

**PRACTICE GUIDELINE**

# Iranian Orthopedic Association (IOA) Response Guidance to COVID-19 Pandemic April 2020

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## Introduction

**I**ranian Orthopedic Community as a part of the national health system feels deeply responsible to take part in the battle against the new coronavirus (COVID-19) pandemic. Although we might not be considered the front-line defenders, we do have a key role in this challenge. As the crisis continues to grow in Iran, the risk of contracting the virus increases with subsequent increase in the number of seriously ill and dying patients. The shortage of ventilators and personal protective equipment (PPE) is a main concern that may even worsen as the number grows. In response to the burden on the health system, the elective part of our practice has to be suspended for now so that the resources can be deployed to more critical patients. There is a social responsibility to preserve vital resources for those who are in greater need. Moreover, we follow the recommended social distancing by postponing elective surgeries which should help reduce further spread of this disease.

Nonetheless in this crisis, we should be prepared to treat non-elective and trauma patients who are in need of emergency care. We should seek the best local solutions to continue the proper management for these trauma patients while preserving resources for the response to COVID-19. Furthermore, we need to plan for probable shortages in our resources including staff, spaces and supplies. The Iranian Orthopedic Association (IOA) supports shared decision-making policy in

these extraordinary circumstances and acknowledges that non-operative management of many orthopedic injuries as well as reducing face-to-face follow-ups are a reasonable path.

The recommendations in this document are valid through the evolving period of the current pandemic. Future amendments and updates will be announced in line with the action plans of the Ministry of Health.

### **Key Goals of the IOA in response to COVID-19 outbreak are to**

1. Reduce morbidity and mortality of the people in need for orthopedic care while preserving healthcare resources
2. Minimize disease transmission by postponing non-essential procedures and reducing face-to-face encounters in line with social distancing recommendations during this stage of the epidemic.
3. Protect healthcare personnel
4. Preserve feasibility and healthcare system functionality
5. Publish up-to-date information for IOA members and public regarding the ongoing pandemic

### **General considerations for all units and subspecialties**

1. It is crucial to educate the staff regarding patient screening, personal protection and needed precautions

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when encountering patients.

2. We recommend enrolling to online educational courses offered by IRIMC and WHO.

3. We recommend arranging local courses to educate the staff and enrolling them in online courses offered by the IRIMC and WHO about the situation.

4. Orthopedists, as members of the national healthcare system, should be open to take part in general medical care upon announcement in the current critical situation.

5. The recommendations provided by the IOA Education Committee for public education regarding the outbreak (<https://iranoa.org/> / اطلاع-رسانی-عمومی-در-مورد-ویروس-کرونا /) are a valuable asset for the orthopedic community.

6. Provision of medical care during the outbreak should follow a prioritization policy of the providers based on their susceptibility to COVID-19 contraction. This policy should take into account the risk factors such as age, general health, immunity status and cardiovascular reserve.

### Educational activities

1. All didactic programs should go virtual (videoconferences or other locally available social media).

2. The principles of PPE should be instructed to all learners.

3. All hospital rotations should be suspended.

4. All local and national continuous medical education (CME) events should be postponed or when possible, be performed through webinars.

5. Virtual conferences in different platforms like webinars should be encouraged to keep orthopedic surgeons up-to-date both in the specialty fields and COVID-19 issues. We strongly support platforms with the capability of interaction between learners and educators for virtual training.

6. In-class undergraduate and postgraduate training programs should be suspended. Virtual classes with the use of video conferences or social media based on available platforms are recommended.

7. Residents and fellows need to be available in urgent and emergent operating rooms (OR) to continue their education unless they are sick which requires sick leave and quarantine for the instructed period.

8. Fellows, residents and interns should pursue visiting patients in the clinic upon discretion of the attending that covers few enough providers in the clinic.

9. The attending physician should be present in the clinic and OR to expedite and smoothen the decision-making process and clinical care provision.

10. A senior physician authorized to efficiently make clinical decisions should be stationed in the emergency room (ER) to guide junior learners.

### Outpatient management

#### A) Paradigm shift

There will be a fundamental change in our medical approaches or underlying assumptions. Coronavirus is going to live with us at least until a vaccine or treatment becomes available which is estimated to

be over a year from now in an optimistic view. Thus, we have to modify our previous routines, behaviors and structures to provide appropriate personal- and patient protection.

During the current stage of the outbreak, outpatient visits for non-urgent chronic conditions ought to be postponed or performed through telemedicine platforms.

Until revised based on updated information on the COVID-19 epidemic, we suggest that health care providers follow the WHO guideline and instructions for personal protection [Table 1, adopted from WHO guideline].

### B) Optimization of PPE

#### Patients

For in-person visits and to follow PPE protocols, the patients should be divided based on respiratory symptoms, as the presence of respiratory symptoms determine the type of PPE. No patient with respiratory symptoms or any other potential COVID-19 symptoms is allowed to the outpatient orthopedic clinic. They should be referred to hospital respiratory triage for further assessment. In addition, at the time of scheduling all patients should be advised to cancel their appointments if they develop respiratory or other COVID-19 related symptoms. Also, if a patient presents to an outpatient clinic with respiratory symptoms, they should be provided with a medical mask and immediately guided to an isolation room or separate area away from others. If not possible, ensure spatial distance of at least 1 meter from other patients. Patients without respiratory symptoms do not require any PPE.

#### Physicians

When visiting patients without respiratory symptoms, standard precautions are necessary. These precautions include hand hygiene (mentioned later), using gloves if the physician touches the patient's secretion (other than sweats), safe handling of potentially contaminated equipment or surfaces in the patient environment and observing cough etiquettes.

If physicians have to examine patients with respiratory symptoms, medical masks, gowns, gloves and eye protection are necessary.

### C) Before the patient arrives

Reduce the number of visits unless there is no alternative. Encourage patients to use telemedicine platforms. For pre-scheduled visits, the patients should be provided with necessary information about what to expect at the clinic, what equipment to bring and what precautions to take through, well in advance. Also, a verbal screening for COVID-19 symptoms and recent exposure to potential carriers is recommended to minimize the virus burden in the clinic.

### D) When the patient arrives at the clinic

1. Triage and early recognition of potential COVID-19 patients

Updated scoring checklist for diagnosing COVID-19

**Table 1. Personal Protective Equipment (PPE) for Outpatient Management**

Person	Task	Required PPE
Consultation room		
Health care workers	Physical examination of patient with respiratory symptom	Medical Mask Gown Gloves Eye protection
Health care workers	Physical examination of patient without respiratory symptom	PPE according to standard precautions and risk assessment
Patients with respiratory symptoms	Any	Provide medical mask if tolerated
Patients without respiratory symptoms	Any	No PPE required
Cleaners	After and between consultations with patients with respiratory symptoms	Medical Mask Gown Heavy duty gloves Eye protection Boots or closed work shoe
Waiting room		
Patients with respiratory symptoms	Any	Provide medical mask if tolerated Immediately move the patient to an isolation room or a separate area away from others; If this is not feasible, ensure spatial distance of at least 1 meter from other patients
Patients without respiratory symptoms	Any	No PPE required
Administrative areas		
All staff including healthcare workers	Administrative task	No PPE required
Screening area		
Staff	First screening (temperature measurement) not involving direct contact	Maintain spatial distance of at least 1 meter No PPE required
Staff	Second screening (i.e. interviewing passengers with fever for clinical symptoms suggestive of COVID-19 disease and travel history)	Medical Mask and gloves

patients  
Temperature check (Optional Non-contact temperature check.  
2. Patient is visited alone with no escort/support unless:  
• Age of <18

- Confusion or mental illness
- Mobility disorder

3. Congregations at the clinic should be avoided. Patients should be arranged as efficiently as possible to avoid such crowding and those in line to be seen should

be instructed to wait in an open space to attain social distancing. Using beepers/buzzers (such as what is used at restaurants to notify the client when the service becomes ready) is another option to facilitate social distancing. An interim option is to have a secretary call the patient's cell phone (those waiting outside) to enter the clinic for the visit.

4. Prioritization of care of symptomatic patients
5. Group symptomatic patients in a separate room (cohorting)
6. Arrange an efficient pathway for referring suspicious cases to relevant centers

#### **E) During visit**

1. Avoid unnecessary touch. No hand shaking.
2. Minimum safe distance is 1 meter. Maintaining 2 m distance is preferable.
3. Avoid unnecessary radiological assessment.
4. Follow a full protection policy during in-person casting. Avoid fiberglass casting that needs another referral to the clinic to remove the cast. Instead, we suggest using conventional plaster casts that are amenable to self-removal after submerging in water and cutting the cotton bandages with scissors. To reduce the contact time, a prefabricated splint that is readily available and washable is another alternative. Moreover, custom-made 3D printed casts/splints can be ordered remotely to reduce the number of visits and contact time and to allow self-removal by the patient.
5. Follow strict hand hygiene protocols (wash your hands frequently for at least 20 seconds before and after touching patients' body/secretions or patient's surroundings)
6. Dispose and change your gloves after each visit.
7. Use a fresh disposable sheet for each patient in case physical examination is needed
8. Provide hand sanitizers with approved antiviral activity for the patients
9. Refer to the above table for the required personal protective equipment during outpatient practice.
10. Do not touch your cell phone. If necessary, wash your hands before and after.

#### **F) Environmental Cleaning and Disinfection Procedures**

Cleaning environmental surfaces with water and detergent and applying commonly used hospital level disinfectants (such as sodium hypochlorite) daily, before and after the clinic time.

#### **Follow up visits during covid-19 outbreak**

##### **A) General**

1. In the event of an emergency, call 115 or an emergency room for assistance.
2. Use remote communicating tools including telephone, social networks and telemedicine platforms for following patients up, unless physical examination is absolutely necessary. Capabilities of telemedicine include:
  - i. Replying patients' questions
  - ii. Viewing medical images & documents
  - iii. Monitoring wounds, ROMs and ambulation status
  - iv. Posting educational brochures, pamphlets and videos

v. Sending electronic prescriptions through capable platforms.

3. In case of necessity for physical examination, please follow the instructions for outpatient management. However, as compliance with the principles of hygiene is questionable at clinics, we suggest avoiding in-person visits during the active phase of the outbreak, unless one can apply all sanitation rules.

4. Postoperative F/U in patients quarantined due to COVID-19 needs special attention and planning accordingly. There might be difficulties to touch base with these groups of isolated patients especially if they are elderly and unfamiliar with telecommunication platforms.

#### **B) Considerations about telemedicine platforms**

We recommend using platforms that:

1. Follow applicable laws and regulations, legally notifying the patient about the limitations of this communication method and obtain consent.
2. Strictly protect patients' confidentiality. The physician takes the legal and moral responsibility of abiding by civil rules and medical ethics.
3. Are able to offer efficient text and video chat and have portal for safe transfer of medical documents.
4. Have the ability to safely save medical records and documents.

Remote follow-up is at discretion of the patient and should not be mandatory. We therefore recommend that the optional but preferred use of this method be explained to the patient at all remote consultation occasions.

Currently there is a tariff for online consultation which is equal to two regular visit reimbursements and not covered by the insurance bodies yet.

#### **Inpatient management**

##### **A) Background**

During the coronavirus pandemic, there will be increased emphasis on reducing hospital admission and minimizing length of stay.

##### **B) Principles for inpatient management**

Concentrated efforts will be required to mobilize all aspects of healthcare to reduce transmission of disease, direct the patients to the right level of care, and decrease the burden on the healthcare system.

1. Patients should only be admitted to hospital if there is no alternative. Day-case facilities, including elective treatment centers and independent sector facilities should be used for ambulatory trauma.

2. Ask patients prior to admission whether they have been in close contact with a person with suspicious COVID-19 infection during the prior 14 days or if the patient has fever, acute respiratory illness or any other symptom in favor of COVID-19 infection. If yes, involve the relevant discipline to confirm the patient's COVID-19 status and take appropriate measures. Also reevaluate the urgency of admitting the patient and reconsider alternative methods of conducting the treatment.

3. Definite care should be performed as soon as the patient has been cleared and medically prepared

4. Given the scarcity of blood products during the outbreak, less invasive surgeries with lesser chances of the need to transfusion should be preferred.

5. Surgery involving high-speed devices is considered to be an Aerosol Generating Procedure.

6. Shift urgent inpatient diagnostic and surgical procedures to outpatient settings, when feasible.

7. Separate symptomatic or confirmed COVID-19 patients in need of urgent ortho procedure from other patients.

8. Assign appropriately trained staff to take care of symptomatic or confirmed COVID-19 patients in need of urgent ortho procedure.

8. Limit visitors to hospitalized patients.

9. Patients not suspicious of infection by COVID-19 should also be kept in circumstances with minimum exposure to others. When possible, one-bed rooms are preferable. If not, leaving one bed empty between 2 successive patients is recommended. Full separation of the equipment, attire and taking strict aseptic measures should be observed.

10. Discharge the patients as soon as medically reasonable. When possible, in-house rehab is preferred to longer hospital stay. Teaching rehab practices to patients before discharge and monitoring their progress through telemedicine minimizes unnecessary exposures.

11. Wearing appropriate PPE, as defined in the section of outpatient care, is absolutely necessary for all staff.

### **C) Inpatient management of orthopedic cases potentially infected by COVID-19**

Attire management when providing care to a symptomatic or confirmed COVID-19 patients:

1. Don N95/FFP2 or higher class respirators.
2. Don full personal protective equipment (PPE), including protective eyewear
3. Doff PPE responsibly as you would for exposure to any infectious disease
4. After doffing equipment, decontaminate hands with an ETOH-based gel

### **Precautions in the or during COVID-19 outbreak**

1. When entering the OR, using specific OR shoes/boots or a clean disposable shoe cover is necessary.

2. Local or regional anesthesia are preferred over general anesthesia, whenever possible.

3. The transfer of cases suspicious or confirmed of COVID-19 infection from the ward to the OR will be done by the ward nurses in full PPE including a well-fitting mask, goggles or face shield, splash-resistant gown, and boot covers.

4. Hospital security is responsible for clearing the route of COVID-19 cases from the ward or ICU to the OR, or vice versa, including the elevators.

5. Patients suspicious or confirmed of COVID-19 infection should not be operated on unless absolutely necessary. Transferring these patients to hospitals designated to provide care for COVID-19 cases is preferable. Otherwise, all such cases should be done in the same OR during the

outbreak.

6. Each surgery on a confirmed or suspicious case of COVID-19 infection needs a designated adjacent room that is kept empty and preferably treated by negative air pressure. This room will be an intermediate space used for decreasing the propagation of virus out of the room.

7. Each surgery on a confirmed or suspicious case of COVID-19 infection needs a runner outside of the room in addition to the circular nurse. The runner will bring any additional drug or instrument that may be needed and put it on a trolley in the adjacent room. This same process in reverse is used to send out specimens such as arterial blood gas samples and frozen section specimens.

8. Wearing full PPE including N95 mask is recommended when using high-speed devices in the surgery

9. When exiting the OR discard your used gowns and gloves in the adjacent room and perform hand hygiene before leaving.

10. COVID-19 cases not requiring ICU care postoperatively are fully recovered in the OR itself and transferred directly to the ward designated for these cases.

11. All unused disposable items on trolleys should be assumed to be contaminated and discarded. All staff in touch with a COVID-19 case in the OR have to shower before resuming their regular duties.

12. Disinfect the devices in the OR and use UV light or a hydrogen peroxide vaporizer to disinfect the room before another patient comes in the room.

### **Immediacy of the procedure management**

#### **A. Emergent (i.e. Life and limb threatening injuries, spine emergencies, ...)**

1. EDs will modify their system and use triage at the front door and stream patients directly to the fracture clinic before examination or diagnostics. Fracture clinics are likely to be asked to take all patients presenting with trauma (including wounds and minor injuries) straight from triage. When possible, this temporary service should be expanded to provide at least 12-hour/day service, 7 days/week.

2. ED will continue to take multi-trauma patients requiring resuscitation.

3. We must avoid unproductive attendance at the hospital. Senior decision-making at the first point of contact is essential; it will reduce the need for further attendances.

4. No patient should be scheduled for surgery by a junior doctor without discussion with a consultant.

5. A decrease in elective work will allow for the presence of a higher level of the decision making hierarchy at the front door.

6. Clinicians may need to work in unfamiliar environments or outside of their subspecialty areas. They will need to be supported.

7. Urgent elective cases, e.g. infected prosthesis in addition to red-flag situations, e.g. cauda equina will still have 24/7 access to fracture clinic or ER.

8. Virtual Follow-up Clinics (VFC) can be very effective

in reducing follow-up visits. Try to develop VFC facilities at your institution.

9. All VFC correspondences should be documented in the patient's electronic or paper chart.

10. Consider postponing long-term follow-up patients until the crisis has passed.

11. Plaster rooms should be accessible for the longest possible time. This will reduce the need for repeat visits to amend casts or splints.

12. A temporary operating theatre and dressings clinic may need to be set up in fracture clinics to allow for surgeries.

13. Ordering CT scans must be limited as it is the investigation of choice for coronavirus pneumonitis.

14. Life and limb threatening injuries should be considered emergent and admitted:

i. Patients with multiple injuries, pelvic & acetabular fractures with major hemorrhage, open fractures, compartment syndrome and exsanguinating injury all require emergent resuscitation and management.

ii. Patients with cauda equina syndrome require emergency treatment.

iii. Patients with septic arthritis, prosthetic joint infection or infected fractures and features of systemic sepsis require emergency treatment. Those who are not septic may be managed on an out-patient basis. Suppression therapy may be considered for the outbreak period, especially for the patients with high vulnerability to COVID-19 infection.

iv. Dislocations should be reduced at the emergency department wherever possible. If the joint is stable after reduction, the patient should be discharged with appropriate follow-up.

#### **Specific points to increase safety and reduce length of stay**

1. COVID-19 should be sought in any patient needing emergency surgery by taking history, lab testing and/or recent chest CT (last 24h) or CXR whenever CT is not available. Any patient undergoing abdominal CT scan must also have a chest CT.

2. Any patient prioritized to undergo urgent surgery must be assessed for COVID-19 as above and the current greater risk of adverse outcomes factored into planning and consenting.

3. Full PPE should be used for emergent surgeries except when the patient is convincingly negative for COVID-19, but note that current tests have a low sensitivity rate. Full PPE includes wearing visors or eye protection. It is imperative to practice donning and doffing PPE in advance.

4. Consider alternative techniques for patients who require soft tissue reconstruction to avoid multiple operations or the need for critical care (like using local flaps, intentional deformity of skin grafting for fasciotomy wounds).

5. Consider early amputation in patients for whom limb salvage has an uncertain outcome and is likely to require multiple operations and a prolonged inpatient stay.

6. Surgeons may need to base decisions about vascular injuries on clinical assessment alone if imaging is not

readily available. Our recommendation is considering the use of telemedicine consultation and documentation for rapid decision making, if clinically reasonable.

7. After management of an emergency condition, the goal is to discharge and readmit the patient in case of adoption of a staged approach.

#### **B. Urgent (i.e. Lower limb fragility fractures, General orthopedic trauma, some spine Fx, PJI, septic arthritis, ...)**

Below is the list of main orthopedic conditions needing urgent surgery during the COVID-19 outbreak. However, the indications for urgent surgery are not strictly limited to this list and the clinical judgement of the physician while considering the principles of care during the outbreak, has a high capacity in decision making [Table 2].

Dislocations of native and replaced joints should be reduced in the Emergency OR or Trauma setting wherever possible. If the joint is stable after reduction, the patient should be discharged with appropriate follow-up.

1. Most upper limb fractures, including clavicle, humeral and wrist fractures, have high rates of union and may be managed non-operatively, recognizing that some patients may require late reconstruction.

2. In cases when the alternative to surgical treatment would be close observation needing multiple imaging (such as a nondisplaced lateral condyle fracture), surgical treatment may better serve the goal of limiting social exposure of the patient and may be considered.

3. Ligamentous injuries of the knee may be managed with bracing in preference to early ligament reconstruction.

4. Abscesses in patients without systemic sepsis may be incised and drained under local anesthesia in the Emergency OR.

5. Patients with hip and proximal femoral fractures remain urgent and a surgical priority. In order to facilitate early surgery hemiarthroplasty might be better than total hip arthroplasty.

6. All patients with fragility fractures of the pelvis, acetabulum or lower limb, whether treated non-operatively or with surgery, should be allowed to bear full weight immediately to allow rehabilitation, reduce inpatient stay and reduce exposure to coronavirus.

7. Use absorbable sutures and warn patients of the small risk of a mild inflammatory reaction to the sutures.

8. Consider non-operative management and bracing of patients with spinal fractures.

9. Orthopedic surgeons will consider particular mortality risk factors in their patients such as:

i. Age over 60

ii. Cardiovascular disease (CAD, atrial fibrillation, HTN)

iii. Pulmonary disease (Asthma, COPD, interstitial lung disease, bronchiectasis, O<sub>2</sub> dependency)

iv. Diabetes

v. End Stage Renal Disease (ESRD)

vi. Immunocompromised

vii. Need for ICU bed following procedure.

10. This consideration might change the decision for surgery to a more conservative approach.

11. For any surgeries not on the approved urgent list, medical staff will need to obtain approval from their

**Table 2. Urgent Orthopedic Surgeries**

	<b>Surgical Intervention</b>	<b>Postpone</b>
<b>Trauma</b>	<ul style="list-style-type: none"> <li>*All new Fractures</li> <li>*Lower Ext. Malunion with significantly impaired daily activity</li> <li>*Lower Ext. Nonunion with significantly impaired daily activity</li> </ul>	<ul style="list-style-type: none"> <li>Upper ext. Malunion</li> <li>Upper ext. non-union</li> </ul>
<b>Sport</b>	<ul style="list-style-type: none"> <li>*Quadriceps/ Patellar tendon Rupture</li> <li>*Achilles tendon Rupture</li> <li>*Locked meniscus</li> </ul>	<ul style="list-style-type: none"> <li>Any other</li> </ul>
<b>Adult Reconstruction</b>	<ul style="list-style-type: none"> <li>*Hip dislocation (native/prosthetic)</li> <li>*Unreducible Knee dislocation (native /prosthetic)</li> <li>*Periprosthetic Fracture</li> <li>*Aggressive PJI</li> </ul>	<ul style="list-style-type: none"> <li>Revision surgery in absence of infection or inability to walk</li> </ul>
<b>Spine</b>	<ul style="list-style-type: none"> <li>*Acute radiculopathy with ongoing axonal loss</li> <li>*Post-surgery infection</li> <li>*Discitis /Osteomyelitis</li> <li>*Unstable spine fracture/dislocations</li> <li>*Cervical myelopathy candidate for surgical interventions</li> </ul>	<ul style="list-style-type: none"> <li>Revision surgery in absence of new onset neurological deficit</li> <li>Compression fracture w/o neurological deficit</li> </ul>
<b>Ortho Oncology</b>	<ul style="list-style-type: none"> <li>*Pathologic Fractures</li> <li>*Impending Pathologic Fractures</li> <li>*Invasive benign or malignant bone/soft tissue tumor</li> <li>*Infection related to tumor surgery</li> </ul>	<ul style="list-style-type: none"> <li>Latent benign tumors</li> </ul>
<b>Pediatric</b>	<ul style="list-style-type: none"> <li>*Septic arthritis</li> <li>*Acute osteomyelitis</li> <li>*SSI/Post-surgical infection</li> <li>*Fractures of necessity</li> </ul>	<ul style="list-style-type: none"> <li>Any other</li> </ul>
<b>Foot and Ankle</b>	<ul style="list-style-type: none"> <li>*Acute foot and ankle fractures (If possible use non-operative)</li> <li>*DFI that need surgical intervention</li> </ul>	<ul style="list-style-type: none"> <li>Any other</li> </ul>
<b>Shoulder and Elbow</b>	<ul style="list-style-type: none"> <li>*Acute fractures (mostly non-op)</li> <li>*Unreducible shoulder /elbow dislocations</li> </ul>	<ul style="list-style-type: none"> <li>Any other</li> </ul>
<b>Hand</b>	<ul style="list-style-type: none"> <li>*Laceration with tendon, nerve injury</li> <li>*Acute fractures of hand/wrist within 2 weeks (mostly non-op)</li> <li>*Acute infection</li> </ul>	<ul style="list-style-type: none"> <li>Any other</li> </ul>

service line chief.

**C. Electives** (i.e. joint replacement, sport surgeries, spine deformity, Foot/Ankle chronic conditions, limb alignment surgeries, upper limb chronic conditions, ...)

1. With the extraordinary burden of the COVID-19 epidemic on the health care system, the emphasis should be on saving the resources and health care providers for necessary care to patients affected by the epidemic. We suggest that the following factors be considered as to whether a planned surgery should proceed:

- i. Current and projected cases in the facility and community.
- ii. Urgency of the procedure.
- iii. Health and age of the patient, especially given the risks of concurrent COVID-19 infection
- iv. during recovery.
- v. Supply of PPE to the facilities in the system.
- vi. Staffing availability.
- vii. Bed availability, especially intensive care unit (ICU) beds.
- viii. Ventilator availability.

2. Health care providers should minimize use of essential items needed to care for COVID-19 patients, including but not limited to, ICU beds, personal protective equipment, terminal cleaning supplies, and ventilators. There are many asymptomatic patients who are, nevertheless, shedding virus and are unwittingly exposing other inpatients, outpatients, and health care providers to the risk of contracting COVID-19.

3. Therefore, during the acceleration interval of the epidemic graph when our health care infrastructure should manage to support a rapid and overwhelming uptick in critical patient care needs, postpone or cancel electively scheduled operations or other invasive procedures. In this situation, orthopedic surgical procedures should **ONLY** be limited to urgent cases when postponing their surgery could jeopardize the outcome. The indications include, but are not limited to the following:

- i. Trauma injuries
- ii. Invasive musculoskeletal infections
- iii. Invasive musculoskeletal tumors

4. A shared decision making should be performed after a detailed counseling of the patient regarding pros and cons of postponing the treatment versus taking possible risks of having a surgery during the outbreak.

5. With proceeding to the descending interval of the outbreak, as pronounced by the Ministry of Health and when progressively less burden on the health system will be expected, gradual modification of this recommendation will be in order.

### Para-clinics guidance

#### A) Imaging

1. Impact on radiology services should be minimized and should be requested after the patient has been assessed in the ER to minimize requests and avoid repeat imaging. Avoid use of multiple imaging modalities and consider

immediate use of the modality most likely to give a definitive diagnosis. Arrange for use of a mini C-arm in the ER if possible. CT scanning should be minimized as this is the investigation of choice for coronavirus pneumonitis.

2. Follow-up imaging should only be performed when there is likely to be a significant change in management. There is little role for imaging to check for fracture union in most injuries.

3. If necessary, children with the following suspected diagnoses may be managed without radiology at presentation:

- Soft tissue injuries.
- Wrist, forearm, clavicle and proximal humeral fractures.
- Long bone fractures with obvious clinical deformity.
- Foot fractures without significant clinical deformity and swelling.

4. Every patient who is going to be admitted to hospital for any orthopedic procedure and suspected to have COVID-19 infection, be screened for COVID-19 with low dose high resolution CT scan (HRCT) of the chest based on the protocol advised by the Iranian Society of Radiology (ISR). If it is not available at your facility, at least a CXR in line with other screening measures according to Iranian National Guidelines for COVID-19 screening is recommended.

#### B) Lab tests

1. For inpatient cases suspected/confirmed for COVID-19 infection, a Complete Blood Count (CBC) test to look for lymphocyte counts and a CRP test is warranted, as advised by the Iranian National Guidelines for COVID-19 screening.

2. For outpatient cases suspected/confirmed for COVID-19 infection, clinicians need to follow the Iranian National Guidelines for COVID-19 screening.

#### Rehabilitation

During the active phase of COVID-19 epidemic, the emphasis is on minimizing the number of outpatient and inpatient rehab referrals. Individual training of the patient by the physician or the therapist, using brochures and telemedicine could substitute institutional rehab service. Considerations for providing rehab services include:

#### A) Symptomatic or confirmed cases of COVID-19, hospitalized or in home-quarantine

Rehab interventions will be provided at the site of quarantine. However, these services should be postponed until the end of the epidemic, if clinically reasonable.

Appropriate PPE as defined by the World Confederation of Physical Therapy (WCPT) should be worn:

(WCPT/Physiotherapy Management for COVID-19 in the Acute Hospital Setting)

Highest quality of care should be applied to the practice in order to minimize the number of rehab referrals.

#### B) Asymptomatic hospitalized patients

Rehab service will be offered at the hospital during the hospitalization period. However, no patient should



be maintained hospitalized in sake of receiving rehab services. Most such practices could be efficiently performed at home by the patient if properly instructed by the physician or the therapist and the progress could be monitored using telemedicine platforms. In cases where the patient is not competent enough for such a program and postponing rehab interventions would not be clinically warranted, arranging home visits by the therapist is preferable over traveling to the rehab institute, especially if the patient needs escorts or attendants during the travel.

Appropriate PPE as defined by the WCPT should be worn:

WCPT/Physiotherapy Management for COVID-19 in the Acute Hospital Setting

Highest quality of care should be applied to the practice in order to minimize the number of rehab referrals.

### C) Outpatient rehab services

Emphasis is on remote rehabilitation: WCPT/INPTRA DIGITAL PHYSICAL THERAPY PRACTICE TASK FORCE

Minimize exposure to viral contamination by following the rules presented in the section of outpatient orthopedic care of this guidance.

Highest quality of care should be applied to the practice in order to minimize the number of rehab referrals.

### Contribution list

- Mohammadali Enayatollahi: Designing the project outline, Collecting and reconciling the sections of the manuscript, First corresponding author
- Mansour Abolghasemian: Directing the project
- Mohammad J. Mortazavi, Mohammad H. Ebrahimzadeh: Moderating the project at the level of the IOA Board of Directors
- Mansour Abolghasemian, Mohammad H. Ebrahimzadeh, Mohammadali Enayatollahi, Kavan Honarmand, Amir R. Kachooei, Soheil Mehdipour, Mohammad J. Mortazavi, Alireza Mousavian, Ali Parsa: Contributed to project design, Data acquisition and appraisal, Writing and Translating the manuscript.
- Amir R. Kachooei: Second corresponding author, Page design

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