






## Slowdown of urology residents' learning curve during the COVID-19 emergency

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The coronavirus disease 2019 (COVID-19) has rapidly been spreading worldwide, and Italy has been hit hard, forcing the Italian Healthcare System to change and adapt to these extreme conditions. The daily activities of the Urology Department have been drastically reduced and limited only to non-deferrable procedures, and the entire organogram re-organised following a rigorous flowchart [1].

It is evident that this unprecedented scenario will have an impact on resident training programmes, as it is very difficult to predict the duration of the COVID-19 emergency. Urology residents do not have the opportunity to carry out clinical activities or to be tutored, as senior physicians are engaged in the emergency's management.

In particular, the Authorities have limited unnecessary access to urology departments for residents in order to contain the infection. Moreover, the procedures most affected by these restrictions are those in which the residents are mostly involved (benign pathologies, lower urinary tract surgery, and andrology); the surgical interventions, when performed, are carried out by expert surgeons, with the aim to standardise the procedures, reduce the operative time and the risk of complications. Very conflicting positions have emerged recently in Italy about the safety of laparoscopic and robot-assisted surgical procedures during the COVID-19 pandemic. This is mainly related to the recently published claims on the potential risk of dissemination of the coronavirus infection through surgical gas [2].

Lastly, case discussions and departmental meetings have been cancelled, to avoid gathering.

Attempts to systematically analyse and categorise the most affected activities during the 5-year training programme (e.g. surgical training, research) are impossible, due to the absence of a homogeneous national training programme. Therefore, it is clear that urology resident training is affected transversally throughout the 5-year residency, due to the involvement of ambulatory, outpatient surgery and major surgery (either open, minimally invasive surgery or endoscopic).

A recently published survey gives a snapshot of residency training in Italy in 2018 [3], showing a high level of satisfaction amongst the residents, notwithstanding limitations concerning scientific activity and surgical training.

In order to limit the impact of the COVID-19 emergency on the residents' learning curves, which can further affect surgical and scientific learning, new alternative teaching methods should be introduced (Table 1).

So, thanks to new web-based technologies, teaching activity can continue.

Among the different technologies available, different types of smart-learning can be implemented.

The first one is represented by an online dedicated platform, where pre-recorded videos of lessons or surgical procedures are uploaded; these files could be available on-demand for the residents.

**Table 1** Summary of the different smart-learning technologies and their respective fields of application.

Smart-learning technology	Smart-learning applications
Pre-recorded videos on-demand	<ul style="list-style-type: none"> <li>• Taught class</li> <li>• Video library</li> <li>• Fundamentals of surgery</li> <li>• Surgical procedure's commentary</li> <li>• Expert's 'tips and tricks'</li> </ul>
Webinar	<ul style="list-style-type: none"> <li>• Interactive lessons</li> <li>• Discussion of clinical cases</li> <li>• Non-technical skills</li> <li>• Live debates</li> </ul>
Journal Club via social media	<ul style="list-style-type: none"> <li>• Differed debates</li> <li>• Critical analysis of the literature</li> <li>• Resident's editorials</li> <li>• Shared working experiences</li> </ul>
Podcast	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Case reports</li> </ul>
Clinical staff and rounds	<ul style="list-style-type: none"> <li>• Daily updates (single or multiple)</li> <li>• 'Virtual' rounds</li> <li>• Collegial discussions of surgical approach</li> <li>• Administration's directives</li> </ul>
Simulation	<ul style="list-style-type: none"> <li>• Home simulators (experimental)</li> </ul>

In this setting, users greatly appreciate the ability to watch pre-recorded surgical procedures commented upon by an expert, with focus on routinely performed urological manoeuvres or new techniques and technologies in urology or, furthermore, expert 'tips and tricks' for challenging cases.

The *Surgery in Motion School of the European Urology Association* (<https://surgeryinmotion-school.org>) represents a well-established video-based educational tool for efficient mentorship in surgical training.

The next facet of online teaching is represented by the webinar format. It has already been shown to be useful in this setting [4], giving to both professors and students the chance to interact and to enjoy multimedia content in real-time. Classes, clinical cases discussion and interactive pre-recorded video presentations can be held by an expert, and the residents have the ability to ask questions. Moreover, various non-technical skills can be covered.

Furthermore, exploiting web microblogging services, like *Twitter* online Journal Clubs can be done. By using social media, residents can engage in critical appraisal of evidence-based medicine with dynamic worldwide shared discussion amongst themselves, having the chance to interact with opinion leaders in specific topics. This format has already proven to change clinical practice in 50% of young attendees [5].

Lastly, pre-recorded audio files of expert opinion can be shared online, creating dedicated Podcast channels. This modality of e-learning is not novel and every week >500 000 podcasts are active worldwide. Today, for urology there are a total of two podcasts experiences and only one of which was active (i.e. <https://www.bjuinternational.com/podcasts>).

From this examination, it appears clear how the theoretical training of residents can continue with smart-learning modalities. However, in reality the implementation of such clinical smart-learning appears to be more challenging.

The daily clinical staff meeting can be web-based and planned by using dedicated webinar slots, opening an interactive discussion amongst the urologists and residents concerning the recovery of patients; a second daily update can be done in the afternoon. The procedures of the day can be discussed jointly: in this emergency period it is important to choose the best surgical approach and surgeon for the selected patient, in order to maximise the efficacy of the procedure and reduce the risk of adverse events. Moreover, planning strategies concerning the management of COVID-19 and non-COVID-19 patients should be planned according to the hospital administration decrees.

Furthermore, thanks to the advent of new telepresence robotic platforms like the *Intouch Vita* by Intouch Health, Goleta, CA, USA (<https://intouchhealth.com/?gdprorigin=true>), the morning rounds can be potentially shared with online attendees. Thanks to advanced features including auto-drive capabilities, remote providers can control or automatically head to a patient care location, having the possibility to live-broadcast images and audio to physicians in their homes.

Finally, notwithstanding the well-established usefulness of surgical simulation training programmes [6], in this particular historic moment, where the Authorities have limited unnecessary transfers, the access to simulation platforms usually located in hospitals or universities is difficult. Preliminary experiences with home-made simulators have already been presented, but their real clinical utility is still under investigation.

In conclusion, we think that the use of smart technology should be maximised and implemented, in order to guarantee continuity in the learning curve of residents. Now, during this extraordinary emergency in which it is very difficult to predict the duration of disruption, the current necessity should hopefully be translated into a future opportunity, in which smart-learning can become a useful tool integrated routinely into residency training programmes and urology daily life.

### Conflict of interest

None disclosed.

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