Operational Considerations for Physical Therapy During COVID-19: A Rapid Review

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Objective. Physical therapists play an important role in responding to pandemic and physical disaster situations. Existing literature can provide guidance to health care leadership teams to appropriately and safely leverage physical therapy resources and skill sets during the COVID-19 pandemic. The purpose of this study was to provide a review of the pandemic and physical disaster management literature to summarize physical therapy–specific operational considerations to assist hospital-based leadership teams in planning and response efforts during the COVID-19 pandemic.

Methods. A rapid review was conducted over a 4-week time frame (April–May 2020). The review team included 3 physical therapist clinician researchers, a health librarian, and a member of the physical therapy leadership team. The initial search strategy identified 303 articles, 80 of which were retained for full-text screening. Twenty articles were included in the review.

Results. Five main categories of operational considerations for physical therapy during the COVID-19 pandemic were identified: (1) organizational actions, (2) staffing considerations, (3) physical therapist roles, (4) physical resources, and (5) other considerations. Additional relevant information from physical therapists' experiences in physical disaster situations was also summarized.

Conclusion. The evidence presented within this review can be used to inform facility-based and regional planning efforts during the current COVID-19 pandemic and in general preparedness planning.

Impact. Physical therapists have an important role to play in response efforts related to major events that impact health and wellness, including the COVID-19 pandemic. Evidence-informed, facility-based, and regional planning during the current COVID-19 pandemic will help physical therapists enhance their role in treating patients in physical therapy and rehabilitation settings.
On March 11, 2020, the World Health Organization declared the coronavirus disease 2019 (COVID-19) a pandemic,1 prompting individuals, businesses, organizations, and professions to dramatically reexamine daily practices and routines. The health care sector, including rehabilitation, has quickly adapted to prepare for their major role in the acute and longerterm response to the COVID-19 pandemic. Physical therapists around the globe have been involved in developing guidance for the management of COVID-19, whether through participating in international guideline writing groups, national advocacy efforts to promote the role of physical therapy in relation to COVID-19, or at the local management and front-line clinician level.2–4 Professional organization and health care leadership teams are reexamining traditional physical therapist roles and scope of practice to determine how the physical therapy profession can best respond during this pandemic.5,4

Evidence-based management promotes the use of research evidence among other factors (experiential evidence, organizational evidence, patient and stakeholder preferences) to aid in decision making.3,6 While lack of time, knowledge, or skills to assess and evaluate research evidence are common barriers to evidence-based management, partnerships between decision makers and researchers, and access to evidence are facilitators of this process.7 The application of evidence-based management approaches, even within the time constraints imposed by a pandemic situation, has the potential to improve the comprehensiveness and effectiveness of the decisions that ensue.

In mid-April 2020, members of this team were contacted to fulfill an evidence-review request from physical therapy leadership at an urban tertiary care facility to inform hospital planning efforts related to COVID-19. We decided on the use of rapid review methodology, to ensure that a summary of the evidence could be provided in a timely fashion and to help with health care planning.7–9 The purpose of this rapid review was to provide an overview of the pandemic and physical disaster management literature and summarize physical therapy-specific operational considerations to assist hospital-based planning and response efforts during the COVID-19 pandemic.

Methods

The rapid review team included 3 physical therapist clinician researchers (K.W., J.P., S.W.), a health librarian (N.A.), and a member of the facility physical therapy leadership team (A.S.). The review request was made on April 17, 2020. The team was assembled, and the initial protocol was finalized over the following week. The team agreed to a 4-week timeline to complete the review. Weekly updates were provided to the physical therapy management team throughout the review process, with key papers and documents forwarded as deemed necessary. The specific methods used to balance the rapid nature of the review with the intent to provide a relevant and comprehensive summary are outlined in Table 1.5–8 Rayyan QCRI (Hamad Bin Khalifa University, Doha, Qatar) was used to facilitate the review.5,9 Inclusion criteria are listed in Figure 1.

Data Sources

Five data sources were searched with the intent to include published academic literature as well as grey literature. The initial search strategy was completed on April 22, 2020, within PubMed (98 results plus 20 identified through the use of the similar article feature), CINAHL (122 results), Google Scholar (first 10 pages; 22 results plus 26 identified through the use of the related articles and cited by features), and Google (first 5 pages; 11 results). One additional resource was found through Google on a Canadian hospital website. The fifth database, Disaster Lit, was added on May 12, 2020, by consensus of the team to ensure comprehensiveness (3 results). Only English language articles were included. A sample search strategy is provided in Figure 2.

Study Selection

To produce a response within a 4-week time frame, we used the method of single-person abstract screening, full-text screening, and data extraction with second-person validation at each step. The study selection process is outlined in Figure 3.11

Title and abstract screening. A first-pass screen of the retrieved titles and abstracts was conducted by the health librarian team member. Included articles were then divided among physical therapist researcher team members for screening and second person validation. Second person validation of excluded articles also occurred. If there was a discrepancy at the screening stage, the article was included for full-text review.

Full-text screening. Full texts of included articles were then screened to determine inclusion or exclusion, divided among 3 team members (K.W., J.P., S.W.) and validated by a second person. Discrepancies were resolved through discussion.

Data Extraction

Data were extracted from the included articles by 3 reviewers (K.W., J.P., S.W.) into a table with common headings, which were revised throughout the review process through discussion, resulting in the headings used in Table 2 (title, author, year/context/operational items).

Data Synthesis

Four of the team members (K.W., J.P., S.W., N.A.) reviewed the content of the extracted data to determine data organization methods and categories. Included studies
Table 1.
Approaches Used to Address Rapid Review Components

| Review Component* | Approach |
|-------------------|----------|
| Breadth of question | Focus on physical therapy-specific actionable operational issues or considerations within health facilities (see inclusion and exclusion criteria) |
| Search strategy | Highly targeted strategy and limited number of databases |
| Title and abstract review | 1-person review with 1-person validation; discussion as required to clarify inclusion and exclusion criteria at this stage |
| Full-text review | 1-person review with 1-person validation; conflicts resolved through discussion and third person involvement as needed |
| Data extraction | 1-person extracted data from included studies based on pre-specified data categories; 1-person validation |
| Analysis | Reporting only actionable items that would be relevant to health care management. No comparative analysis between studies |
| Interrater agreement | Not assessed |
| Timelines (year of publication of included studies) | No limits |
| Geographic boundaries | No limits |
| Integrated input from physical therapy leadership to refine focus | At minimum, weekly research team meetings to refine protocol in collaboration with input from physical therapy management. Weekly updates to physical therapy management, and relevant documents sent to management as identified. |

*Component headings informed by the work of Patnode et al., Tricco et al., and Abrami et al.

To be included in the review, articles must:
- include recommendations specific to physical therapy
- include actionable items that can be considered for / implemented within the health system
- include actionable items directed toward ensuring an adequate and appropriately skilled physical therapy workforce
  - Can include retraining and optimization of scope of physical therapists (eg, advanced practice) to assist within the health care system during pandemic (eg, X-ray orders, casting)
- be based on real event or experience OR disaster planning / pandemic guidance documents with specific actionable items for physical therapy
- be relevant to local regional planning efforts
- be able to be accessed within the time frame of the review
- be an English language publication
- abstracts can be included if full publication is not available AND the abstract meets other inclusion criteria

Figure 1.
Review inclusion criteria.
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Search ("Physical Therapy Specialty"[Mesh] OR "Physical Therapy Department, Hospital"[Mesh] OR "Physical Therapists"[Mesh] OR "Physical Therapist Assistants"[Mesh] OR "physiotherapy"[title/abstract] OR "physical therapy"[title/abstract]) AND ("Disaster Planning"[Mesh] OR "Disasters/organization and administration"[Mesh] OR "Pandemics"[Mesh] OR "Mass Casualty Incidents"[Mesh] OR "Surge Capacity"[Mesh] OR "Influenza A Virus, H1N1 Subtype"[Mesh] OR "SARS Virus"[Mesh] OR "Severe Acute Respiratory Syndrome"[Mesh] OR "Zika Virus"[Mesh] OR "Zika Virus Infection"[Mesh] OR "Hemorrhagic Fever, Ebola"[Mesh] OR "Ebolavirus"[Mesh] OR pandemic*[title/abstract] OR disaster*[title/abstract] OR epidemic*[title/abstract] OR "mass casualty"[title/abstract] OR "surge capacity"[title/abstract] OR "COVID-19" [Supplementary Concept] OR "severe acute respiratory syndrome coronavirus 2"[Supplementary Concept] OR 2019nCov*[title/abstract] OR "2019 nCov"[title/abstract] OR coronavirus*[title/abstract] OR covid19*[title/abstract] OR "covid 19"[title/abstract] OR "severe acute respiratory syndrome"[title/abstract] OR h1n1*[title/abstract] OR zika*[title/abstract] OR ebola*[title/abstract])) Filters: English

Figure 2.
Sample search strategy (Legacy PubMed).

were then sorted such that the most relevant studies (concrete operational considerations) remained in table format, while the remainder (less concrete considerations, or those that did not fit table headings) were summarized in narrative format. Risk of bias and quality appraisal of the included articles was not conducted due to the rapid nature of the review process.

Results
Eighty articles were retrieved for full-text screening; 60 of these were assessed to not meet the inclusion criteria (Fig. 1). Of the 20 included articles, 7 were specific to the COVID-19 pandemic.2,12–17 Twelve articles discussed the role of physical therapy in response to physical disaster situations,18–29 and 1 was a guidance document found on a Canadian hospital website that was deemed relevant for organizational planning by physical therapy management.30

Nine articles with concrete actionable considerations relevant to hospital-based physical therapy operations during the COVID-19 pandemic are summarized in Table 2; this includes the 7 COVID-19 articles and 2 studies describing physical therapy operational actions during the 2002 Bali bombing disaster (1 primary30 and 1 considered a companion article30 for the purposes of this review).

Major categories of operational items from this literature include organizational actions, staffing considerations, physical therapist roles, physical resources, and other pertinent information that did not fit in 1 of those 4 categories. Findings within each of these categories are summarized below.

Guidance Document
Within the first week of the review, a preliminary Google search located a guidance document from Alberta Health Services, titled: "Allied Health Skills to Support COVID-19 Across the Continuum (April 2020)."30 This document provided an overview of skills held by the various allied health care professions, including physical therapy, that may be useful in supporting COVID-19 pandemic response efforts. Roles and skills for each allied health profession were detailed across care settings. It included a table with additional considerations for how the various professions may function in the case of redeployment. This guidance document was immediately forwarded to facility physical therapy leadership and subsequently informed the template for provincial allied health resource management.

Operational Items
The following is a narrative synthesis of recommendations or actions from the articles included in Table 2 across the 5 categories of organizational actions, staffing considerations, physical therapist roles, physical resources, and other considerations.
### Table 2.
Hospital Operational Considerations for Physical Therapy During COVID-19 Pandemic or Disaster Scenarios

| Title, Author, Year                                                                 | Context                                                                 | Operational Items                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First impact on services and their preparation. “Instant paper from the field” on rehabilitation answers to COVID-19 emergency Boldrini et al, 2020 | Reports on impact of COVID-19 on inpatient and outpatient rehabilitation services in Italy between March 18 and 31, 2020. | **Organizational actions**  
Visitors were not permitted to enter facilities.  
Health care workers communicated with patients’ families via telephone.  
Preadmission screening of patients for COVID-19 was initiated.  
An initial plan to keep 1 hospital free of COVID-19 (and only admit rehabilitation patients who were prescreened and found to be negative) was unsuccessful.  
Rehabilitation beds, wards, and entire hospitals were converted to acute medical wards to accept patients with COVID-19.  
Inpatient rehabilitation stays were shortened for patients who did not have COVID-19. Care continued through home or community rehabilitation as available.  
Outpatient rehabilitation services were discontinued although these services still needed; tele-rehabilitation was initiated to provide consultations and home exercise programs to patients.  
Rehabilitation professionals experienced significant levels of stress in the face of uncertainty and change. In response, they were offered psychological support and allowed more involvement in decision-making processes.  
**Staffing considerations**  
Physical and rehabilitation medicine physicians received fewer referrals for consultations from acute services.  
Health professionals’ work hours were adjusted to minimize interactions between staff assigned to areas with active infections vs non–COVID-19 areas; social activities were limited for hospital employees.  
**PT roles**  
Rehabilitation teams focused on stabilizing patients’ medical conditions and preventing complications while providing basic functional training and assistive devices.  
**Other considerations**  
COVID-19 cases appeared in rehabilitation services shortly after first outbreak.  

| Impact of COVID-19 outbreak on rehabilitation services and Physical and Rehabilitation Medicine (PRM) physicians’ activities in Italy. An official document of the Italian PRM Society (SIMFER) Boldrini et al, 2020 | Recommendations to ensure adequate rehabilitation care is provided while also protecting rehabilitation professionals and patients and limiting the spread of COVID-19. | **Organizational actions**  
Institute screenings to identify people who have COVID-19 symptoms (eg, inform the public, conduct remote assessments, or evaluate with interviews and/or questionnaires).  
Inpatient rehabilitation facilities should:  
Increase capacity to assist with early discharge from acute care.  
Assist with early and safe discharge to community, home, or outpatient rehabilitation where these options are still available.  
Carefully evaluate potential admission of patients to inpatient rehabilitation from home or community to ensure that it is necessary.  
Postpone admission or find alternate pathways for care where possible.  
Outpatient care and home-based services should:  
Ensure care is available so that functional decline does not occur and/or disability does not worsen.  
Consider alternate care options (eg, remote consultation, tele-rehabilitation) for individuals with chronic conditions.  
Apply exceptions to individuals with chronic conditions who may experience rapid deterioration if not provided with treatment.  
**Physical resources**  
Ensure PPE is available.  
Organize a designated physical space for preadmission screening.  
Organize space, equipment, and access to service to comply with distancing requirements.  

(Continued)
| Title, Author, Year | Context | Operational Items |
|---------------------|---------|------------------|
| How should the rehabilitation community prepare for 2019-nCoV? Choon-Huat Koh et al, 2020 | This special communication provides general recommendations for the rehabilitation community with a focus on physical distancing and infection control. | **Organizational actions**<br>Tele-rehabilitation should be implemented when possible. If patients are to be seen face-to-face, implement a screening protocol prior to their attendance. Managers must keep staff continually updated on the evolving situation and related policies and actions. The communication system must allow for open discussion in both directions (manager to staff, and staff to manager).<br><br>**Staffing considerations**<br>Staff must be appropriately trained in donning and doffing PPE, and mask fit. Work in teams that are always physically distanced from each other, and that have the required clinical skills to continue providing needed care if 1 team becomes ill or needs to self-isolate. When assigning staff coverage, consider the risk to staff with chronic respiratory conditions of working in high risk areas. Facilitate staff to work from home when feasible. To allow staff to be available to work, provision of childcare needs to be considered as well as temporary living quarters for staff reluctant to return home between shifts for fear of infecting others in their household.<br><br>**PT roles**<br>PTs should strictly follow public health policy regarding handwashing, staying home if symptomatic, and using appropriate PPE when treating patients.<br><br>**Physical resources**<br>Hospitals should procure adequate supplies of PPE, including planning for a surge of cases. Rehabilitation equipment must be properly disinfected. Provide creams or lotions to assist with skin irritation resulting from repetitive hand washing and PPE use. |
| The essential role of home- and community-based physical therapists during the COVID-19 pandemic Falvey et al, 2020 | This point of view article responds to some long-term care, assisted living, and other community facilities defining home and community PT as being “nonessential” during COVID-19. | **PT roles**<br>Community and home-based PTs, with proper PPE and adhering to physical distancing requirements, can: Decrease the risk for new/avoidable hospitalization or admission to a personal care home, decreasing demand on those facilities. Consider keeping clinics open to decrease the risk of patients being exposed to COVID-19 compared with if they were to attend the emergency department instead. Prevent readmission post-hospital discharge, especially if patients are being discharged earlier than usual to manage patient volumes and infection risk during the pandemic. Perform home safety assessments, obtain equipment, and train caregivers to prevent patients from experiencing decline in function. Provide services to help patients recover post-COVID-19 infection, including treatment for post-intensive care syndrome when required. This may reduce emergency department visits and other health care use. In hospitals, PTs can: Assist with decreasing wait times and over-crowding in emergency departments by managing musculoskeletal concerns and benign paroxysmal positional vertigo, preventing admissions, and facilitating discharge. Decrease burden on physicians, nurses, and social workers in emergency departments. Assist with care transitions, which may result in fewer subsequent readmissions to hospital. PTs in all settings can: Develop innovative home- or clinic-based care models for musculoskeletal injuries to prevent emergency department visits, over-crowding, and/or hospital admissions, making hospital staff more available to manage patients affected by COVID-19. Consider telehealth when in-person visits are not permitted but recognize this may introduce and/or exacerbate inequities in care for those with poor access to technology or inability to engage in telehealth for social, cognitive, or other reasons. |
| Title, Author, Year                                      | Context                                                                 | Operational Items                                                                                                                                 |
|---------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Rehabilitation and respiratory management in the acute and early post-acute phase: “Instant paper from the field” on rehabilitation answers to the COVID-19 emergency Kiekens et al, 2020 | This paper is a summary of a webinar presented on March 26, 2020, organized by the Italian Society of Physical and Rehabilitation Medicine. | **Organizational actions**
Visitors were no longer allowed to attend hospitals.
Patients were discharged early when possible.
Typical rehabilitation activities and admissions were decreased or discontinued.
Used video consulting to connect with COVID-19 specific wards to reduce need for all staff to continually come in direct contact with patients.
Develop plans for rehabilitation in post-acute phase for individuals who experienced severe illness due to COVID-19.
Ensure that discharged patients were contacted to promote continuity of care.
Recognize that the pandemic is placing high psychological burden on health care professionals, which may have long-term consequences.

**Staffing considerations**
Health care professionals worked longer shifts to reduce contact between personnel and patients with COVID-19 and to conserve PPE.

**PT roles**
PTs supported nurses in basic nursing care and in prone positioning patients in ICU.

| Italian physical therapists’ response to the novel COVID-19 emergency Pedersini et al, 2020 | This point of view paper describes the PT response to COVID-19 in Italy. | **Organizational actions**
Tele-rehabilitation by video or telephone should be implemented where possible.
Defer all face-to-face PT sessions except the following (with use of appropriate PPE):
Inpatient respiratory physical therapy.
Postoperative treatment for mobility and respiratory function.
Treatment following fractures.
Treatment in “immediate post-acute phase of disabling heart disease and neurological patients.”
Reintroduce hands-on treatment only when evolving pandemic situation allows and only when patient’s health could decline without treatment.
Provide accurate information to provide assurance to staff.
Support mental health and morale of PTs, as psychological health will impact functioning of the health care system.

**Staffing considerations**
PTs made themselves available at atypical times (eg, evenings and weekends) in response to need.

**PT roles**
Due to nature of PT treatment and inability to maintain physical distancing of 1.5 m, appropriate PPE should be worn at all times.
PTs must follow all international health regulations.
PTs participated in activities not normally within their routine (eg, triage, screening).
PTs can provide the following support within interdisciplinary teams:
“Qualified care in the different modalities of non-invasive ventilation.”
Assess and intervene for respiratory fatigue.
Assess and intervene for respiratory fatigue.
Prevent sequelaes of immobility.
Assist with prone positioning.
Participate in weaning patients from ventilators.
Assist with recovery of activities of daily living.
Specific ICU-based care.
 Expedite early discharge to free up bed space.
Assist with triage.
Assist work of physicians and nurses when those resources are strained.

**Other considerations**
A “physical therapy task force” was assembled where PTs could come together and improve skills needed for types of care that might be required.
Table 2.
Continued

| Title, Author, Year | Context | Operational Items |
|---------------------|---------|-------------------|
| Physiotherapy management for COVID-19 in the acute hospital setting: clinical practice recommendations Thomas et al, 2020¹ | This invited review presents recommendations for the PT management of COVID-19, including the organization of staff and facilities. | **Organizational actions**<br> Compile relevant educational resources for PTs who may be deployed to ICU. Institute protocol for frequent communication with staff. Engage in planning at institutional level for designating spaces where patients with COVID-19 will be treated and establishing resource needs for varying no. of patients (see article for sample plan). Recognize impact of stress and workload on staff and provide support and access to needed resources.  
**Staffing considerations**<br> Additional PT staff will be needed. Possible solutions include: Schedule extra shifts for part-time staff. Allow staff to cancel or postpone leave. Recruit new staff to fill temporary or casual positions (eg. PTs in research, administration, or academic positions; recent retirees). Lengthen work shifts. Identify staff with relevant skills (cardiorespiratory or critical care experience) and assign to COVID-19 wards. Identify PTs with specific ICU expertise not currently working in ICU and redeploy to ICU. PTs with less familiarity with cardiorespiratory skills should be in positions that support discharge, rehabilitation, or preventative measures that reduce hospital use among people without COVID-19. PTs with ICU skills should be in position to mentor less experienced PTs and help with assessment, screening, and deciding course of treatment for patients with COVID-19. Staff at higher risk should not be assigned to COVID-19 specific isolation zones. When scheduling, include extra time to ensure proper PPE use and atypical activities (eg. repetitive disinfecting of equipment and spaces). Create teams that will work with patients with COVID-19 and teams that will not, and limit contact between teams.  
**PT roles**<br> Adhere to local, provincial, and national infection control policies and recommendations. PTs can assist in prone positioning in ICU and train staff in prone protocols. PTs should work with other team members to reduce total no. of staff exposures to patients with COVID-19. For example, once PT has chosen appropriate mobility aid, another health care professional already in the room with patient can trial device with patient.  
**Physical resources**<br> When planning for space, consider that negative-pressure rooms (ideal) or a single room with the door closed are indicated if available when aerosol-generating interventions are necessary as part of PT treatment with patients with COVID-19. Identify equipment necessary for PT treatment and take steps to minimize cross-contamination risk (eg. use single-use, disposable devices when available). Avoid use of specialty equipment not easily cleaned. Inventory rehabilitation equipment and develop a protocol for provision of equipment to different areas within hospital to prevent cross-contamination. Provide sufficient PPE for airborne precautions, which are strongly recommended when respiratory PT treatments conducted. Plan for use of uniforms or scrubs or a protocol for changing clothes at end of shift to prevent virus spread. |
Table 2. Continued

| Title, Author, Year | Context | Operational Items |
|---------------------|---------|-------------------|
| Maintaining physical therapy standards in an emergency situation: Solutions after the Bali bombing disaster Edgar et al, 2005. 28 | This report summarizes the actions taken to ensure high-quality PT services with a surge in patients with burns after the 2002 Bali bombing. | **Organizational actions**<br>Initial support from entire hospital and higher-level administration including government was required to ensure appropriate staffing levels to provide high-quality, individualized PT care. Twice-daily meetings occurred between administration and relevant units to ensure patients received appropriate level of individualized PT and to support staff who did not typically work with burn patients. | **Staffing considerations**<br>Staffing was increased in ICU and burn unit to allow 24-h coverage. These 2 staff groups did not interact for infection control purposes. PT service coverage was increased from usual 5 d/wk to 7 d/wk. PTs less familiar with burn treatment or working in ICU were quickly trained and given instructions. Training delivered at different times (morning, afternoon, night, and weekend) to accommodate staff shifts. Increased staffing was possible through assistance of student PTs and secondment of staff with appropriate experience from other hospitals. These additional staff positions were maintained for 6 mo post-event to help with ongoing outpatient needs of patients affected. | **PT roles**<br>Role of senior PTs transitioned from clinical to administrative multidisciplinary case management duties. Junior PTs decreased time spent on non-clinical duties such as tracking caseload statistics. PTs led (with support from Medical Illustrations) rapid development and prominent posting of individualized positioning diagrams for each ICU patient. This assisted all health care staff to maintain optimal positioning. Individualized exercise programs were also posted bedside, which allowed all health care staff to encourage participation, encouraged patients to take early responsibility for their rehabilitation, and facilitated communication with patients if language was a barrier. | **Physical resources**<br>Extra exercise equipment was procured and set up in a space designated only for burn patients. This supported rehabilitation while adhering to infection control procedures. Rehabilitation in gym became a positive group experience with encouragement from survivors for one another. | **Other considerations**<br>Focus of PT staff from beginning was keeping quality of service and outcomes on par with those of non-disaster times rather than the "best for the most" philosophy, which often occurs in mass casualty situations. Post-event, review of PT statistics demonstrated that patients affected by bombing received equivalent frequency of PT contact and minimally lower (6.8%) duration of PT contact during crisis period compared with usual times. Shoulder active range of motion, grip strength, and patient-reported outcome measures demonstrated a similar timeline of recovery compared with non-mass casualty situations. As a result of this experience, hospital increased its stores of burn and splinting supplies and implemented therapist rotation system to ensure PT skills maintained in various areas. |

ICU = intensive care unit; PPE = personal protective equipment; PT = physical therapist.
Organizational actions included implementation of COVID-19 symptom screening protocols for staff and for patients as part of the preadmission process. Visitors were limited or prohibited and communication with families conducted by telephone. In certain instances, rehabilitation areas were converted into acute medical units for patients with COVID-19, and it was suggested to compile education/resources for physical therapists redeployed to these areas, or to intensive care units without recent experience. One article discussed the use of video consultation on wards dedicated to COVID-19 as a method to reduce the frequency of direct contact. Specific and limited indications for hands-on inpatient physical therapy treatment were outlined in another article. Therapy efforts were directed toward safe and early hospital discharge for patients not affected by COVID-19, with referral to other appropriate services where available. The need to admit people for inpatient rehabilitation was carefully evaluated. Within-hospital outpatient services were largely discontinued, and the majority of articles highlighted virtual care or tele-rehabilitation as important options to allow for continued rehabilitation service provision where possible. The need for available outpatient and home-based service provision was acknowledged, with special consideration for individuals with chronic conditions (eg, potential to make exceptions and allow for in-person care). Organizational recognition of the high stress levels experienced by rehabilitation staff was responded to by providing psychological support, by involving staff in decision-making, and through ensuring frequent, bidirectional, and transparent communication. Finally, the importance of planning for follow-up and post-acute rehabilitation needs of patients affected by COVID-19 was recognized.
Staffing considerations included a focus on ensuring adequate staffing levels, proper staff training, and staff and patient safety. Most of the articles discussed the strategy of creating teams that would have minimal interactions with each other and distinct assignments either toward treating patients with COVID-19 or without COVID-19 (intensive care unit or burn unit in the case of the Bali bombing disaster). This strategy aimed to reduce the risk of infection transmission between wards and staff while allowing for continued clinical care by a fully staffed team should another team become ill or need to isolate. Hours of work were adjusted to minimize interaction between staff and conserve personal protective equipment (PPE). Additional recommendations to ensure adequate staffing included offering extra shifts to part-time staff, allowing staff to cancel/postpone planned leaves, and redeploying staff to intensive care units, wards designated to COVID-19, or other areas to support discharge or preventive care depending on the skill set of the therapist. Adequate training and mentorship for redeployed staff was emphasized as well as training for proper donning and doffing of PPE. There was special mention to consider the risk of infection for staff with chronic health conditions and to provide work-from-home options where possible. Provision of childcare and/or temporary living quarters were also recommended as measures to support staff. In the article describing the response to the bombing in Bali, increased staffing was maintained for 6 months after the initial event to accommodate ongoing and outpatient needs of patients.

Physical therapist roles related to hospital-based management of COVID-19 were discussed for both the outpatient and inpatient setting. The importance of maintaining some level of outpatient therapy was highlighted to prevent functional decline, hospital visits, or potential admission of patients not affected by COVID-19. It was recognized that this may be delivered in patients’ homes or a community setting (where possible) or using tele-rehabilitation or virtual care. A caution was made that tele-rehabilitation or virtual care delivery may exacerbate care inequities for individuals who do not have access to technology or who have difficulty engaging in virtual/tele-rehabilitation for other reasons (eg, cognitive demands of this mode of care). Within-hospital roles for physical therapists were discussed in multiple settings, including the emergency department (eg, management of musculoskeletal concerns to assist with patient flow) and intensive care unit (eg, prone positioning, preventing/addressing effects of immobility). Authors suggested physical therapists can have a role in screening, triage, supporting safe early discharge, and supporting other hospital staff (eg, physicians, nurses, social workers) where resources are at capacity. The need for physical therapists to follow infection control guidelines, use proper PPE, and work collaboratively with the interdisciplinary team to limit the number of staff directly exposed to patients with COVID-19, while still providing best care, was highlighted.

Physical resource recommendations focused on ensuring adequate and appropriate PPE availability for the various procedures (including aerosol-generating procedures) that physical therapists are involved with. Physical space considerations included planning for preadmission screening as well as organizing space and rehabilitation equipment to comply with infection control and physical distancing recommendations. There was an emphasis on proper equipment cleaning or using single-use/disposable equipment. One article suggested planning for use of uniforms or implementation of a protocol wherein staff change their clothes at the end of a shift to minimize infection spread.

As for other considerations, while a number of articles indicated a role for mentorship and education for physical therapists, 1 article specifically highlighted the creation of a “physical therapy task force” to help therapists improve skills that may be required to care for patients with COVID-19. Reflections on physical therapy involvement in the Bali bombing disaster discussed the difference between an “individualized” versus a “best for most” approach to care. These authors reported that the staffing measures taken (see Table 2) and an individualized philosophy of care contributed to the facility achieving service quality and patient outcomes during the disaster response that were equivalent to what was achieved in non-disaster times.

### Summary: Physical Therapist Roles in Physical Disaster Scenarios

Ten articles included in our review contained actionable items for a physical therapy workforce that were not immediately relevant given the current local situation with COVID-19. Our team decided to retain these studies and summarize them narratively as certain recommendations may become more relevant should the situation with the pandemic worsen. They may also provide useful guidance for other regions or scenarios. All of these articles provided recommendations for physical therapists working during or in the aftermath of natural or human-made disasters, such as floods and landslides, earthquakes, terrorist attacks, and war. Traditional physical therapist roles that are important during a disaster situation include acute care skills such as wound care and respiratory care. Authors noted that there is a general lack of understanding among other health care professionals, emergency responders, and the public about the knowledge and skills possessed by physical therapists that are relevant in disaster situations, and that education on the roles physical therapists can fulfill is needed.

After natural disasters such as earthquakes, hurricanes, and floods, there are typically many patients with...
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fractures, amputations, or spinal cord injuries. In these instances, physical therapists have contributed in the early immobilization of fractures and in training rescue workers and other health care professionals in safe patient transport techniques, proper use of walking aids, and bed mobility procedures.20,21,26,27 Physical therapists have set up clinics to treat the neuromusculoskeletal injuries incurred by other emergency response personnel.20,24 Because physical therapy is focused on function, therapists play an important role in discharge planning with patients injured in disasters and in educating other medical staff regarding criteria for safe discharge.21,22 Identifying the need for follow-up and organizing outpatient rehabilitation services has been noted as an important role physical therapists can assume.18,20,21 This may include setting up tele-rehabilitation options,18,28 community-based rehabilitation,21,22 and free services provided by physical therapist volunteers.18 There was also general consensus that physical therapists can contribute beyond their traditional roles, for example in triaging patients, assessing vital signs, and providing first aid.19–21,23–27,31 Physical therapists' expertise in assessing and treating orthopedic conditions has allowed them to work in “physician extender” roles in field hospitals, freeing orthopedic surgeons for the most critical cases, resulting in more timely treatment for all and fewer unnecessary evacuations.19,26

Discussion
We have provided a rapid review of the evidence to inform physical therapy–planning efforts at a local tertiary care hospital. The results can be used by others in similar settings during this pandemic, for any subsequent waves of the virus, and in the case of future pandemics or other disaster situations. Perhaps not surprisingly, the most relevant operational considerations for the current COVID-19 pandemic were drawn from literature that shared approaches and lessons learned during the response in countries affected earliest by the virus. Major categories of operational items included organizational actions, staffing considerations, physical therapist roles, physical resources, and other pertinent information that did not fit in 1 of those 4 categories. Useful information was also gleaned from the existing disaster response literature; this was either included in the main table (Tab. 2) or summarized narratively to highlight how physical therapists can contribute through traditional roles (eg, respiratory care, musculoskeletal care) and in extended roles (eg, orthopedic extender role, triage, monitoring vital signs).

Inclusion of physical therapy leadership within the review team ensured that the information gathered for this review was relevant to local planning efforts, facilitating evidence-based management during the COVID-19 pandemic.5,6 Within 1 week of initiating the review, one of the resources was adapted to inform planning at a provincial level. In addition to aligning with evidence-based management practices, this review highlights the importance of inter-professional team-based practice during a pandemic or disaster scenario. The 2011 report “Core Competencies for Inter-professional Team-Based Practice” reviews 3 major categories of interprofessional competencies: (1) individual professional competencies (eg, unique therapist clinical skills), (2) common competencies (eg, skills common to multiple health professions such as patient positioning), and (3) inter-professional collaborative competencies (eg, communication skills).32 Recommendations throughout the 5 categories of physical therapy operational considerations highlight the need for all of these competencies to (1) maximize the unique skill set of physical therapists during the COVID-19 pandemic, (2) support other team members who are at capacity, and (3) facilitate effective teamwork. Embracing inter-professional team-based practice during a pandemic or disaster situation can contribute to effective care with a focus on patient and provider safety.

Strengths of this review include a focused and time-sensitive review that was designed to inform health system planning and response to COVID-19 and a team composition that included physical therapists, a health librarian, and a member of the physical therapy leadership team. Limitations of this review are primarily related to the measures taken to ensure adherence to the 4-week timeline, including (1) use of a single primary screener/reviewer with secondary validation rather than 2 full screeners/reviewers, (2) lack of quality assessment or risk of bias assessment of included articles, and (3) lack of an update prior to publication. We will monitor our local situation as well as national and international need to determine whether future updates are warranted.

Conclusion
Physical therapists have an important role to play in response efforts related to major events impacting health and wellness, including the COVID-19 pandemic. The evidence presented within this review can be used to inform facility-based and regional planning efforts during the current COVID-19 pandemic and in general preparedness planning. Rapid and timely sharing of evidence and experience is essential to ensure that physical therapy departments are ready and able to respond to the fullest scope of practice during pandemic or disaster situations.

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