomes. The competency of Medical Knowledge is a large part of the curriculum, and in many areas is inextricably linked to Technical Skills, while not one of the recognized six competencies, is sometimes considered the seventh competency for many procedural-based specialties. Furthermore, regularly scheduled didactic sessions throughout the year should be arranged based on the list of colon and rectal disorders listed below.

As set by the ACGME Program Requirements for Graduate Medical Education in Colon and Rectal Surgery, the residents must demonstrate proficiency in the evaluation and management of patients with the following essential colon and rectal disorders:

1. Anorectal:
 - a. Anal fissure
 - b. Anal fistula
 - c. Hemorrhoids
 - d. Pelvic Floor
 - e. Constipation
 - f. Incontinence

2. Abdominal:
 - a. Carcinoma of the colon
 - b. Carcinoma of the rectum
 - c. Crohn's disease
 - d. Diverticular disease
 - e. Genetic neoplasia – FAP, **Lynch Syndrome, Etc.**
 - f. Rectal Prolapse
 - g. Ulcerative colitis

3. Other essential colon and rectal surgery disorders **and/or evaluation** must include:
 - a. Pre-operative diagnosis, indications, alternatives, risks and preparation for operation; assessment of patient risk, nutritional status, co-morbidities, and need for pre-operative treatment and peri-operative prophylaxis; appropriate non-operative management; operative management, including all technical aspects, intra-operative decision-making, avoidance and management of intra-operative complications, and management of unexpected findings; and, post-operative management, including recognition and treatment of complications; and, appropriate follow-up and additional treatment.
 - b. Colorectal infectious diseases, including sexually transmitted diseases (STDs) and other colitis, including clostridium difficile and HIV related infection.
 - c. Gastrointestinal obstruction, including those due to adhesions, malignancy, volvulus, hernias, and pseudoobstruction.
 - d. Lower gastrointestinal hemorrhage.
 - e. Other neoplastic processes, including GIST tumors, lymphoma, carcinoid, desmoids, small bowel and mesenteric tumors.
 - f. Radiation enteritis and the effects of ionizing radiation.
 - g. Other anorectal: **anorectal stenosis; rectovaginal fistula**, hidradenitis; meningocele, chordoma, and teratoma; necrotizing fasciitis; pilonidal disease; presacral lesions including cysts; and pruritus ani; pelvic floor disorders, including: constipation, clinical and physiological **pelvic floor** evaluation, dysmotility, anismus and other forms of pelvic outlet obstruction; fecal incontinence; rectal and pelvic prolapse, rectocele, and solitary rectal ulcer syndrome.
 - h. Congenital disorders, including congenital pelvic and sacral neoplasms; Hirschsprung's disease; imperforate anus; and urogenital and sacral dysgenesis, including spina bifida.
 - i. Genetics and molecular biology as they apply to colorectal disorders.
 - j. Gynecological disorders, including endometriosis, considerations in managing the pregnant patient with colorectal disorders, and related intraoperative findings such as ovarian lesions, fibroids, endometrial implants, and gynecological prolapse.
 - k. Pediatric and congenital disorders, including childhood fissure, encopresis, juvenile polyposis, malrotation, Meckel's diverticulum, and prolapse.
 - l. Cystocele, enterocele, urinary incontinence, and vaginal and uterine prolapse.
 - m. Radiological and other imaging modalities, including plain x-rays, contrast studies, computed tomography (CT), positron emission tomography (PET), CT colonography, magnetic resonance imaging (MRI) for rectal cancer staging, nuclear medicine scans, angiography, defecography, abdominal ultrasound, evaluation for deep vein thrombosis and pulmonary embolism, fistulograms, and sonograms (**abdominal and anorectal**).

OBJECTIVES

1. ANATOMY/EMBRYOLOGY OF SMALL BOWEL, COLON, RECTUM, ANUS, PELVIS, AND PELVIC FLOOR

Residents in colon and rectal surgery should be able to identify, describe, and discuss the significance of the following anatomic features:

- A. Colon: anatomic features; anatomic relationship of colon segments; blood supply; lymphatic drainage; sympathetic and parasympathetic innervation.
- B. Small bowel: segments of the small bowel; origin and anatomy of vascular supply of small bowel segments; innervation.
- C. Rectum: anatomic relation of rectum to fascia, peritoneum, and nerves innervating other pelvic organs; anatomy/histology of rectal wall including valves of Houston; blood supply; lymphatic drainage; sympathetic and parasympathetic innervation.
- D. Anal canal: anatomic relations of anal canal; muscles and epithelium of anal canal, including transitional zone; anal glands; pudendal artery as blood supply to anal canal; lymphatic drainage of anal canal above and below dentate line; innervation of internal and external anal sphincters.
- E. Pelvis and pelvic floor: anatomy and blood supply of bony pelvis; blood supply and innervation of pelvic floor muscles; blood supply and innervation of external pelvic muscles; pathway of sciatic nerve.

Residents in colon and rectal surgery should be able to identify, describe, and discuss the significance of the following embryologic areas:

- a. Normal embryologic development of the small bowel, colon, rectum, anus, and pelvic floor; normal embryologic rotation of the small bowel, colon, and rectum.
- b. Pathologic embryologic development of the small bowel, colon, and rectum, including abnormalities of rotation, proximal colon duplications, Meckel's diverticulum, Hirschsprung's disease.
- c. Embryologic anomalies associated with the rectum, anus, and pelvic floor, including imperforate anus, rectal duplication cysts, epidermoid cysts, developmental cysts, and teratoma.
- d. Normal embryologic development of the sacrum.
- e. Embryologic sacral anomalies, including sacral dysgenesis, spina bifida, and anterior sacral meningocele.

2. NORMAL AND ABNORMAL PHYSIOLOGY OF COLON, RECTUM, ANUS, AND PELVIC FLOOR; PHYSIOLOGIC EVALUATION

Residents in colon and rectal surgery should be able to describe and discuss the normal physiologic functions of the colon, rectum, and anus, including:

- A. Normal colonic absorption/secretion of water and electrolytes.
- B. Normal colonic metabolism of complex carbohydrates and proteins.
- C. Function of the proximal versus the distal colon in these processes.
- D. Normal colonic motility patterns, transit times, and myoregulation/neuroregulation processes.
- E. The process of normal defecation and the role of colonic fecal storage.
- F. The contribution of the rectum and anus to normal defecation (including rectal compliance and reservoir function, the role of the pressure receptors in the puborectalis and pelvic floor muscles, the rectoanal inhibitory reflex, the sampling reflex, and the role of the external and internal sphincters, the puborectalis and levator ani muscles).
- G. The pharmacology of anal sphincter neurotransmitters.
- H. The contribution of different muscle fiber types to anal continence.

Residents in colon and rectal surgery should be able to describe and discuss the presentation and etiologies of the following disturbances in colonic, rectal and anal function:

- a. Constipation
- b. Enterocele and sigmoidocele
- c. Colonic inertia
- d. Megacolon
- e. Colonic pseudo-obstruction
- f. Irritable bowel syndrome
- g. Solitary rectal ulcer syndrome
- h. Rectal prolapse
- i. Symptomatic rectocele
- j. Short segment Hirschsprung's disease
- k. Anismus
- l. Fecal incontinence

Residents in colon and rectal surgery should be able to describe and discuss evaluation methods for colon, rectum and anal physiologic alterations (including required equipment, indications, techniques, and interpretation):

- a. Endoscopy
- b. Contrast study
- c. Transit time study
- d. Anorectal manometry
- e. Electromyography and pudendal nerve testing
- f. Dynamic defecography/dynamic MRI
- g. Balloon expulsion
- h. Pelvic floor exercise
- i. Directed biofeedback
- j. Endoanal ultrasonography

3. PREOPERATIVE RISK ASSESSMENT AND PREPARATION FOR SURGERY; POSTOPERATIVE CARE; COMPLICATIONS

Regarding patients facing major colorectal resection; residents in colon and rectal surgery should be able to describe and discuss the preoperative risk assessment and preparation, including:

- A. The evaluation of risk for postoperative morbidity/mortality using Goldman or ASA classification.
- B. The need for specific preoperative organ system assessment, including cardiac, respiratory, renal, and metabolic/endocrine/nutritional assessment.
- C. Indications and advantages/disadvantages of complete mechanical bowel preparation versus enemas for low anastomosis for open and laparoscopic procedures.
- D. Prophylactic antibiotic usage, including antibiotic choices to decrease site-specific infection, indications and antibiotic choices to prevent endocarditis and prosthetic seeding, and risks vs. benefits of prophylactic antibiotics.
- E. Strategies for prevention of venous thromboembolism in low to moderate risk patients, high risk patients, and very high-risk patients.
- F. Strategies to decrease postoperative ileus, including intraoperative fluid restriction, selective gastric drainage, early feeding, and pharmacologic agents.
- G. Preoperative planning for stoma placement, including consultation with enterostomal therapy.

Residents in colon and rectal surgery should be able to describe and discuss the postoperative management of colorectal surgery patients, specifically as it relates to the enhanced recovery after surgery (ERAS) pathway, including:

- a. Postoperative pain control via the oral, intravenous, Transverse Abdominis Plane (TAP) block, and epidural route, including use of non-narcotic measures.
- b. Goal directed perioperative fluid management.
- c. DVT prophylaxis, including compression devices, low dose unfractionated or low molecular weight heparin.
- d. Early postoperative feeding.
- e. Early ambulation.
- f. Indications and use of the selective mu receptor antagonist alvimopan in the perioperative period.

Residents in colon and rectal surgery should be able to describe and discuss appropriate evaluation and management of common colorectal postoperative complications, including:

- a. Infectious complications, including abdominal or perineal wound infection, intraabdominal or pelvic abscess, anastomotic leaks.
- b. Clostridium difficile colitis.
- c. Genito-urinary complications, including injury to ureter, bladder, or urethra; sexual and urinary dysfunction; and female infertility and trapped ovary syndrome.
- d. Additional intestinal complications, including adhesive obstruction, prolonged ileus, enteric fistula, and stomal complications.
- e. Deep venous thrombosis and pulmonary embolism.
- f. Postoperative bleeding.

4. IMAGING, INCLUDING ENDORECTAL/ENDOANAL ULTRASOUND

Residents in colon and rectal surgery should be able to describe and discuss imaging modalities relevant to the practice of colorectal surgery, including:

- A. The indications, technique, limitations, risks, and interpretation of plain films, barium enema, gastrograffin enema, small bowel contrast studies, fistulograms and sinograms, abdominal ultrasound, and positron emission (PET) scan.
- B. The indications, technique, limitations, risks, and interpretation of standard computed tomography (CT) scanning (plain, or with oral, intravenous, and rectal contrast), CT enterography, and CT colonography.

- C. The indications, technique, limitations, risks, and interpretation of magnetic resonance imaging (MRI), including use of intravenous contrast.
- D. The indications, technique, limitations, risks, and interpretation of tests used in the evaluation and management of lower GI bleeding, specifically angiography, technetium-labeled RBC scan and Meckel's scan.
- E. The indications, technique, limitations, risks, and interpretation of dynamic proctography/**defecography**.
- F. The indications, technique, limitations, risks, and interpretation of tests used in the evaluation and management of deep vein thrombosis (DVT) and pulmonary embolism (PE), specifically venous duplex scan, ventilation/perfusion (V/Q) scan, chest CT scan, and pulmonary angiography.

Residents in colon and rectal surgery should be able to describe and discuss:

- a. The preparation for and the performance of endoanal (EAUS) and endorectal (ERUS) ultrasonography.
- b. Normal and abnormal anal and rectal ultrasonographic anatomy.
- c. The utility of EAUS in evaluation of fecal incontinence, perianal sepsis, fistula-in-ano, and anal canal neoplasms.
- d. The **utility and** accuracy of ERUS in staging rectal cancer.
- e. The utility of ERUS in follow-up after rectal cancer resection.

5. ENDOSCOPY OF COLON, RECTUM, ANUS, AND POUCHES

Residents in colon and rectal surgery should be able to describe and discuss:

- A. The indications, contraindications, limitations and potential complications (with their management) of anoscopy, rigid proctoscopy, flexible sigmoidoscopy, pouchoscopy, ileoscopy, and colonoscopy.
- B. The preparation, positioning, and technique used for anoscopy, rigid proctoscopy, flexible sigmoidoscopy, pouchoscopy, ileoscopy, and colonoscopy.
- C. The normal and abnormal findings encountered (including normal landmarks) in the course of anoscopy, rigid proctoscopy, flexible sigmoidoscopy, pouchoscopy, ileoscopy, and colonoscopy, and their significance.
- D. The different types/sizes of anoscopes and rigid proctoscopes, and the indications for their use.

- E. The indications/contraindications, advantages/disadvantages of air versus carbon dioxide insufflation in flexible endoscopy.
- F. The indications/contraindications, advantages/disadvantages of rigid versus flexible pouchoscopy and ileoscopy.
- G. The technique, indications, contraindications and potential complications (including their management) of polypectomy, tattooing for localization, pneumatic dilation of colonic strictures, and stenting of colonic strictures. **If colorectal faculty have the expertise, residents should be exposed to endoscopic mucosal resection and endoscopic submucosal dissection.**
- H. The techniques for endoscopic control of colonic bleeding and potential complications (including their management).
- I. The indications for prophylactic antibiotic use for endoscopic procedures.
- J. The management of anticoagulants or antiplatelet agents in elective, urgent, and emergent endoscopic settings.
- K. The indications for use of conscious sedation, monitored anesthesia care with intravenous sedation, and general anesthesia for endoscopy.
- L. The drugs used for conscious sedation, including appropriate dosages, side effects, and reversal agents.
- M. The appropriate monitoring and discharge instructions for endoscopy performed under conscious sedation, monitored anesthesia care with intravenous sedation, or general anesthesia.

6. PELVIC FLOOR

A. Fecal Incontinence

Residents in colon and rectal surgery should be able to:

- i. List the causes of fecal incontinence, with incidence, pathophysiology, and the characteristic anatomic, neurologic, dermatologic, endoscopic, **and imaging** findings associated with each cause.
- ii. Describe and discuss an algorithm to approach patients with fecal incontinence.
- iii. Describe the key components of a thorough history and physical examination of patient with fecal incontinence, including the clinical tools available to quantify fecal incontinence.

- iv. Order anorectal physiology tests and imaging studies as indicated by history and physical findings.
- v. Describe the normal and abnormal findings of anorectal physiology tests and imaging studies that are used in the evaluation of incontinence.
- vi. Interpret anorectal physiology tests and imaging studies that are used in the evaluation of incontinence.
- vii. Describe and discuss non-operative strategies and surgical options (including injectable tissue bulking agents, sphincteroplasty, sacral nerve stimulation, and other implantable devices in the management and treatment of fecal incontinence.
- viii. Describe and discuss the indications, contraindications, post-operative care, complications and functional results of fecal diversion, sphincter repair, sacral nerve stimulation, postanal repair, **radiofrequency therapy**, total pelvic floor repair, muscle transpositions, artificial bowel sphincter, and encirclement procedures.

B. Constipation and Pelvic Floor Disorders

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The etiology and differential diagnosis of constipation and define constipation using the Rome criteria.
- ii. The utility of contrast and magnetic resonance dynamic proctography, transit studies, anorectal manometry, electromyography (EMG) recruitment, balloon expulsion, contrast enema, and endoscopy in the evaluation of chronic constipation
- iii. The indications, contraindications, modes of action, complications, and classification of laxatives
- iv. The etiology, appearance, and significance of melanosis coli
- v. Anismus, including diagnostic criteria and treatment.
- vi. Short segment/adult Hirschsprung's disease, including diagnostic criteria and treatment.
- vii. Symptomatic rectocele, including clinical presentation and nonsurgical versus surgical treatment options.
- viii. Enterocele and sigmoidocele, including clinical presentation, diagnostic criteria, and surgical treatment options.
- ix. Isolated colonic and panenteric inertia

- x. Colonic pseudo-obstruction, including etiology, and management options with indications, contraindications, risks, and outcomes.
- xi. The Rome diagnostic criteria for irritable bowel syndrome (IBS).
- xii. Management options of IBS for constipation and diarrhea predominant IBS.

C. Rectal Prolapse

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The epidemiology, pathophysiology, and anatomic findings of rectal prolapse and solitary rectal ulcer in adults and children.
- ii. The clinical presentation, endoscopic and histologic findings, and associated pelvic floor disorders in patients with solitary rectal ulcer.
- iii. The significance of internal intussusceptions and the radiologic findings suggestive of it
- iv. The clinical presentation, physical findings, functional disturbances, and the office diagnostic maneuvers used to evaluate rectal prolapse.
- v. Physiologic, radiographic, and endoscopic evaluation of rectal prolapse as indicated by history and physical findings.
- vi. The significance of constipation and incontinence in the management of rectal prolapse.
- vii. Non-operative strategies for the management of rectal prolapse.
- viii. The indications, contraindications, risks, post-operative care, complications, functional results, and recurrence rates of abdominal and perineal surgical options for rectal prolapse (including abdominal rectopexy with or without sigmoidectomy, ventral rectopexy, Ripstein procedure, perineal rectosigmoidectomy, Delorme procedure, and anal encirclement).
- ix. An algorithm to approach patients with rectal prolapse.

D. Pelvic Pain

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The etiology, pathophysiology, diagnostic modalities, differential diagnosis and treatment strategies of chronic rectal pain syndromes, including levator **ani** syndrome, proctalgia fugax, coccydynia, and pudendal neuralgia, and their association with pelvic floor abnormalities.

7. ANORECTAL DISEASE

The resident should be able to assess specific history details in formulation of differential diagnosis and independently perform an exam. Recognize timing for intervention, provide appropriate resuscitation and selecting appropriate intervention. Anticipate misdiagnosis or treatment failure and be able to implement alternative plan.

A. Hemorrhoids

Residents in colon and rectal surgery should be able to describe and discuss:

- i. Proposed etiologies of **complicated** internal and external hemorrhoids
- ii. Anatomic distinction between internal and external hemorrhoids
- iii. Classification of internal hemorrhoids
- iv. Medical management for hemorrhoid disease, with the indications, risks, and limitations of each option
- v. **Clinic procedures for management of hemorrhoidal disease, including rubber band ligation, sclerotherapy, urgent external hemorrhoidectomy, etc.**
- vi. Surgical (operating room) management of hemorrhoid disease, including indications, limitations, and complications.

B. Anal Fissure

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The etiology, signs, and symptoms of anal fissure
- ii. The anatomic location of a classic anal fissure
- iii. The significance of hypertonic vs. hypotonic internal sphincter in planning the management of anal fissure
- iv. Indications, contraindications, limitations, and complications of non-operative management of fissures **including both topical ointments and clinic Botox injections.**
- v. Indications, contraindications, and complications of operating from lateral internal sphincterotomy, anoplasty, fissurectomy, and anal dilatation

C. Abscess and Fistula, Including Rectovaginal/Rectourethral Fistula

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The cryptoglandular origin of anorectal abscess/ fistula
- ii. How to differentiate cryptoglandular abscess/fistula from fistula due to other causes
- iii. The classification of cryptoglandular perianal/perirectal abscess/fistula based on anatomic spaces.
- iv. Park's classification system of anal fistula
- v. Horseshoe abscess/fistula
- vi. The natural history of surgically treated perianal/perirectal abscess.
- vii. The operative management of abscess/fistula disease, including complications.
- viii. The etiology, classification, preoperative evaluation and treatment of rectovaginal fistulas based on location and etiology, and the results of surgical repair.
- ix. Integrate classification scheme for rectovaginal fistulae and justify appropriate timing for intervention.
- x. The evaluation and treatment of rectourethral fistulas, and the results of surgical repair

D. Benign Anal Misc; Benign Diseases of Skin Appendages

Regarding each of the following conditions, residents in colon and rectal surgery should be able to describe and discuss:

- i. Anal Stenosis
 1. The etiologies of anal stenosis
 2. The surgical and non-surgical management of anal stenosis, including indications, risks, and benefits.
- ii. Pruritis Ani and Dermatologic Conditions
 1. The clinical presentation, etiology, and management of pruritus ani, including indications for skin biopsy.
 2. The clinical presentation, etiology, and management of perianal dermatologic complaints, including psoriasis, eczema, shingles, herpes, and contact dermatitis.

- iii. Sexually Transmitted Infections
 1. The etiology and colon and rectal manifestations of the most common bacterial and viral sexually transmitted infections
 2. The medical treatment of the most common bacterial and viral sexually transmitted infections which affect the anorectum.
 3. The etiology and diagnosis of condylomata acuminata
 4. The influence of human papilloma virus serotypes on subsequent cancer development
 5. The technique, limitations, pros and cons of anal cytology **and high resolution anoscopy** in the diagnosis and management of anal intraepithelial dysplasia
- iv. Hidradenitis Suppurativa
 1. The pathophysiology, signs/symptoms, and medical and surgical management of hidradenitis suppurativa
 2. Options for surgical management of hidradenitis suppurative, including risks and benefits.
- v. Pilonidal disease
 1. The pathophysiology and signs/symptoms of pilonidal disease
 2. Options for surgical management of pilonidal disease, including risks and benefits.

8. BENIGN DISEASE (INCLUDES IBD)

A. Colonic Diverticular Disease

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The proposed etiologies, incidence, and epidemiology of colonic diverticular disease
- ii. The spectrum of presentation of uncomplicated and complicated colonic diverticular disease, including symptoms, physical findings, and diagnostic test findings
- iii. The signs, symptoms, and diagnostic findings for uncommon presentations of colonic diverticular disease
- iv. The rationale and indications for medical and/or surgical management of diverticular disease and its complications. **Residents should know that antibiotics can be omitted in uncomplicated sigmoid diverticulitis.**

- v. The role, technique, and outcomes for laparoscopic lavage in purulent peritonitis secondary to perforated diverticulitis.

B. Lower Gastrointestinal Bleeding (LGB)

Residents in colon and rectal surgery should be able to:

- i. List the etiologies of hematochezia.
- ii. Compare and contrast the utility, specificity, and sensitivity of colonoscopy, angiography, and nuclear scans in the evaluation of lower GI bleeding.
- iii. Discuss the evaluation of chronic recurrent lower GI bleeding, including the use of capsule enteroscopy, double-balloon enteroscopy, exploratory laparotomy with intraoperative endoscopy, and provocative angiography
- iv. Discuss etiologies of angiodysplasia
- v. Discuss the classification of hemangiomas, their clinical presentation, and predominant GI sites.

C. Benign Colon Misc.

Regarding each of the following conditions, residents in colon and rectal surgery should be able to describe and discuss:

- i. Volvulus and Large Bowel obstruction
 - a. Proposed etiologies, incidence, and epidemiology of volvulus or obstruction of the colon
 - b. The clinical presentation and diagnosis of colonic volvulus or bowel obstruction
 - c. Rationale and indications for nonoperative and operative management options for colonic volvulus (i.e. initial endoscopic decompression) or large bowel obstruction (i.e. endoscopic stent placement)
- ii. Endometriosis involving the colon and/or rectum
 - 1. The etiology of endometriosis involvement of the colon or rectum
 - 2. The clinical presentation and endoscopic and laparoscopic findings of endometriosis
 - 3. The indications for medical management of endometriosis involving the colon or rectum.
 - 4. Indications for operative management of endometriosis involving the colon or rectum.

d. Colon, Rectal and Anal Trauma (Including Foreign Bodies)

Residents in colon and rectal surgery should be able to:

- i. Compare and contrast the utility of imaging and diagnostic tests in the evaluation of blunt colonic abdominal trauma.
- ii. Compare and contrast the utility of different methods of evaluating penetrating colonic abdominal trauma.
- iii. Describe and discuss the management options of colorectal trauma, including their indications, risks, and benefits in selected colonic trauma scenarios.
- iv. Identify clinical situations requiring evaluation for possible rectal trauma.
- v. Describe and discuss methods for the diagnosis of rectal trauma and associated injuries.
- vi. Describe and discuss issues in the surgical management of rectal trauma including drainage, fecal diversion, rectal washout, and primary repair.
- vii. Describe and discuss the evaluation and treatment of third and fourth degree obstetrical injuries.
- viii. Describe and discuss the evaluation and treatment of traumatic anal injuries including the role of primary repair, delayed repair, and fecal diversion.
- ix. Describe and discuss the evaluation and treatment, surgical and non-surgical, of rectal foreign bodies.

e. Inflammatory Bowel Disease Etiology, Classification, Presentation, Findings

Residents in colon and rectal surgery should be able to describe and discuss:

- i. Presenting symptoms, physical findings, clinical patterns, and natural history of Crohn's disease (CD), ulcerative colitis (UC), unclassified inflammatory bowel disease (IBDU), and indeterminate colitis (IC)
- ii. Extraintestinal manifestations of inflammatory bowel disease, including hepatic, bone and joint, dermatologic, ophthalmologic and hypercoagulability
- iii. The etiology of inflammatory bowel disease, including the possible role of genetics, immune function, infectious agents, psychological issues, and environmental factors
- iv. The comparable and contrasting epidemiologic features of Crohn's disease and ulcerative colitis including age and gender distribution, prevalence, risk, and ethnic and geographic variations.

- v. The criteria for severity of disease as defined by the Crohn's disease activity index (CDAI) and the Truelove classification for ulcerative colitis; the Vienna and Montreal classifications of Crohn's disease and ulcerative colitis.
- vi. The endoscopic and radiographic findings, distinguishing histologic characteristics and serologic markers in ulcerative colitis, Crohn's disease, unclassified inflammatory bowel disease, and indeterminate colitis
- vii. The differential diagnosis of diseases mimicking inflammatory bowel disease.
- viii. The impact of inflammatory bowel disease on fertility and pregnancy outcome; and the impact of pregnancy on the course of inflammatory bowel disease.

f. Medical Management of Inflammatory Bowel Disease

Residents in colon and rectal surgery should be able to discuss:

- i. Mechanism of action, indication, dosage, side effects, and toxicity of drugs used for the treatment of Crohn's disease and ulcerative colitis, including aminosalicylates, corticosteroids, antibiotics, immunomodulatory drugs, and biologics.
- ii. The initial site-specific medical management
- iii. The role of nutritional support
- iv. Approaches for induction of remission and maintenance of remission, including the pros and cons of a top-down strategy versus a bottom-up strategy.
- v. **When to stop inflammatory bowel disease medications, e.g. steroids/biologics prior to surgery**
- vi. Medical management of perianal Crohn's disease
- vii. The use of postoperative medical prophylactic therapy in Crohn's disease
- viii. Risk of small and large bowel carcinoma with regard to extent and duration of disease
- ix. Cancer surveillance recommendations, including technique, limitations, interpretation of biopsy results, and the significance of dysplasia (low versus high-grade) and concomitant inflammation. **The importance of visible vs. invisible dysplasia during regular optical or chromoendoscopy.**

g. Surgical Management of Ulcerative Colitis

Residents in colon and rectal surgery should be able to describe and discuss:

- i. Indications for surgery, comparing and contrasting elective strategies for chronic ulcerative colitis with urgent/emergent strategies for acute or fulminant colitis.
- ii. Indications, contraindications, risks, limitations, operative technique and complications of total proctocolectomy with pelvic pouch (including S, J, W, or lateral isoperistaltic), with continent ileostomy, or with end ileostomy; or total abdominal colectomy with ileorectal anastomosis.
- iii. Specifics of ileoanal pouch construction, including double stapled versus hand sewn anastomosis, shape and size of the ileal pouch, and intraoperative techniques used to obtain a tension-free pouch-anal anastomosis.
- iv. Indications, risks, and benefits for temporary diverting ileostomy proximal to an ileoanal pouch; and the role of a 2 stage versus 3 stage approach
- v. Consideration of ileoanal pouches in the setting of colorectal cancer, in patients with unclassified inflammatory bowel disease and indeterminate colitis, and in the elderly
- vi. Management of post-surgical surveillance and prophylaxis

h. Surgical Management of Crohn's Disease

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The indications for surgery for Crohn's disease, comparing and contrasting elective, urgent and emergency operative strategies.
- ii. The indications, contraindications, risks, limitations, operative technique and complications of segmental resection with or without anastomosis, strictureplasty, fecal diversion, and intestinal bypass
- iii. The management of complicated abdominal Crohn's disease, including interloop, intermesenteric, and iliopsoas abscess; enterocutaneous, enteroenteric, and colovaginal fistula; and Crohn's disease of the duodenum and proximal GI tract
- iv. Management of anorectal Crohn's disease, including abscess, anal fissure and ulcer, perianal/perirectal fistula (including role of draining setons in the setting of biologic therapy), and rectovaginal and anovaginal fistula, skin tags
- v. Management of post-surgical surveillance and prophylaxis

i. Management of Less Common Benign Colorectal Disorders

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The etiology, pathogenesis, clinical presentation, diagnostic evaluation, and medical and surgical management of acute and chronic colonic ischemia
- ii. Risk factors, mechanism of injury, gross and microscopic findings, and medical and surgical management of acute and chronic radiation injury
- iii. The clinical presentation and management of microscopic/collagenous colitis, eosinophilic colitis, and lymphocytic colitis
- iv. The clinical presentation and management of collagen-associated colitides, including polyarteritis nodosa, cryoglobulinemia, Henoch-Schönlein purpura, Behçet's syndrome, systemic lupus erythematosus, scleroderma, and polymyositis
- v. The clinical presentation and management of miscellaneous colitides, including diversion colitis, neutropenic enterocolitis, disinfectant colitis, corrosive colitis, NSAID-induced colitis, and toxic epidermal necrolysis
- vi. The etiology, epidemiology, pathogenesis, and medical and surgical treatment of infectious colitides, including *Clostridium difficile* colitis, bacterial, viral, and parasitic colitis.
- vii. The etiology, epidemiology, pathogenesis, and medical treatment of diarrhea in the HIV patient

j. Stomas and Associated Complications

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The indications and contraindication for temporary and permanent colostomy, temporary and permanent ileostomy, and continent ileostomy
- ii. The techniques for stoma creation, including end colostomy, end ileostomy, Brooke ileostomy, loop stoma, loop-end stoma, and continent ileostomy; and the use of extraperitoneal tunneling.
- iii. Normal ileostomy, colostomy, and urostomy function and physiology, and their corresponding pathologies
- iv. The diagnosis and medical/surgical management of stoma-related complications, including herniation, stenosis, prolapse, ischemia, retraction, bolus obstruction,

bowel obstruction, hemorrhage associated with portal hypertension, stomal varices, high output, skin irritation/leakage, and skin infections.

9. NEOPLASIA (INCLUDING POLYPS)

A. Polyps and Polyposis Syndromes

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The epidemiology, incidence, and prevalence, and potential etiologic factors of colorectal adenomas
- ii. The molecular pathways of the adenoma-carcinoma sequence, and the serrated adenoma pathway to carcinoma
- iii. The gross and microscopic features of hyperplastic, inflammatory, adenomatous, and hamartomatous polyps
- iv. The potential for missed polyps during colonoscopy; techniques used to reduce miss rates, including high resolution endoscopy and chromoendoscopy.
- v. The criteria used to recommend formal oncologic bowel resection for malignant polyps, including Haggitt classification for pedunculated polyps, the risk of lymph node metastasis, and the depth of submucosal invasion (for flat polyps)
- vi. Familial adenomatous polyposis (FAP), including clinical features, extracolonic manifestations, genetic features, the role and usefulness of genetic testing in FAP, the modalities and role of screening in FAP families, surveillance in FAP, and surgical management.
- vii. Clinical variants of FAP, including attenuated FAP, Gardner's syndrome, and Turcot's syndrome
- viii. MYH-associated polyposis (MAP), including clinical features, extracolonic manifestations, genetic features, the role and usefulness of genetic testing, and the modalities and role of screening and surveillance in MAP families.
- ix. Clinical features and malignant potential of polyps in the following syndromes:
 - Hamartomatous Polyposis Syndromes
 - Peutz-Jeghers syndrome
 - Juvenile polyposis hamartomatous syndromes

- PTEN Hamartoma Tumor Syndrome (PHTS), including Cowden syndrome and Bannayan-Riley-Ruvalcaba syndrome.
- Metaplastic syndrome
- Cronkhite-Canada syndrome
- Hyperplastic polyposis syndrome
- Serrated polyposis syndrome (SPS)

B. Epidemiology and Etiology of Colorectal Cancer

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The epidemiology, incidence, and prevalence of sporadic colorectal cancer; associated socioeconomic factors; ethnic, gender, age, and geographic variations; and anatomical distribution of cancers within the colon.
- ii. The etiology of colorectal cancer, with occupational/environmental risk factors including obesity, smoking, physical activity and dietary considerations including fiber, calcium, folate, red meat
- iii. Factors associated with elevated risk for colorectal cancer, including inflammatory bowel disease, personal and family history of colon cancer and cancer syndromes, inherited susceptibility to colorectal cancer, and cholecystectomy.
- iv. The molecular pathways leading to carcinogenesis, including specific genes involved in the development of cancer.
- v. Appropriate screening modalities and relative efficacy of each screening modality for usual-risk patients as well as patients with a personal history of colorectal cancer or polyps and for familial adenomatous polyposis (FAP), MYH-associated polyposis (MAP), hereditary non-polyposis colorectal cancer (**Lynch Syndrome**), and inflammatory bowel disease
- vi. De novo carcinoma
- vii. Colorectal cancer prevention, including aspirin and NSAIDS.
- viii. Specific genes involved in hereditary non-polyposis colorectal cancer (**Lynch Syndrome**) and genotype-phenotype relationships; genetic testing for **Lynch Syndrome**, including immunohistochemistry (IHC) analysis, microsatellite instability (MSI) testing, and germline testing.

- ix. The Amsterdam II criteria and the modified Bethesda criteria for clinical diagnosis of **Lynch Syndrome**
- x. The clinical features of Lynch Syndrome, including common extracolonic tumors; the pathologic features of **Lynch Syndrome**.
- xi. Surgical management of **Lynch Syndrome**, including treatment options (indications, contraindications, and limitations); prognosis after resection and surveillance patterns
- xii. Chemoprevention options in **Lynch Syndrome**
- xiii. Familial colorectal cancer type X

C. Colorectal Cancer Diagnosis, Staging and Prognosis

Residents in colon and rectal surgery should be able to describe and discuss:

- i. Signs and symptoms of colon cancer and rectal cancer, including location-specific symptoms (**right colon, left colon, rectum**)
- ii. The clinical evaluation and the localization of lesions in the colon and rectum
- iii. The clinical staging of colorectal cancer, including imaging studies and serum markers; staging following neoadjuvant therapy (including post-treatment imaging and serum markers); and pathologic staging, including the associated prognosis.
- iv. The indications, limitations, and usefulness of CT scan, MRI, endorectal ultrasound, and PET scan in preoperative staging of colon cancer and rectal cancer
- v. The use of carcinoembryonic antigen (CEA) in the staging and management of colorectal cancer
- vi. Mechanisms and patterns of metastases in colorectal cancer
- vii. TNM based treatment strategy.
- viii. The pathologic features and the impact of histologic grade, microsatellite instability, mucinous histology, signet cell histology, venous invasion, lymphatic invasion, perineural invasion, and lymph node involvement on colorectal cancer prognosis
- ix. The significance of proximal, distal, and radial margins in the prognosis of colorectal cancer
- x. The use of a multi-discipline team (MDT) approach for the management of patients with **colorectal cancer**.

D. Surgical Management of Intraoperative Colon Cancer

Residents in colon and rectal surgery should be able to describe and discuss:

- i. Preparation of the patient for colon resection for cancer
- ii. The key surgical aspects of oncologic colon procedures, including right hemicolectomy, extended right hemicolectomy, left colectomy, sigmoid colectomy, and total abdominal colectomy.
- iii. The role of minimally invasive techniques in the surgical management of colon cancer
- iv. The prognosis for colon cancer based on intra-operative and histopathologic findings.
- v. The role of prophylactic oophorectomy
- vi. The surgical management of acute obstructive colon cancer, perforated colon cancer, synchronous colon cancer, and unsuspected metastatic disease
- vii. The indications, contraindications, and complications of endoluminal stenting in the management of large bowel obstruction secondary to an obstructing colon cancer.
- viii. The most common complication of the procedures and their timely management

E. Surgical Management of Rectal Cancer

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The role of a multidisciplinary approach in the evaluation and management of rectal cancer
- ii. Multimodality treatment for rectal cancer, including indications, limitations, risks, and outcomes of neoadjuvant therapy for unfavorable rectal cancer; indications, limitations, risks and outcomes of adjuvant therapy.
- iii. The prognostic significance of complete and near-complete pathologic response to neoadjuvant therapy, and its impact on management
- iv. Preparation of the patient for rectal cancer resection
- v. The surgical treatment options for rectal cancer, including local excision, transanal microsurgery (TEMS), transanal minimally invasive surgery (TAMIS), and total mesorectal excision, demonstrating knowledge of the techniques, indications, limitations, risks, and outcomes. **They should know about the new investigational technique of transanal total mesorectal excision (TaTME).**

- vi. The role of minimally invasive techniques, including robotics and transanal TME, in the surgical management of rectal cancer.
- vii. The indications, contraindications, and technique of sphincter preservation surgery, colonic J pouch or colectomy, and intersphincteric dissection.
- viii. The outcome of surgery and the long-term prognosis of rectal cancer based on intra-operative and histopathologic findings.
- ix. The most common complication of the procedures and their timely management.

F. Total neoadjuvant therapy for rectal cancer.

Residents in colon and rectal surgery should be able to describe and discuss:

- i. **Different options including induction vs. consolidation neoadjuvant chemotherapy/immunotherapy.**
- ii. **Short vs long course neoadjuvant radiation**
- iii. **How to determine complete or near-complete clinical response**
- iv. **How to survey complete or near-complete clinical response in a watch and wait protocol.**

G. Adjuvant Therapy and Surveillance for Colon and Rectal Cancer

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The indications, agents, and schedule of adjuvant chemotherapy for node-positive (Stage III) colon and rectal cancer.
- ii. The role of adjuvant chemotherapy in node-negative (Stage II) colon and rectal cancer.
- iii. **The role of adjuvant immunotherapy in mismatch-repair deficient colon and rectal cancer.**
- iv. The tests used for surveillance of recurrence after an initial diagnosis of cancer.
- v. The recommended schedule for surveillance colonoscopy after an initial cancer diagnosis.
- vi. The risks, patterns, and timing of recurrent cancer after an initial cancer diagnosis.
- vii. The incidence of metachronous polyps and cancer after an initial cancer diagnosis.

H. Management of Locally Advanced, Metastatic and Recurrent Colorectal Cancer

Residents in colon and rectal surgery should be able to describe and discuss:

- i. Clinical symptoms and imaging and intraoperative findings suggestive of unresectability.
- ii. The role of multi-modality therapy in the treatment of colorectal cancer unresectable at presentation, including surgery (**diversion**), radiation therapy (intra-operative and external beam), and chemotherapy.
- iii. Indications, contraindications, limitations and technique of endoscopic stenting and laser ablation or recanalization.
- iv. Palliative management of the primary cancer and metastatic disease, including options to treat/palliate metastases to the liver, peritoneum, ovary, lungs, bone, and brain.
- v. The role of a multidisciplinary approach in the evaluation and management of metastatic disease and palliative approaches.

I. Less Common Malignant Lesions of the Colon and Rectum

Residents in colon and rectal surgery should be able to describe and discuss the clinical presentation, management and prognosis of the following colorectal pathologies:

- i. Carcinoid
- ii. Lymphoma
- iii. GIST
- iv. Leiomyoma and leiomyosarcoma
- v. Squamous and adenosquamous carcinoma
- vi. Plasmacytoma
- vii. Melanoma
- viii. Leukemic infiltration

J. Anal and Perianal Neoplasia

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The distinction between the anal canal, the anal margin, including the lymphatic drainage patterns and associated implications for management of neoplasms in the region.
- ii. The histology of the anal canal, with the significance of the anal transitional zone
- iii. The epidemiology and etiology of anal neoplasia, including demographics, changing incidence, association with sexual practices, and high-risk groups.

- iv. The staging of anal neoplasia including **anal intraepithelial neoplasia, low vs. high grade intraepithelial lesion**, and TNM staging
- v. The histology, biology, and treatment of anal canal malignancies, including epidermoid carcinoma, adenocarcinoma, small cell carcinoma, and melanoma.
- vi. The treatment of recurrent or residual anal canal cancer
- vii. The histology, biology, and treatment of anal margin malignancies, including squamous cell carcinoma, basal cell carcinoma, intraepithelial squamous cell carcinoma (Bowen's disease), intraepithelial adenocarcinoma (Paget's disease), giant verrucous tumor (Buschke-Lowenstein), and HIV-related cancers (Kaposi's sarcoma, lymphoma)
- viii. Role of HPV vaccine in prevention of anal neoplasia

K. Presacral Tumors

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The anatomy, physiology and clinical presentation of presacral tumors
- ii. The differential diagnosis and classification of presacral tumors
- iii. The gross and histologic appearance of presacral tumors
- iv. A decision-making algorithm for the diagnosis and management of presacral tumors, including the role and usefulness of pre-operative imaging, pre-operative biopsy, and neoadjuvant therapy.
- v. The surgical management of presacral tumors, including the various approaches with their indications and technique.
- vi. The prognosis and post-operative outcome for presacral tumors

MISCELLANEOUS

L. Minimally Invasive Colorectal Surgical Techniques

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The advantages, disadvantages, indications, and contraindications of laparoscopic **or robotic-assisted** management of benign and malignant colon and rectal diseases, including the physiologic impact of pneumoperitoneum on cardiovascular, respiratory, and immunologic function; and the learning curve in **minimally invasive** colorectal surgery. Please refer to the APDCRS Robotic Colorectal Surgery curriculum for further details.
- ii. Equipment, operating room set up, patient positioning, and instrumentation for the performance of a laparoscopic **or robotic-assisted** colorectal procedures.
- iii. Outcomes of **laparoscopy or robot** in surgery for colon and rectal cancer, diverticular disease, rectal prolapse surgery, Crohn's disease, and ulcerative colitis.
- iv. Factors that influence the decision for conversion from **minimally invasive** to open procedure
- v. The advantages, disadvantages and indications for the use of Transanal Endoscopic Surgery (TES), including Transanal Endoscopic Microsurgery (TEM) and Transanal Minimally Invasive Surgery (TAMIS), for the treatment of rectal neoplasia and benign disease.
- vi. The advantages, disadvantages and indications for the use of Transanal **Total** Mesorectal Excision for rectal neoplasia.

M. Pediatric Colorectal Disease

Residents in colon and rectal surgery should be able to describe and discuss:

- i. The incidence, etiology, histology, varying anatomic extent, associated congenital anomalies, and differential diagnosis of pediatric Hirschsprung's disease.
- ii. Ultrashort segment Hirschsprung's disease and total colonic aganglionosis.
- iii. Indications, technique, limitations, and outcomes of operative options in the management of pediatric Hirschsprung's disease.
- iv. The incidence, etiology, and classification of imperforate anus, including specific anatomical defects in male and female infants, and associated anatomic abnormalities.

- v. Diagnostic tests, initial and definitive treatment strategies, surgical options, and long-term outcome of operative repairs of imperforate anus and its various presentations.
- vi. Frequent pediatric colon and rectal conditions, including constipation/encopresis, rectal prolapse, anal fissure, Meckel's diverticulum, juvenile polyps and juvenile polyposis, necrotizing enterocolitis (NEC), gut malrotation, and sexual abuse.

TECHNICAL SKILLS

GOALS

The specialty of Colon and Rectal Surgery encompasses a sizable technical component. It is therefore paramount that residents in Colon and Rectal Surgery demonstrate the ability to competently, safely, and independently perform all essential surgical procedures indicated in the management of colon and rectal diseases.

Initiatives are currently underway to improve teaching and assessment of technical competency skills with objective structure scenarios. This is an evolving process and has not been validated yet.

OBJECTIVES

The American Board of Colon and Rectal Surgery (September 18, 2011) established that each resident must complete a minimum of ONE procedure in each of the following Key Index Areas:

- Pouch Surgery (Colitis or FAP)
- Prolapse Surgery
- Fistula Surgery
- Hemorrhoid Surgery
- Incontinence surgery
- Abdominal proctectomy alone (or as part of a Total Proctocolectomy)

The ACGME established Minimum Case Numbers for Colon and Rectal Surgery (04/2015) which includes 2 categories. The first category is Surgical Management and has 3 subcategories: Anorectal Procedures, Abdominal Procedures, and Endoscopy/Pelvic Floor Procedures. The second category is Disease Management and has 2 subcategories: Anorectal and Abdominal Diagnoses. These are as follows:

1. SURGICAL MANAGEMENT

a. Anorectal Procedures:

- i. Hemorrhoidectomy (rubber band/sclerotherapy/excisional)
- ii. Fistulotomy
- iii. Complex Fistula Management (Endorectal advancement flap, intersphincteric fistula ligation, **etc.**)
- iv. Fecal incontinence (Sphincteroplasty, sacral nerve stimulator, Solesta, **radiofrequency ablation**)
- v. Internal sphincterotomy
- vi. Transanal excision

b. Abdominal procedures:

- i. Segmental colectomy (including ileocolic resection)
- ii. **Safe use of vessel sealing devices (both open and minimally-invasive)**
- iii. **Safe use of staplers (linear, Contour, EEA, laparoscopic, robotic)**
- iv. Laparoscopic **or robotic-assisted** colon resection (**should be exposed to intracorporeal anastomosis**).
- v. Low anterior resection (straight anastomosis, pouch, coloplasty)
- vi. Abdominoperineal resection
- vii. Proctocolectomy with ileostomy or with ileoanal reservoir (handsewn, stapled anastomosis)
- viii. Rectal prolapse repair (abdominal, perineal approach)
- ix. **Handsewn coloanal anastomosis (after pouch formation or rectal cancer resection).**
- x. Stoma **construction (including preop marking)**
- xi. Stoma complication repair (parastomal hernia, stenosis, retraction, prolapse, fistula)
- xii. Total Pelvic dissections (subcategory for cancer)

c. Endoscopy/and pelvic floor procedures:

- i. Proctoscopy/Anoscopy
- ii. Colonoscopy (diagnostic, biopsies, polypectomy, injection, stenting, dilation, ablation). **To assess skill acquisition, track time to cecum and % of time cecum were intubated. To assess quality, track % of screening colonoscopies with an adenoma detected (should be about 30%).**
- iii. Pelvic Floor Evaluations (endorectal and endoanal ultrasound, anorectal manometry, pudendal nerve terminal motor latency/PNTML, defecography)

2. DISEASE MANAGEMENT

a. Diagnoses - Anorectal

- i. Anal fissure
- ii. Anal fistula
- iii. Hemorrhoids
- iv. Pelvic floor
- v. Constipation
- vi. Incontinence

b. Diagnoses - Abdominal

- i. Carcinoma of the colon
- ii. Carcinoma of the rectum
- iii. Crohn's disease
- iv. Diverticular disease
- v. Genetic neoplasia (FAP, AFAP, **Lynch Syndrome, etc.**)
- vi. Prolapse
- vii. Ulcerative colitis

The minimum case numbers as set by the ACGME are listed at:

<https://www.acgme.org/specialties/colon-and-rectal-surgery/documents-and-resources/>

Examples of tools that may be used to assess technical skills include, but are not limited to:

1. Direct observation of the resident performing a wide variety of abdominal, anorectal and endoscopic procedures either as the surgeon or as the first assistant. All procedures are performed under the direct supervision of an attending physician who ensures that the resident is functioning in a skillful and safe manner. Patient safety is paramount at all times. Structured feedback is critical to ensure further development of skills and the use of procedure specific checklists and global rating forms is encouraged.
2. Operative simulation - various modules exist for training of specific core and advanced procedures and can be utilized in an animate experience. Virtual simulations for endoscopic and robotic procedures are encouraged where appropriate simulators are available. Engaged faculty to provide timely feedback and direction is critical in the development and improvement of technical skills using simulation.

3. Surgical lab experience - Much work has been done in the development of performance assessment in using training models and whether skills and tasks taught in laboratory environments can translate into the clinical setting. However, evaluating performance in the operating room remains in evolution, and most efforts have focused on techniques that standardize the assessment process outside the operating room. Current and evolving assessment tools are based on direct observation and video recordings of performance of a particular simulated task or procedure and include the use of task specific checklists and rating scales, such as the Objective Structured Assessment of Technical Skills (OSATS) developed at the University of Toronto and the Southern Illinois University (SIU) Verification of Proficiency. The first component of OSATS is a task specific checklist consisting of specific surgical maneuvers that are considered essential elements of the procedure. The second is a global rating form, which includes a number of surgical behaviors, such as respect for tissues, economy of motion, and appropriate use of assistants. The attending surgeons and instructors are trained on the use of the assessment tools and are anchored on the assessment criteria to ensure and optimize inter-rater reliability. There are currently assessment forms available online for certain colorectal procedures that were developed in conjunction and based on the principles developed by the American College of Surgeons in collaboration with the Association of Program Directors in Surgery, Southern Illinois University (SIU) Surgical Skills Laboratory, and the Intercollegiate Surgical Curriculum Programme (London).
4. Video recordings of procedures – most advanced endoscopic and laparoscopic systems allow for the recording of the procedure. Utilization of video as a means of providing feedback on critical components of the procedure, technical maneuvers, and the ability to discuss ways for improvement has been shown to be beneficial in providing feedback on the development of technical skills. Utilization of video has been shown to be valid in providing feedback and as a measure of assessing progress in training.
5. Training courses in specific procedures, for example robotics, laparoscopy, transanal total mesorectal excision and Transanal Endoscopic Microsurgery can be utilized in the development and refinement of technical skills. Many courses are available to residents at no or reduced charge through the program directors' association or at the ASCRS annual meeting.
6. Further robotic surgery training and assessment tools are provided in the Robotic Surgery curriculum.