Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

CoViD-19 and ortho and trauma surgery: The Italian experience

Italy was the first country to report a case of Coronovirus in Europe and since the onset of the novel coronavirus (SARS- CoV-2) pandemic in China at the end of December 2019, it has been the country with the highest number of deaths worldwide to date (Table 1) [1–2].

This might be explained by the high percentage of elderly people living in Italy, who make up the majority of the deaths. Moreover, the late recognition of this novel Coronavirus as a potentially serious type, unlike a seasonal flu, might have contributed to the wide spread of the disease [3].

The first cases of Coronavirus disease (CoViD) in Italy were detected in Rome, on January 20th, when a Chinese couple on holiday there resulted affected, and then in Codogno, a little village in Lombardy, on February 21st. However, an Italian Study confirmed that the virus had been circulating since the beginning of January [3].

On January 30th the Italian Government declared the state of emergency over the spread of Coronavirus disease.

Afterwards, on February 22nd, the "Istituto Superiore di Sanità" (the highest Italian authority in the health-care field) ordered that some detected towns in Lombardy and Veneto, the so-called "red zones", be quarantined for 14 days. Nevertheless, given the rapid spread of the virus, northern Italy was initially locked down on March 7th but then the entire country had to be declared on lockdown on March 11th [4].

These restrictions were deemed necessary to stop virus diffusion, but, as they were not immediately applied to the whole nation, people kept on travelling around and with them did the virus.

In a few weeks many changes had to be made to face the increasing need for medicine and ICU wards. Orthopaedics and Traumatology units, as well as each single hospital unit, had to help as much as possible in order to handle the epidemic in the best possible way.

The Italian epidemic can be divided in two periods: an early phase, when only few CoViD patients were diagnosed in confined areas, and a second later phase: the former lasted from the middle of January to the country lockdown; the latter started with this declaration and is still on-going at the moment, due to the epidemic emergency state.

Early epidemic phase

Before the CoViD-19 outbreak, Orthopaedic and Traumatology departments in Italy were organized by national guidelines that favoured early fixation of fractures and a short hospitalization period both for elective and emergency patients. Since mid January, because of the news from China and the first Italian cases, clinical practice has been guided by principles conceived to protect patients and health-care workers.

Orthopaedic and traumatology teams were allowed to continue performing surgery for Traumatology and Oncology patients, but all the patients at risk for CoViD (former or recent contacts with people from "red quarantined areas") or with flu symptoms had to wait in the Emergency Department (ED) until the definitive results of Coronavirus detection swabs were available.

In Lombardy, the most affected region in Italy by the CoViD-19 epidemic, Orthopaedic practice for elective patients was abruptly stopped in mid-February to preserve health-care resources, trying to gradually vacate hospital beds and prepare the departments for the increasing number of patients affected by the virus induced acute respiratory syndrome (called SARS-CoV2) who needed hospital care. Orthopaedic teams were advised to wear surgical masks and new gloves for every patient and to follow strict hand hygiene practices.

Only in private clinics were the Day-surgery cases (requiring less than 23 h of hospital stay, including arthroscopies and simple procedures) allowed to continue, respecting the measures of social isolation such as the use of single rooms with personal bathrooms and no visits from relatives allowed.

In the rest of Italy, where the quarantine was not active, no CoViD-19 specific security measures were adopted. Gradually, since the beginning of March, available beds in Orthopaedics and Traumatology departments were reduced and often were merged with General Surgery departments. In this phase, the CoViD+ patients with traumatology or surgical urgent issues were hospitalized in single rooms in these hybrid departments, with dedicated health-care workers and without the possibility to receive external visitors. During interdepartmental referrals for inpatients who required Orthopaedic consultations, whether in the emergency department, inpatient facilities, or in isolated wards, all personnel was instructed to wear full personal protective equipment (PPE) and was taught to remove it safely. All patients with debilitating pain deriving from Orthopaedic degenerative disease were managed with conservative treatments for pain relief, yet inviting patients to go to the hospital only for unbearable pain. The clinical follow-up of operated or ER discharged patients was ensured, changing the method for the Orthopaedic surgeon to examine and deal with the patient. People with SARS-CoV2 infection, as described in literature, belong to all age groups; outpatients couldn't be screened for coronavirus, therefore all patients had to be treated as infected, even if young and apparently healthy [5,6].

It was mandatory to avoid direct contact with the patients, to perform as little orthopaedic clinical examination as possible, and to carry out every kind of ambulatory procedure (stitch removal, wound dressing) wearing a complete surgical gown. Clinical practice was conducted in order to ensure that services could run without risks for both surgeons and patients: outpatients were encour-

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Table 1
Data from WHO Situation report - 72 Coronavirus disease 2019 (COVID-19) 1 April 2020 https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/ Italy to date of April 02 2020, is the country with the highest number of victims in the world.

Country	Total confirmed cases	Total deaths
Italy	**105,792**	**12,430**
Spain	94,417	8189
France	51,477	3514
China	82,631	3321
Iran	44,606	2898
United States of America	163,199	2850
The United Kingdom	25,154	1789
Germany	67,366	732
Republic of Korea	9887	165
Canada	7695	89
Japan	2178	57
Australia	4707	20
South Africa	1353	5

aged to use home delivery services for medication prescriptions, clinicians were advised to prolong the time distance between non-urgent follow-ups, and the interval between consecutive scheduled visit in a single day was extended to avoid patient overcrowding in hospitals.

Every seat was placed at least one meter away from other seats in all the waiting rooms, and all the people inside the room had to wear personal safety devices.

Later epidemic phase

As SARS-CoV2 spread across the country and the number of cases increased to approximately 1500 CoViD affected people at the beginning of March 2020 [7], hospitals in northern Italy began to change their organization in order to face the worsening emergency state. Non-emergency procedures as elective surgery and clinical office activity were postponed or cancelled. These measures were essential to leave in ICU departments the highest number of free beds for CoViD patients. An additional advantage of this management was that many medical doctors (not only anaesthesiologists but also orthopaedics and rehabilitation specialists) and nurses had the possibility to be transferred to CoViD medical wards or to CoViD dedicated I.C.U.

The “Hub and Spoke” model was used in Lombardy [4–8].

On March 8th, 2020 several hospitals were designated to be hubs for specific healthcare fields such as major trauma, neurological and cardiovascular emergencies. This model maintains a certain number of facilities dedicated to non-CoViD patients who require immediate treatment. CoViD hubs were also identified. The goal was to channel patients to the most efficacious and efficient treatment, leaving the non-CoViD hubs with the lowest possible probability of hospital-acquired coronavirus infection.

In CoViD hubs, emergency rooms were provided with alternative access routes for non-contagious patients, and surgical masks were distributed to everyone at the entrance. Healthcare workers were provided with FFP2/FFP3 protective face masks before the evaluation or contact with any subject. Additionally, surgical gowns and eye protections were used if patient’s symptoms were suggestive of respiratory disease.

Orthopaedic physicians evaluated traumatology patients limiting the time of physical examination as much as possible and maintaining adequate distance in order to avoid unnecessary contacts. Rooms were carefully cleaned and disinfected after every access. Both healthcare workers and patients had to follow strict hand hygiene practices. Patients who needed hospitalization for surgical and medical procedures which couldn’t be postponed were sent to traumatology hubs.

Orthopaedic wards in CoViD hubs were progressively shut down as the postoperative patients from the previous weeks were dismissed. The number of visitors was limited to a single person per patient and the visit had to last only a few minutes, strictly enforcing the use of personal protective equipment. Orthopaedic attendings, residents and nurses, together with their colleagues from various other specialties, were asked to be enroled as volunteers in CoViD ward shifts and to help with data collection about the pandemic.

As the number of CoViD patients in the second part of March 2020 became very high, elective orthopaedic activity has been completely suspended/postponed in every hospital, with the exception of oncologic treatments. Traumatology is still active in dedicated hubs, both surgery activity and office visits. All the orthopaedic-traumatologic hubs had to re-organize their internal activity: hospital wards and operating rooms were divided into CoViD-free and CoViD+ sections. Every healthcare worker has been provided with PPE (FFP2/3 face masque, waterproof shields, goggles, hair cap and gloves) to wear in E.R., CoViD+ operating rooms and CoViD+ wards.

Due to the possibility of asymptomatic carrier transmission of CoViD-19, all people entering in E.R. are required to receive an oropharyngeal swab and, when appropriate, a chest x-ray in order to detect CoViD patients [9].

If the surgery has to be performed before the laboratory and radiographic results are obtained, the patient is considered as a CoViD patient, until the definitive outcomes are ready. As in many other hospital wards, common security measures are undertaken: patient’s relatives are not allowed to enter hospital wards and operative personnel is minimized as much as possible in order to permit social distancing.

The emergence of such a crisis led to the use of novel technologies in the workplace. These include the adoption of telemedicine initiatives, allowing patients to be reviewed and reassured especially in post-operative conditions.

Since February 24th, university activities have been suspended in the entire country: they were initially supposed to be freezed for one week, but in fact the measure is still in place. Meanwhile universities got themselves organized in order to provide their students with telematic lessons and to permit them to graduate from home. Teaching programs for medical students were adopted, using e-learning platforms and videoconferences as all university lessons had been suspended along with in-hospital rotations and internships.

Orthopaedic residents had their speciality activity reduced day after day; unlike students, regional guidelines allowed residents to continue working, because they are equalized to hired doctors.

The “Hub and Spoke” model has played, and is still playing right now, a central role in the management of SARS-COV2 pandemic in northern Italy. Orthopaedic surgeons and residents as well as MDs of other specialities are doing their part in order to overcome this heath emergency. All healthcare workers are doing their best to mitigate the CoViD-19 crisis, both assisting CoViD patients and maintaining a high standard in the treatment of other diseases.

Declaration of Competing Interest

None.

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