

Pleasurable and problematic receptive anal intercourse and diseases of the colon, rectum and anus

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Abstract

The ability to experience pleasurable sexual activity is important for human health. Receptive anal intercourse (RAI) is a common, though frequently stigmatized, pleasurable sexual activity. Little is known about how diseases of the colon, rectum, and anus and their treatments affect RAI. Engaging in RAI with gastrointestinal disease can be difficult due to the unpredictability of symptoms and treatment-related toxic effects. Patients might experience sphincter hypertonicity, gastrointestinal symptom-specific anxiety, altered pelvic blood flow from structural disorders, decreased sensation from cancer-directed therapies or body image issues from stoma creation. These can result in problematic RAI – encompassing anodyspareunia (painful RAI), arousal dysfunction, orgasm dysfunction and decreased sexual desire. Therapeutic strategies for problematic RAI in patients living with gastrointestinal diseases and/or treatment-related dysfunction include pelvic floor muscle strengthening and stretching, psychological interventions, and restorative devices. Providing health-care professionals with a framework to discuss pleasurable RAI and diagnose problematic RAI can help improve patient outcomes. Normalizing RAI, affirming pleasure from RAI and acknowledging that the gastrointestinal system is involved in sexual pleasure, sexual function and sexual health will help transform the scientific paradigm of sexual health to one that is more just and equitable.

Sections

Introduction

Pleasurable RAI

Problematic RAI

Non-malignant gastrointestinal diseases

Colon, rectal and anal cancer

Management of problematic RAI

Conclusions

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Key points

- Receptive anal intercourse (RAI) is common worldwide.
- Pleasurable RAI occurs through stimulation of the perianal or anal nerves and prostate or paraurethral glands, inducing vasodilation, erectile tissue engorgement, anorectal tissue sensitization, and anal sphincter and pelvic muscular contractions.
- Patients with a stoma and anorectal stump should be counselled on hygiene and dilator use to minimize infections, maintain anorectal patency, and prevent a permanent stoma, promoting RAI restoration.
- Antidiarrhoeals, anti-flatulence medications, fibre supplements, lower residue diet to control regularity, avoiding spicy foods, timing meals, and defecation prior to RAI can help control symptoms and relieve distress.
- Survivors of anal, rectal, and colon cancer and patients with gastrointestinal disease should be counselled on problematic RAI due to anal sphincter, neurovasculature, and prostate or paraurethral gland damage resulting in arousal dysfunction, anodyspareunia or orgasm dysfunctions.
- Management strategies, including anal dilators for anodyspareunia, anal vibrators for arousal disorders, pelvic floor strengthening for anorgasmia and psychological interventions for decreased desire, should be discussed with patients.

Introduction

Maintaining the capacity for consensual and pleasurable sexual activity is an essential component of human health and a fundamental human right^{1–3}. Despite being a pleasurable sexual activity⁴, anal intercourse, particularly receptive anal intercourse (RAI) – defined here as stimulation of the anus by a phallus, finger, object (such as dildo), tongue or mouth – is stigmatized and often not acknowledged by health-care professionals^{5,6}. Moreover, RAI is criminalized and even punishable by death in many countries and territories^{7–9}.

Nonetheless, RAI is common worldwide^{10–27}. Up to 81% of cisgender gay and bisexual men¹⁰, 20–46% of cisgender women^{10,28} (including cisgender heterosexual²⁹, lesbian³⁰ and bisexual³⁰ women), 80% of transgender women (or transfeminine people)^{31,32} and 28% of transgender men (or transmasculine people)³³ engage in RAI. For intersex people and individuals with differences of sex development³⁴, RAI is a major source of erogenous sensation and pleasure – particularly for those who had genitopelvic surgery at birth resulting in decreased genital sensations³⁵. Additionally, up to 3% of cisgender heterosexual men have engaged in RAI with a phallus³⁶ (likely underestimated due to associated stigma³⁷), up to 27% of cisgender heterosexual women and 13% of cisgender heterosexual men have engaged in RAI through anal stimulation by tongue or mouth (termed analingus or ‘rimming’) in the past month³⁸, and up to 17% of people have engaged in RAI through a dildo attached to a sexual partner^{39,40} (termed ‘pegging’)⁴¹.

In RAI, the anal canal, perianal skin, prostate or paraurethral glands, erectile tissues, pelvic floor muscles, and supplying neurovasculature facilitate pleasure^{4,42,43}. Diseases of the colon, rectum and anus (including disorders of gut–brain interaction (DGBI), structural

diseases such as haemorrhoids, infectious diseases, inflammatory bowel disease (IBD) and malignancies) and their treatments (surgical resections, ostomy formation, anal closures, pelvic radiation and systemic therapies, among others) can adversely affect these anatomical structures and sexual function. However, research has largely equated sexual function with penile erections, vaginal intercourse and reproduction^{44–50}, neglecting the effects of diseases and their treatments on people who engage in RAI^{4,36,51}. Moreover, RAI is interconnected with diseases of the colon, rectum and anus. For example, anal cancer can develop through human papillomavirus (HPV) transmission during RAI⁵² and aggressive force during RAI can lead to structural gastrointestinal disorders such as anal fissures⁵³.

Research on problematic RAI – encompassing anodyspareunia (painful RAI), arousal dysfunction, orgasm dysfunction and/or decreased sexual desire – due to gastrointestinal diseases and their treatments is lacking. The National Comprehensive Cancer Network acknowledges that RAI is a risk factor for anal cancer⁵⁴, that anal cancer is more common in cisgender gay and bisexual men than in the general population⁵⁴ (with anal cancer incidence being approximately 20–80 times higher in gay and bisexual men than in the general population)⁵⁵, and that sexual dysfunction is among the most distressing toxic effects of cancer treatment⁵⁴. Unfortunately, National Comprehensive Cancer Network guidelines fail to acknowledge problematic RAI as a distressing outcome or to offer guidance for engaging in RAI after cancer treatments⁵⁴. Similarly, a survey of 426 members of the Italian Society of Gastroenterology found that 70% of gastroenterologists never or infrequently discuss sexual dysfunction with their patients; by contrast, 70% of patients believe that their gastroenterologist should be able to manage their sexual dysfunction⁵⁶. Strikingly, the survey completely omits RAI. To address the health-care inequities for people who engage in RAI, it is necessary for health-care professionals to acknowledge pleasurable and problematic RAI^{4,56,57}.

In this Review, we detail the role of anatomy, neurophysiology and microbiota in pleasurable RAI to provide a framework for understanding problematic RAI. We highlight the influence of DGBI, structural diseases, infectious diseases, inflammatory diseases and malignant diseases of the colon, rectum, and anus as well as their associated treatments on RAI. We then discuss management, mitigation and treatment strategies for disease and treatment-related problematic RAI. Overall, this Review seeks to normalize RAI and transform the scientific paradigm of sexual health to one that is more just and equitable.

Pleasurable RAI

The number of people engaging in RAI (Figs. 1 and 2 and Supplementary Box 1) is increasing^{58–60}, including a ~5% per decade increase in the UK⁵⁸ and Australia^{59,60}, potentially corresponding to worldwide cultural and demographic changes such as an increase in the number of people self-identifying as an individual from a sexual and gender minority community^{61–63}. Despite this observation, most health-care workers do not routinely discuss, or even acknowledge, RAI^{23,64,65} due to a lack of RAI-specific health education⁶⁶ and the cultural stigma^{5–9,67}. The few existing educational programmes address RAI as it relates to sexually transmitted infections (STIs) and harm reduction^{5,6}.

The absence of RAI (and particularly its relation to pleasure) in medical training and sexual education⁶⁶ results in a lack of information and resources for people engaging in RAI. Additionally, the systemic omission of RAI from medicine and health care might contribute to patient reluctance to initiate discussions and hesitation to seek

health-care guidance on RAI as well as in an increase in potential patient harm during RAI⁶⁶ and the stigma⁶⁸, including RAI criminalization^{5–9}, everyday colloquialisms (for example, use of the word ‘butthurt’ to critique an overly sensitive person^{69,70}), and negative judgements of the receptive partner (‘bottom’) but not of the insertive partner (‘top’) in anal intercourse (termed ‘bottom-shaming’^{66,67,71}).

To effectively discuss RAI (Fig. 3) and counsel patients on the effects of gastrointestinal diseases and their treatment on RAI, it is essential to destigmatize and normalize RAI and understand it as it relates to pleasure⁷² – specifically the genitopelvic anatomy, physiology and gut microbiology involved in facilitating pleasurable RAI.

Functional anatomy and physiology

Although the exact genitopelvic anatomy might differ among cisgender women, cisgender men, intersex people or individuals with differences of sex development, and gender-expansive individuals (that is, those with gender identities or expressions that are outside the gender binary determined by society), the functional anatomy involved in pleasurable RAI are embryologically homologous and functionally equivalent⁷³ (Figs. 1 and 2 and Supplementary Box 1). Stimulation of the nerves in the perianal skin, anus, erectile tissues, and prostate or paraurethral glands^{4,74}, including the pudendal, hypogastric, pelvic splanchnic nerves and their associated branches^{74,75}, helps facilitate the phases of the RAI sexual response cycle – initial excitement, plateau of arousal, orgasm and resolution^{76,77}.

Sensory stimuli – visual, tactile or other forms – initiate excitement during RAI, leading to increased blood flow to the pelvis, which is maintained by a compensatory increase in heart and respiratory rate⁷⁸. From in vitro studies of human tissues and in vivo studies with animal models⁷⁹, it is well established that nitrous oxide production triggers pelvic vascular smooth muscle relaxation, enhancing regional blood flow and pelvic tissue sensitivity^{80,81}. The pelvic muscles, erectile tissues and anus continue to become engorged with blood from branches of the internal pudendal artery^{82,83}, enhancing nutrient delivery crucial for neuron communication⁸⁴. Pressure on the cavernous nerves, located anterolateral to the anorectum (or neovagina), directly from an object (such as finger, phallus, dildo or tongue) or indirectly through the movement of surrounding structures (such as prostate or paraurethral glands, posterior erectile tissues, and vagina or neovagina) can elicit erectile tissue expansion^{85–87}.

As the erectile tissues become engorged with blood, the glans (of the natal bulbocleftoritis (clitoris and vestibular bulbs)⁸⁸, penis, neoclitoris or metoidioplasty neophallus) becomes more sensitive and, through the bulbocavernosus reflex, glans stimulation leads to external anal sphincter contractions^{89,90}. Simultaneously direct and indirect pressure on the prostate or paraurethral glands will cause pelvic floor muscular contractions – the bulbospongiosus and ischiocavernosus muscles (deep perineal nerve) and external anal sphincter contraction (inferior anal nerve)^{91,92}. Additionally, stimulation of the afferent inferior anal and perineal nerves (branches of the pudendal nerve)^{86,93} in the sensate anus (below the pectinate line) and adjacent skin can elicit anal sphincter contractions^{86,94,95} through the anocutaneous reflex nerve pathway^{96,97}.

In contrast to the anus, rich in nerves that transduce pain and pleasure⁹⁸, the rectum contains mechanoreceptor nerves that detect and translate rectal stretching into neural output^{98–100}. Nevertheless, the rectum is involved in pleasurable RAI as low levels of rectal distension can activate rectal contractions and anal relaxations^{99,100}, promote feelings of ‘rectal fullness’⁷⁴ (pleasurable for many individuals engaging in RAI)⁷⁴, and reflexively place pressure on a finger, phallus, attached dildo

or tongue of a partner, which can increase dyadic arousal, intimacy and pleasure. As genitopelvic nerve electrical impulse signalling continues, blood flow to genitopelvic anatomy increases, organ sensitivity intensifies and RAI arousal escalates, culminating in orgasm^{80–82}.

Gut microbiome and RAI

The gastrointestinal–oral and gut–microbiome axes are an important component of gastrointestinal function and gut–brain communication¹⁰¹. By influencing metabolite levels in the neural, endocrine and inflammatory pathways, including dopamine, serotonin, nitric oxide, hydrogen sulfide and γ -aminobutyric acid, experimental data from in vitro studies have suggested that the gut microbiome can contribute to sexual function^{101,102}. The gut microbiome might also help maintain structural integrity¹⁰³, preserve anatomical function¹⁰³ and modulate intestinal permeability¹⁰⁴, which can influence sexual health. Gut microbial dysbiosis, or an imbalanced microbiome, has been associated with anatomical abnormalities in the anus (anal sphincter hypertonicity, inflammation, anal pain and anal fistulas^{103,105}) and sexual dysfunction^{106,107}, which is likely multifactorial but could be due to metabolite dysregulation¹⁰² as well as anatomical dysfunction from pelvic cross-organ sensitization increasing inflammatory-related intestinal permeability¹⁰⁴.

The oral microbiome might additionally affect sexual health¹⁰⁸ and the relative abundance of nitrate-reducing bacteria in the oral microbiome might influence nitric oxide production¹⁰⁹, essential for sexual arousal¹¹⁰. Thus, it is logical that oral microbial dysbiosis might cause sexual arousal dysfunction¹⁰⁸. Awareness of how the gastrointestinal microbiome might be implicated in pleasurable and problematic RAI is important to counsel patients, provide context to disease-related and treatment-related dysfunction, and develop novel technologies.

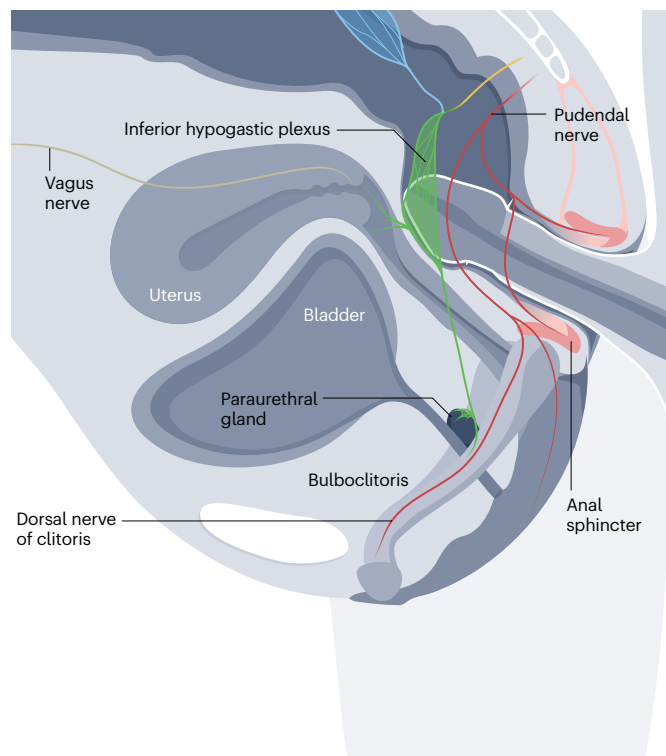
Engaging in RAI might influence the composition of the gut microbiome¹¹¹ as well as the oral microbiome^{112–114}; yet, it is imperative to emphasize that RAI represents only one singular factor among numerous influences that collectively shape the microbiome of an individual¹¹⁵. The microbiota can be influenced by environmental factors such as pH, availability of nutrients and temperature¹¹⁶. Studies have suggested that people who engage in RAI might exhibit a gut microbiome with a higher ratio of *Prevotella* to *Bacteroides*¹¹⁷ (a biomarker of diet and lifestyle, with an increased ratio corresponding to a plant-based diet¹¹⁸), possibly influenced by factors such as a higher fibre diet to facilitate RAI preparation^{119,120}, the presence of *Prevotella* in semen¹²¹, post-RAI irritation¹²², aggressive douching¹²³ and hyperosmolar lubricant use¹²⁴.

Nonetheless, it is known that many factors likely contribute to the gut microbiota, including diet or antibiotic exposure, as well as to other aspects of health for which inequitable outcomes exist due to the social determinants of health¹¹⁵. Advances in gut–brain microbiome research have suggested that discrimination, social inequity and minority stress likely have direct influences on the gut–brain microbiome axis^{125–127}. Thus, one must be cautious and never presume that the gut microbiota is influenced solely by RAI. Still, future research will hopefully provide insight into the role of the microbiome, if any, in facilitating pleasurable RAI, which might help develop interventions for problematic RAI.

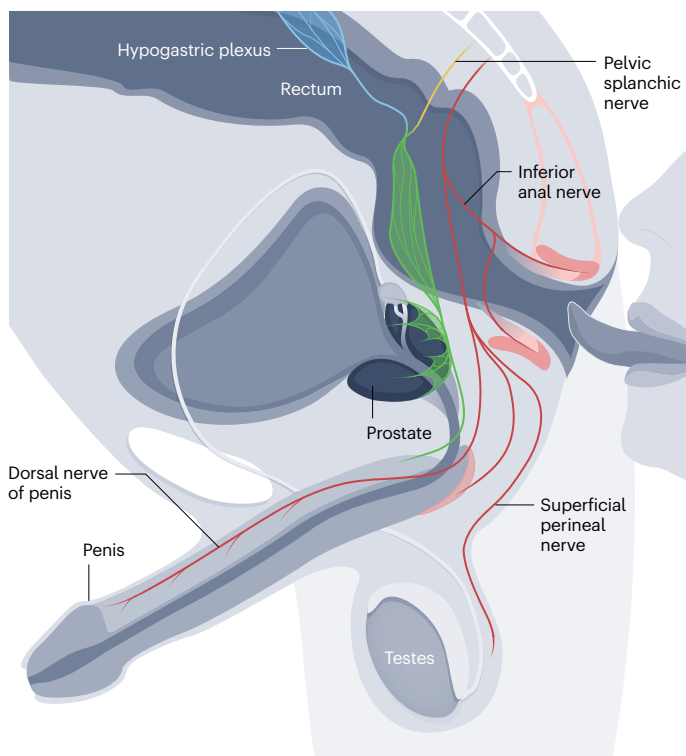
Problematic RAI

Problematic RAI is characterized by pain during or after RAI (anodyspareunia), arousal dysfunction, orgasm dysfunction and/or decreased sexual desire^{4,128–131}. The aetiology of each dysfunction subdomain is multifactorial and can result from issues with the functional anatomy and physiology involved in pleasure^{4,128,129}. Sexual dysfunction can result from multiple factors, including gastrointestinal diseases,

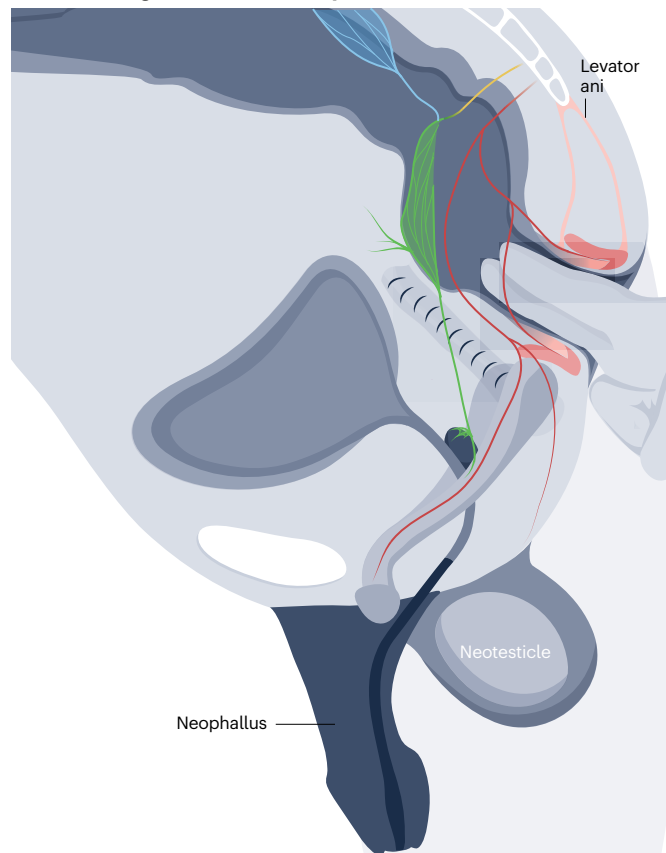
a RAI with phallus, cisgender woman



b RAI with tongue and mouth, cisgender man



c RAI with fingers, transmasculine person



d RAI with dildo, transfeminine person

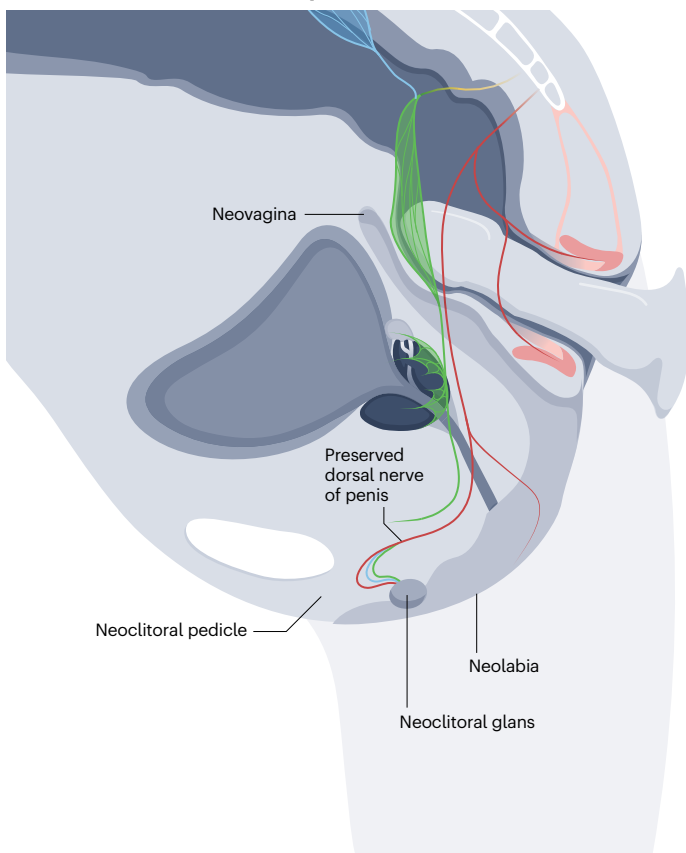


Fig. 1 | Genitopelvic anatomy of pleasurable RAI. Schematics represent stereotypical anatomy and are provided for general insights into anatomical structures of complex anatomy. **a**, Representative sagittal image illustrating the genitopelvic anatomy of a cisgender woman experiencing pleasurable receptive anal intercourse (RAI) with a phallus. During RAI, pressure on the cavernous nerves (located between the vagina and rectum)⁴¹⁹, paraurethral glands, cervix, posterior bulboclititoris (clitoris and vestibular bulbs)^{420–422}, and anus will elicit pleasure and reflexive external anal sphincter contractions^{96,97,423}. Pressure on the cavernous nerves will induce flow into the vestibular bulbs and cause bulboclititoris enlargement⁴²⁴. Engorgement of the vestibular bulbs and crura will additionally induce pressure on the glans, resulting in pleasure and anal sphincter contractions through the bulbocavernosus reflex^{89,97,425}. Thrusting in the anus can cause pressure on the vestibular glands and movement of the bulboclititoris, ultimately inducing pleasure, lubrication and pelvic muscle contractions. Movement of the paraurethral glands and bulboclititoris can further stimulate the surrounding nerves to induce anal sphincter and pelvic muscle contraction⁹¹. During receptive intercourse, the bulboclititoris will move and stimulate the surrounding nerves to induce pleasure⁴²⁰. Simultaneously, the clitoral bulbs, along with surrounding pelvic structures, become engorged with blood, stabilizing the vagina, anus and paraurethral glands⁴²⁶. As the pelvic and erectile structures fill with blood and the genitopelvic anatomy fixates and sensitizes, movement during RAI will become more pleasurable⁴²⁶. Sustained repetition can result in orgasm⁴²⁷. **b**, Representative sagittal image illustrating the genitopelvic anatomy of a cisgender man experiencing pleasurable RAI with a tongue and mouth. During RAI, stimulation of the perianal skin and anus will elicit reflex external anal sphincter contraction, and stimulation and movement of the deep portion of the penis (rather than the pendulous part) and prostate will stimulate the pudendal

nerve⁹⁵ and/or cavernous nerves (located between the prostate and rectum⁴¹⁹) and elicit reflex external anal sphincter contractions, causing pleasure, erection, ejaculation and orgasm^{96,97,423}. Sustained repetitive activation of these sensory circuits during RAI can continue to build and intensify, which can ultimately lead to orgasm⁴²⁷. **c**, Representative sagittal image illustrating the genitopelvic anatomy of a transmasculine person experiencing pleasurable RAI with fingers. In transmasculine people who have undergone metoidioplasty^{428,429} and/or phalloplasty, pleasure from RAI occurs through the stimulation of cavernous nerves and surrounding erectile tissues, paraurethral tissues, perianal skin, and cervix. For those who have undergone metoidioplasty^{428,429}, tactile stimulation of the neophallus might cause a reflex reaction through the dorsal clitoral nerves. For those who have undergone a phalloplasty^{430–432}, direct tactile stimulation of the natal clitoris at the base of the neophallus and indirect stimulation through movement of the phallus might cause a reflex reaction through the tissue flap to the dorsal clitoral nerve anastomoses^{433,434}. **d**, Representative sagittal image illustrating the genitopelvic anatomy of a transfeminine person experiencing pleasurable RAI with an attachable dildo. The reconstructed neurovascular pedicle flap for neoclitoral sensation (which contains the preserved dorsal penile nerves) and a reconstructed neolabia (which might contain the dorsal penile nerves and posterior scrotal nerve innervation) facilitate pleasurable intercourse for patients with zero-depth and full-depth neovaginas^{435,436}. Stimulation of the prostatic and neoclitoral or neolabial neurovasculature will elicit afferent sensory impulses, with reflex efferent impulses causing contraction of the anal sphincter and pelvic floor muscles. Notably, these muscles (the bulbospongiosus and/or the ischioavernosus) might be partially or completely resected during vaginoplasty⁴³⁵. Further details are available in Supplementary Box 1. Adapted from ref. 4, Springer Nature Limited.

iatrogenic interventions (such as medications, surgery or radiation) and biopsychosocial factors^{4,128,129} (Fig. 4).

Anodyspareunia and painful RAI

Criteria for the measurement of anodyspareunia – recurrent or persistent pain that occurs before, during or after RAI¹³² – are varied and include elements similar to those used to measure dyspareunia and vaginismus^{15,133–135}. Some have advocated for a standardized clinical definition of anodyspareunia that aligns with genitopelvic pain or penetration disorders¹⁵ but criteria used in existing studies vary. A systematic review (identifying 8 studies) notes that the prevalence of anodyspareunia is difficult to assess given varying criteria among studies¹¹⁹; however, using a consistent definition, it is estimated to be from 12% (of $n = 277$) to 14% (of $n = 404$) in sexually active cisgender sexual minority men and 9% (of $n = 505$) in cisgender women engaging in RAI at least twice yearly¹¹⁹, potentially underestimated due to those avoiding RAI due to pain^{136,137}.

Although RAI might initially be painful, over time, the pain generally diminishes and pleasure increases^{74,138}. Anatomical, physiological and psychosocial factors that can contribute to painful RAI include inadequate anorectal lubrication, the anorectal angle, anal sphincter tightness, size of the penetrating object, and lack of relaxation and foreplay^{133,139–142}. Painful RAI typically occurs at the anus during initial entry (39.6%) or during entry and/or thrusting (16.7%)¹⁴³. Internal anal sphincter hypertonicity and sphincter spasms can result in difficulty with anal entry and painful RAI⁶⁵. Sharp pain might additionally be experienced during RAI entry or thrusting if a penetrating object pushes on the rectosigmoid junction causing mesenteric stretching¹⁴⁴.

Psychosocial factors, such as generalized or conditioned anxiety, trauma history (more prevalent in women and people from sexual and gender minority communities¹⁴⁵), internalized homophobia, fear of STI transmission (including HIV), and fear and/or phobia of engaging

in a stigmatized act, can increase sympathetic nervous system activity^{139,146} and anal sphincter hypertonicity^{147–149}. Additionally, defecation concerns, including defecation during RAI, were associated with anodyspareunia in a cohort of cisgender sexual minority men without any particular medical comorbidities engaging in RAI in the 4 weeks prior ($n = 135$)¹⁵⁰. Normalizing and discussing RAI, affirming pleasurable RAI, and offering mitigation strategies can help prevent unnecessary phobias and resultant pain and dysfunction^{135,143,151}.

Arousal dysfunction

Arousal dysfunction can occur from direct damage to the functional erectile and pelvic tissues, injury to the supplying neurovasculature, or impaired blood flow preventing genitopelvic tissue engorgement^{4,42,152,153}. During RAI, people might transiently lose an erection as other areas are stimulated and blood is diverted from erectile tissues; however, diseases and treatment-related sequelae can further shunt blood flow away from pelvic and erectile structures, further decreasing arousal and ultimately delaying orgasm or altogether preventing it^{4,42}.

Orgasm dysfunction

Orgasm dysfunctions include dysorgasmia and anorgasmia^{4,154}. In RAI, the anal sphincters and levator ani are important for facilitating arousal and orgasm^{155,156} by squeezing an inserted object and helping it apply pressure on the sensate pelvic structures during RAI¹⁵⁵. During orgasm, the pelvic floor muscles, including the anal sphincters, contract rhythmically⁷⁷. Decreased pelvic floor and anal sphincter muscle strength is associated with anorgasmia^{155–157}, whereas overactive and inflamed pelvic floor and anal sphincter muscles are associated with dysorgasmia in all people^{158,159}. Thus, damage to the anal sphincters and pelvic floor muscles contributes to orgasm dysfunction in RAI.

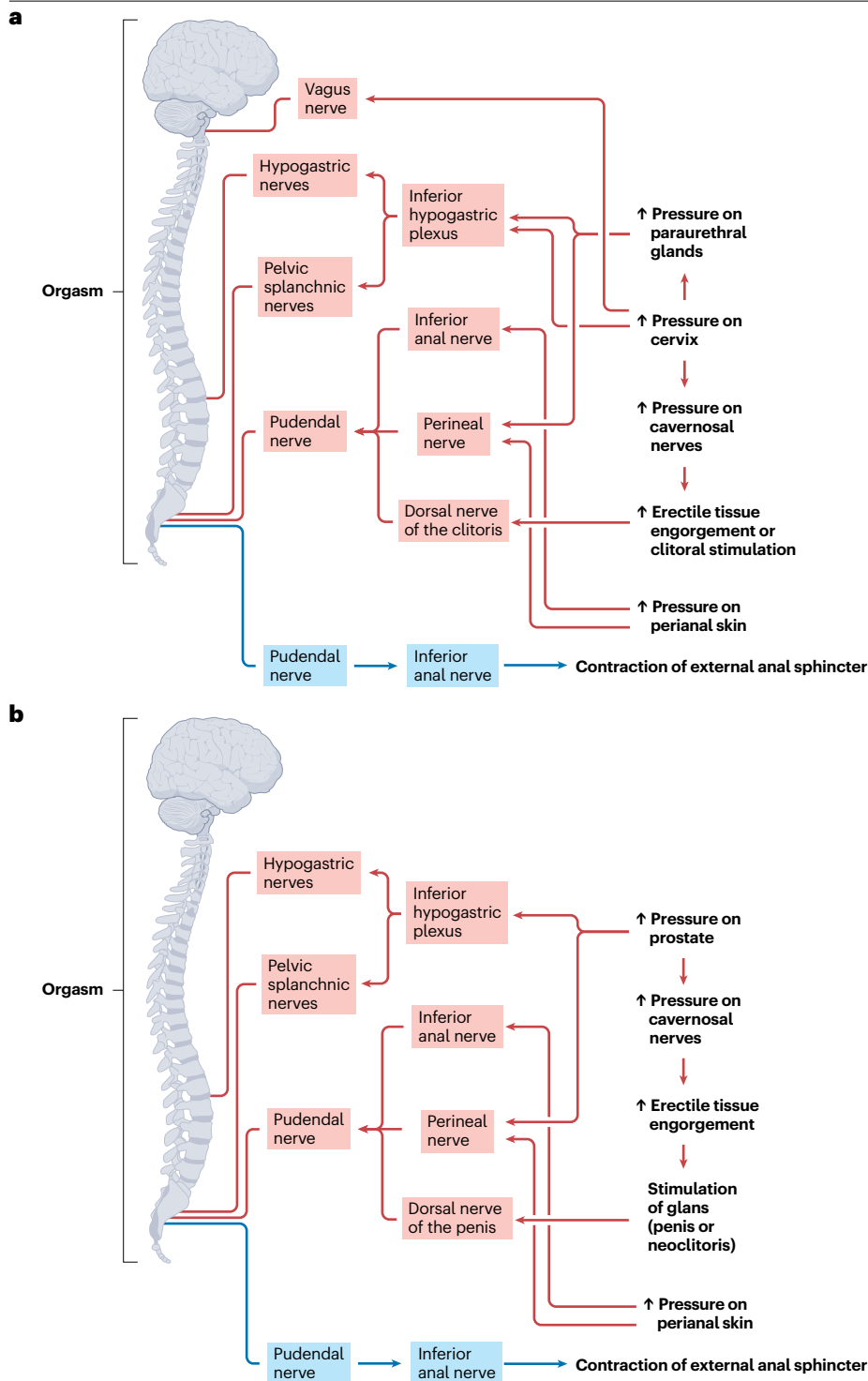


Fig. 2 | Schematic of stereotypical genitopelvic neuroanatomy involved in pleasurable receptive anal intercourse. Schematics represent stereotypical genitopelvic neuroanatomy and are provided for general insights into complex structures in cisgender women and transmasculine people (part **a**) and cisgender men and transfeminine people (part **b**). Pressure on the anopelvic structures will elicit pleasure, orgasm and external anal sphincter contraction through distinct neural pathways (red: afferent pathway; blue: efferent pathway), resulting in reflex external anal sphincter contraction, which will place pressure on the finger, phallus, object (for example, dildo, vibrator) or tongue of a partner, increasing dyadic arousal, intimacy and pleasure. Further details are available in Supplementary Box 1. Adapted from ref. 4, Springer Nature Limited.

Decreased sexual desire

Gastrointestinal diseases and their treatments commonly influence body image and self-esteem, which in turn can negatively affect sexual desire^{160–162}. For example, patients with gastrointestinal diseases might have an ostomy or stoma as a result of disease and/or treatment^{163–166}.

The presence of a stoma might influence patient self-perception and inhibit RAI by diminishing the desire for sexual intercourse and intimacy^{160,161}. Reported concerns include anxiety about faecal leakage during intercourse, embarrassment about odour and concern about perception of the stoma by a sexual partner^{167,168}. Among patients with a

stoma ($n = 540$), 51% lived with their stoma for approximately 1–5 years and many described the stoma as negatively influencing their body confidence and sexual desire¹⁶⁷. Additionally, in patients with colorectal cancer (CRC; $n = 141$), compared with patients with no history of an ostomy ($n = 98$) and patients with a history of a temporary ostomy ($n = 18$), those with a permanent ostomy ($n = 25$) have markedly worse body image, even when adjusting for age, sex and depressive symptoms ($P < 0.001$)¹⁶⁸.

Non-malignant gastrointestinal diseases

Non-malignant diseases of the colon, rectum and anus include structural diseases, DGBI, infectious diseases, and inflammatory diseases. It is important for health-care professionals to recognize how each of these disorders and their treatments might affect pleasurable RAI to counsel patients, identify the issue (Fig. 4) and select appropriate management (Table 1).

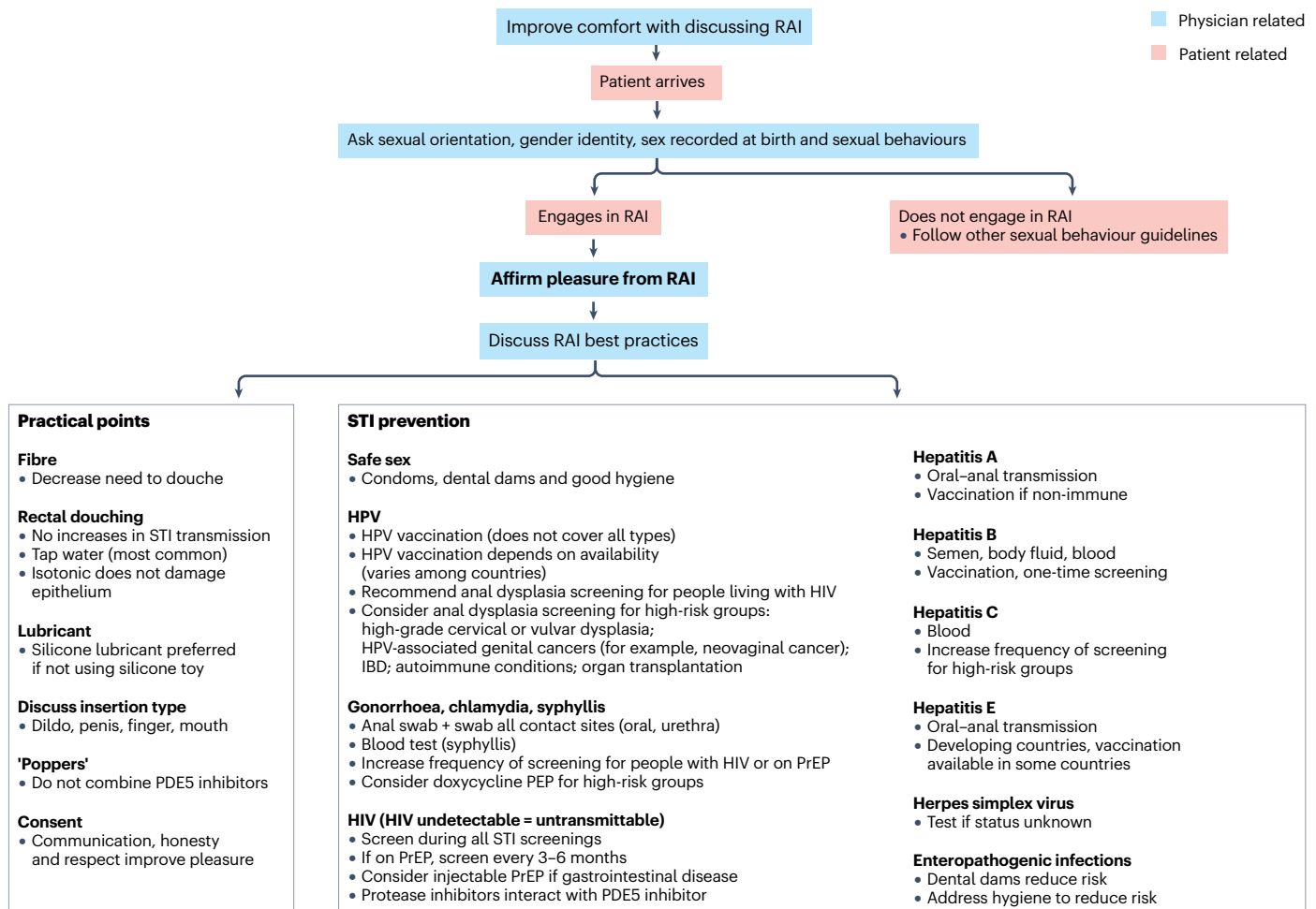
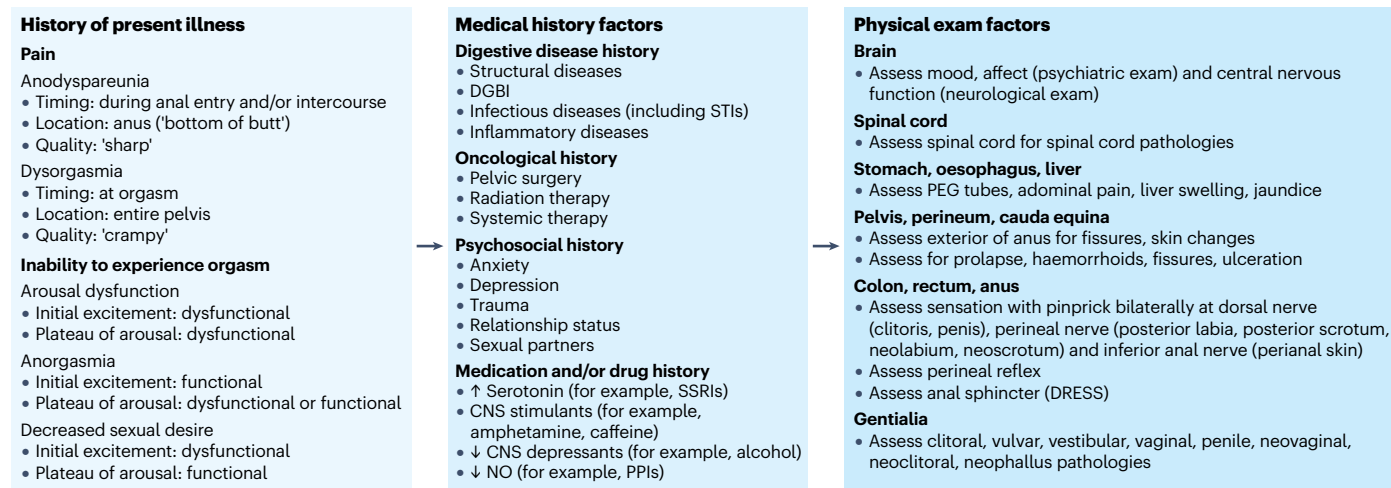


Fig. 3 | Suggested algorithm for discussing RAI. To address medical inequities for individuals engaging in receptive anal intercourse (RAI), health-care providers should proactively engage in open conversations with colleagues, friends and family to learn inclusive language⁴³⁷ and gain awareness of the diverse lived experiences. Then, when interacting with a patient, one can more easily adapt terminology and tone to ensure patient comfort to prevent potential delays in care⁴³⁸. Discussing sexual orientation, gender identity and sex recorded at birth with a patient is a necessary step before asking about preferred sexual behaviours, gender-affirming hormone therapies and genital anatomy^{439–443}. Gathering this information can not only strengthen the physician–patient relationship but also influence accurate diagnoses and treatment recommendations^{405,444}. If a patient does engage in RAI, centring the conversation on pleasure can enhance patient comfort and encourage disclosure of medical concerns^{5,6,72}. Emphasizing pleasure should include a discussion about disease and treatment effects, supporting informed decision-making and improving quality of life^{445,446} and health outcomes^{447–450}. Subsequently, a conversation about best practice and safety during RAI should occur and cover

anorectal douching, lubricant, alkyl nitrites (termed ‘poppers’) and sexually transmitted infections (STIs). Educating patients about potential interactions between ‘poppers’ and medications (for example, phosphodiesterase 5 (PDE5) inhibitors) is vital to prevent adverse cardiovascular events. Iso-osmolar lubricants (typically silicone based) might be preferred for RAI as hyperosmolar lubricants (typically water based) can induce epithelial damage and increase risk of bleeding and infection^{374–376}. However, caution is advised when using silicone lubricant with silicone objects (for example, dildo). STI screening and treatment should be addressed in relation to sexual practices rather than specific populations⁴⁵¹ to ensure inclusive and personalized recommendations³⁷⁵. Importantly, STIs affecting the anorectum might be asymptomatic²¹⁰, and there might be a risk of transmitting protozoal infections (for example, *Giardia intestinalis*) and enteropathogenic bacterial infections (for example, *Escherichia coli*) during RAI through oral–anal stimulation and indirect contamination of objects used during intercourse or fingers²²². HPV, human papillomavirus; IBD, inflammatory bowel disease; PEP, post-exposure prophylaxis; PrEP, pre-exposure prophylaxis.

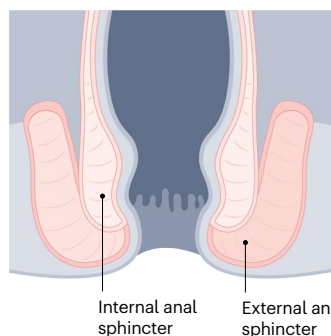
a History of present illness, medical history and physical exam



b Diagnostic tests

Digital rectal exam

Assess sphincter tone



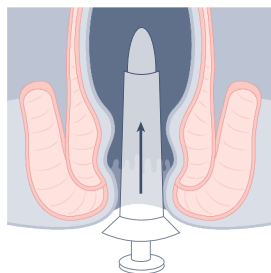
- Anodyspareunia
- -/↑ Resting tone
 - ↑ Squeeze tone
- Dysorgasmia
- ↑ Resting tone
 - -/↑ Squeeze tone
- Arousal dysfunction
- -/↓ Resting tone
 - ↓ Squeeze tone
- Anorgasmia
- ↓ Resting tone
 - -/↓ Squeeze tone

- Anal resting tone**
- ↑ Fissures; haemorrhoids
 - ↓ Radiation; chemotherapy; surgery (myenteric plexus damage)

- Anal squeeze tone**
- ↑ Anxiety (for example, fear of defecation)
 - ↓ Surgery (damage to pudendal nerve)

Anoscopy

Assess anal epithelium and structural integrity of anus



Flexible sigmoidoscopy or colonoscopy

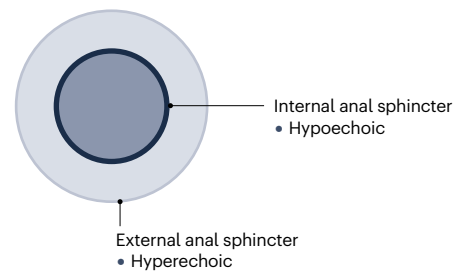
- Assess inflammation

MRI

- Assess underlying pathologies
- External anal sphincter: hypointense (T2-weighted)
- Internal anal sphincter: iso-hypointense (T2-weighted)
- Levator ani: iso-hypointense (T2-weighted)

Endoanal ultrasonography

Assess anal sphincter injury, particularly internal sphincter



Anorectal manometry

- Assess muscle function and need for biofeedback therapy for pelvic floor dysfunction

Defecography

- Assess nerve integrity

Labs

- Assess physiological aetiology

Structural gastrointestinal diseases

Structural gastrointestinal diseases are common globally^{169,170}, with the exact prevalence and incidence likely being underreported¹⁷¹. Structural gastrointestinal diseases include diseases of the anus (external haemorrhoids, anal fissures, anorectal fistulas), rectum (internal haemorrhoids, rectal prolapse, perirectal abscess) and colon (colonic polyps, diverticular disease)¹⁷² (Table 1). Haemorrhoids and anal fissures are among the most common, affecting, for example, at least 13% of the adult population in the USA¹⁷¹.

Anodyspareunia and structural gastrointestinal disorders, such as anal fissures, are indeed strongly linked⁶⁵. However, in patients who regularly engage in RAI, an anal fissure is likely not from a hypertonic sphincter and likely due to traumatic preparation (enemas, fingers to clean stool, overwiping) or intercourse (inadequate lubricant, aggressive partner)^{173,174}. Before recommending treatment for anal fissures in patients engaging in RAI, a thorough history is necessary as topical

calcium channel blockers or botulinum toxin might not be appropriate and conservative management, including increasing fibre, sitz baths and education, might be preferred¹⁷⁴.

Before diagnosing idiopathic anodyspareunia, it is important to exclude pain originating from structural gastrointestinal disorders. Utilizing the term 'genitopelvic pain/penetration disorder' as a surrogate for anodyspareunia, a cross-sectional ecological study (published as a thesis) found that cisgender sexual minority men who met the study criteria for anodyspareunia ($n = 175$) were approximately three times more likely to report a history of anal fissures (37%) and 1.5–2 times more likely to report a history of haemorrhoids (48%) than patients who did not meet criteria¹⁷⁵. In patients with recurrent anal fissures, chronic ischaemia can result in increased anal sphincter tone and increased anal resting pressure, further predisposing to anodyspareunia¹⁷⁶.

Patients with structural gastrointestinal diseases might be predisposed to arousal dysfunction, orgasm dysfunction and/or decreased

Fig. 4 | Diagnosing problematic RAI. Diagnosing problematic receptive anal intercourse (RAI) requires a comprehensive, patient-centred approach. Establishing trust and comfort is critical; encouraging an open discussion in the patient's own words will substantially help understand the issue. **a**, Asking specific questions regarding pain (timing during intercourse, location, quality), arousal (associated phallus-related symptoms), orgasm, desire (body image) and taking a comprehensive medical history can help construct a differential diagnosis. A systematic physical examination should begin with inspection, noting any visible abnormalities (such as skin changes in the genitopelvic area or anus) or devices (such as a stoma) to provide further evidence on issues with sexual desire or pain. Assessing the anus and pelvis for tenderness, swelling, or irregularities and performing focused neurological assessments by evaluating sensation and reflexes (anocutaneous^{96,97}, bulbocavernosus^{89,90}) can assist in differentiating the aetiology (for example, neurological, vascular, structural, psychological). The Digital Rectal Examination Scoring System (DRESS; 0 = no pressure, 3 = normal, 5 = tight) can quantify anal sphincter resting and squeeze tones⁴⁵². Throughout the exam, patient engagement and communication of findings are key for patient understanding and autonomy. Additionally, it is important to discuss trauma, including intimate partner violence, and note any inconsistencies between history and physical exam¹⁹⁶. **b**, Lab tests and imaging can complement clinical assessment and provide further confirmation

if a diagnosis is not yet evident^{453–457}. Ultimately, these steps should identify underlying physiological and anatomical factors contributing to problematic RAI to guide targeted treatment strategies. Laboratory values might reveal imbalances or underlying conditions contributing to decreased sexual desire or other aspects of problematic RAI^{453–457}. Anoscopy¹⁷³ can assist in the diagnosis of external structural abnormalities (for example, fissure, haemorrhoids) and endoanal ultrasonography can assess internal structural abnormalities, specifically the anal sphincters and intersphincteric plane⁴⁵⁸. MRI provides a detailed analysis of genitopelvic anatomy, uncovering issues such as pelvic floor dysfunction due to inflammation or other structural abnormalities²⁴⁰. Vascular studies employing Doppler ultrasonography can help evaluate blood flow to erectile and pelvic tissues, crucial for diagnosing issues with arousal⁴⁵⁹. Using fluoroscopy, MRI defecography can evaluate anorectum and pelvic floor dynamics during defecation to provide insight into the neurophysiology of the anal sphincters⁴⁶⁰. Ultimately, empathetic dialogue, a comprehensive assessment and multidisciplinary collaboration among health-care professionals can enable accurate diagnosis and lead to personalized treatment and support for patients with problematic RAI. CNS, central nervous system; DGBI, disorders of gut–brain interaction; NO, nitric oxide; PEG, percutaneous endoscopic gastrostomy; PPIs, proton pump inhibitors; SSRIs, selective serotonin reuptake inhibitors; STIs, sexually transmitted infections.

sexual desire. Haemorrhoids can affect arousal by shunting blood away from erectile tissues¹⁷⁷. Pelvic and anal muscular contractions can inhibit venous return from the haemorrhoid plexus, further inhibiting functional blood circulation during RAI^{177,178}. Diverticular diseases might be associated with erectile dysfunction through physical vessel blockage, inflammation and vasculopathies preventing blood flow to erectile tissues^{152,153}. Structural disorders can also influence sexual desire through changes to the physical appearance of the anus, which might result in self-consciousness and decreased desire to engage in RAI^{179,180}.

Disorders of gut–brain interaction

DGBI affecting the colon, rectum and anus include irritable bowel syndrome (IBS), chronic constipation, functional diarrhoea, faecal incontinence, dyssynergic defecation, and functional abdominal bloating and distension, among others¹⁷². Similar to structural diseases, prompt recognition of their effects on RAI and appropriate treatment is crucial (Table 1).

Sexual dysfunction in patients with IBS is common, with decreased desire as the most frequently reported manifestation¹⁸¹, occurring in ~21% of participants with IBS ($n = 283$) in one study¹⁸². Decreased sexual desire in IBS is multifactorial, including both physiological and neurotransmitter alterations. Approximately 95% of serotonin is produced in the gastrointestinal tract, which, when dysregulated, can contribute to gut distension, motility and visceral hypersensitivity^{183–185}. Patients with IBS have decreased expression of the serotonin reuptake transporter¹⁸⁴, which is responsible for regulating serotonin levels¹⁸⁴. An increase in serotonin can lead to diarrhoea, discomfort and decreased sexual desire^{183,184}. Patients with IBS are three times more likely to have anxiety or depression than patients without IBS, with an estimated global prevalence of up to 23%^{186,187}. Medications for anxiety and depression, referred to as central neuromodulators in DGBI, can cause adverse effects that include issues with arousal, orgasm and desire¹⁸⁸. Before initiating patients on these medications, it is important to assess baseline sexual function to distinguish between subsequent disease effects and medication-related problematic RAI⁴.

A history of trauma, including sexual abuse, has long been considered a risk factor for patients with IBS and DGBI^{189,190}. Although trauma prevalence varies based on contextual factors, cisgender heterosexual

women and people from sexual and gender minority communities are vulnerable to trauma¹⁹¹. Intimate partner violence, which includes physical, sexual and/or emotional abuse perpetuated by a current or former partner or spouse^{192,193}, is another important consideration when diagnosing problematic RAI for a patient with DGBI¹⁹⁴. Intimate partner violence is more common among cisgender heterosexual women and people from sexual and gender minority communities^{192,193}. People from sexual and gender minority communities face unique barriers to obtaining support for intimate partner violence, including stigma and structural inequities¹⁹⁵. In the context of RAI, intimate partner violence might include a partner refusing to use or secretly removing a condom during intercourse and/or intentionally infecting a victim with an STI (such as HIV) as a means to gain control and power^{192,193}.

A person presenting with problematic RAI with a history of intimate partner violence might complain about DGBI due to anxiety¹⁹⁴, anodyspareunia due to a hypertonic anal sphincter^{139,146–149}, or an anal tear or fissure¹⁹⁶. It is important to screen for intimate partner violence in patients presenting for problematic RAI¹⁹⁶; screening can include a psychological assessment¹⁷⁶, a comprehensive physical exam looking for bruises, bites, cuts, burns or broken bones at various stages of healing (especially in the extremities)¹⁹⁶, and an anal exam to look for fissures, tears or bruises and assess sphincter tone^{139,146–149}. Thus, when discussing and diagnosing problematic RAI, it is important to consider a history of trauma, as trauma is a risk factor for painful RAI¹⁹⁷ and pelvic floor muscle dysfunction^{190,198}.

Infections of the colon, rectum and anus

Infectious diseases affecting the colon, rectum and anus that can lead to problematic RAI include condyloma acuminata (from HPV), HIV or AIDS, folliculitis, infectious proctitis, hepatitis, protozoal infections, and enteropathogenic bacterial infections (Table 1).

HPV, which is transmitted through skin–skin contact (including anal–penile and anal–oral RAI), is the most common STI worldwide with an estimated prevalence of 44%¹⁹⁹. Condylomata acuminata (anogenital warts) arise in approximately 1% of the global population^{200–202}; however, they are twice as common in sexual minority men and can substantially decrease the desire to engage in RAI, whether painful or painless²⁰³. Similarly, in cisgender women, anal warts have

Table 1 | Engaging in RAI with structural diseases, infectious diseases and DGBI

Gastrointestinal disease	Problematic RAI dysfunction	Advice for engaging in RAI
Structural diseases of colon, rectum and anus		
Anal fissure	AD: recurrent fissures or chronic ischaemia increase sphincter tone and can predispose to AD ¹⁷⁶ ↓ Arousal: shunting blood away from erectile tissues ⁴⁷ Dysorgasmia: pelvic muscle contractions during orgasm increase spasms and fissure-related pain ↓ Desire: changes to anal appearance ^{179,180}	Wait for fissure to resolve (medical or surgical treatment) before re-engaging in RAI, especially if painful; anal dilators can help remodel healing and scar
External haemorrhoids	AD: pain from sensitive anal skin below dentate line ^{65,171,175} ↓ Arousal: shunt blood away from erectile tissues ^{177,178} ↓ Desire: changes to anal appearance ^{179,180}	Can engage in RAI if no pain and no surgical management; if surgical management, consider anal dilator to remodel scar
Internal haemorrhoids	↓ Arousal: shunt blood away from erectile tissues ^{177,178}	Can engage in RAI; increase fibre intake to decrease straining ^{177,178}
Rectal prolapse	↓ Arousal: decreased sphincter tone ↓ Desire: mucus discharge and change to anal appearance ^{179,180}	Can engage in RAI; increase fibre intake; perform sphincter exercises; surgery can be considered ⁴¹²
Perirectal abscess	AD: pain from abscess at baseline	Abscess drainage before re-engaging in RAI
Colonic polyps	↓ Arousal: vessel blockage, ↓ blood to erectile tissues ^{152,153}	Can engage in RAI; increase fibre intake
Anorectal fistula	AD: pain during penetration if filled with fluid ¹⁶⁷ ; setons in situ can be uncomfortable ²⁷² ↓ Arousal: sphincter damage ^{240,247} from fistula or surgery ²⁴⁰ Dysorgasmia: scarring causing tightening ¹⁶⁷ ↓ Desire: anxiety from leakage, anus changes ^{167,179,180} , setons in situ can be deforming ²⁷²	Can engage in RAI if no pain and no draining; consider knotless setons to mitigate painful RAI and effects on desire ²⁷² ; consider advancement flap ²⁴⁰ or ligation ²⁴⁰ to preserve sphincter function (if candidate)
Rectourethral fistula	↓ Desire: anxiety from fistula leakage ¹⁶⁷	Can engage in RAI; psychotherapy for anxiety; definitive management
Colovesicular fistula	↓ Desire: anxiety from fistula leakage ¹⁶⁷	Can engage in RAI; psychotherapy for anxiety; definitive management
DGBI of colon, rectum and anus		
Irritable bowel syndrome	AD: anxiety correlated to AD ¹³⁴ Anorgasmia: medication induced ↓ Desire: symptom unpredictability, medications (for example, SSRIs) ^{188,413}	Can engage in RAI; CBT to help decrease anxiety, fear of symptoms and catastrophizing ³⁹³ ; assess baseline sexual function before prescribing medication, switch medication if necessary ¹⁸⁸
Functional diarrhoea	AD: diarrhoea can cause pain during RAI ↓ Desire: unpredictability of symptoms	Can engage in RAI; consider antidiarrhoeals, fibre supplements and lower residue diet ^{208,355,356}
Faecal incontinence	↓ Arousal: sphincters unable to squeeze object tightly during RAI	Can engage in RAI; consider sacral nerve stimulator ^{387,388}
Chronic constipation	↓ Desire: discomfort, fear of stool being expelled during RAI if incomplete evacuation	Can engage in RAI; consider biofeedback ⁴¹⁴ ; increase fibre intake; anorectal douching with adequate time
FABD	↓ Desire: symptom unpredictability, discomfort	Can engage in RAI; consider anti-flatulence medications; expel flatulence before RAI ^{357,358}
Dyssynergic defecation	↓ Arousal: sphincter dysfunction Dysorgasmia: sphincter spasms	Can engage in RAI; consider biofeedback ⁴¹⁵ ; increase fibre intake
Infectious diseases of colon, rectum and anus		
Condyloma acuminata	AD: treatment related, especially if treatment is within anal canal ↓ Desire: body image issues	Can engage in RAI; HPV, including latent HPV, is transmissible; partner communication and HPV vaccination for prevention ^{416,417}
HIV or AIDS	AD: infectious diarrhoea, stigma or stress ↓ Arousal: protease inhibitors ↓ Desire: stigma or stress, ART-induced lipodystrophy	Undetectable=untransmissible; can engage in RAI; assess sexual function before initiating ART; if prescribing PDE5 inhibitors, titrate up
Folliculitis	↓ Desire: body image issues	Typically not contagious; can engage in RAI
STI proctitis	AD: pain from inflammation	Re-engage after symptom resolution; treat STI
Viral hepatitis	↓ Desire: liver damage can lead to ↓ albumin, which leads to ↓ testosterone	Hepatitis A and E: re-engage after virus is cleared (hepatitis A: 3 months (85%); 6 months (nearly all people)) ⁴¹⁸ Hepatitis B and D: vaccination of sexual partners, condom use, medication Hepatitis C: use condom, avoid if actively bleeding in anorectum and discuss with partner

Table 1 (continued) | Engaging in RAI with structural diseases, infectious diseases and DGBI

Gastrointestinal disease	Problematic RAI dysfunction	Advice for engaging in RAI
Infectious diseases of colon, rectum and anus (continued)		
Protozoal infection	AD: diarrhoea ↓ Desire: altered bowel habits	Re-engage after symptom resolution; treat infection
Enteropathogenic bacterial infection	AD: diarrhoea ↓ Desire: altered bowel habits	Re-engage after symptom resolution; treat infection

AD, anodyspareunia; ART, antiretroviral therapy; CBT, cognitive behavioural therapy; DGBI, disorders of gut–brain interaction; FABD, functional abdominal bloating and distension; HPV, human papillomavirus; PDE5, phosphodiesterase 5; RAI, receptive anal intercourse; SSRI, selective serotonin reuptake inhibitor; STI, sexually transmitted infection.

substantial negative psychosexual effects and can affect desire¹⁶². Treatment for condylomata can help alleviate cosmetic concerns; however, local treatments can result in pain during RAI^{200,201}. Condylomata can extend into the intra-anal canal^{200,201}, rich in innervation. As such, treatments for condylomata, including topical and ablative therapies, are frequently associated with pain^{204,205} and anodyspareunia¹⁵⁰. Thus, patients with condylomata should be counselled on the possible risk of treatment-related anodyspareunia.

Patients can acquire and transmit bacterial STIs, including chlamydia, gonorrhoea and syphilis, through RAI²⁰⁶, which can lead to problematic intercourse. If bacterial STIs are untreated, they can cause infectious proctitis^{207,208}, which might be a risk factor for painful RAI, including anodyspareunia²⁰⁹. As STIs of the anorectum (and throat) are more likely to be asymptomatic than those of the genitalia²¹⁰, it is particularly important to screen patients engaging in RAI for the appropriate STIs. Best practices for STI screening include urinary, oropharyngeal and anorectal swabs (Fig. 3).

It is well established that people living with HIV have an increased risk of sexual dysfunction, and HIV and antiviral therapies can negatively influence RAI by affecting desire and arousal²¹¹. Additionally, among cisgender sexual minority men, RAI is the primary route of HIV transmission²¹². In people living with HIV, issues with desire are likely multifactorial due to diarrhoea (antiretroviral-related opportunistic infections)²¹³, body image changes (antiretroviral-induced lipodystrophy)²¹¹ and anxiety (fear of transmission)^{140,211,214}. Anodyspareunia can also affect people living with HIV, reported in up to 18% of cisgender gay and bisexual men living with HIV in one study²¹⁵. However, HIV itself might not be a risk factor for anodyspareunia as one study found no association between the two¹⁵⁰. Yet, a different survey study of sexual minority men found that HIV status was associated with painful intercourse, although no distinction was made regarding the type of pain (anodyspareunia or dysorgasmia)²⁰⁹.

Viral hepatitis can be spread through RAI and could contribute to problematic RAI because damage to the liver and resultant hypoalbuminaemia might decrease sexual desire. The liver regulates albumin production, which is directly correlated to testosterone levels, whereby hypoalbuminaemia from a damaged liver can cause low testosterone, decreased sexual desire^{216,217} and problematic RAI. Additionally, hepatitis A virus and hepatitis E virus can be transmitted through RAI with a mouth or tongue (oral–anal intercourse) and hepatitis B and D viruses can be transmitted during RAI through bodily fluids²¹⁸. Hepatitis C virus might be transmitted during RAI if there is active bleeding²¹⁸.

Additionally, antiretroviral therapy, classically protease inhibitors used for the management of HIV and viral hepatitis, can cause erectile dysfunction²¹¹. However, due to inhibiting CYP3A4, protease inhibitors can increase the levels of phosphodiesterase 5 inhibitor concentrations; thus, for patients on protease inhibitors with arousal

dysfunction, phosphodiesterase 5 inhibitors should be prescribed at a lower dose and uptitrated^{219–221}.

For patients who engage in RAI, protozoal and enteropathogenic bacterial infections can provoke altered bowel habits²²², making RAI painful, embarrassing and challenging overall. Engaging in RAI might pose a risk (potentially minor) of transmitting protozoal infections (such as *Giardia intestinalis*) and enteropathogenic bacterial infections (such as *Escherichia coli*) through oral–anal contact or through a contaminated object, such as a dildo, as the protozoa and bacteria can be located within microscopic faecal matter²²². A case–control study in the USA (case $n = 199$; control $n = 381$) identified that, among several risk factors for giardiasis, “male–male sexual behaviour” was among the biggest risk factors for contracting *Giardia* whereas “female–female sexual behaviour” was not²²³; however, male–male sexual behaviour does not equate to oral–anal intercourse²²⁴. Although oral–anal intercourse might be a potential risk factor for certain infections, it might not be the biggest risk factor.

When evaluating risk factors, it is crucial to be aware of the social determinants of health. For example, in the case of *Giardia*, access to safe drinking water and sanitation is an important consideration²²⁵. Individuals from sexual and gender minority communities encounter unique barriers to accessing safe drinking water and sanitation²²⁶, including segregated sanitation facilities based on sex recorded at birth²²⁷, histories of trauma or bullying related to bathrooms and locker rooms²²⁸, as well as actual or perceived risk of violence in sanitation facilities at shared spaces²²⁶. Social determinants of health can substantially contribute to the overall profile for the risk of acquiring an infection, emphasizing the need for a comprehensive understanding beyond assuming that specific sexual behaviours solely contribute to an infection. In addition to advising patients on thoroughly cleansing the anus before anal–oral intercourse, discussing potential use of dental dams during anal–oral intercourse, cleaning sex objects (for example, dildo) after use in an anus, and washing hands after anal stimulation²²⁹, it is critical to ask about their ability to access clean water.

Inflammatory bowel disease

Nearly 6.8 million people worldwide live with IBD²³⁰, a chronic immune-inflammatory disorder encompassing Crohn’s disease and ulcerative colitis²³¹. Crohn’s disease can affect anywhere along the gastrointestinal tract, including the perianal region in the form of skin tags, fissures, fistulas and strictures²³². In ulcerative colitis, inflammation begins in the rectum and extends proximally through the colon in a continuous manner²³². Malnutrition and extraintestinal manifestations, including inflammatory disorders of joints, skin and eye, also contribute to the effects of IBD on the quality of life of individuals^{45,231–234}.

IBD incidence is rising, and it is estimated that it will affect 1% of the global population within the next decade²³⁵. IBD symptom onset

typically occurs at 15–30 years of age²³⁶, with approximately 50% of patients with IBD diagnosed before the age of 35 years⁴⁵. The prevalence of IBD among older patients (≥ 60 years old) is increasing rapidly due to a combination of new diagnoses among older adults and an ageing IBD population²³⁷. Given the growing incidence and population affected by IBD, understanding the effects of this disease on sexual health is essential⁴⁵.

Both the disease and its treatments can affect sexual function, including RAI. Sexual dysfunction affects up to 40% of cisgender men and 97% of cisgender women with IBD⁴⁵. However, there remains a paucity of data to support people with IBD who engage in RAI²³⁸. A mixed methods study ($n = 50$) of cisgender sexual minority men and women with IBD found that these patients experienced fear of judgement related to disclosing their sexuality and sexual practices²³⁸. The study highlighted that patients felt 'robbed' of their choice to engage in RAI as their gastroenterologists did not discuss RAI nor the effects of IBD and treatments on RAI²³⁸. The urgent need to address health inequities in people from sexual and gender minority communities with IBD was additionally identified in a cross-sectional analysis ($n = 93$) illustrating that individuals from sexual and gender minority communities with IBD have a high risk of mental health comorbidities, social exclusion and unmet nutritional needs²³⁹, which can contribute to problematic RAI.

Problematic RAI due to local inflammation. In the anorectal region, IBD can manifest as skin tags, fissures, proctitis, strictures and inflammatory skin disorders; whereas perianal fistulas occur primarily in Crohn's disease (17–21%²⁴⁰ of patients developing a perianal fistula at 10 years, with incidence increasing with disease duration), they also occur in ~4.5%²⁴¹ of patients with ulcerative colitis after ileal pouch–anal anastomosis (IPAA)^{240,242}. Perianal disease can be disfiguring and greatly affects quality of life²⁴³.

Pain from inflammation and flares might interfere with pleasurable RAI in people with IBD. Proctitis (inflammation of the rectum) is a common manifestation of IBD, occurring in up to 40% of patients with IBD^{244–246}, and is associated with rectal pain, tenesmus and bleeding²³². For a patient with IBD engaging in RAI, increased bleeding from proctitis might not be life-threatening, but could create anxiety for the patient (and partner if present) from concern as well as confusion regarding the underlying aetiology of the bleeding. Additionally, in individuals with prostates affected by IBD with rectal involvement, local inflammation can cause persistent prostatic inflammation²¹⁷, likely affecting RAI⁴.

Crohn's disease-associated perianal fistulas, which are tunnels that occur between the rectum or anal canal and perianal skin, might also contribute to problematic RAI. These lesions are challenging to manage and can be chronic and painful²⁴⁰. The relative position of the fistula (intersphincteric, transphincteric, suprasphincteric or extrasphincteric) might influence sphincter function, treatment type²⁴⁰ and resultant sphincter tonicity²⁴⁷, and therefore RAI.

Perianal fistulas might damage other surrounding structures involved in pleasurable RAI, cause scarring that might make the area feel dry or tight or cause pain during penetration, especially if the fistula is filled with fluid¹⁶⁷. Perianal fistulas are also frequently associated with anorectal strictures causing anorectal narrowing^{248,249}, which could limit the ability to engage in RAI, potentially even making penetrative RAI impossible. Additionally, rectovaginal and colo-urethral fistulas can lead to unintentional leakage, causing anxiety surrounding RAI¹⁶⁷.

Perianal skin tags are generally benign and can be found in healthy individuals; however, they are more commonly associated with Crohn's disease²⁵⁰. When enlarged, skin tags can cause idiopathic pain and

anatomical blockage^{251–253}. Other skin manifestations from inflammation in patients with IBD include erythema nodosum, pyoderma granulatum, anogenital cutaneous Crohn's disease, and general impaired skin or wound healing^{243,254}, all of which can contribute to pain^{255,256} and likely anodyspareunia. Although more research is needed, patients with IBD might consider avoiding RAI if pain occurs during penetration and/or if there is active flaring^{208,257–259}.

Problematic RAI due to systemic inflammation. Systemic inflammation in patients with IBD can cause fatigue, increased faecal urgency, faecal incontinence, bloody diarrhoea, abdominal pain and malnutrition^{232,233,236,260}, all of which could be associated with problematic RAI. In IBD, fatigue is a common symptom present in up to 50% of patients at diagnosis⁴⁵. Fatigue can be extremely distressing for patients with IBD and one of the primary contributors to sexual dysfunction²⁶¹. Patients also report abdominal pain, diarrhoea and the fear of having diarrhoea as contributing to issues with intimacy²⁶¹.

Problematic RAI due to systemic therapies. Systemic treatments for IBD can influence sexual function⁴⁵, and likely RAI. Studies investigating the association of steroid use and sexual function in patients with IBD found that prolonged steroid use is associated with decreased sexual satisfaction and pleasure. Prolonged steroid use can lead to adrenal insufficiency, a known risk factor for fatigue and decreased desire²⁶², and body image disturbances, due to acne, fluid retention, obesity, stretch marks and hirsutism⁴⁵. Patients with IBD identify corticosteroid-related body changes to be most contributory to body image disturbances^{45,263}. Body image dissatisfaction is associated with arousal and orgasm dysfunctions^{264,265} and, notably, body image might be particularly important for sexual minority men²⁶⁵. Health-care providers should limit the length of steroid use to prevent adverse effects of body image disturbances on sexual health^{264,265}. Biologic therapies to control active inflammation might reduce the need for steroids and the associated adverse effects, helping to prevent steroid-related problematic RAI.

Problematic RAI due to surgical treatments. For people with IBD engaging in RAI who require surgical intervention, a comprehensive discussion on surgical treatment options for IBD and associated risks is essential and should potentially involve their sexual partners (Fig. 5). Rectal inflammation itself can affect RAI but surgical treatments, including bowel resection, fistula repair, diversion procedures and completion proctectomy, can cause complications that further influence RAI such as bleeding, mucus discharge and tenesmus.

Intestinal resection and colectomy rates, though slightly declining since the availability of biologic therapies, persist with 7–10% of patients with IBD undergoing one of these procedures²⁶⁶. Restorative proctocolectomy with IPAA, involving the creation of a pouch (called J-pouch) from tissue from the ileum and anastomosis to the anus²⁶⁷, is the gold standard for patients with refractory ulcerative colitis and patients with specific conditions (such as familial adenomatous polyposis).

Qualitative interviews with individuals with IBD from sexual and gender communities reveal how IPAA surgery adversely affected their ability to engage in RAI²³⁸. Patients expressed feeling uninformed²³⁸ and noted that, while there was guidance on sexual health after surgery, RAI was completely omitted, further affecting their mental health, sexual health and overall quality of life²³⁸. Discussing the length of the pouch and pouchitis (inflammation of the J-pouch)²⁶⁷ with people who engage

a Complications (outcomes) of IBD resection

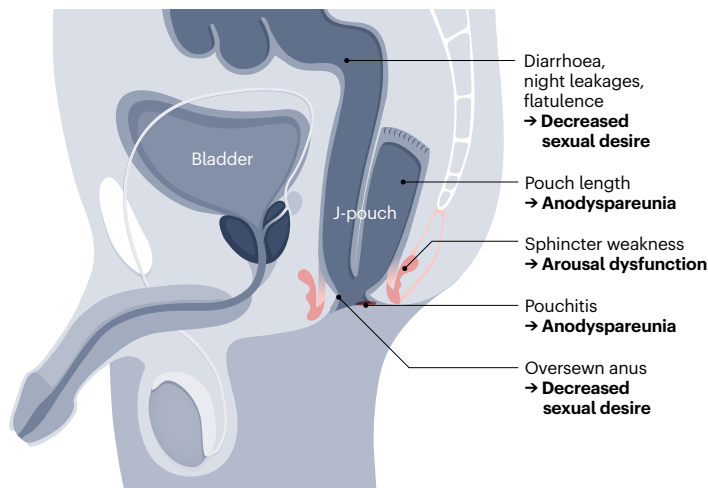
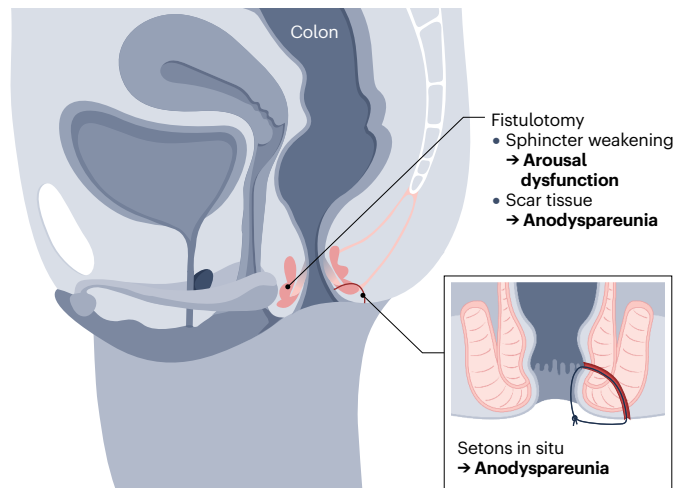


Fig. 5 | Effect of IBD-specific procedures on RAI. **a**, Effect of inflammatory bowel disease (IBD) resection procedures on receptive anal intercourse (RAI). Restorative proctocolectomy with ileal pouch–anal anastomosis surgery is a gold standard for refractory ulcerative colitis; however, it might affect ability to engage in RAI. The J-pouch, created from ileum and anastomosed to the anus²⁶⁷, might cause problematic RAI if it becomes inflamed (pouchitis) or if it is too small to accommodate an object for RAI. For patients with Crohn’s disease who require colectomy, ileorectal anastomosis²⁰⁸ might be another option, which is associated with fewer bowel movements and night leakages, but increased faecal urgency than ileal pouch–anal anastomosis²⁶⁹. Total proctocolectomy with end ileostomy is reserved for specific cases²⁴⁰, with implications for people who engage in RAI. Patients with IBD might

b Complications (outcomes) of IBD fistula



also undergo temporary or permanent ostomy¹⁶³, which can affect body image, intimacy and intercourse^{160,161}. **b**, Effect of IBD fistula procedures on RAI. Patients with perianal fistulizing Crohn’s disease often require abscess drainage and seton placement²⁴⁰. Traditional setons can be uncomfortable and affect sexual intimacy¹⁶⁷, knotless setons are associated with less pain²⁷², potentially enabling more pleasurable RAI. Fistulotomy can be considered for low intersphincteric fistulas²⁴⁰; however, this approach might create a scar, affecting anorectal elasticity and RAI. Sphincter weakening and stenosis²⁴⁰, which can lead to decreased arousal or anodyspareunia, respectively, are other possible complications from sphincterotomy. In eligible patients, mucosal advancement flaps and fistula ligation might be good options to preserve sphincter function and pleasurable RAI.

in RAI is likely important – pouch length might affect the ability to accommodate different lengths of objects inserted during RAI²⁵⁹ and pouchitis might make RAI painful.

For patients with Crohn’s disease requiring colectomy, ileorectal anastomosis, which preserves the rectum²⁰⁸, is associated with better sexual function in general, improved fecundity, fewer bowel movements, and fewer night bowel leakages compared with an IPAA²⁶⁸, although it is associated with increased faecal urgency²⁶⁹. It has been reported that hand-sewn anastomosis might be preferred over stapled anastomosis for people engaging in RAI to allow for continued intercourse²⁷⁰. Notably, ileorectal anastomosis is infrequently used in patients with ulcerative colitis due to the potential of persistent rectal inflammation and risk of colitis-associated malignancy^{268,271}.

Patients with IBD might also undergo temporary or permanent ostomy, with up to 10% of patients with Crohn’s disease living with a permanent stoma¹⁶³, which can affect body image, intimacy and intercourse^{160,161}. Although reserved for select patients, it is important to be aware that total proctocolectomy with end ileostomy, which removes the entire colon and rectum without re-establishment of continuity of the gastrointestinal tract, results in permanent ostomy and would permanently prohibit RAI²⁴⁰, which could substantially and negatively influence quality of life and identity for people who engage in RAI.

In patients with perianal fistulizing Crohn’s disease, fistula management often involves surgical procedures. The most common are abscess drainage and seton placement²⁴⁰. Setons in situ can cause pain

and discomfort²⁷² as well as frustration due to decreased sexual spontaneity and difficulties explaining setons to sexual partners¹⁶⁷. Knotless setons are associated with significantly less pain ($P < 0.001$; $n = 60$)²⁷², possibly enabling more pleasurable RAI. Fistulotomy, typically used for low intersphincteric fistulas that have failed medical management²⁴⁰, carries many risks including scar formation²⁴⁰ (which could reduce anorectal elasticity and the ability to accommodate an object for RAI) and sphincter weakening²⁴⁰ (which could cause decreased arousal). For patients who engage in RAI and are candidates, mucosal advancement flaps and fistula ligation might be preferred options. Mucosal advancement flaps involve mobilizing rectal tissue to cover fistula tracts and preserve the sphincters²⁴⁰; however, the procedure can only be performed in patients without active proctitis and reoperation occurs in up to 50% of patients²¹⁴. Ligation of intersphincteric fistulas, which has a low risk of faecal incontinence, is another treatment option that might preserve sphincter function²⁴⁰.

Colon, rectal and anal cancer

Maintaining the capacity for sexual pleasure, including pleasurable RAI, after cancer diagnosis and treatment can be fundamental to the quality of life of cancer survivors. Patients with colon, rectal or anal cancer have estimated 5-year overall survivals of 63%, 68% and 70%, respectively²⁷³, and advancements in multimodality cancer therapies continue to increase the number of CRC and anal cancer survivors living with treatment-related toxicities^{44,274–276}. Among colon, rectal or anal cancer survivors, sexual dysfunction is frequent and

Glossary

Anodyspareunia

Painful receptive anal intercourse.

Anorgasmia

Failure to achieve orgasm or the experience of weakened or diminished orgasms.

Bottom

The receptive partner in anal intercourse; although this term has also been generalized in sexual minority culture to include the receptive partner in oral intercourse.

Bottom-shaming

Judging, demeaning or devaluing someone for deriving pleasure from receptive anal intercourse.

Bulboclititoris

Clitoris and vestibular bulbs.

Butthurt

A colloquialism used to describe someone who is overly sensitive, potentially originating from a sensitive child who is spanked, but now also connotating that people who engage in receptive anal intercourse (RAI) might be sensitive and that RAI is painful, thus minimizing the association of pleasure and RAI.

Dysorgasmia

Pain during orgasm.

Neobanus

A reconstructed or created anus.

Neoclititoris

A reconstructed or created clitoris.

Neophallus

A reconstructed or created phallic structure, typically through metoidioplasty or phalloplasty.

Neovagina

A reconstructed or created vagina.

Pegging

Pleasurable receptive anal intercourse experienced through stimulation by an attachable artificial phallic object on a partner; commonly but not exclusively used in the context of a cisgender heterosexual male receiving anal pleasure from a cisgender woman with a strap-on dildo.

Rimming

Pleasurable receptive anal intercourse experienced through stimulation by the tongue or mouth of a partner.

Role-in-sex

The role a person identifies with during sexual intercourse (for example, top, bottom, versatile, side).

Sexual and gender minority

Individuals who identify as lesbian, gay, bisexual, transgender, gender diverse, asexual, queer or intersex as well as those who do not but whose sexual orientation, gender identity or reproductive development varies from traditional, societal, cultural or physiological norms.

Shower shot

Anorectal douching using an enema attached to a shower.

Side

A person who does not identify with “top”, “bottom”, or “vers” and might not engage in anal intercourse.

Social determinants of health

The environmental conditions in which people are born, reside, learn, work, worship, engage in recreational activities and age that influence health outcomes.

Top

The insertive partner in anal intercourse; although this term has been generalized in sexual minority culture to also include the insertive partner in oral intercourse.

Vers

Or verse, short for ‘versatile’, a person who engages in both the receptive and insertive role in intercourse.

distressing, respectively reported at rates of 47% and 28%⁴⁹, 86% and 72%⁴⁴, and 40% and 38%⁵⁰ among male and female survivors.

Colorectal cancer

CRC is the third most common cancer worldwide²⁷⁷. The incidence of CRC can be influenced by oestrogen, an important consideration when managing female, transgender and gender diverse, and intersex patients^{278–282}.

Survivors of CRC might experience iatrogenic sexual dysfunction, including problematic RAI. Approximately 80% of patients with colon cancer undergo surgery²⁸³ and patients with rectal cancer are treated with multimodality therapy, including combinations of systemic therapy, radiotherapy and surgery, depending on disease extent and biomarkers²⁸⁴. The probability of a permanent ostomy for patients with CRC who undergo surgery ranges from 10% to 30%¹⁶⁴, with up to 21% of patients with rectal cancer who undergo surgery requiring a permanent stoma¹⁶⁵. In a survey study of 418 survivors of CRC of varied sexual orientations, 70% of patients reported issues with sexual desire²⁸⁵. When stratified by sexual orientation, a markedly higher proportion of sexual minority patients expressed body image dissatisfaction than heterosexual patients (12% versus 6%; $P = 0.04$) and a significant

association between health-care utilization and sore buttock skin was observed in sexual minority patients but not in heterosexual patients²⁸⁵. Sore buttock skin and body image dissatisfaction can contribute to problematic RAI, highlighting the importance of counselling patients with CRC on these possibilities.

Survivors of CRC experiencing problematic RAI after treatment can encounter inadequate support and feelings of isolation²⁸⁶, which might worsen any treatment-related pain they could be experiencing²⁸⁷. In general, individuals from sexual and gender minority communities experience more loneliness and less familial and social support than the general population^{288–292}. Additionally, they are more prone to experiencing pain during cancer survivorship than their cisgender heterosexual counterparts²⁸⁷. Loneliness triggers similar brain signalling and inflammatory responses as physical pain, and the isolation experienced by individuals from sexual and gender minority communities likely contributes to the observed pain disparity²⁸⁷.

Neglecting conversations about RAI in clinical settings might inadvertently contribute to problematic RAI²⁸⁶ as the omission of RAI-related discussions during cancer care could amplify feelings of isolation, ultimately worsening pain²⁸⁷ and sexual dysfunction. A qualitative analysis (published as a thesis) of semi-structured interviews with six

sexual minority men with cancer revealed that the two patients with CRC experienced concerns related to problematic RAI, including pain and relationship breakdowns. However, unlike the three sexual minority men with prostate cancer, the CRC survivors struggled to identify support groups, resulting in more feelings of isolation and loneliness²⁸⁶.

Recognizing sexual health as a crucial component in cancer survivorship, it is essential for clinicians to discuss RAI during CRC care because, by addressing RAI during care and fostering a sense of belonging, clinicians could potentially help mitigate problematic RAI and improve the quality of life for survivors of CRC who engage in RAI.

Anal cancer

Approximately 90% of new anal cancer cases are caused by HPV, often transmitted through sexual intercourse, including RAI²⁹³. Despite global efforts in HPV vaccination^{294,295} and improved anal dysplasia screening²⁹⁶, new anal cancer cases continue to rise worldwide²⁹⁷.

Among the general population, anal cancer is rare; however, among sexual minority men, transgender and gender diverse people, and those with long-term immunosuppression, anal cancer is a relatively common malignancy^{206,298–305}. In the USA, sexual minority men constitute approximately 43% of new anal cancer cases among cisgender men³⁰⁶, with incidence rates ~20–80 times higher in cisgender sexual minority men than in cisgender men and/or women⁵⁵. Additionally, among gender-expansive individuals, anal cancer ranks as the second most common cancer³⁰¹.

Sexual minority men with anal cancer are more likely to be single than cisgender heterosexual patients. Mauro et al. found that 60% of sexual minority men with anal cancer were single³⁰⁷, consistent with other studies suggesting that people from sexual and gender minority communities with cancer are more likely to be single than cisgender heterosexual people with cancer^{287,308}, assumed to be proportional to societal tolerance and legal acceptance of same-sex relationships³⁰⁹.

Anal cancer and its treatments can lead to sequelae affecting sexual pleasure^{4,42,44}. In patients with anal cancer, 80% present with locoregional disease³¹⁰ and are treated with sphincter-sparing concurrent chemotherapy and radiation therapy³¹⁰. Approximately 10% of patients with anal cancer³¹¹ receive an ostomy prior to chemoradiation treatment and, of those patients, at least half go on to live with a permanent ostomy¹⁶⁶. Treatment of anal cancer with chemoradiation spares patients the morbidity associated with abdominoperineal resection³¹⁰; however, it can still adversely affect sexual function^{312–314}. For example, in a prospective study evaluating the effects of chemoradiation on quality of life in sexual minority men with anal cancer (mean age: 59.3 years)³⁰⁷, Mauro et al. showed that quality of life and sexual function (specifically penile erectile function) worsened during treatment. Both returned to baseline within a year following treatment completion. However, there were no questionnaires related to the effect of treatment on RAI specifically. To date, no published studies have systematically examined the effect of anal cancer treatments on RAI, and studies are needed to fully elucidate the effect of treatment on RAI.

Surgery and RAI

Surgical resection in patients with CRC can lead to problematic RAI through damage to the neurovasculature and organs responsible for arousal and orgasm⁴ (Fig. 6). Surgical approaches can also include colostomy, which can affect body image and desire^{160,161}. Nerves implicated in pleasurable RAI can become damaged from surgery, thermal injury, inflammation, ischaemia or stretching³¹⁵. Patients with colon cancer are treated with a colectomy, which can damage the inferior

mesenteric nerves and hypogastric nerves, both of which facilitate sexual, urinary and gastrointestinal function³¹⁵. Depending on the location of the rectal tumour (low, middle or high), surgical techniques might damage the genitopelvic neurovasculature or even completely remove functional anatomy (including the sphincters)³¹⁶. For low and middle rectal tumours, sphincter-sparing low anterior resection (LAR) with or without a coloanal anastomosis or abdominoperineal resection with total mesorectal excision might be used, whereas high rectal tumours can undergo a LAR with a higher anastomosis, thus sparing the morbidity associated with extensive resection³¹⁶.

Patients with rectal cancer who undergo surgery are likely at increased risk of problematic RAI compared with patients with colon cancer who undergo surgery. A multicentre cross-sectional analysis of survivors of colon cancer ($n = 1,145$) and rectal cancer ($n = 350$) showed that LAR syndrome – characterized by increased frequency of bowel movements, tenesmus and faecal incontinence – occurred more frequently in patients with rectal cancer (55%) than in those with colon cancer (21%)³¹⁷. Despite more survivors of rectal cancer having received neoadjuvant therapy (radiation and/or systemic therapy) than survivors of colon cancer (72% versus 1.7%; $P < 0.001$), neoadjuvant therapy was not a risk factor for LAR syndrome in this population. Risk factors for this syndrome included female sex and a prior diverting stoma. Additionally, patients who received adjuvant therapy and left hemicolectomy were at lower risk of developing LAR symptoms, further implicating disease location and direct surgical nerve damage as contributing factors³¹⁷.

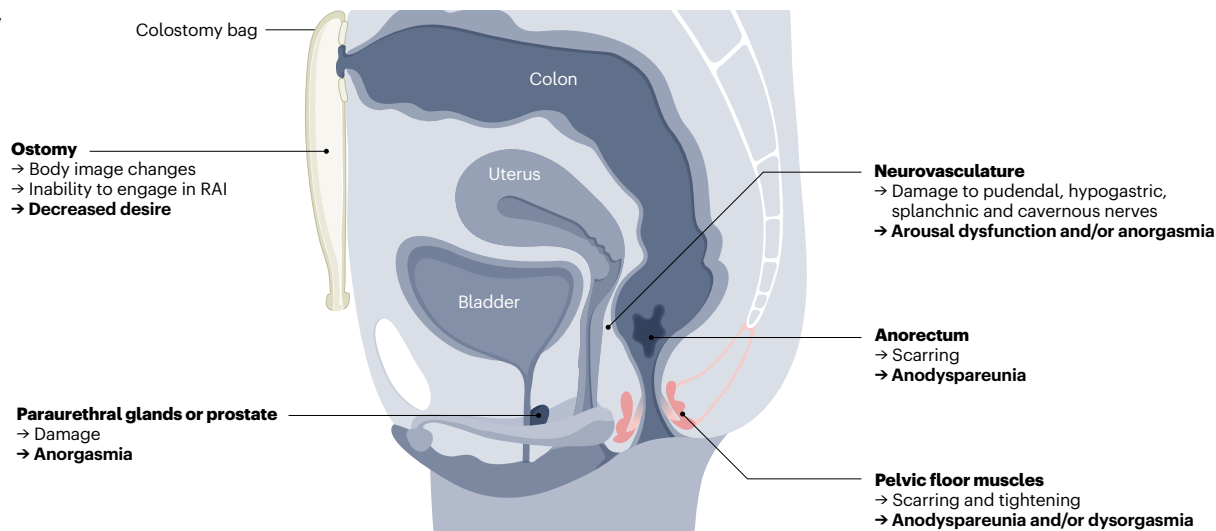
The role of non-operative management for rectal cancer is evolving. Patients with rectal cancer managed non-operatively with chemoradiation alone have a lower risk of LAR syndrome than those treated with multimodality therapy. In a cross-sectional survey study of survivors of rectal cancer, patients managed non-operatively with chemoradiation alone ($n = 23$) experienced fewer LAR syndrome symptoms and less distress than those treated with multimodality therapy ($n = 101$)³¹⁸. Using multivariable linear regression, the authors found that surgery was the only statistically significant predictor of worse bowel dysfunction³¹⁸. Rectal cancer treatments can damage functional anatomy and lead to problematic RAI, especially in patients with low rectal cancers for whom the sequelae can be similar to what is seen after treatment of anal cancer.

Radiation and RAI

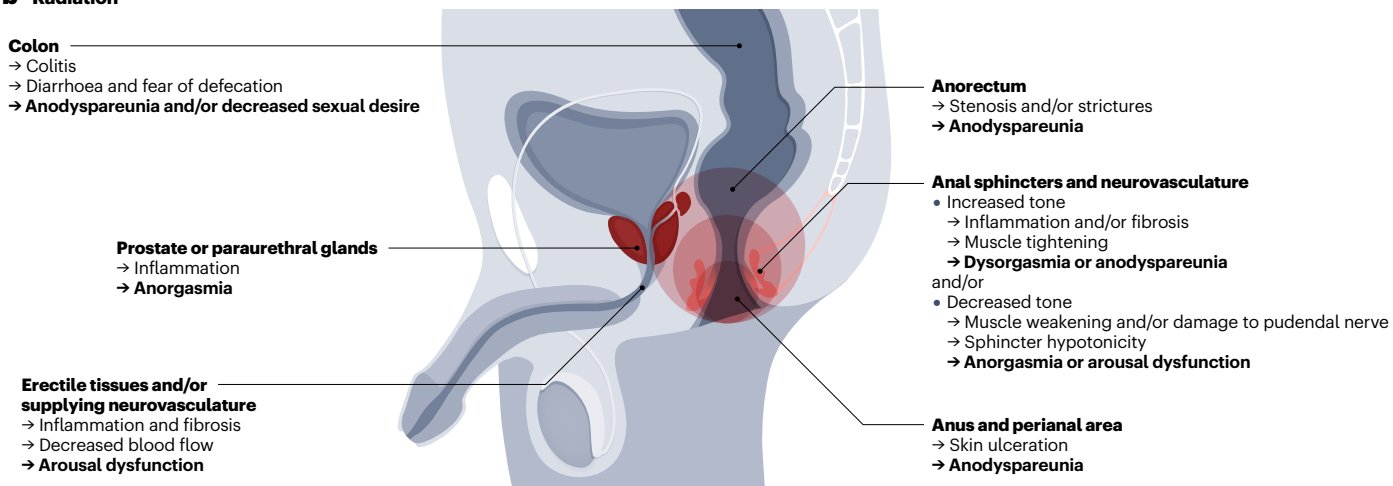
Radiation therapy can lead to problematic RAI in patients with anal and rectal cancer through long-term anal pain, perianal discomfort, rectal bleeding and faecal incontinence^{4,42,44,310,313,314} (Fig. 6). Radiation can damage the functional anatomy involved in pleasurable RAI as a result of normal functional tissue cell death, inflammation, mucosal ulceration and fibrosis³¹⁹. An observational cohort study of 79 survivors of anal cancer with late treatment toxicity identified that the radiation dose to the hottest 0.5 cm³ of functional anatomy – perianal skin, anal canal and large bowel – was associated with skin toxicity, anal toxicity (for example, sphincter dysfunction) and diarrhoea³²⁰.

Patients might experience anodyspareunia due to damage of the sensitive perianal skin and anal canal. Thematic analysis of qualitative interviews with survivors of anal cancer ($n = 84$) identified problematic RAI as a contributing factor to poor quality of life, for example, one sexual minority male patient discussed his inability to enjoy pleasurable RAI with his husband due to fear of anodyspareunia³²¹. Similarly, prostate-directed radiation has been associated with anodyspareunia through incidental damage to the anus^{4,15}. Given that the anal canal receives a higher dose of radiation during anorectal cancer treatments than prostate cancer treatments, it is important to acknowledge the

a Surgery



b Radiation



c Systemic treatment

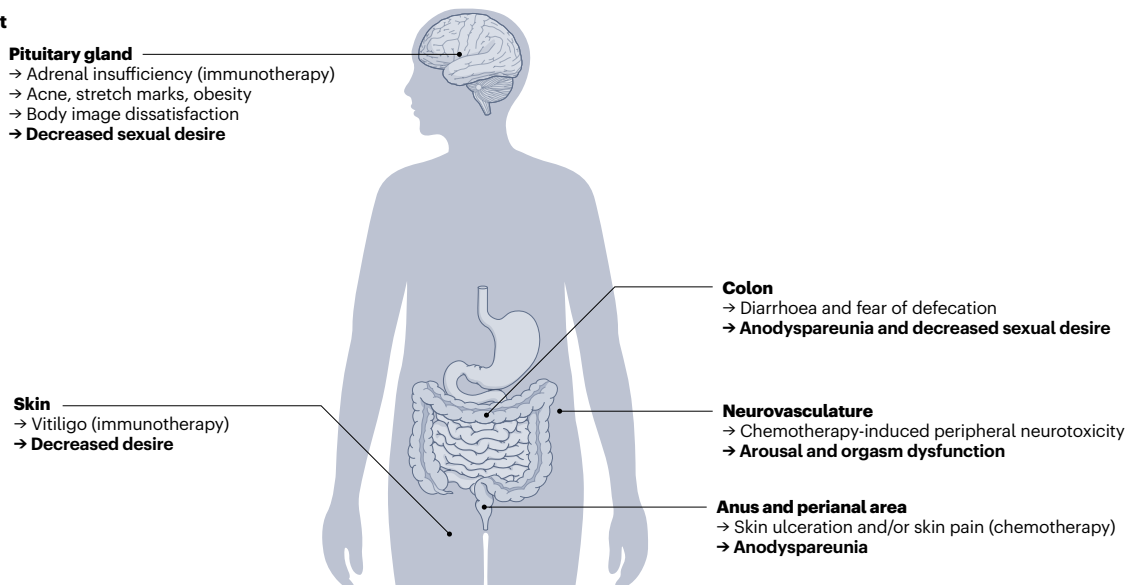


Fig. 6 | Treatment-related problematic RAI in patients with colon, rectal and anal cancer. **a**, Surgery-related problematic receptive anal intercourse (RAI).

Sphincter-sparing surgery is associated with less morbidity than an abdominal perineal resection⁴⁶¹. An abdominal perineal resection removes the sphincters and anus, precluding RAI^{461,462}. A low anterior resection with nerve-sparing techniques can be used to reduce sexual dysfunctions, including problematic RAI; however, it can still damage the hypogastric nerves and neurovascular bundle⁴⁶², adversely affecting arousal⁴⁶³. Ongoing debate exists on removal of the rectoprostatic or rectovaginal fascia for posterior rectal tumours but it is removed during total mesorectal excision for anterior rectal tumours^{462,464}. The rectoprostatic fascia is the location of a neovagina in transfeminine people, and removal of this space would complicate future reconstructive surgery³³¹. Additionally, for anterior tumours, total mesorectal excision has an increased risk of damaging the neurovascular bundle responsible for erectile tissue engorgement during RAI arousal⁴⁶². Damage to these nerves might also result in low anterior resection syndrome, characterized by increased frequency of bowel movements, tenesmus and faecal incontinence³¹⁵. The probability of a permanent ostomy for a patient with colorectal cancer undergoing surgery ranges from 10% to 30%¹⁶⁴, with potentially 21% of patients with rectal cancer who

undergo surgery requiring a permanent stoma¹⁶⁵, decreasing sexual desire^{160,161} and affecting RAI. **b**, Radiation-related problematic RAI. Radiation contributes to problematic RAI in patients with anal and rectal cancer through long-term anal pain, perianal discomfort, rectal bleeding and faecal incontinence^{4,42,44,310,313,314}. Radiation can damage the functional anatomy involved in pleasurable RAI due to normal functional tissue cell death, inflammation, mucosal ulceration and fibrosis³¹⁹. Approximately 10% of patients with anal cancer³¹¹ receive an ostomy prior to chemoradiation treatment and, of those patients, at least half go on to live with a permanent ostomy, affecting patient self-perception and the desire for sexual intercourse and intimacy¹⁶⁶. **c**, Systemic treatment-related problematic RAI. Systemic therapy, including chemotherapy^{335,336} and immunotherapy, can influence pleasurable RAI through skin changes, diarrhoea^{1,150} and resultant malabsorption³³⁸, colitis³⁴⁶, and chemotherapy-induced peripheral neurotoxicity³⁴⁰. Immunotherapy is emerging as part of the treatment for colorectal and anal cancers^{333,344,345}. Immunotherapies are associated with diarrhoea and/or colitis³⁰⁷, which might cause anodyspareunia or adrenal insufficiency³⁴⁷, leading to decreased sexual desire and body image dissatisfaction, and may even be associated with vitiligo, which could affect sexual desire⁴⁶⁵.

risk of anodyspareunia when recommending or initiating anal cancer radiation treatments^{320,322,323}.

Radiation can also cause issues with orgasm and arousal by damaging erectile tissue, prostate or paraurethral glands, anal sphincters and anal canal^{4,42,324}. Radiation treatment for anal and rectal cancer includes the prostate as part of its clinical target volumes, which could lead to issues with arousal and orgasm during RAI³²⁵. Radiation therapy can damage the anal sphincters and anal canal, especially in patients with large tumours, causing inflammation and fibrosis^{326,327}. Additionally, if the cancer invaded the anal sphincters, sphincter dysfunction can occur even after tumour regression due to initial damage from the tumour. In addition to faecal incontinence, sphincter dysfunction can result in a decreased ability to squeeze a phallus or object for sexual pleasure, further affecting arousal and orgasm in RAI^{328,329}. Fibrosis of the anal canal might cause anal strictures and anal stenosis³³⁰, which could lead to painful RAI and anodyspareunia⁴.

Radiation for anorectal cancer might also influence cosmesis associated with genital-affirming surgery³³¹, influencing the ability and desire of a patient to engage in RAI. For example, a transfeminine person who underwent radiotherapy for anal cancer developed lymphoedema due to the interaction between radiation and injected liquid silicone in the pelvis³³². It is important to counsel people experiencing gender incongruence who underwent or are planning to undergo genital-affirming procedures on the implications of radiation treatment on cosmetic outcomes^{333,334}. Moreover, silicone injection is not a standard genital-affirming surgical practice, and it is important for health-care professionals to ask appropriate questions and offer counselling while considering non-standard therapies.

Systemic therapy and RAI

Systemic therapy can negatively affect pleasurable RAI through skin toxicity, malabsorption from diarrhoea and neurotoxicity (Fig. 6). Mitomycin-C³³⁵ and 5-fluorouracil³³⁶ can cause skin ulceration, skin pain and skin irritation, and 5-fluorouracil can cause diarrhoea³³⁷. Diarrhoea can decrease sexual desire⁴ and cause anodyspareunia¹⁵⁰. Malabsorption can lead to pelvic floor muscle weakening and cramps³³⁸, causing arousal and orgasm dysfunction¹⁵⁵.

Systemic therapy can also affect arousal and orgasm³³⁹ through chemotherapy-induced peripheral neurotoxicity³⁴⁰. Chemotherapy-induced peripheral neurotoxicity is among the most common adverse effects, with a prevalence ranging from 19% to 85%, and can markedly affect pleasurable intercourse³⁴¹. Chemotherapy-induced peripheral neurotoxicity is dependent on agent and dose and particularly common among platinum-based antineoplastics (oxaliplatin and cisplatin), vinca alkaloids (vincristine and vinblastine), epothilones (ixabepilone), taxanes (paclitaxel and docetaxel), proteasome inhibitors (bortezomib) and immunomodulatory drugs (thalidomide)³⁴¹. Cisplatin, oxaliplatin and other alkylating agents are commonly used for CRC treatment, and secondary nerve damage can result in arousal dysfunction and anorgasmia³⁴². The underlying mechanism for nervous system damage by alkylating agents is neuroinflammation and altered neuron excitability³⁴¹. Neuroinflammation is caused by the activation of immune cells and an increase in inflammatory cytokines³⁴¹. These agents also create reactive oxygen species, leading to apoptosis and inflammation. Lastly, chemotherapy can alter the expression of ion channels, including upregulating sodium-gated channels and downregulating potassium-gated channels inducing neuronal hyperexcitability^{341,343}, which might alter sensitivity and therefore influence arousal and orgasm³⁴¹.

Immunotherapy is emerging as part of the treatment for CRC and anal cancer^{333,344,345}. Immunotherapies are associated with colitis³⁴⁶ (which might cause anodyspareunia) and adrenal insufficiency³⁴⁷ (which is associated with decreased sexual desire and body image dissatisfaction) (Fig. 6). Systemic treatment-related effects can last for many years, and it is important to discuss the lasting effects of systemic therapy on sexual health with patients with CRC or anal cancer.

Treatment choice

Although anal and colon cancers are typically treated with chemoradiation and surgical resection, respectively, rectal cancer is treated with multimodality therapy. As treatment paradigms for cancer continue to evolve, select patients, particularly those with rectal cancer, might be faced with unique treatment choices with variable toxicity profiles^{348–351}. To guide patients with rectal cancer, physicians should use knowledge of the sexual behaviours of patients, including their

Table 2 | Management of inflammatory bowel disease treatment-related problematic RAI

Treatment	Problematic RAI dysfunction	Approaches for rehabilitation and restoration
Ileoanal or ileorectal anastomosis	Anodyspareunia	Discuss pouch length, antidiarrhoeals, CBT
	↓ Arousal	Gut-directed hypnotherapy, biofeedback
	↓ Desire	Antidiarrhoeals, CBT
Total proctocolectomy	↓ Desire	Reframe sexual pleasure, CBT
Setons in situ	Anodyspareunia	Knotless setons
Fistulotomy	Anodyspareunia or ↓ arousal	Anal dilator

CBT, cognitive behavioural therapy; RAI, receptive anal intercourse.

preferred role-in-sex (insertive partner ('top'), receptive partner ('bottom'), both ('vers'), neither ('side')⁴) and anatomy. Systematic collection of patient-reported outcomes related to all sexual behaviours, including RAI, will be important to inform future treatment strategies and inform treatment choice decision-making and counselling³⁵¹.

Management of problematic RAI

Strategies to manage, mitigate and treat problematic RAI can help patients prevent and/or restore the ability to experience pleasure, arousal, orgasm and satisfaction³ (Tables 2 and 3). Although limited evidence exists regarding restorative therapies for pleasurable RAI⁴ (Tables 2 and 3), it is important to discuss potential therapies for pleasurable RAI rehabilitation. Discussing, characterizing and diagnosing the nature of problematic RAI for a patient (Fig. 3) can help provide insight into optimal strategies to engage in pleasurable RAI safely and confidently.

Engaging in RAI

Generally, if there is no pain, it is safe for patients with non-malignant gastrointestinal disorders to engage in RAI^{56,172,182} (Table 1). The unpredictability of pain, faecal incontinence, flatulence and/or discomfort²⁰⁸ might cause anxiety and depression regarding RAI. Direct partner communication regarding disease-specific insecurities and symptoms might help alleviate apprehension^{92,352,353}. If it is difficult to receive more rigid objects due to strictures and tightening, pleasurable RAI from the tongue of a partner or soft and small anal beads³⁵⁴ might be good options. However, patients should be counselled on adequate cleaning and preparation to promote partner safety and intimacy.

Practically, antidiarrhoeals, fibre supplements, lower residue diet to control regularity, avoiding spicy foods, timing meals, and defecation immediately prior to intercourse might help control symptoms and relieve mental distress^{208,355,356}. Anti-flatulence medications and/or positioning in the left lateral decubitus position for 15 min in advance of RAI can help expel and prevent unwanted flatulence^{357,358}.

Resumption of RAI. Guidance on resuming RAI after anal, rectal and colon cancer treatments is limited. Counselling patients on safely resuming RAI following treatment is crucial to avoid complications. Extrapolating from the literature and other cancer disease sites,

resumption of RAI following treatment should only occur after complete clinical response, complete healing from surgical resection and complete subsidence of radiation-induced inflammation. With regards to anal cancer, a safe approach would likely be approximately 7 months (~30 weeks) after treatment completion, which was identified by adding 4 weeks³⁵⁹ to the 26 weeks that it typically takes for patients with anal cancer to have a complete clinical response³¹⁰.

Resumption of RAI in survivors of CRC depends on treatment modality. Extrapolating from other disease sites, patients should wait at least 1 month after complete clinical response or treatment completion³⁵⁹, which will likely allow sufficient time for tissue healing and inflammation resolution. Once complete, clinical response is obtained and the anal canal is fully healed (that is, without any anal fissures), survivors of CRC and anal cancer can consider using anal dilators to help remodel scarring and safely stretch the anal and pelvic musculature^{4,310}. Similarly, for patients with non-malignant gastrointestinal diseases who undergo surgery, it is imperative³⁶⁰ to allow the anal canal to heal completely before re-engaging in RAI³⁶⁰. Anal dilators can similarly be introduced to help remodel scar tissue.

Anorectal douching. Anorectal douching should be discussed with cancer survivors and patients with gastrointestinal diseases (Fig. 3). Preparation for RAI with a high-fibre diet and a gentle shower before intercourse should be emphasized; however, patients might still desire douching³⁶¹. A discussion surrounding douching should focus on minimizing douching-induced damage and not abstinence²¹².

Health-care professionals should enquire about douching products, timing relative to RAI and delivery method. Plain water (hypo-osmolar) is the most common substance used for anorectal douching³⁶¹. Additionally, iso-osmolar and hypo-osmolar solutions result in less intestinal damage than hyperosmolar (for example, fleet enemas) solutions as characterized by cell sloughing on histological analysis³⁶². Douching too frequently and/or aggressively, such as with a shower attachment ('shower shot')²¹², can damage the anorectal mucosa and epithelium^{19,363}. A douche enema bulb might be preferable to control the force, especially as self-resolving bleeding can occur in up to 10% of people²¹². If bleeding occurs, waiting for resolution can decrease infection and further damage. People should limit douching after RAI due to the risk of additional anorectal irritation and infection²¹², and douching with adequate time before engaging in RAI will allow for residual solution to be expelled³⁶¹. Counselling patients on the risks of anorectal damage due to product, timing and delivery method is especially important for patients with underlying gastrointestinal disease or long-term treatment sequelae.

STI prevention. Clinicians should discuss appropriate STI screening and prophylaxis with people with gastrointestinal diseases who engage in RAI (Fig. 3). Pre-exposure HIV prophylaxis can be taken as a daily oral pill, such as emtricitabine-tenofovir³⁶⁴, or as long-acting cabotegravir via intramuscular injection administered every 1–2 months³⁶⁵. Gastrointestinal diseases can influence drug pharmacokinetics, including distribution, metabolism and excretion³⁶⁶ as the result of altered gastric emptying time, reduced intestinal length, altered pH, or inflammation impacting permeability^{366,367}. A study investigating the bioavailability of raltegravir in rodents found that pH-altering agents, metal-containing agents and food reduced raltegravir bioavailability³⁶⁸. Similarly, a case study of a patient with a history of HIV and jejunostomy found decreased absorption of orally administered dolutegravir and tenofovir³⁶⁹. Therefore, physicians might consider

recommending pre-exposure HIV prophylaxis with long-acting cabotegravir via intramuscular injection for patients with gastrointestinal diseases that influence oral drug absorption^{365,370}.

Furthermore, it is important to discuss doxycycline post-exposure prophylaxis with people who engage in RAI to prevent bacterial STIs (gonorrhoea, chlamydia and syphilis)³⁷¹. However, although doxycycline post-exposure prophylaxis is safe for cancer survivors and patients with structural and infectious gastrointestinal diseases, patients with IBD and DGBI should be counselled on potential for changes in the microbiome from doxycycline, which could worsen disease³⁷². Furthermore, doxycycline can cause diarrhoea³⁷², which can be distressing for patients who engage in RAI. Still, infectious prophylaxis can likely help to reduce STI transmission-related anxiety and associated issues with sexual desire.

Additionally, discussing condom use during RAI³⁷³, potential use of dental dams during anal–oral intercourse²²⁹, and sex object and/or finger hygiene during anal intercourse²²⁹ is important to prevent STIs. However, acknowledging that what worked for patients before their gastrointestinal disease and associated treatment might no longer be sufficient for pleasurable RAI is recommended as is counselling that patience and tailoring might be necessary due to anatomical and physiological changes. For example, surgical and radiation scarring might increase friction⁴ and make condom use more difficult. Lubricants can be used to help accommodate an inserted object, including an object covered in a condom⁴. Due to its ability to adhere to mucosa and scar tissue in addition to minimal drying properties compared with water-based lubricants^{374–376}, a silicone-based lubricant might be preferred for RAI⁴ (Fig. 3).

Engaging in RAI with an ostomy. A stoma might temporarily or permanently prevent patients from engaging in RAI (Figs. 5 and 6). Patients should never insert objects into the stoma, although addressing this aspect with patients should be approached thoughtfully³⁷⁷ (Tables 2 and 3). Patients interested in RAI without a sufficient anorectal stump might experience distress in learning that RAI might not be possible³⁶⁷, and counselling should be offered. Patients with a stoma and an anorectal stump should be counselled on anal dilator use to maintain anorectal patency and help prevent the stoma from becoming permanent³⁷⁸. Additionally, patients should be counselled on cleaning the anorectal stump because it will continue to produce mucus despite the presence of a stoma³⁷⁹.

Patients with a permanent stoma might still have an anorectal stump that is sufficient for RAI. The UK National Health Service cautions against using an anorectal stump for RAI after ostomy formation due to the risk of tearing and bleeding³⁸⁰. However, for many patients, RAI can be extremely important for sexual health and, assuming a sufficient and intact organ, patients might continue engaging in intercourse³⁸¹. Similar to an anorectal stump, a neovagina can be created from intestine³⁸². For patients with neovaginas, recommendations exist on receptive neovaginal intercourse³⁸², including cleaning with soapy water and maintaining neovaginal patency with dilators³⁸³. Given that patients with neovaginas can safely engage in pleasurable receptive neovaginal intercourse, it is likely that patients could safely use an anorectal stump for pleasurable RAI³⁸⁴. For patients without an anorectal stump, research into the creation of a neoanus might be considered to provide patients with the possibility of continuing to engage in pleasurable RAI³⁸⁵. Guidelines and/or consensus statements are necessary regarding the safety and best practices of using an anorectal stump or a neoanus for pleasurable RAI³⁸⁴.

Pelvic floor muscle restoration

The pelvic floor muscles, especially the anal sphincters, are important for arousal, orgasm, satisfaction and pleasure in RAI. Understanding patient symptoms can help guide treatment as a careful balance between pelvic floor stretching, relaxation and strengthening is necessary for pleasurable RAI rehabilitation^{158,159}.

Pelvic floor muscle strengthening. Strengthening the pelvic floor musculature is important for restoring the capacity for orgasm and arousal during RAI. Increased strength of the levator ani muscle, which is connected to the external anal sphincters and penile or clitoral corpus cavernosum and facilitates defecation, bulbocavernosus erection, and penile ejaculation, was associated with increased arousal and orgasm¹⁵⁷. Researchers hypothesize that increased tone of the vagina facilitates pressure from the inserted object on surrounding sensate structures during intercourse, increasing arousal, orgasm and sexual satisfaction¹⁵⁵. Similar to vaginal pressure and tone, anorectal pressure and tone increase during orgasm³⁸⁶ and increased pelvic floor muscle strength helps facilitate pressure from an inserted object on the surrounding sensate structures during RAI, including the bulbocavernosus, cavernous nerves, and prostate or paraurethral glands. Strengthening the pelvic floor muscles (including the anal sphincters and levator ani muscles) through Kegel exercises can help restore arousal and orgasm during RAI⁴ (Table 3).

Sacral nerve stimulator. Sacral nerve stimulation can be used to treat problematic RAI from sphincter dysfunction. Indications include colorectal surgeries (including J-pouch reconstructions), cancer-directed therapies, rectal prolapse and other aetiologies of faecal

Table 3 | Management of cancer treatment-related problematic RAI

Anatomical structure damage	Problematic RAI dysfunction	Approaches for rehabilitation and restoration
Neurovasculature	↓ Arousal, anorgasmia	Sacral nerve stimulator, phosphodiesterase 5 inhibitors
Erectile tissues	↓ Arousal	Oral phosphodiesterase 5 inhibitors, vacuum pump devices, prostaglandin injectables, prostaglandin intra-urethral suppositories
Prostate or paraurethral glands	↓ Arousal, anorgasmia, dysorgasmia	Anal vibrator
Pelvic floor muscles or anal sphincters (hypotonic or hypertonic)	Hypotonic: ↓ arousal, anorgasmia Hypertonic: anodyspareunia, dysorgasmia	Hypotonic: sacral nerve stimulator, pelvic floor strengthening Hypertonic: anal dilator, pelvic floor stretching, diazepam suppository, sitz bath
Anus and perianal area	Anodyspareunia	Topical ointments, sitz bath
Colon or intestine	Anodyspareunia, ↓ desire	Antidiarrhoeals, cognitive behavioural therapy
Abdomen, stoma	↓ Desire	Reframe sexual pleasure

RAI, receptive anal intercourse.

incontinence³⁸⁷. Implantation of an electrode can re-establish neural pathways and restore sphincter function, strength and control³⁸⁷. For patients with problematic RAI due to functional sphincter control as opposed to anatomic sphincter impairment, sacral nerve stimulation might be a good treatment option³⁸⁸ (Table 3).

Pelvic floor muscle relaxation. There is a complex relationship between biological and psychosocial elements leading to an overactive pelvic floor. Gastrointestinal diseases, surgical interventions and chemoradiation can cause pelvic floor tightness resulting in high tone and/or an overactive pelvic floor, causing pain and impeding arousal by inhibiting blood flow^{158,159}. An overactive pelvic floor has been associated with IBS, illustrating the complex relationship between the pelvic floor, particularly the anal sphincters, and the gut–brain axis^{158,159}.

Pelvic floor tissue flexibility is important for arousal and pain prevention during RAI and orgasm^{158,159}. Physical rehabilitation and behaviour therapy can be used to help with relaxation^{158,159}. A multimodality physical therapy technique incorporating biofeedback, relaxation and stretching was superior to topical lidocaine for the treatment of painful receptive vaginal intercourse in a cohort of cisgender women ($n = 212$)³⁸⁹. Physical therapy incorporating stretching and biofeedback might help relax pelvic floor muscles and the sphincters to allow for pleasurable RAI (Table 3).

Little evidence exists on medical treatment options for problematic RAI from hypertonic pelvic floor muscles. Diazepam suppositories, botulinum toxin A and muscle relaxants (for example, cyclobenzaprine) have been shown to help with receptive vaginal intercourse^{158,159}. However, more research is needed to confirm the safety of these techniques for the treatment of problematic RAI and caution is needed before administering these treatments (Table 3).

Psychological interventions

For patients experiencing problematic RAI, evaluation by a health psychologist, psychotherapist or certified sex therapist should be considered. Psychotherapy and counselling might start before treatments begin to enable preparation and informed decision-making^{158,159,390} as many gastrointestinal-directed treatments and, indeed, the gastrointestinal disorders themselves can markedly affect the ability of a patient to engage in pleasurable RAI. A multidisciplinary team coordinating psychological, social behavioural and medical aspects of RAI is ideal for people with gastrointestinal diseases engaging in RAI^{158,159}. Still, a simple empathetic discussion with patients might be effective in decreasing anxiety, alleviating pain and supporting future pleasurable RAI^{158,159}.

Cognitive behavioural therapy. Psychosocial factors can additionally contribute to an overactive pelvic floor and pain^{158,159}. Similar to the relationship between anxiety and pain in receptive vaginal intercourse³⁹¹, there is a positive correlation between anxiety and pain in RAI¹³⁴. Anxiety might lead to increased defecation, leakage, flatulence and, subsequently, more anxiety and/or avoidance, creating a cyclical avoidant pattern and further increasing overall hypervigilance, hypertonic pelvic floor muscles and pain^{186,390,392}.

Cognitive behavioural therapy, a highly personalized and collaborative behavioural approach that focuses on remediating maladaptive thoughts, emotions and behaviours, can reduce pain and improve sexual satisfaction. It is one of the most successful gut–brain behaviour therapies for chronic digestive disorders, particularly for those in

which the gut–brain interaction is influenced by fear of symptoms³⁹³. Cognitive behavioural therapy has been advocated for as a treatment for patients suffering from anodyspareunia³⁹⁴, and might be useful in terminating an anxiety cycle in patients with gastrointestinal diseases to enable pleasurable RAI (Tables 2 and 3).

Gut-directed hypnotherapy. Anatomical changes, such as a J-pouch, from colorectal surgery interventions might make it difficult for patients to connect with their body^{390,395}. Gut-directed hypnotherapy, a therapist-guided relaxation technique with focused suggestions directly related to the symptom or sensation in question (for example, pain) is also a well-tolerated, effective brain–gut behaviour therapy³⁹³. Although little is known about its potential to restore healthy brain–gut connections in patients with J-pouches specifically, gut-directed hypnotherapy might be customized to increase positive sensory experiences in the rectum or anus after anatomical changes (Table 2).

Restorative devices

Gastrointestinal diseases, surgical treatments and chemoradiation can cause irritation, pain and friability from inflammation and anal spasms³³⁰. It is important to discuss hygienic and safe anal dilation and vibrator practices, including gradually increasing device size³⁹⁶, using a water-based lubricant for sexual device insertion, and cleaning devices with warm water and antibacterial soap to prevent infection³⁹⁷. Ultimately, anal dilators and vibrators might help restore the capacity for pleasurable RAI.

Anal dilators. Anal dilators can help restore anal canal elasticity after treatment for gastrointestinal diseases by stretching and strengthening the anal sphincters (Tables 2 and 3). Anal dilators help minimize anal spasms by stretching the muscles and reducing penetration-associated pain³⁹⁶. Anal dilators can prevent the formation of new scar tissue and help remodel existing scar tissue, shaping the anal canal and promoting anorectal elasticity^{398–400}. Anal elasticity, strength and length have important roles in accommodating an inserted object for pleasurable RAI^{401,402}. Anal dilators can also be used to teach relaxation techniques, allowing the patient to gain control over their pelvic floor muscles.

Anal vibrators. Vibrators can help restore reduced sensation from treatment or disease and can be used for arousal and orgasm rehabilitation⁴ (Table 3). Through stimulation of the prostate or peri-urethral glands, erectile tissues, and surrounding sensitive structures, anal vibrators might be able to restore sensation and pleasure⁴ following gastrointestinal disease treatments. Even after anatomical alterations or damage, surrounding sensory nerves might be stimulated and enhanced by a vibrator^{403,404}. Thus, vibrators could be useful for patients with gastrointestinal diseases, although more studies are required to confirm their benefit⁴.

Reframing sexual pleasure

For many patients, RAI can be a substantial component of sexual identity⁴⁰⁵. Gastrointestinal diseases and treatments can result in a temporary or permanent inability to engage in RAI, thus severely affecting quality of life⁴⁰⁵. An informed treatment discussion focused on pleasurable affirmation and psychological flexibility is essential. Moreover, a discussion reconceptualizing pleasurable intercourse and sexual activity is important. Framing sexual intercourse around

pleasure rather than solely on prevention of negative experiences (or avoidance) is associated with improved health outcomes^{72,406}.

Acknowledging other anatomical erogenous regions in the human body can help reframe sexual pleasure (Tables 2 and 3). Pleasurable regions of the human body, aside from the genitopelvic area, include the mouth or lips, nape of the neck, nipples, and ears⁸¹. An anatomical analysis revealed that the non-genitopelvic erogenous zones⁸¹, spanning up to 26% of the body surface⁴⁰⁷, elicit arousal that is even stronger when elicited by a partner rather than self (masturbation)⁸¹. Stimulation of these erogenous zones can produce orgasm⁴⁰⁷. Although the exact neurobiology and neurocircuitry of these areas are poorly understood, evolving research has identified neuroanatomical and psychological bases for sexual pleasure⁴⁰⁸. Thus, a conversation with patients who are unable to engage in RAI might highlight pleasure from stimulation of other anatomical locations outside the pelvis and from strong interpersonal connections^{72,407}.

Conclusions

RAI is common, and its prevalence will continue to increase with changing global demographics^{61–63} and decreasing stigma. The number of patients with gastrointestinal diseases will also continue to increase^{235,277,297}, furthering the need for effective counselling on the safe and pleasurable practice of RAI. Existing studies illustrate that non-malignant gastrointestinal diseases and treatments for CRC and anal cancer can cause problematic RAI. Disease-related and treatment-related problematic RAI include anodyspareunia, arousal dysfunction, orgasm dysfunction and decreased sexual desire⁴. The physiology and anatomy involved in RAI are well described; however, more studies are needed to understand the pathophysiology underlying disease-related and treatment-related problematic RAI. Understanding the mechanisms of treatment-related damage will enable researchers to develop novel ways for alleviating problematic RAI, further helping to correct the inequities in scientific and biomedical research⁴³.

Effective communication between clinicians and patients is crucial to mitigate the repercussions of problematic RAI associated with malignant and non-malignant gastrointestinal diseases. Clinicians must ask patients about sexual orientation, gender identity, and sex recorded at birth^{44,254}, and discussions with patients with gastrointestinal diseases should incorporate sexual behaviours, especially RAI, and how disease-related or treatment-related complications might affect sexual pleasure. Centring conversations regarding sexual behaviours on pleasure will help guide conversations, shared decision-making and treatment selection⁴.

Malignant and non-malignant gastrointestinal disease research and clinical trials must incorporate sexual orientation, gender identity and RAI questionnaires to elucidate disease or treatment effects on RAI^{409–411}. As treatment options increase^{333,348–351}, these questionnaires will be crucial to provide clinicians with evidence for discussing anatomy, physiology and pathophysiology of organ function related to disease-specific and treatment-specific problematic RAI. Additionally, these data could further empower cisgender women, sexual minority men, gender-expansive people and intersex individuals to advocate for more equitable care and research. With these data, RAI can become integrated into medical education and training, further destigmatizing and normalizing sexual behaviours for all people^{5,6}. Gastroenterologists, surgical oncologists, radiation oncologists, medical oncologists and clinical oncologists must expand their definition of sexual activity focused on insertive vaginal intercourse and reproductive ability to include sexual pleasure from all sexual behaviours, including RAI.

Health-care professionals must recognize the anorectum as a sexual organ and that the gastrointestinal system is involved in sexual pleasure, sexual function and sexual health to provide basic human rights for all patients, including those who engage in RAI.

Published online: 19 May 2024

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Acknowledgements

The authors thank A. Fenner (*Nature Reviews Urology*) for providing initial support. D.C.M. is supported by the Office of The Director, National Institutes of Health, under Award Number DP5OD031876. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Author contributions

All authors researched data for the article, made a substantial contribution to the discussion of content, and reviewed and edited the article before submission. D.R.D. wrote the manuscript.

Competing interests

S.E.G. is an investigator on the human papillomavirus vaccine and consultant for Merck. C.R.R. reports speaker training with Takeda. The other authors declare no competing interests.

Additional information

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1038/s41575-024-00932-1>.

Peer review information *Nature Reviews Gastroenterology & Hepatology* thanks Marco Romano, Laura Targownik and Christopher Velez for their contribution to the peer review of this work.

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