Review

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Urogynecology, Urology, and Coloproctology: Historical Development, Shared Pelvic Floor Disorders, and Competency-Based Surgical Limits

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Summary

Pelvic floor disorders frequently involve urinary, genital, and anorectal functions simultaneously. Urogynecology, urology, and coloproctology have evolved as distinct fields with different historical origins, training pathways, and major areas of expertise; however, their clinical and surgical boundaries are not always anatomically distinct. This narrative review examines the historical development and contemporary roles of these specialties, identifies major areas of overlap, and considers whether surgical responsibility should be assigned by specialty title, organ-based jurisdiction, or demonstrated specific procedural competence. Directed searches of PubMed and professional guidelines were used to identify historical reviews, terminology reports, clinical practice guidelines, and studies on multidisciplinary pelvic floor care. The evidence describes clear differences in central experience but also substantial interfaces in pelvic organ prolapse, urinary and fecal incontinence, urethral reconstruction, fistulas, obstetric pelvic floor injuries, and multicompartmental diseases. Current guidance supports multidisciplinary assessment in selected complex, recurrent, bowel-associated, and mesh-related cases, but does not establish exclusive ownership of all overlapping procedures. We propose a competency-based framework in which operational leadership is determined by dominant pathology, reconstructive goal, documented training and experience, case complexity, institutional accreditation, and ability to manage complications. The framework is a conceptual proposition, not a validated guideline. Thus, specialties are distinct but not fully independent in practice: collaboration should be directed to clinical need, while independent operation should require demonstrable competence and clear accountability.

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Introduction

The pelvic floor is an integrated anatomical and functional system comprising the bladder and urethra, vagina and reproductive organs, rectum and anal canal, connective tissue supports, striated and smooth muscle, and peripheral and autonomic neural pathways. Dysfunction in one compartment may alter symptoms or treatment decisions in another. Patients may present with urinary incontinence, urinary dysfunction, pelvic organ prolapse, obstructed defecation, fecal incontinence, pelvic pain, or fistulas that cross organ boundaries. These conditions are not simply adjacent diagnoses: they may share labor-related injuries, connective tissue failure, neurological dysfunction, previous surgery, or impaired pelvic biomechanics. (1–4)

Urology, urogynecology, and coloproctology emerged through different professional and educational trajectories. Their differentiation supports focused expertise, but a rigid model of organ ownership can become inadequate when a reconstruction involves multiple compartments. Conversely, anatomical proximity alone does not make the operational skills of specialists interchangeable. The central question then is not whether these fields are identical, but how their distinct specialty should be coordinated when a patient's disease crosses conventional boundaries.

This narrative review summarizes the historical evolution and contemporary scope of the three fields, maps clinically important areas of overlap, and proposes principles for assigning operational leadership without asserting exclusive procedural ownership.

Methods

This narrative review and conceptual analysis was based on targeted searches of PubMed and public guidelines from professional societies and the National Institute for Health and Care Excellence (NICE). Search concepts included history of urogynecology, urology, and colorectal surgery; female pelvic medicine and reconstructive surgery; pelvic organ prolapse; urinary and anorectal dysfunction; urethral diverticulum; fistula repair; rectal prolapse; obstetric pelvic floor injury; and multidisciplinary care. Priority was given to historical reviews, international terminology reports, clinical practice guidelines, systematic reviews, and observational studies relevant to interspecialist practice. Sources were synthesized descriptively; no comprehensive systematic search, duplicate independent screening, formal risk of bias assessment, or meta-analysis were performed. Therefore, this article should be interpreted as a narrative review and conceptual proposal rather than a systematic review, consensus statement, or clinical guideline.

Historical development and contemporary scope

Urogynecology: From Obstetric Injuries to Pelvic Floor Medicine

Problems now described as urogynecological have been recognized since ancient times. Historical accounts describe prolapse and attempts to manage it in Egyptian, Greek, and Roman medicine, often in the context of childbirth and reproductive health. (1) During the nineteenth century, advances in gynecologic surgery included an increasingly systematic repair of obstetric fistulas and pelvic support defects. The work of surgeons such as Thomas Addis Emmet helped establish reconstructive repair of vesicovaginal fistula as an important component of gynecologic surgery, although the story must also be understood in the context of the ethical failings and exploitation associated with some early surgical practices. (2)

During the twentieth century, clinical interest expanded from anatomical repair to continence physiology, pelvic support, urodynamics, and quality of life. The growth of professional societies and multidisciplinary research helped establish urogynecology as a focused discipline. (3) In the United States, Female Pelvic Medicine and Reconstructive Surgery (FPMRS) was formally recognized through a process that involved subspecialty certification and accredited fellowship training, with certification pathways involving both obstetrics and gynecology and urology. (4) Terminology continues to evolve internationally, reflecting different national systems and the effort to describe a field that bridges gynecology, female urology, and pelvic reconstructive surgery. (5)

Contemporary urogynecology typically emphasizes disorders of the female pelvic floor, including urinary incontinence, pelvic organ prolapse, urinary dysfunction, and selected reconstructive conditions involving the vagina, urethra, bladder, and pelvic support structures. Its distinctive contribution is the integrated assessment of urinary, vaginal, sexual, reproductive, and support-related outcomes. However, training and practice vary by country; the term does not imply universal proficiency in all urinary or colorectal operations.

Urology: An organ-focused surgical specialty with functional and reconstructive branches

Modern urology developed as a distinct surgical specialty during the nineteenth century, shaped by advances in endoscopy, instrumentation, lithotripsy, and the increasing tendency of surgeons to focus on specific organ systems. (6) Its scope subsequently expanded beyond the kidneys and urinary tract to include lower urinary tract function, male reproductive health, oncology, stone disease, and complex reconstruction. The development of urodynamics and specialized societies dedicated to lower urinary tract dysfunction provided a scientific and educational foundation for functional urology and female pelvic medicine. (7)

Urologists can manage female urinary incontinence, urethral diverticula, bladder dysfunction, urinary tract lesions, and vesicovaginal fistulas or other urinary fistulas, depending on local training and practice. Urologists with advanced expertise in female pelvic or reconstructive medicine may be particularly suited for complex urethral or vesical reconstruction. However, general urological training should not automatically be interpreted as advanced competence in all forms of vaginal support surgery, anal sphincter reconstruction, or rectal prolapse repair. As in other specialties, competence is procedure-specific.

Coloproctology: from proctology to colorectal and pelvic floor surgery

Colon, rectum, and anus surgery has ancient roots, but modern colorectal surgery developed through changes in anatomy, anesthesia, antisepsis, pathology, surgical technique, and the organization of specialized societies and training. (8) Proctology gradually expanded into a field encompassing colorectal neoplasia and inflammatory diseases, as well as benign anorectal disorders, pelvic floor dysfunction, rectal prolapse, fecal incontinence, and anal sphincter lesions. Contemporary colorectal practice includes both abdominal and perineal approaches to rectal prolapse, management of anorectal fistulas, and selected reconstructive procedures.

The main contribution of coloproctology to pelvic floor care is the diagnosis and treatment of disorders centered on the colon, rectum, anal canal, and anal sphincter. This includes distinguishing full-thickness rectal prolapse from posterior vaginal wall prolapse or rectocele, evaluation of defecatory dysfunction, and treatment of structural sphincter injury. Guidelines emphasize condition-specific assessment and individualized treatment for rectal prolapse. (9) Colorectal experience alone does not establish proficiency in urethral reconstruction or vaginal apical support surgery.

Why boundaries overlap

The pelvic floor is not organized according to occupational specialties. The anterior, middle, and posterior compartments interact through shared connective tissues, muscle, neural control, and pressure transmission. International terminology reports from the International Association of Urogennology (IUGA) and the International Continence Society (ICS) standardize descriptions of pelvic organ prolapse, anorectal dysfunction, and obstetric pelvic floor disorders, facilitating communication across disciplines. (10–12) Shared terminology does not eliminate specialty differences; rather, it makes the common clinical territory more explicit.

Three distinctions are helpful. First, symptom overlap is not necessarily disease overlap: urinary and fecal incontinence can coexist without requiring simultaneous surgery. Second, anatomical overlap does not equate to procedural equivalence: a rectocele and a full-thickness rectal prolapse are different diagnoses. Third, a multidisciplinary evaluation does not mean that all patients require a multidisciplinary operation. Collaboration is most valuable when expertise from another specialty could change diagnosis, treatment selection, surgical sequence, or management of complications.

Main clinical interfaces

Prolapse, rectocele, and rectal prolapse of pelvic organs

Pelvic organ prolapse may involve the anterior vaginal wall, vaginal apex, or posterior wall of the vagina. Urogynecologists commonly lead vaginal and apical support reconstruction. However, a posterior vaginal wall protrusion should not be automatically labeled as rectal prolapse: rectocele refers to herniation of the rectal wall into the vagina, while rectal prolapse is protrusion of the rectal wall through the anal canal or an internal intussusception. Symptoms such as splinting, incomplete evacuation, or protrusion of external tissue require targeted examination and, when appropriate, functional testing or imaging. When clinically significant rectal prolapse coexists with vaginal support defects, colorectal and urogynologic planning may help avoid treating only one component of a multicompartmental disorder. (9,10)

Urinary incontinence and lower urinary tract reconstruction

Female stress urinary incontinence can be managed by a urogynecologist or urologist with relevant expertise in female continence. Guidelines emphasize appropriate assessment, shared decision-making, and recognition of recurrent complications and symptoms. (13) The deciding factor is not only specialty etiquette, but whether the surgeon is trained and authorized to perform the proposed procedure and manage its complications. Recurrent incontinence, previous continence surgeries, suspicious mesh complications, urethral injury, or mixed functional pathology may warrant specialized review or multidisciplinary discussion.

Female urethral diverticulum

Female urethral diverticulum is a clear interface between urology and urogynecology. Excision requires precise anatomical definition, careful dissection, multilayered urethral closure, and preservation of continence. The evidence base is dominated by retrospective series, and outcomes depend on lesion characteristics and surgical experience. (14) Extensive, circumferential, recurrent, or fistulizing diverticula may require advanced reconstructive expertise. Both a urologist and urogynecologist can be an appropriate guide when the individual surgeon has documented competence and institutional authorization.

Complex urinary, rectovaginal, and pelvic fistulas

Vesicovaginal fistula involves the urinary tract and vagina; rectovaginal fistula involves the rectum and vagina. Its causes and reconstructive requirements vary. Obstetric injury, malignancy, radiation, inflammatory bowel disease, and previous pelvic surgeries can produce complex tissue defects. The lead surgeon should be selected based on the organ of origin, the anatomy of the defect, tissue quality, and the reconstructive task. Recurrent fistulas, radiation injury, malignancy, or simultaneous urinary and bowel involvement usually require joint planning, with explicit agreement on which surgeon performs which component.

Combined urinary and fecal incontinence; obstetric pelvic floor injury

Urinary and fecal incontinence may coexist after childbirth, neurological injury, aging, or pelvic surgery. Obstetric anal sphincter injury may affect continence, sexual function, and pelvic support, so accurate evaluation is important. (12,18,20) However, the presence of multiple symptoms does not automatically warrant three-specialty surgery. Management may include pelvic floor physical therapy, bowel-directed treatment, urodynamic or anorectal testing, and selective reconstructive procedures. Colorectal involvement becomes especially relevant when a structural defect of the anal sphincter or a complex anorectal disorder is a goal of treatment.

Mesh complications and recurrent multicompartment disease

NICE recommends a regional multidisciplinary review for selected complex cases, including repeated continence surgery, repeated prolapse surgery at the same site, coexisting bowel problems that may require colorectal intervention, and suspicious mesh-related complications. (15) Mesh-related symptoms may include pain, urinary dysfunction, vaginal exposure, bowel symptoms, or fistula. These cases illustrate why specialties may be complementary rather than competing: diagnosis and treatment planning may require various perspectives, while the surgical plan has yet to identify a primary responsible clinician.

Are the specialties independent or overlapping?

The most accurate answer is that they are institutionally and educationally distinct, but clinically interdependent under selected conditions. Their primary domains remain different: urogynecology focuses on female pelvic floor function and vaginal support; urology focuses on the urinary tract and its function; coloproctology focuses on the colon, rectum, anal canal, and anorectal function. These domains should not collapse into a single, undifferentiated specialty. At the same time, no single organ-based boundary adequately resolves all cases involving the shared pelvic floor.

The evidence for multidisciplinary care is encouraging but not definitive. In an observational evaluation by a regional multidisciplinary team for complex urogynecologic conditions, the original management plan changed in 25 of 60 presentations (41.7%), and 22 patients (36.7%) were reported as cured or improved following the team's recommended management. (16) These findings suggest that joint review may alter decisions, but observational data do not prove that all patients benefit from multidisciplinary review or identify a specialty as the owner of the universal procedure.

Therefore, we propose a competency-based model. Surgical leadership should be determined by: 1) the predominant pathology and affected compartment; 2) the technical goal of reconstruction; 3) documented training and procedure-specific experience; 4) case complexity and foreseeable complications; and 5) institutional privileges, professional regulation, and local referral pathways. This approach preserves specialized expertise while avoiding unsubstantiated proprietary claims. It also prevents the opposite mistake: assuming that an overlapping anatomical field grants unlimited authority to operate beyond one's own training.

Proposed Framework for Operational Leadership

We propose that operational leadership be determined by five considerations:

1. The predominant pathology and the anatomical compartment affected.
2. The technical requirements of the proposed reconstruction.
3. The surgeon's documented training and specific experience in procedures.
4. The complexity of the case and the need for additional expertise.
5. Applicable professional standards, institutional privileges, and accountability agreements.

This framework distinguishes the surgeon who coordinates the surgical plan from the specialists who contribute to the individual components of the treatment (**Table 1**) (**Figure 1**).

A practical decision-making path

A practical pathway can make collaboration and accountability explicit. First, establish the diagnosis and identify each compartment affected, distinguishing the coexistence of symptoms from structural disease. Second, define the intended reconstruction and functional outcomes that matter to the patient. Third, verify the proposed lead surgeon's specific training, current experience, and institutional clearance. Fourth, assess complexity, including recurrence, mesh, radiation, malignancy, fistula, previous surgery, and multi-compartment disease. Fifth, involve another specialty when their expertise may materially change diagnosis, treatment selection, operational safety, or functional outcome. Sixth, document the lead clinician, each surgeon's role, consent, postoperative follow-up, and responsibility for complications. Finally, monitor outcomes such as complications, recurrence, reoperation, urinary and bowel function, patient-reported quality of life, and referral delays.

Educational, Ethical and Research Implications

Shared education in pelvic anatomy, continence physiology, anorectal function, fistula repair, obstetric injuries, and multicompartmental reconstruction can improve communication and referral. However, exposure to procedures from another specialty does not equate to independent operational competence. Training programs and hospitals should define procedure-specific competencies, supervised experience, skill maintenance, and thresholds for referral. Patients should be given a clear explanation of the diagnosis, alternatives, material risks, and roles of participating surgeons; they should not be required to resolve professional disputes.

Future studies should compare competency-based referral pathways with usual specialty-based pathways, using outcomes that include complications, recurrence, reoperation, functional recovery, quality of life, patient experience, and time to definitive treatment. Multicenter registries could characterize which disease and procedure combinations benefit most from joint planning. Professional societies can also develop statements of shared competence for selected procedures across specialties, preserving jurisdiction-specific certification and accreditation.

Limitations

This is a narrative review with targeted, non-exhaustive literature selection. No formal risk of bias assessment or systematic scoring of evidence was conducted. Training pathways and legal domains vary between countries and institutions, so the proposed framework cannot be universally prescriptive. The framework has not been prospectively validated and should not be interpreted as a formal consensus or clinical practice guideline.

Conclusion

Urogynecology, urology, and coloproctology are distinct specialties with different core competencies, historical trajectories, and training structures. However, their clinical responsibilities overlap because urinary, genital, and anorectal function are integrated within the pelvic floor. Overlap is most relevant in multicompartmental prolapse, urinary and fecal incontinence, urethral reconstruction, fistulas, obstetric pelvic floor injuries, and mesh-related complications. Current guidance supports multidisciplinary assessment for selected complex cases, but

does not establish a universal procedural property. A balanced model should preserve specialty-specific expertise while assigning surgical leadership based on dominant pathology, reconstructive goal, documented competence, complexity, and applicable credentialing. The central question is not which specialty possesses an organ, but which appropriately trained and licensed clinician or team can provide safe, accountable, and patient-centered care.

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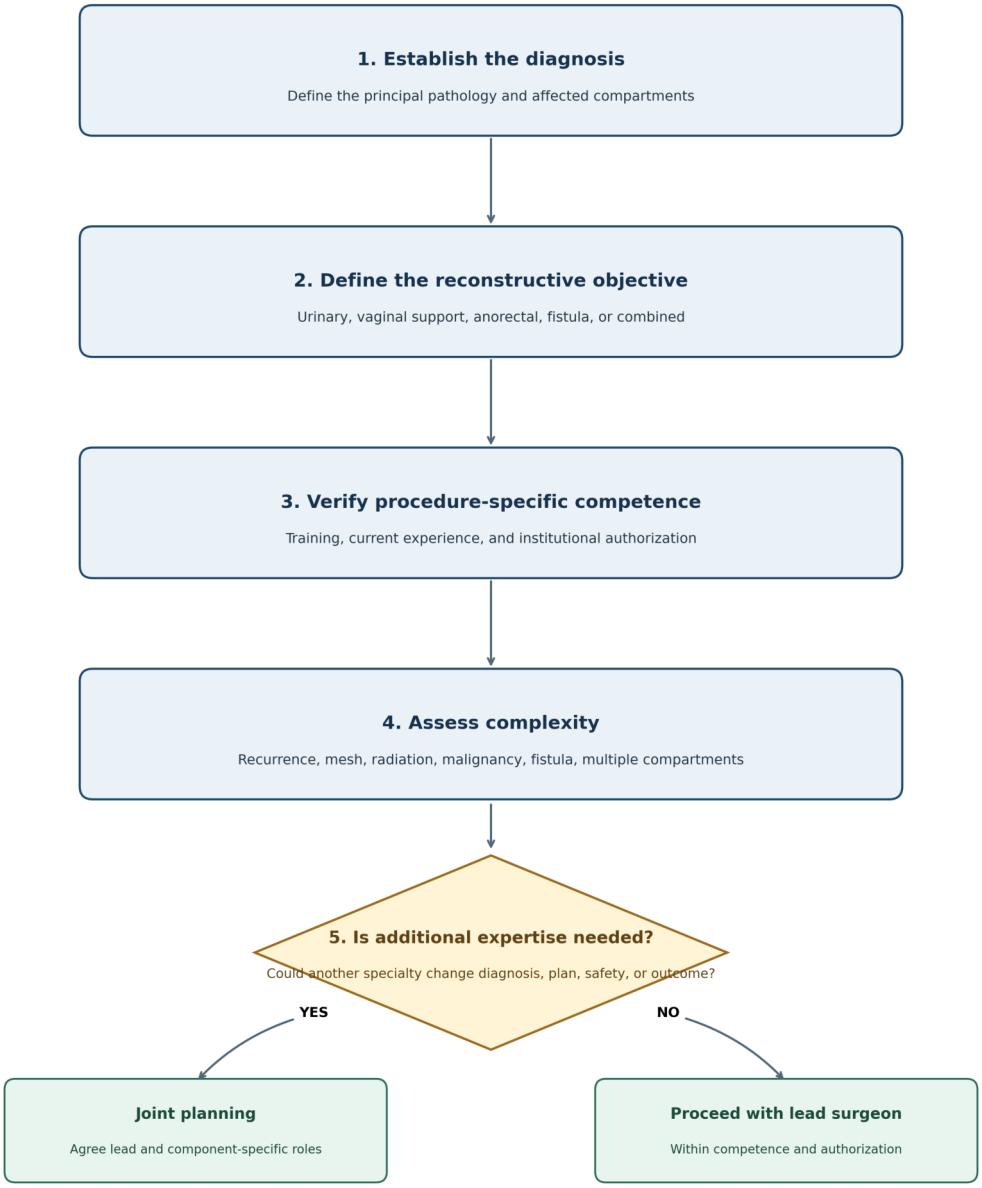
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Table 1. Proposed conceptual framework, not a binding allocation of procedural rights

Clinical problem	**Possible operational lead**	**When collaboration is particularly relevant**
Uncomplicated female stress urinary incontinence	Urogynecologist or urologist with expertise in female continence	Recurrent symptoms, previous continence surgery, suspected mesh complication
Anterior or apical vaginal prolapse	Urogynecologist or pelvic reconstructive surgeon with relevant training	Recurrent prolapse, urinary tract injury, multicompartment disease
Rectocele/prolapse of the posterior vaginal wall	Based on the dominant pathology and the surgeon's experience	Defecatory dysfunction, suspected rectal prolapse, sphincter injury
Female urethral diverticulum	Urologist or urogynecologist with experience in urethral reconstruction	Circumferential/recurrent injury, fistula, substantial urethral defect
Vesicovaginal fistula	Urologist or urogynecologist with experience in fistula repair	Ureteric involvement, recurrence, radiation, malignancy
Rectovaginal fistula or anal sphincter defect	Colorectal surgeon or other properly trained reconstructive surgeon	Associated vaginal or urinary injury, obstetric trauma, recurrence
Full-thickness rectal prolapse	Colorectal surgeon with experience in rectal prolapse	Significant vaginal apical prolapse or urinary dysfunction requiring coordinated treatment
Complex multi-compartment or mesh-related reconstruction	Lead selected according to the main pathology and the reconstructive objective	Usually a multidisciplinary review when experience from more than one specialty can change the plan

Note: Created by the authors, the table does not replace local regulations, specialized certification, individual competency assessment, or institutional accreditation.

Figure 1. Proposed competency-based decision pathway



Conceptual pathway for assigning operative leadership in pelvic floor reconstruction. The pathway is a proposal for local governance and has not been prospectively validated.

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