

## The Novel Coronavirus (COVID-19): Making a Connection between Infectious Disease Outbreaks and Rehabilitation

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In late December 2019, people from a local market in China's Wuhan Province began to present with symptoms similar to those seen in the 2003 severe acute respiratory syndrome (SARS) epidemic.<sup>1,2</sup> The world now knows that Dr. Li Wenliang was likely the first person to report these cases of a novel coronavirus (COVID-19) that had made the leap from animals to humans, signaling yet another emerging zoonotic disease.<sup>3</sup> In the months since COVID-19 was signaled, it has spread to at least 217 countries and infected more than 35.6 million people.<sup>4</sup> The effects on human life have been tragic, with more than 1 million known casualties. Beyond human tragedy, massive economic impacts are unfolding as industries ranging from manufacturing to tourism are grinding to a halt, panic has almost overtaken the financial markets, and a sense of fear and misinformation have emerged. The World Health Organization (WHO) has declared COVID-19 a global pandemic.<sup>5</sup>

Infectious diseases are not new. Between 1347 and 1351, the plague took the lives of more than 200 million people.<sup>6</sup> Only after the plague ravaged Europe did strategies such as quarantine of infected people and policies to restrict trade from endemic countries become common. At that time, transmission of infectious disease was not well understood, and it took hundreds of years for science to catch up. It was during the 1854 cholera outbreak in London that Dr. John Snow, known as the Father of Epidemiology, identified that the cholera transmission vector was water droplets, not miasma or "bad air."<sup>6,7</sup> Although his scientific approach was not well accepted at the time, he was correct, and so began the pre-vaccine period of public health interventions to curb infectious disease. Vaccinations against disease were eventually pioneered, and their worldwide distribution largely explains the extended global life expectancies at the dawn of the 20th

century.<sup>8,9</sup> Some 600 years after the plague, a combination of treatments including vaccination, rehydration, and improved public health have become the standard approach to the eradication of infectious disease.

So what is the connection between physiotherapy and rehabilitation in the context of infectious disease outbreaks? We suggest that given the relatively high likelihood of survival after exposure to infectious disease, physiotherapy can mediate the deleterious pulmonary, respiratory, and immobility complications that are commonplace. Moreover, we argue that rehabilitation can offer a cost-effective upstream strategy that can restore mental and emotional quality of life during and after medical intervention. For instance, on the basis of quarantine experiences during the 2003 SARS outbreak, Lau and colleagues reported that patients who took part in a physiotherapist-supervised exercise program improved their cardiorespiratory and musculoskeletal fitness.<sup>10</sup> Moreover, Hawryluck and colleagues reported that post-traumatic stress disorder and depression were observed in as many as 31% of respondents who had contracted SARS and were isolated and that longer periods of quarantine were associated with higher symptom impact.<sup>11</sup>

Similarly, with Ebola, another highly infectious disease, Moll and colleagues reported that patients benefited from an interdisciplinary approach (including physiotherapy) that reduced hospital length of stay and optimized successful patient transfer to the community.<sup>12</sup> Others, such as Martin and colleagues and Jacobs and colleagues,<sup>13,14</sup> have also highlighted the need for multidisciplinary care among Ebola-infected survivors to improve their physical and mental function. As a case in point, the Chartered Society of Physiotherapy and Howlett and colleagues have highlighted the critical role of physiotherapists who are

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specially trained to treat patients with infectious disease, revealing that patients who contracted Ebola had “marked improvement in symptoms” after intervention.<sup>15,16</sup> (p. 1416)

Landry and colleagues argued the need to consider rehabilitation for children who contracted the congenital Zika virus during the 2015 outbreak in the Americas.<sup>17</sup> More recent evidence has emerged from Amundsen and Evensen and Longo and colleagues,<sup>18,19</sup> who have reported overall functional improvement among those who received rehabilitation after contracting Zika. Although we support the need for further research, we suggest that early evidence supports a role for physiotherapy and rehabilitation to mediate the short-, middle-, and long-term consequences of infectious disease. The range of possible interventions in which rehabilitation could be effective becomes much more clear when viewed beyond the acute phase and when considering the framework of the *International Classification of Functioning, Disability and Health*,<sup>20</sup> which can help to uncover opportunities to intervene with the impairment, activity, and participation triad.

Irrespective of the origin of infectious disease, facilitating physical, emotional, and mental recovery after exposure is well within the scope of physiotherapists and other rehabilitation providers, and it is an area in which providers have a moral imperative to act. However, to what extent would we as individual practitioners, or as a community of rehabilitation providers, be willing to challenge the status quo and advocate for involvement in this unrepresentative area of practice? Greater involvement is not likely to be offered, and so we propose that practitioners must be willing to advocate both at the time of an outbreak such as the current COVID-19 but also in less media-attractive moments such as emergency preparedness planning. An excellent example of mainstreaming rehabilitation services in emerging practice areas was WHO's 2016 guideline development of minimal technical standards for emergency response that articulated that, for an emergency response team to be verified by WHO, the team needs to clearly demonstrate rehabilitation capacity.<sup>21</sup> In the years since the development of the WHO guidelines, it has become routine to include rehabilitation in disaster response.<sup>22,23</sup>

The emergence of COVID-19 is another stark reminder of the interconnectedness of people and communities around the world and how nations at all economic levels are increasingly interdependent. We believe that it is time to apply a 21st-century interdisciplinary response and fully integrate physiotherapists and other rehabilitation providers in a robust local and global response to infectious disease outbreaks. We ask ourselves, if not the collective us, then who, and if not now, then when?

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## Le nouveau coronavirus (COVID-19) : un lien entre les éclosions de maladies infectieuses et la réadaptation

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À la fin de décembre 2019, les commerçants d'un marché local de la province de Wuhan, en Chine, ont commencé à ressentir des symptômes s'apparentant à ceux observés lors de l'épidémie de syndrome respiratoire aigu sévère (SRAS) de 2003<sup>1,2</sup>. Le monde sait maintenant que le docteur Li Wenliang a probablement été le premier à signaler des cas de ce nouveau coronavirus (COVID-19) transmis par des animaux, témoignant de l'émergence d'une nouvelle zoonose<sup>3</sup>. Depuis son signalement, la COVID-19 s'est propagée dans au moins 217 pays et a infecté plus de 35,6 millions de personnes<sup>4</sup>. Elle a des effets tragiques sur la vie humaine, puisqu'elle est responsable de plus d'un million de décès connus. Au-delà de la tragédie humaine, elle a une incidence massive sur l'économie, car toutes les industries sont paralysées, de la fabrication au tourisme, la panique a presque envahi les marchés financiers et un sentiment de peur et de désinformation se dessine. L'Organisation mondiale de la Santé (OMS) a qualifié la COVID-19 de pandémie mondiale<sup>5</sup>.

Les maladies infectieuses n'ont rien de nouveau. Entre 1347 et 1351, la peste a emporté plus de 200 millions de vies<sup>6</sup>. Il a fallu attendre qu'elle eût ravagé toute l'Europe pour que des stratégies comme la mise en quarantaine des personnes infectées et les politiques pour restreindre le commerce avec les pays endémiques se généralisent. Le mode de transmission des maladies infectieuses n'était alors pas très bien compris, et ce n'est que des centaines d'années plus tard que les scientifiques ont découvert la vérité. Pendant l'épidémie de choléra de Londres en 1854,

le docteur John Snow, connu comme le père de l'épidémiologie, a déterminé que les gouttelettes d'eau étaient les vecteurs de transmission du choléra, plutôt que les miasmes ou le « mauvais air »<sup>6,7</sup>. Même si son approche scientifique a été accueillie avec scepticisme, il avait raison, et c'est à ce moment qu'a commencé la période d'interventions de la santé publique pour freiner les maladies, qui a précédé la découverte de la vaccination. Les vaccins ont fini par prendre le relais, et c'est en grande partie grâce à leur diffusion mondiale si l'espérance de vie s'est rallongée au début du XX<sup>e</sup> siècle<sup>8,9</sup>. Quelque 600 ans après la peste, une combinaison de traitements, incluant la vaccination, la réhydratation et de meilleures mesures de santé publique, est devenue la démarche standard d'éradication des maladies infectieuses.

Quel est donc le lien entre la physiothérapie et la réadaptation dans le contexte des éclosions de maladies infectieuses? Les auteurs sont d'avis qu'étant donné la probabilité relativement élevée de survie après l'exposition à une maladie infectieuse, la physiothérapie peut atténuer les complications courantes d'ordre pulmonaire ou respiratoire et associées à l'immobilité. Ils avancent également que la réadaptation peut représenter une stratégie rentable en amont pour rétablir la qualité de vie émotionnelle et mentale pendant et après une intervention médicale. Par exemple, sur la foi des expériences de quarantaine vécues pendant l'écllosion de SRAS en 2003, Lau et ses collègues ont établi que les patients qui avaient participé à un programme d'exercices supervisés

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