Impact of COVID-19 on management of urogynaecology patients: a rapid review of the literature

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Abstract
Introduction and hypothesis The coronavirus (COVID-19) pandemic has impacted health systems worldwide. There is a continuing need for clinicians to adapt practice to facilitate timely provision of medical care, whilst minimising horizontal transmission. Guidance and recommendations are increasingly available, and this rapid review aimed to provide a timely evidence synthesis on the current recommendations surrounding urogynaecological care.

Methods We performed a literature review using PubMed/Medline, Embase and Cochrane and a manual search of national and international societies for management recommendations for urogynaecological patients during the COVID-19 pandemic.

Results Nine guidance documents and 17 articles, including 10 reviews, were included. Virtual clinics are recommended for new and follow-up patients, to assess and initiate treatment, as well as triage patients who require face-to-face appointments. Outpatient investigations such as urodynamics and cystoscopy for benign indications can be deferred. Prolapse and continence surgery should be suspended, except in specific circumstances such as procidentia with upper tract complications and failed pessaries. There is no evidence to support a particular route of surgery, but recommendations are made to minimise COVID-19 transmission.

Conclusions Urogynaecological patients face particular challenges owing to inherent vulnerabilities of these populations. Behavioural and medical therapies should be recommended as first line options and initiated via virtual or remote clinics, which are integral to management during the COVID-19 pandemic. Expanding the availability and accessibility of technology will be increasingly required. The majority of outpatient and inpatient procedures can be deferred, but the longer-term effects of such practices are unclear.

Keywords Coronavirus • COVID-19 • Surgical prioritisation • Telemedicine • Urogynaecology

Introduction

Coronavirus (COVID-19) disease caused by the SARS-CoV-2 virus was first declared as a pandemic by the World Health Organization (WHO) on 11 March 2020 [1]. Since then it has continued to rapidly spread worldwide impacting all aspects of life, not least medical care and how clinicians assess and treat patients. Medical providers worldwide have been required to adapt and streamline services to minimise unwarranted, multiple healthcare facility attendances and patient contact where possible, by conducting remote consultations, delaying non-urgent visits and optimising provision of one-stop services.

The urogynaecology scope of practice involves, to a significant proportion, care and management of elderly and vulnerable patients and therefore these measures are of particular importance. As the pandemic continues, national and international societies and organisations have published guidance for management mainly based on consensus and expert advice given that evidence base to support recommendations is still scarce [2–5].

Rapid reviews are a method of knowledge or evidence synthesis [6] to produce information in a more timely manner than traditional systematic reviews [7]; therefore, they are

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Materials and methods

We performed a literature review using the OvidSP search platform and interrogating through this the databases PubMed/Medline, Embase and Cochrane using keywords and MeSH terms including: COVID-19, SARS-CoV-2, coronavirus, incontinence, pelvic organ prolapse, vaginal prolapse, uterine prolapse, cystocele, rectocele, bladder pain, childbirth trauma, perineal trauma, perineal laceration, urogynaecology, overactive bladder (OAB), recurrent cystitis, recurrent urinary tract infections (UTIs); (Appendix 1).

The aim of this rapid review is to systematically review and evaluate the available evidence from published research, as well as to collate guidelines and recommendations in order to provide guidance on the management of urogynaecological conditions and clinical practices in response to the COVID-19 pandemic. This review has been undertaken by CHORUS, An International Collaboration for Harmonising Outcomes, Research and Standards in Urogynaecology and Women’s Health (i-chorus.org).

Results

Nine guidance documents and 17 articles, 10 of which are reviews, were included (Fig. 1; Table 1).

Quality assessment of guidelines was performed using Appraisal of Guidelines for Research and Evaluation II instrument (AGREE II) [12] and the quality of reviews assessed using Scale for the Assessment of Narrative Review Articles (SANRA) [13].

Recommendations

All 12 articles and guidelines that included outpatient clinic recommendations stated that virtual clinics should be used to minimise horizontal transmission. Virtual clinics can be used for all non-urgent indications such as urinary incontinence and prolapse, and for both initial consultations and follow-up appointments. Patient satisfaction is unaffected and clinic attendance may be increased owing to a reduction in non-attendance [19].
When used for postoperative follow-up there is no increase in adverse outcomes [19]. For patients awaiting surgery, virtual clinics can be conducted to rediscuss alternative therapies. During virtual clinics, patients can be triaged and limited face-to-face appointments arranged if necessary. When seen face to face, appropriate screening should be undertaken, personal protective equipment (PPE) worn, physical distance maintained, and sanitation available [31].

It has been reported that COVID-19 transmission could be as high as 12.8% at a physical distance of less than 1 m compared with 2.6% at a distance of more than 1 m, reflecting the importance of maintaining physical distance [34]. In keeping with these findings, the Scientific Advisory Group for Emergencies (SAGE), who provide scientific and technical advice to support government decision makers in the UK, reported that COVID-19 transmission could be 2-10 times higher at a physical distance of 1 m compared with 2 m [35]. See Table 2 for a summary of guidance for virtual clinics and inpatient admissions.
| Reference | Date       | Title                                                                 | Article type | Topics included                                                                 | Quality assessment score |
|-----------|------------|----------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------|--------------------------|
| [14]      | 23 March   | Urology practice during the COVID-19 pandemic                        | Guidance     | Surgical prioritisation, Surgical techniques to minimise exposure, Outpatient procedures | 5                        |
| [2]       | 26 March   | Joint RCOG/BSGE Statement on gynaecological endoscopy during the COVID-19 pandemic | Guidance     | Laparoscopic and hysteroscopic surgery, Limiting horizontal spread of COVID-19, Optimising patient outcomes | 4                        |
| [4]       | 27 March   | Joint Statement on minimally invasive gynecologic surgery during the COVID-19 pandemic | Guidance     | Limiting horizontal spread of COVID-19, Endoscopic surgery, Vaginal and open abdominal surgery | 5                        |
| [15]      | 3 April    | COVID-19: outpatient services; office consultations and procedures   | Guidance     | Outpatient clinics and procedures                                                | 4                        |
| [3]       | 9 April    | BSUG guidance on management of urogynaecological conditions and vaginal pessary use during the Covid 19 pandemic | Guidance     | Assessment and management of lower urinary tract symptoms, Management of prolapse, Pessary management, Outpatient procedures | 5                        |
| [16]      | 20 April   | COVID-19: recommendations for functional urology                     | Guidance     | Assessment and management of lower urinary tract symptoms, Management of prolapse, Outpatient procedures, Surgical prioritisation | 6                        |
| [17]      | 28 April   | Guidance for the management of urogynaecological conditions during the coronavirus (COVID-19) pandemic | Guidance     | Assessment and management of lower urinary tract symptoms, Management of prolapse, Post-operative follow-up | 6                        |
| [18]      | 28 April   | Joint Statement on re-introduction of hospital and office-based procedures in the COVID-19 climate for the practicing urogynaecologist and gynecologist | Guidance     | Surgical prioritisation, Inpatient and outpatient procedures                   | 5                        |
| [5]       | July       | An organisation-wide collaborative effort to adapt the EAU guidelines recommendations to the COVID-19 era | Guidance     | Surgical prioritisation, Management of lower urinary tract symptoms             | 6                        |
| [19]      | 27 April   | A guide for urogynecologic patient care utilizing teledicine during the COVID-19 pandemic: review of existing evidence | Review       | Virtual clinics, Management of lower urinary tract symptoms, Management of prolapse, Pessary management | 12/12                    |
| [20]      | 24 May     | Forecasting the future of urology practice: a comprehensive review of the recommendations by international and European associations on priority procedures during the COVID-19 pandemic | Review       | Telemedicine, Prioritisation strategies for oncological and non-oncological urology procedures, Minimally invasive surgery | 11/12                    |
| [21]      | 29 May     | Practical recommendations for gynecologic surgery during the COVID-19 pandemic | Review       | Surgical prioritisation                                                         | 8/12                     |
| [22]      | 17 June    | Guidance for gynecologists utilizing teledmedicine during COVID-19 pandemic based on expert consensus and rapid literature reviews | Review       | Telemedicine                                                                   | 12/12                    |
| [23]      | 18 June    | Systematic review                                                   |              | Telemedicine                                                                    | 12/12                    |
| Reference | Date     | Title                                                                 | Article type     | Topics included                                                                 | Quality assessment score |
|-----------|----------|----------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------|--------------------------|
| [8]       | 23 June  | Telehealth in urology: a systematic review of the literature. How much can telemedicine be useful during and after the COVID-19 pandemic? | Review           | Management of lower urinary tract symptoms                                    | 11/12                    |
| [24]      | 9 July   | Triaging office based urology procedures during the COVID-19 pandemic | Recommendations  | Outpatient procedures                                                           |                          |
| [25]      | 25 August| How did COVID-19 pandemic change the way we attend the patients in an urogynaecological unit | Review           | Assessment and management of lower urinary tract symptoms Management of prolapse Surgical prioritisation | 9/12                     |
| [26]      | 2 September | A lasting impression: telemedicine in urology during the coronavirus disease 2019 pandemic | Review           | Telemedicine                                                                     | 10/12                    |
| [27]      | 15 September | A systematic review on guidelines and recommendations for urology standard of care during the COVID-19 pandemic | Review           | Uro- oncology Endoscopic and robotic surgery Outpatient procedures               | 12/12                    |
| [28]      | 15 September | Management of female and functional urology patients during the COVID pandemic | Review           | Surgical prioritisation Management of prolapse Surgical techniques to minimise exposure | 11/12                    |
| [29]      | March    | Resumption of elective surgery following COVID-19 outbreak, guideline for female pelvic medicine and surgery | Editorial        | Surgical prioritisation                                                           |                          |
| [30]      | 1 June   | Global challenges to urology practice during the COVID-19 pandemic    | Comment          | Surgical prioritisation                                                           |                          |
| [31]      | 11 June  | Technology-based management of neurourology patients in the COVID-19 pandemic: is this the future? A report from the International Continence Society (ICS) institute | Virtual clinics |                                                                                 |                          |
| [18]      | 1 July   | Widespread postponement of functional urology cases during the COVID-19 pandemic: rationale, potential pitfalls, and future consequences | Editorial        | Assessment and management of incontinence and voiding disorders Management of prolapse |                          |
| [32]      | 2 July   | Virtual consent for virtual patients: benefits of implementation in a peri- and post-COVID-19 era | Editorial        | Virtual clinic and consent                                                        |                          |
| [33]      | 17 July  | Neuro-urology during the COVID-19 pandemic: triage and priority of treatments | Letter to editor | Voiding dysfunction Neurogenic bladder                                             |                          |

RCOG Royal College of Obstetricians and Gynaecologists, BSGE British Society for Gynaecological Endoscopy, AUGS American Urogynecologic Society, RANZCOG Royal Australian and New Zealand College of Obstetricians and Gynaecologists, BSUG British Society of Urogynaecology, EAU European Association of Urology
Table 2  Summary of guidance for virtual clinics and inpatient admissions

| Reference | Virtual clinics/telemedicine | Outpatient department, inpatient admissions |
|-----------|-----------------------------|--------------------------------------------|
| [17]      | Postoperative follow-up can be virtual | If seeing face-to-face, patient to wear surgical mask and gloves, clinician to wear apron, surgical mask, visor and gloves |
|           | Non-inferior for patient satisfaction, complication rates and adverse events | |
| [31]      | Cancel all face-to-face outpatient appointments | Invasive tests: clinician wears N95 mask, impermeable gown, gloves and visor |
|           | Virtual consultations where possible | |
| [28]      | Initial and follow-up consultations can be virtual | |
|           | Can identify patients requiring urgent consultation | |
|           | Triage patients for face-to-face consultation | |
| [19]      | Virtual clinics: patient satisfaction unaffected, can increase clinic attendance | |
|           | Postoperative virtual clinics: no increase in adverse outcomes or primary care visits | |
|           | Native tissue prolapse repair and mid-urethral sling with no incontinence can be safely followed up in virtual clinic | |
|           | Triage all patients for virtual clinic: established patients not requiring examination, new patients who would benefit from non-surgical treatment, postponed patients awaiting surgery to rediscuss alternative therapies | |
|           | Provide patient information leaflets from established bodies | |
| [8]       | Virtual clinics | Physical distancing |
|           | Work from home | Sanitisation areas |
|           | Minimise face-to-face | Limit friends and family accompanying |
| [3]       | Virtual clinic for pessary follow-up | Adequate PPE |
|           | Triage patients: see semi-urgently, within 30 days or delayed review | |
| [16]      | Use telemedicine | |
|           | Avoid face-to-face where possible | |
| [26]      | Telemedicine to minimise exposure | |
| [22]      | Use telemedicine | |
|           | Avoid face-to-face where possible | |
|           | Use telemedicine to assess need for face-to-face review | |
|           | Postoperative follow-up: equal patient-related outcomes with telemedicine compared with face-to-face | |
| [36]      | Use video or teleconsults for all non-urgent indications | |
| [5]       | Use telemedicine to allow physical distancing and minimise footfall | |
| [18]      | Telemedicine whilst awaiting surgery to help with symptom management | |
| [15]      | Essential staff only in clinic rooms | |
|           | Discourage accompanying persons | |
|           | Physical distancing | |
|           | Cleaning surfaces with appropriate disinfectant | |
|           | Handwashing before and after patient contact | |
|           | Waiting and clinic room with appropriate safe spacing | |
|           | COVID-19 positive or those in isolation should not be seen face-to-face. If no option, then wear appropriate PPE | |
|           | If face-to-face appointment, screen all patients and accompanying persons for symptoms, travel and exposure | |

*PPE* personal protective equipment
| Reference | OAB, UUI and SUI | Prolapse and pessaries |
|-----------|-----------------|------------------------|
| [17]      | Virtual consultations | Virtual consultations |
|           | Use validated questionnaires for urinary symptoms | Use validated questionnaires for prolapse |
|           | Lifestyle measures, PFMT as first line | If mild symptoms: PFMT |
|           | Consider starting antimuscarinics/B3 agonist/vaginal oestrogen | If severely affecting bladder/bowel function and/or ulcer present, may require face-to-face appointment |
|           | Regular follow-up, i.e. 4 weeks after starting antimuscarinics | Pessaries: arrange face-to-face if bleeding or pain symptoms |
|           | Yearly review of long-term antimuscarinic | Can delay face-to-face if bleeding or pain symptoms |
| For SUI consider incontinence pessaries | | Can delay face-to-face if bleeding or pain symptoms |
| [33]      | For neurogenic SUI: device implantation can be deferred until safe, no time limit, use pads in interim | |
|           | Erosion from implants requiring removal of prosthesis: defer up to 4 weeks | |
|           | Neurogenic bladder with risk factors for upper renal tract, e.g. DSD: Botox can be deferred up to 8 weeks | |
|           | Neurogenic bladder without risk factors for upper renal tract: can defer Botox during pandemic, no time limit | |
| [31]      | Can teach and monitor PFMT via video consultation | |
| [28]      | Delay all continence procedures until after COVID crisis | |
|           | Manage as outpatients with conservative and medical therapy | |
|           | Delay all new sacral neuromodulation until end of COVID crisis | |
|           | Remove percutaneous nerve evaluation lead in outpatient clinic if one in situ | |
|           | If infected implant treat with intravenous antibiotics; if severe infection remove urgently, i.e. <2 weeks | |
| [27]      | Stage 2 neuromodulation: no delay owing to risk of infection | Pessary changes: defer for 3–6 months |
| [19]      | Behavioural measures | Virtual consultations |
|           | Self-inserted incontinence tampons or pessaries can be recommended | Online instructions for PFMT |
|           | Patients having invasive treatment, e.g. intravesical Botox, can restart antimuscarinic/mirabegron until service restarts | Behavioural measures, e.g. weight loss, Kegel exercises, PFMT |
|           | Short-term antimuscarinic unlikely to cause dementia therefore can use in elderly if required | Smart phone apps, e.g. for Kegel training |
| [3]       | Initial virtual consultations | Home biofeedback devices |
|           | Can commence treatment remotely | Pessaries: encourage self-cleaning at home |
|           | Provide patients with information resources | Can safely delay change up to 6 months |
|           | | Consider vaginal oestrogen and empiric treatment for bacterial vaginosis |
|           | | If bleeding/discharge can remove and observe for voiding dysfunction prior to clinic review |
| [16]      | Encourage conservative and medical treatments | Procidentia causing bowel/urinary problems need early review within 30 days |
|           | | Pessaries: face-to-face review within 7 days if symptoms suggestive of fistulation |
|           | | Pessaries: face-to-face review within 30 days if bleeding/pain/ulceration |
|           | | Pessaries: refer via local PMB cancer pathway if PMB with pessary and uterus in situ |
|           | | Ring pessaries: can defer change up to 6 months |
|           | | Shaatz, shelf, Gelhorn, double pessaries: defer for a maximum of 3 months |
|           | | Patients to be given contact numbers in the case of symptoms of ulceration |
|           | | Virtual clinics |
Of 15 articles and guidelines providing recommendations regarding the management of urinary incontinence and OAB, 12 advise behavioural therapies as the first line. Two recommend use of smart phone apps to supplement education, for example, for Kegel exercises [19, 26]. Suspension of invasive therapies for urinary incontinence is advised, except where stage 1 sacral neuromodulation is in place or in cases of neurogenic bladder with a high risk of upper renal tract complications [33]. Pelvic floor muscle training is recommended as the first-line for symptomatic prolapse [16, 17, 19, 23, 26]; however, in one editorial, suspension of pelvic floor muscle training is suggested to maintain physical distancing [36].

Use of pessaries is recommended, whilst prolapse surgery is deferred [16, 26, 36], and the pessary change interval can be extended by 3–6 months unless the patient has symptoms of ulceration or fistulation [3, 24, 27]. See Table 3 for a summary of guidance for urinary incontinence and prolapse.

Acute retention or a blocked catheter warrants urgent review for catheterisation [20].

If an indwelling catheter is in situ, routine changes can be deferred for 2–4 weeks, unless the patient has a history of difficult changes or recurrent UTIs [24]. Deferring suprapubic catheter changes [3, 20] for up to 3 months has been suggested and changes in the community rather than in the hospital setting are preferred [3, 36].

Urinary tract infections can be managed via virtual consultation [17, 19, 23, 25]. If the patient has recurrent UTIs conservative measures and non-antibiotic therapies should be encouraged [17]. If antibiotics are required, they should be prescribed according to previous culture results. Face-to-face review should be arranged if the patient has complicated UTI or is refractory to treatment [19]. See Table 4 for a summary of voiding dysfunction and urinary tract infection.

Gross haematuria requires urgent investigation with cystoscopy; however, microscopic haematuria investigations can be deferred. A systematic review of telemedicine in urology, however, reported that data indicate that virtual clinics for initial evaluation are feasible, effective, and associated with a high degree of patient satisfaction [23].

Bladder pain syndrome investigations should be deferred, but oral treatments can be started [5, 28].

Fourteen articles reported recommendations for outpatient procedures, including cystoscopy, intravesical Botox and

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Table 3 (continued)

| Reference | OAB, UUI and SUI | Prolapse and pessaries |
|-----------|------------------|------------------------|
| SUI: all new patients with signs of retention and overflow, see face-to-face for PVR with external probe | If grade 4 prolapse, consider US KUB | Favour pessary management |
| Non-surgical options as first line whilst elective surgeries restricted | Non-surgical options as first line whilst elective surgeries are restricted | Smart phone apps |
| Medication management | PFMT postponed to maintain physical distancing | Use pessary |
| Start all UI consultations using telemedicine | Screen for red flag symptoms that may indicate bladder cancer and warrant urgent cystoscopy | Urgent surgery if grade 4 prolapse/renal tract complications and failed pessaries |
| Supplement with use of mobile apps | Postpone SNS unless in test phase. If test phase, consider removal or placement of pacemaker under local anaesthesia | Use of behavioural measures and PFMT |
| Conservative measures—weight loss, bladder training, PFMT, Kegel exercises ± medications | Use non-surgical management UI as advised by IUGA | Can delay pessary change up to 3 months if no erosion or ulcer |
| [26] | Evidence that behavioural measures and PFMT via video conferencing as effective as face-to-face | Use conservative and medical treatments |
| [25] | Start all UI consultations using telemedicine | Evidence that behavioural measures and PFMT via video conferencing as effective as face-to-face |
| [26] | Non-surgical options as first line whilst elective surgeries restricted | Use of behavioural measures and PFMT |
| [25] | Non-surgical options as first line whilst elective surgeries restricted | Use of behavioural measures and PFMT |
| [36] | Prescribe medication if required, all intravesical Botox postponed | Use pessary |
| [21] | Use non-surgical management UI as advised by IUGA | Use of behavioural measures and PFMT |
| [23] | Evidence that behavioural measures and PFMT via video conferencing as effective as face-to-face | Use of behavioural measures and PFMT |
| [5] | Use conservative and medical treatments | Use of behavioural measures and PFMT |
| [24] | Can delay pessary change up to 3 months if no erosion or ulcer | Use of behavioural measures and PFMT |

**BSUG** British Society of Urogynaecology, **EAU** European Association of Urology, **OAB** overactive bladder, **UUI** urge urinary incontinence, **SUI** stress urinary incontinence, **PFMT** pelvic floor muscle training, **DSD** detrusor sphincter dyssynergia, **PVR** post-void residual volume, **UI** urinary incontinence, **SNS** sacral nerve stimulation, **IUGA** International Urogynecological Association, **US KUB** ultrasound kidneys, ureters and bladder, **PMB** postmenopausal bleeding.
### Table 4

**Summary of voiding dysfunction and urinary tract infection**

| Reference | Voiding dysfunction and catheters | Urinary tract infection |
|-----------|----------------------------------|------------------------|
| [17]      | Severe voiding difficulty requires face-to-face appointment for PVR ± ISC | Virtual consultations | Acute UTI: consider antibiotics based on symptoms and previous cultures For recurrent UTI: non-antibiotics therapies, fluid advice, hygiene advice, vaginal oestrogen low dose. Self start or rotating antibiotics. Safety net re: ascending infection |
| [33]      | If chronic retention, no limit on deferral IDC if ISC not available | Conservative and lifestyle measures: hygiene, non-antibiotics therapies, low-dose antibiotics, vaginal oestrogen |
| [31]      | Can teach and monitor ISC via video consultation | Culture with every episode and treat whilst awaiting results | Previous cultures can guide prescribing |
| [28]      | If acute retention, see face-to-face to assess for IDC or SPC ± US KUB. Delay functional tests Indwelling catheter: can defer by 4 weeks. Change earlier if encrustations/blockages | Remote prescribing effective, may have a negative impact on antibiotics resistance. Fever and diabetes can indicate severe infection, may warrant face to face appointment Prescribing: nitrofurantoin or cotrimoxazole 3–7 days. Seven-day course for the elderly and diabetic. Fluoroquinolone in complicated UTI to avoid admission Encourage conservative measures, e.g. cranberry, hydration, d-mannose, vaginal oestrogen |
| [19]      | Encourage conservative measures to help void Chronic retention >300 ml >6 months and acute retention: face-to-face review CISC preferable to IDC | Culture with every episode and treat whilst awaiting results | Consider face-to-face review if refractory UTI with complications |
| [20]      | Acute retention: see face-to-face Defer all SPC and IDC changes | Empirical treatment of UTI, including recurrent UTI |
| [14]      | Acute retention: see face-to-face for IDC or SPC | Electronic prescribing is effective and efficient |
| [3]       | If acute retention need emergency/urgent review (within 12 hours) for IDC If arranging TWOC, can defer on a case-by-case basis. If high PVR, then teach CISC Change of SPC can be delayed up to 3 months Aim for SPC change in community not hospital setting | Resolution of symptoms indicative of cure |
| [25]      | Encourage conservative measures to help void, e.g. double/triple voiding Chronic urinary retention, e.g. >300 ml for >6 months, consider USS KUB and face-to-face consultation for ISC or IDC ISC preferable to IDC | BSUG British Society of Urogynaecology, EAU European Association of Urology, PVR post-void residual volume, ISC intermittent self-catheterisation, IDC indwelling urethral catheter, SPC suprapubic catheter, US KUB ultrasound of the kidneys, ureters and bladder, UTI urinary tract infection, CISC clean intermittent self-catheterisation, TWOC trial without catheter |
| [36]      | Acute retention: place IDC or SPC, change regularly in the community. Consider ISC if teaching and education possible | Sepsis/complicated UTI: high priority |
| [30]      | Obstructive urinary disorders—face-to-face clinics with reduced capacity | Can be managed safely and effectively using telemedicine |
| [5]       | Voiding dysfunction: teach ISC or catheterise Blocked catheter requires emergency review | |
| [23]      | | |
| Reference | Haematuria and bladder pain syndrome | Outpatient procedures |
|-----------|------------------------------------|-----------------------|
| [17]      | Referral to secondary care if gross haematuria | Delay urodynamics for 3–6 months |
| [24]      | Gross haematuria: urgent cystoscopy, no deferring Microscopic haematuria with risk factors: can defer for up to 3 months unless symptomatic Microscopic haematuria and no symptoms: can defer for 3 months or more | Delay urodynamics. Time frame 1–6 months |
| [27]      | Most but not all experts recommend urgent cystoscopy for macroscopic haematuria. EAU and USANZ say it can be deferred for 1–2 months | Neurogenic intravesical Botox can be deferred for up to 4 weeks Slings: clinical harm unlikely if postponed for 6 months |
| [20]      | Macroscopic haematuria: urgent cystoscopy Microscopic: postpone | Defer all cystoscopy for benign conditions |
| [23]      | Use telemedicine for initial haematuria consult and triage, then see face-to-face if needed | All outpatient cystoscopy suspended, continue only for suspected cancer |
| [30]      | Continue cystoscopy for suspected cancer | Do not commence new intravesical Botox treatments |
| [28]      | Delay BPS investigations until after COVID Use oral medications, e.g. amitriptyline Continue bladder instillation if self-administered already Defer if administered in hospital | Delay intravesical Botox until end of COVID crisis |
| [19]      | Consider face-to-face review if acute BPS flare requiring instillation | All urodynamics postponed |
| [5]       | Manage BPS conservatively Can offer amitriptyline | All urodynamics postponed |
| [31]      | | Intravesical Botox can be carried out under local anaesthetic for high-risk patients, e.g. autonomic dysreflexia |
| [14]      | | Defer all cystoscopy for benign conditions |
| [3]       | | Defer all outpatient treatments and investigations, i.e. cystoscopy (non-cancer indications), bladder instillations, PTNS |
| [16]      | | Intravesical Botox suspended unless neurological bladder with upper tract risk Cystoscopy: perform within 2 months if risk factors for cancer and refractory OAB |
| [25]      | | If planned intravesical Botox, can defer and restart antimuscarinics/B3 agonists |
| [36]      | | Intravesical Botox postponed. Consider continuing under local anaesthesia for neurogenic bladder with renal tract complications |
| [29]      | | Intravesical Botox: non-essential, i.e., not time sensitive unless, e.g. failure of conservative and progressive symptoms |
| [18]      | | Tier 1 can delay beyond 12 weeks i.e. new Botox, new bulking, new PTNS, urodynamics, pessary fittings, new PFMT Tier 2 delay 4–12 weeks, e.g. repeat bulking agent, pessary cleaning, PFMT follow-up Tier 3 delayed for up to 4 weeks Microscopic haematuria, established PTNS, bladder instillations Tier 4 cannot be delayed |

EAU European Association of Urology, BSUG British Society of Urogynaecology, USANZ Urological Society of Australia and New Zealand, BPS bladder pain syndrome, PTNS percutaneous tibial nerve stimulation, OAB overactive bladder, PFMT pelvic floor muscle training, ISC intermittent self-catheterisation
| Title of article or guidance | Elective surgery and consent | Surgical techniques to minimise horizontal transmission |
|-----------------------------|-----------------------------|--------------------------------------------------|
| [2] Outcomes worse for asymptomatic COVID-19 patients so surgery may worsen or accelerate progression | No evidence of increased risk with laparoscopy when PPE worn | No evidence of increased risk with laparoscopy when PPE worn |
| COVID-19 test all patients | Vacuum suction devices for desufflation | Vacuum suction devices for desufflation |
| 14 days self-isolation preoperatively | Use smoke extractor | Use smoke extractor |
| Temperature on admission, defer if $\geq 37.3^\circ$C and retest after 14 days | | |
| Aim for local/regional anaesthetic if possible | | |
| Negative pressure in theatre | | |
| High frequency of filtered air exchange | | |
| Essential theatre staff only | | |
| Most experienced surgeon operating | | |
| PPE when GA: water repellent, long-sleeved gowns, eye and face protection, gloves and FFP3 respirators | | |
| If pyrexial within 30 days screen and retest for COVID-19 | | |
| [28] No contraindications to open, transurethral and vaginal procedures | Low power setting for electrosurgery | Low power setting for electrosurgery |
| Special care to be taken with laparoscopic and robotic procedures | Avoid long desiccation times | Avoid long desiccation times |
| Consider local anaesthesia where possible to minimise AGPs | Closed smoke evacuation/filtration system with ULPA capability | Closed smoke evacuation/filtration system with ULPA capability |
| COVID testing for any at-risk patient prior to surgery according to local guidelines and availability | Laparoscopic suction to remove smoke and deflate abdomen | Laparoscopic suction to remove smoke and deflate abdomen |
| Most surgery is priority level 4 and can be deferred over 3 months | Low intra-abdominal pressure 10–12 mmHg if feasible | Low intra-abdominal pressure 10–12 mmHg if feasible |
| | Avoid rapid deflation | Avoid rapid deflation |
| | Minimise blood/liquid droplet spread | Minimise blood/liquid droplet spread |
| | Be careful at time of instrument exchange and tissue extraction | Be careful at time of instrument exchange and tissue extraction |
| | Minimise CO$_2$ leakage from trocars | Minimise CO$_2$ leakage from trocars |
| [27] Endoscopic and robotic surgery: low electrocautery settings to generate less smoke, lowest pressure insufflation, only essential staff present in theatre, all staff in PPE | | |
| Route of surgery at surgeon’s discretion | | |
| Use closed system for insufflation | | |
| Smoke extractor | | |
| Adequate PPE | | |
| Use lowest intrabdominal pressure possible | | |
| Use lowest cautery setting possible | | |
| [8] Symptom screen and COVID test all patients preoperatively | Shorter hospital stay | Shorter hospital stay |
| Clean COVID-free sites for surgery | Can physical distance more than in open surgery | Can physical distance more than in open surgery |
| All elective surgery for benign indications suspended | Risk of COVID transmission if not operating on GI tract during laparoscopy is low | Risk of COVID transmission if not operating on GI tract during laparoscopy is low |
| | Low power diathermy. Closed smoke evacuation | Low power diathermy. Closed smoke evacuation |
| | Filtration system | Filtration system |
| | Use suction to deflate abdomen | Use suction to deflate abdomen |
| | Low pressure 10–12 mmHg intraoperatively | Low pressure 10–12 mmHg intraoperatively |
| | Avoid rapid desufflation, minimise blood or fluid spray | Avoid rapid desufflation, minimise blood or fluid spray |
| | Check seals around all reusable ports | Check seals around all reusable ports |
| | GA in negative pressure room | GA in negative pressure room |
| [14] Experienced surgeon to minimise operating time | Filter system to reduce viral release with gas | Filter system to reduce viral release with gas |
| Clinical trials and trials of new technology to be postponed | Low pressure pneumoperitoneum | Low pressure pneumoperitoneum |
| COVID test all patients preoperatively | Low bipolar cautery setting | Low bipolar cautery setting |
| Temperature testing and wearing masks on arrival | | |
| Reduce inpatient beds to allow physical distancing | | |
| [4] Suspend all elective surgery | | |
| Universal COVID-19 testing recommended before all surgery | Low power settings for electrosurgical devices | Low power settings for electrosurgical devices |
Table 6 (continued)

| Title of article or guidance | Elective surgery and consent | Surgical techniques to minimise horizontal transmission |
|-----------------------------|-----------------------------|-----------------------------------------------------|
| Preoperative screening on day of surgery, i.e. history examination | Avoidance of long desiccation times | Full PPE in theatre—shoe covers, impermeable gowns, surgical or N-95 masks, protective head covering, gloves and eye protection |
| Full PPE in theatre—shoe covers, impermeable gowns, surgical or N-95 masks, protective head covering, gloves and eye protection | Closed smoke evacuation or filtration system with ultra-low particulate air filtration capability | Restricted movement of personnel in and out of the operating room |
| Restricted movement of personnel in and out of the operating room | Suction desufflation of abdomen | Trainee participation should be limited and include only essential personnel |
| Trainee participation should be limited and include only essential personnel | Avoid rapid desufflation, i.e. with specimen removal | Avoidance of long desiccation times |
| Enhanced recovery | Minimise CO₂ leakage from trocars | Minimise blood/ fluid droplet spray |
| Only urgent procedures to minimise inpatient stays | Minimise blood/ fluid droplet spray | Vaginal and open surgery: non-electrosurgical techniques where possible |
| Screening consultation prior to procedure—symptoms in last 2 weeks, any travel | Low power setting, avoidance of long desiccation times | Smoke evacuators alongside ULPA filters |
| Test patients and clinical team prior to procedure | Suction device to remove surgical plume | Suction of CO₂ for desufflation |
| Positive pressure on hold during procedure and restarted 20 min after patient leaves | Minimize blood/ fluid droplet spray or spread | Safety of minimally invasive surgery remains undetermined |
| Limited personnel in theatre | [16] Enhanced recovery | [30] Only urgent procedures to minimise inpatient stays |
| Recommend only high priority/emergency cases, experienced surgeon | [5] Recommend only high priority/emergency cases, experienced surgeon | [31] All invasive procedures under GA deferred |
| Minimal staff numbers, no observers | Low insufflation pressure | [19] All elective cases deferred |
| Intubation and extubation in negative pressure room | Suction of gas prior to removing ports | Aim for same-day discharge where possible |
| Use low cautery settings | Smoke evacuation system capable of filtering aerosolized particles from CO₂ should be provided for laparoscopic surgery | Spinal anaesthesia in preference to general anaesthesia, unlikely to greatly increase voiding dysfunction |
| Avoid monopolar or advanced bipolar where possible | | Transmission of fomites during vaginal surgery appears highly unlikely |
| If monopolar use smoke evacuator | Regional anaesthesia preferable to general anaesthesia—lower risk postoperative retention, reduces aerosol generation |
| No clear evidence to favour open or laparoscopic | Augmentation cystoplasty, cystectomy, and continent and incontinent diversions all postponed owing to high-dependency in-patient care required |
| Consider treating intermediate priority patients if capacity available but not during COVID surge | | |
urodynamics. All urodynamics and cystoscopy for benign indications should be deferred. See Table 5 for a summary of guidance for haematuria, bladder pain syndrome and outpatient procedures.

Recommendations regarding surgery advise regional or local anaesthesia where possible, in order to reduce aerosol generation with general anaesthesia [2, 19, 25, 28]. Screening for COVID-19 symptoms and testing preoperatively is advised, as evidence has shown poorer surgical outcomes for asymptomatic COVID-19 patients, therefore surgery may worsen or accelerate progression [2, 4, 5, 8, 14, 21, 28, 30].

Although better able to maintain physical distance and potentially shorter hospital stays with laparoscopic surgery than with open surgery [8], no evidence is available to support a specific route of surgery; therefore, this is at the surgeon’s discretion [5, 20].

Recommendations to reduce horizontal transmission in surgery include having essential staff only in theatre, low electrocautery settings, closed smoke evacuation and minimising blood and fluid droplet spray [4, 5, 8, 14, 16, 20, 27, 28]. See Table 6 for a summary of guidance for elective surgery and techniques to minimise horizontal transmission.

Continuing or restarting surgery during the pandemic requires prioritisation of cases, taking into account the severity of the pathology, patient comorbidities and the impact on physical and mental health and quality of life. Seven documents specified prioritisation guidance. See Table 7 for a summary of the prioritisation of surgery.

**Strengths**

We followed a standardised rapid review methodology in order to provide a summary of recommendations and practice guidelines in a timely manner. We performed a comprehensive literature search including published articles, articles in press and association guidelines to ensure that we identified and included all available evidence regarding management of urogynaecology patients during the COVID-19 pandemic.

There is a high degree of consensus regarding the use of virtual clinics, management outpatient procedures, and surgical techniques to minimise horizontal transmission of COVID-19.

As further evidence emerges, resources change and the pandemic continues, this synthesis of available guidance can be used as a reference for clinicians to guide management.

**Limitations**

Given the aim to issue a summary without delay using rapid review methodology, some studies may have been omitted, which is an inherent limitation of rapid reviews. There is susceptibility to bias in streamlining a systematic review process, for example, in choosing studies for inclusion or exclusion and in data extraction, as fewer independent reviewers conduct each step.

Recommendations are predominantly based on expert opinion and, given the rapidly evolving nature of the COVID-19 virus, there is often a lack of robust scientific evidence [8] for clinically relevant questions.

Indeed, the COVID-19 “infodemic” has been described by WHO as an “overabundance of information—some accurate and some not—that occurs during an epidemic” [37].
| Reference | Prioritisation of surgery |
|-----------|--------------------------|
| **[28]** | Emergency <1 h: life-threatening emergencies  |
|          | Urgent <24 h: e.g. haemorrhage after functional urology surgery, urinary retention, unable to place catheter, surgical site or device infection  |
|          | Urgent elective <4 weeks: e.g. second stage of SNS, disabling refractory BPS, Botox in high-risk neurogenic bladder patients, urinary diversion in urinary fistula with severe complications  |
|          | Elective, intermediate priority, 1–3 months: e.g. Botox in low-risk neurogenic bladder, bladder outlet obstruction due to mesh, removal of vaginally extruded uninfected mesh, prolapse with complications, e.g. retention, hydronephrosis  |
|          | Elective, low-priority, >3 months: e.g. refractory OAB, elective SUI surgery, BPS, elective prolapse surgery, urethral diverticulum without complications, uncomplicated neurogenic bladder  |
| **[8]**  | 1a: emergency <24 h to save life  |
|          | 1b: urgent <72 h as life-threatening condition  |
|          | 2: is required within <4 weeks with expectation of cure  |
|          | 3: can defer for 10–12 weeks with no predicted negative outcome  |
|          | Enhanced recovery pathways: delay any oncology surgery by at least 15 days if COVID-19 symptoms preoperatively  |
| **[16]** | A: continue, e.g. second-stage neuromodulation, intravesical Botox for neurogenic bladder with risk of high bladder pressure, surgery for grade 4 prolapse with acute renal failure and failed pessary  |
|          | B: 1–8 weeks, e.g. refractory OAB and bladder cancer risk factors  |
|          | C: delay 8–16 weeks, e.g. intravesical Botox  |
|          | D: can be delayed >16 weeks, e.g. stress urinary incontinence surgery  |
| **[29]** | 1: urgent, <1 month—delay could cause major harm, e.g. prolapse beyond hymen with voiding dysfunction or upper renal tract complications  |
|          | 2: essential elective, <3 months—increased risk of adverse outcomes if delayed for undetermined time period, e.g. prolapse beyond hymen with progressive symptoms, impaired QoL, failed pessaries but no upper renal tract complications  |
|          | 3: non-essential elective, postpone up to 1 year—not time sensitive, e.g. prolapse beyond hymen with no upper renal tract complications and able to use pessary  |
|          | Continence surgery: non-essential elective, unless failure of conservative and progressive symptoms  |
| **[21]** | Category 1: urgent: within 30 days, potential to deteriorate and become an emergency  |
|          | Category 2: semi-urgent: within 60 days, causes pain dysfunction or disability, but unlikely to deteriorate quickly, unlikely to become an emergency  |
|          | Category 3: elective: within 365 days, causes pain dysfunction or disability, unlikely to deteriorate quickly, does not have potential to become emergency  |
|          | All urogynaecology cases are category 3, should be postponed. Can start in highly symptomatic patients when risk of transmission reduces, depending on local situations  |
| **[5]**  | Low priority: clinical harm very unlikely if postponed for 6 months, e.g. stress or urge incontinence surgery, surgery for urethral diverticula  |
|          | Intermediate: clinical harm possible if postponed for 3–4 months but unlikely, e.g. surgical management of patients with urinary retention, intravesical Botox for selected cases of neurogenic bladder  |
|          | High priority: clinical harm likely if postponed for over 6 weeks, e.g. cystoscopy for macroscopic haematuria  |
|          | Emergency: life-threatening situation and likely to have presented in ED despite pandemic  |
| **[18]** | Tier 1: non-life-threatening illness, low acuity, i.e. SUI surgery, laparoscopic sacrolcopexy, native tissue transvaginal prolapse surgery, asymptomatic mesh exposure  |
|          | Tier 2: non-life-threatening, but potential for near future morbidity or mortality, intermediate acuity, i.e. fistula repair, mesh-related complication, e.g. severe pain/infection  |
|          | Tier 3: high potential for near future morbidity or mortality, severe impairment of QoL, high acuity, i.e. prolapse with upper tract obstruction and unable to retain pessary, obstructed voiding after MUS  |
|          | Tier 4: emergency surgery  |
|          | Each tier has subsets A and B  |
|          | Subset B denotes patients with comorbidities that may be deferred until after lower acuity patients  |

**EAU** European Association of Urology, **BPS** bladder pain syndrome, **OAB** overactive bladder, **SUI** stress urinary incontinence, **ED** emergency department, **MUS** mid-urethral sling, **QoL** Quality of life
This is an inherent limitation of all reviews in this area given the unprecedented public health crisis and the epidemiological characteristics of the current pandemic.

As the COVID-19 pandemic continues, and our understanding and resources change, there is high potential for modifications within recommendations and publication of further guidance, which may have already occurred during publication of this rapid review.

**Conclusion**

The COVID-19 pandemic has changed the way in which we conduct healthcare and will do so for the foreseeable future. Evidence suggests that a large proportion of urogynaecological conditions might be able to be managed using virtual consultations utilising behavioural measures, lifestyle changes and medical therapy. Outpatient procedures in one-stop clinics to investigate and treat conditions such as refractory OAB can be maximised to avoid inpatient admissions, and to reduce the frequency of visits and the use of general anaesthesia.

Technology is required to maintain and develop the quality of virtual consultations and this is particularly important for remote teaching of clean intermittent self-catheterisation, home trial without catheter, pessary management and triaging symptoms. For those unable to use or without access to the required technology, smaller ad hoc face-to-face clinics with PPE and physical distancing should be considered.

Various healthcare providers and organisations have developed and published guidance for practice, which should always be observed, as it is linked and adapted to local policies, sociodemographic and epidemiological conditions, as well as infrastructures. This review is aimed at providing a wider perspective on practice recommendations that have been published to date and can be adapted or even considered for implementation at local levels.

Although adaptations and provisions are being made to manage urogynaecological conditions, given that the majority of patients are elderly with comorbidities that increase risk of COVID-19 morbidity and mortality, and with most surgical procedures for quality of life, the resumption of elective activity is expected to be slow. Consequently, there is likely to be a significant impact on quality of life within this cohort of patients and the impact of delayed diagnosis and treatment on the trajectory of the disease is yet to be determined.

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**Compliance with ethical standards**

**Conflicts of interest** The authors declare that they have no conflicts of interest.

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