Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 113; No. 8; P157

The Early Impact of COVID-19 on Urological Service Provision

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Abstract

Aim

COVID-19 has posed an unprecedented challenge to healthcare systems. We aimed to observe the impact on urological care delivery in an Irish university hospital.

Methods

Data on urological activity was prospectively collected for 3 months from March 2020**.** A retrospective review of the same period in 2019 was performed for control data**.**

Results

Over the 2020 study period, 356 urological admissions were recorded; a 23.1% decrease from the 2019 corresponding period(n=463). A 21.7% decrease in flexible cystoscopies was seen (162 versus 207). 125 theatre cases (36 off-site) were performed in the 2020 period, versus 151 in 2019. Emergency case load remained stable, with 69 cases in the 2020 period. The percentage of trainee-performed cases was preserved. COVID-era outpatient activity increased, to involve 559 clinic consultations compared to 439 the preceding year; a reflection of annual growth in service demand and facilitated by virtual clinic application (n=403). There were 490 instances of patients cancelling/failing to attend outpatient appointments, compared to 335 in 2019.

Conclusion

The Irish COVID-19 outbreak has created obstacles for urological care. Nonetheless, urgent/emergent urological cases persist. Our unit has managed this to-date with flexible adaptation of service delivery. The global challenge posed by COVID-19 will demand ongoing resourcefulness to minimise impact on patients with time-sensitive urological conditions.

Introduction

Healthcare systems across the globe have been presented with an unprecedented challenge in the face of the current pandemic caused by the SARS-CoV-2 virus. This has been via both the direct threat to health posed by the resultant disease, COVID-19, and a ripple effect on hospital services. Rapid emergence of various COVID-era clinical guidelines has ensued.[1-3] These have suggested a paradigm shift at all stages of surgical care pathways, from diagnosis to intervention.

Surgical decision making has become more multi-faceted than ever before, with the need to balance multiple conflicting risks to patients, staff and resources in determining both scheduled and unscheduled management plans.

Surgical teams have also encountered stark changes to the structure and delivery of healthcare at a national level, implemented following the first confirmed case of the SARS-CoV-2 virus in Ireland on the 29th February 2020.[4] The National Public Health Emergency Team (NPHET) directed on the 27th March that "all non–essential surgery, health procedures and other non–essential services be postponed." Simultaneously, the Health Service Executive (HSE) entered a partnership deal with private hospitals, allowing use of private facilities and staff for the delivery of public healthcare under the HSE for a period ceasing on 1st July 2020.

Results

Inpatient & Procedural Activity

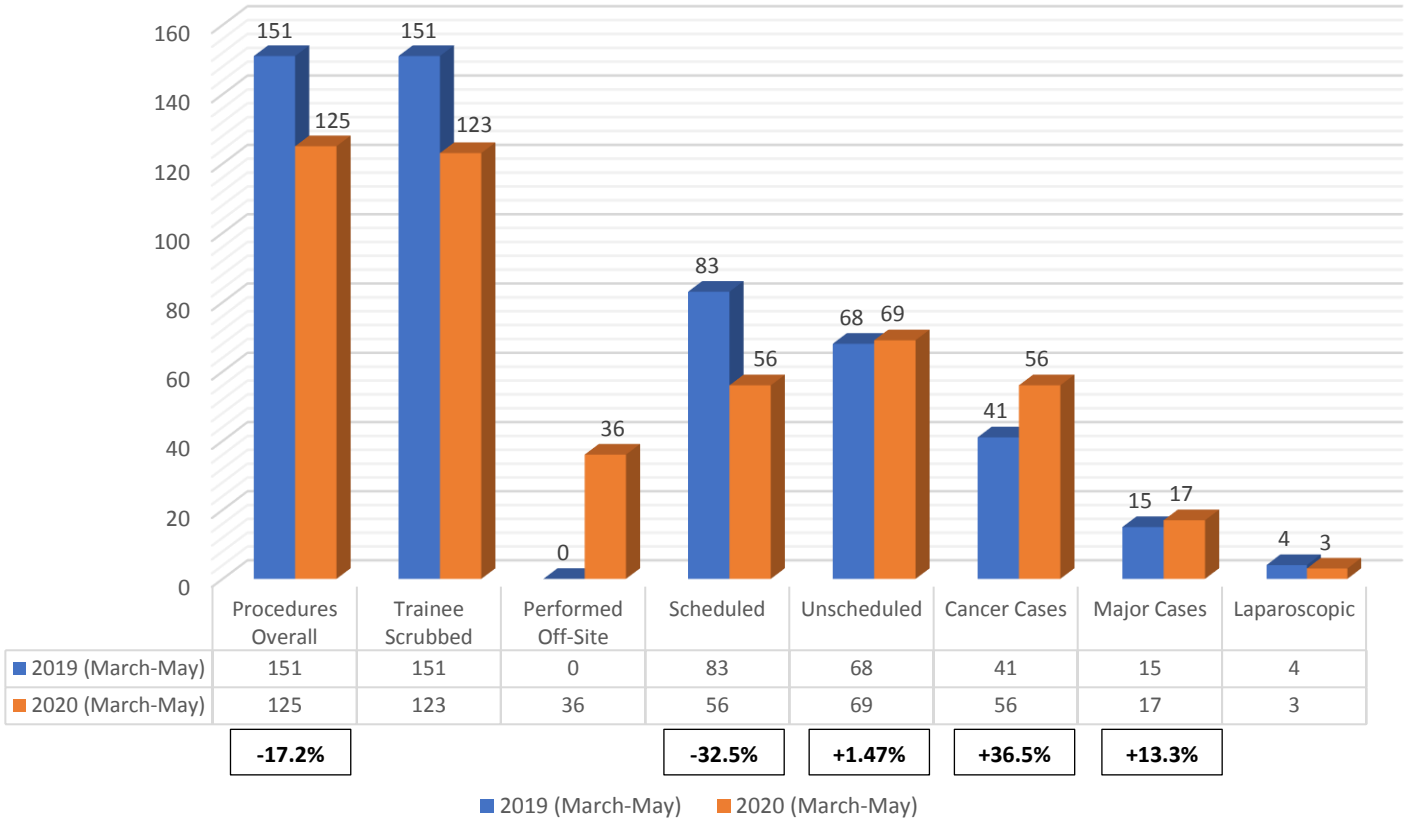
Inpatient and procedural activity data is presented in Table 1 and Figures 1 - 3. Over the 2020 study period, 356 urological admissions, including non-endoscopy day cases, were recorded, demonstrating a 23.1% decrease from the 2019 corresponding period (n=463). A 21.7% decrease in flexible cystoscopy procedures was seen (162 versus 207). One hundred and twenty-five theatre cases (36 off-site at a private hospital under the previously referenced Health Service Executive agreement)[8] were performed in the 2020 period, compared to 151 in 2019. Major cancer case numbers increased to 17 in 2020, from 15 the preceding year. Unscheduled case load remained stable, with 69 cases in the 2020 period. A trainee was actively involved in 100% (151/151) cases in the 2019 period, and 99.2% (123/125) cases in the 2020 period.

Table 1: Admissions.

	2019 (March – May)			2020 (March – May)			Change
Total Admissions	463			356			**-23.1%**
Overnight Admissions	173	**Mean LOS* (days)**	2.94	137	**Mean LOS* (days)**	2.55	**-20.8%**
		% Unscheduled	43.9 %		**% Unscheduled**	65.7 %	
Non-endoscopy Day Cases**	83			57			**-31.3%**
Endoscopy Day Cases	207			162			**-21.7%**

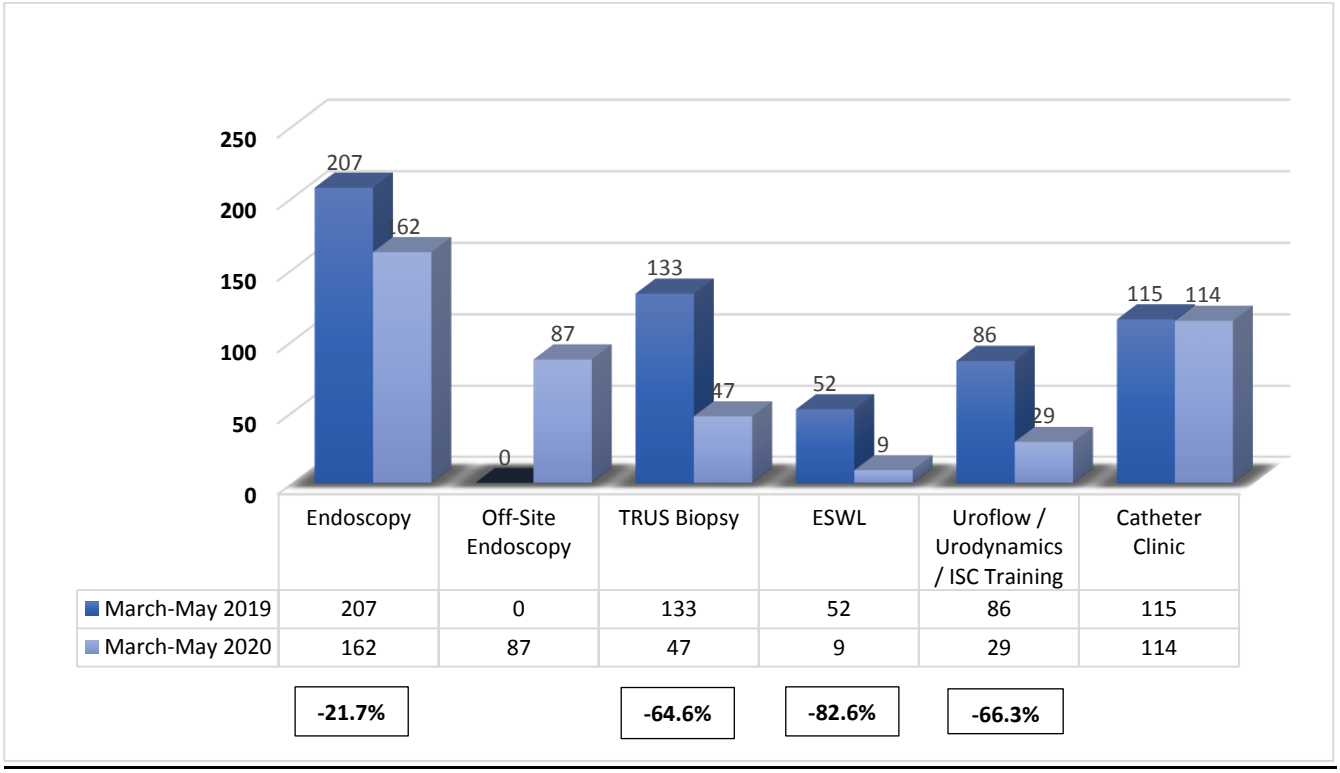
*LOS = Length of Stay **Including non-operative day cases

Figure 1. Operative Workload.



**Trainee scrubbed – A urological / surgical trainee performed the case, or was actively involved in assisting and operating to the level of his/her ability*

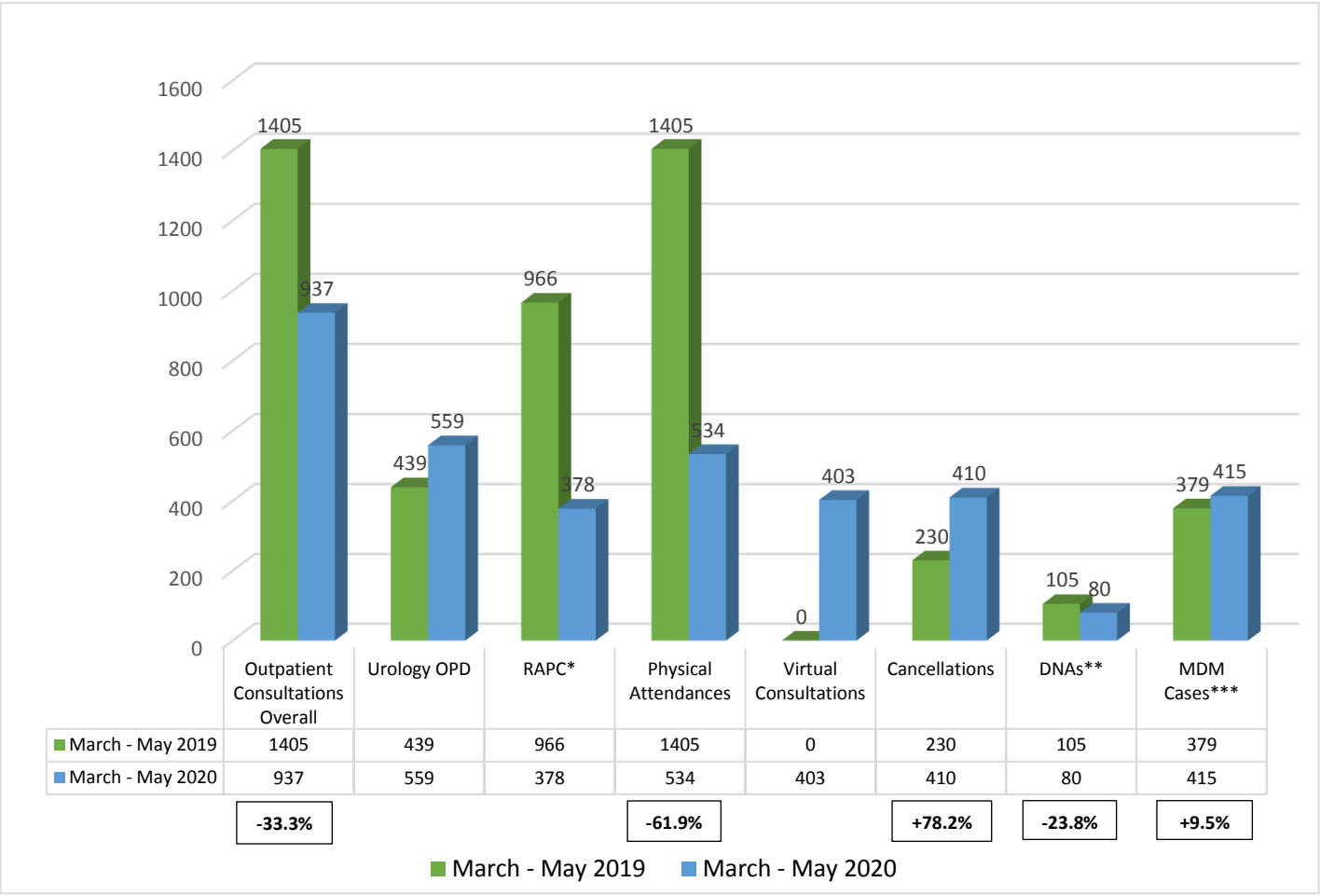
Figure 2. Diagnostics and Non-Theatre Procedures.



Outpatient Activity

Prospectively studied outpatient activity involved 559 (control n=439) clinic consultations, of which 403 were delivered virtually, 410 cancellations (n=230 in 2019 period) and 80 patients recorded as 'did not attend' (DNA) (n=105 in 2019 period) (Figure 3). Virtual clinic consultations involved a telephone call by a urology team member to the patient during an allocated time period of which the patient was notified in advance by postal mail. Video telecommunication was not used.

Figure 3. Outpatient and MDM Activity.



**Rapid Access Prostate Clinic **Did not attend or were uncontactable at virtual clinics ***Cases discussed at multi-disciplinary team meetings. These were delivered via secure videoconference in the 2020 period.*

Many urological conditions are time-critical in their management, with high morbidity and mortality rates associated with delayed intervention. Accordingly, the potential impact of COVID-19 has caused great concern amongst urological communities.[5]

In Ireland, urology is one of the busiest surgical specialities as measured by patient turnover per annum, despite having one of the lowest ratios of accredited urologists per capita in the developed world.[6] As a result of a severely understaffed workforce working at maximum capacity, >30,000 patients were recorded on urology outpatient waiting lists in 2019, with predicted rapid annual growth.[6] This context renders Irish patients with urological conditions particularly vulnerable to service disruption.

A further potential challenge pertains to training of urology trainees, an essential facet of planned expansion of urology consultant numbers. The potential reduction in technical skill training in the context of the virus is likely to impede this, an issue echoed internationally.[7]

We aimed to observe the impact of the SARS-CoV-2 outbreak on urological practice in an Irish university hospital.

Methods

Data on urological activity was collected prospectively over a 3-month period from March 2020. All activity was reviewed weekly and corroborated by two researchers during this period. Control data was obtained by performing a retrospective review of the same 3-month calendar period in 2019, based on prospectively collected, anonymised hospital activity data.

Variables collected included numbers of day-case and inpatient admissions, scheduled and unscheduled theatre cases, endoscopy admissions, extra-corporeal shock wave lithotripsy (ESWL) attendances, numbers of cases discussed at multi-disciplinary meetings (MDMs) and figures for nurse-led and outpatient clinics. Data was further analysed to identify virtual versus in-person conduction of outpatient consultations, off-site relocation of elective theatre cases and use of laparoscopic versus open surgical approach. Data from the two discrete time periods was collated with activity figures compared. Statistical analyses were performed using SPSS®.

Discussion

Our results show a decrease in urological hospital admissions and in overall activity figures in the COVID-19 era. This was a result of theatre resource reallocation, the deferral of non-essential activity in accordance with practice guidelines, and patient reluctance to attend healthcare facilities.

Emergency cases presented in similar numbers in the 2020 and 2019 periods. This is unsurprising, as the majority of urological emergencies are acute, painful and difficult for patients to ignore.[9] They are also generally spontaneous, rather than trauma-related for example, and unlikely to decline on account of 'lockdown' conditions. We did notice a trend towards delayed presentations in the COVID era; for example, 3 cases of severe epididymoorchitis presented late with abscess formation, requiring operative intervention in all and orchidectomy in two. Early evidence however, suggests an international reluctance of patients to attend healthcare systems, anecdotally due to their apprehension surrounding potential exposure to SARS-CoV-2, which might underly this.[10, 11] A 'non-COVID' emergency theatre for patients with no clinical suspicion of COVID-19 was in operation throughout the study period and time to intervention was similar to that in 2019.

Scheduled operative activity was reduced by 32.5%. Elective theatre capacity was markedly curtailed at our main hospital, to allow reallocation of resources in COVID-preparedness efforts. However, the impact of this was greatly negated by the use of a local private hospital's facilities under a government-funded public contract. This facilitate time-critical scheduled care to be delivered to patients with confirmed or suspected malignancies and other time-sensitive urological conditions, such as urolithiasis in patients with indwelling ureteric stents. Had use of these off-site facilities not been possible, our figures suggest that a reduction in scheduled theatre cases by 76% rather than 32.5% and a reduction in flexible cystoscopy procedures of 63.8% as opposed to 21.7% would have been encountered. A greater number of cancer cases were operated on during the 2020 versus the 2019 period. Cancer cases were prioritised during both periods, and this increase

merely reflects an annual increase in referrals to the service. A shift in practice towards using spinal anaesthesia in all eligible cases was observed in the 2020 period, to avoid the risks of virus aerosolization at intubation.[12] Whilst a wide range of urological procedures are feasible under spinal anaesthesia, it was generally reserved for high anaesthetic risk procedures and those using glycine irrigation fluid in the 2019 period. Much debate has surrounded the use of minimally-invasive surgery in the COVID-19 climate, due to concerns of potential aerosolization of viral particles and transmission to operating theatre staff. This remains to date, however, a theoretical danger, based on assumption that viral particles identified in peritoneal fluid may result in infection to staff.[13] Furthermore, minimally-invasive radical nephrectomy, for example, is associated with multiple advantages over an open approach, including reduced hospital stay and decreased burden on hospital and critical care beds in the postoperative period.[14] We therefore proceeded with a laparoscopic approach to radical nephrectomy and radical nephroureterectomy during the study period, in asymptomatic, SARS-CoV-2 swab-negative patients, whilst implementing precautions such as use of the AirSeal® insufflation management system and the wearing of personal protective equipment. All cancer cases were operated on only following a multi-disciplinary meeting risk assessment where the verdict was that deferring treatment would not be appropriate.

Flexible cystoscopy procedure numbers fell significantly in the 2020 period. This was of great concern given the high proportion of diagnostic procedures performed on each list for visible haematuria, a symptom associated with urological malignancy in up to 20% of patients.[15] Midway through the study period, cystoscopy lists were established in the off-site private hospital, greatly increasing capacity. Activity was somewhat limited, however, by poor patient attendance rates, presumed due to healthcare facility avoidance discussed above.[10, 11]

Urodynamic investigations were suspended as these were seen as non-urgent and requiring periods of prolonged contact between patient and healthcare provider. Similarly, extracorporeal shock wave lithotripsy (ESWL), was suspended entirely, as delivery of this treatment in our hospital group involves use of a mobile lithotripter, with both the machine and ESWL technicians traveling from overseas. Patients with obstructing stones or indwelling ureteric stents were managed with ureteroscopy. Consequences of the ESWL suspension, such as patients developing increased stone burden and greater requirement for operative intervention, will likely be significant, but it is too soon to quantify the impact.

Transrectal ultrasound guided (TRUS) biopsies for prostate cancer were suspended in our institution, where they are usually performed by interventional radiology colleagues, during a portion of the 2020 study period. This was in line with national and international guidance to avoid TRUS biopsy where possible.[16] The rationale underlying this decision included concerns of potential concomitant TRUS sepsis and SARS-CoV-2 infection placing patients at serious risk, of TRUS sepsis increasing demand on critical care resources, and of possible viral particle aerosolization during rectal probe manipulation. Diagnostic prostate MRI was continued in an off-site private hospital. Potentially delayed cancer diagnoses by inability to biopsy, are of course, a major concern as the pandemic continues. We are currently exploring other options, including establishment of a trans-perineal (TP) prostate biopsy programme, which may confer a lower risk of sepsis and be associated with a lower requirement for repeat biopsy due to improved diagnostic accuracy, and are following National Cancer Control Programme (NCCP) recommendations.

The outpatient cancellation rate rose during the study period, both from patients volitionally cancelling appointments due institutional avoidance, and from the department cancelling non-urgent consultations in the early phase of the pandemic, prior to establishment of virtual clinics which were commenced 3 weeks into the study period. Virtual outpatient clinics were conducted over the phone and seemed successful, with the vast majority of patients contactable and a

management plan being agreed upon. The 'did not attend' rate was significantly lower than the previous year, possibly because patients found it easier to be available for a telephone consultation, or because those who forgot about their appointments were reminded by the call, although this would require further exploration. This also allowed patients to have a family member listen in on the consultation if desired; something not possible with face-to-face consultations due to the hospital's ban on visitors and companions. Studies by other authors have demonstrated various forms of telemedicine to be seen as pragmatic and acceptable to urology outpatients during the pandemic.[17, 18] In fact a greater number of outpatient consultations were ultimately delivered than in the 2019 period, in keeping with the annual increase in urology referrals. This was also facilitated in part by a reduction in annual leave taken by team members during the study period.

We acknowledge a number of limitations to our study. Our hospital is located in a region with relatively low numbers of confirmed COVID-19 cases to date, and therefore may have suffered less service disruption than centres in other regions. Nonetheless, similar precautions, restrictions, and resource reallocation were implemented in our institution as in other hospitals nationally. The unit was fortunate in maintenance of a full workforce, as no team members contracted the virus or had to self-isolate during the study period, and further curtailment of services may occur if this arises as an issue. Diagnostic and surveillance imaging are an important part of urological care. We could not, however, accurately quantify the impact of radiological service restructuring on outpatient scan numbers from our data, particularly as some imaging was performed off site.

We envisage continued delivery of emergency and urgent elective urological care as the pandemic continues, and should continue to learn from colleagues who observed earlier outbreaks of the virus.[19, 20] Depending on time frame, efforts will need to be undertaken to resume semi-urgent scheduled care in addition. Continued utilisation of 'non-COVID' private hospital facilities should permit this. Incorporation of rapid point-of-care testing (e.g. qSARS-CoV-2 IgG/IgM Rapid Test, Cellex Inc)[21] into screening algorithms may help to safeguard the use of these. Maximisation of the potential of telemedicine to continue outpatient consultations, and potentially to review inpatients,[22] seems desirable.

The early phase of the Irish COVID-19 outbreak has demanded rapid reallocation of hospital resources and restructuring of services. Our data confirm, however, that emergency and urgent urological cases continue to present in significant numbers and require timely management. To date, ongoing service provision has been possible in our centre with flexibility and resourcefulness, by securing use of private hospital facilities under a publicly-funded contract and by incorporating telemedicine into outpatient consultations. As the pandemic continues, we anticipate increasing demands on services as patients with semi-urgent conditions temporarily deferred begin to surface or transition into urgent or emergency categories. Urologists globally will need to continue to adapt, innovate and converse to minimise the impact of SARS-CoV-2 on patients' access to urological care.

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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