

# BMJ Open Recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic: a scoping review

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## ABSTRACT

**Objective** To map the recommendations for hospitalised patient safety in the context of the COVID-19 pandemic.

**Design** Scoping review using the method recommended by the Joanna Briggs Institute.

**Data sources** Databases: Medline, SCOPUS, EMBASE, ScienceDirect, LILACS, CINAHL and IBECs; grey literature platform: Google Scholar; and 11 official websites of leading healthcare institutions were searched on 27 April 2021 and updated on 11 April 2022.

**Eligibility criteria** We included documents that present recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic, published in any language, from 2020 onwards.

**Data extraction and synthesis** Data extraction was performed in pairs with consensus rounds. A descriptive analysis was carried out to present the main characteristics of the articles. Qualitative data from the extraction of recommendations were analysed through content analysis.

**Results** One hundred and twenty-five documents were included. Most papers were identified as expert consensus (n=56, 44.8%). Forty-six recommendations were identified for the safety of hospitalised patients: 17 relating to the reorganisation of health services related to the flow of patients, the management of human and material resources and the reorganisation of the hospital environment; 11 on the approach to the airways and the prevention of the spread of aerosols; 11 related to sanitary and hygiene issues; 4 about proper use of personal protective equipment and 3 for effective communication.

**Conclusions** The recommendations mapped in this scoping review present the best practices produced so far and serve as a basis for planning and implementing good practices to ensure safe hospital care, during and after COVID-19. The engagement of everyone involved in the care of hospitalised patients is essential to consolidate the mapped recommendations and provide dignified, safe and quality care.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The extensive search made by the review, involving scientific databases, grey literature and official documents from reference health institutions, together with the rigorously applied method, corroborate the reliability of the data presented.
- ⇒ The review process was performed independently by peer reviewers, and the research team was trained to conduct scoping reviews and developed a prior research protocol, which gave greater reliability.
- ⇒ The primary weakness of this review is that most studies are those of the expert consensus type.
- ⇒ Nevertheless, as the context is that of a pandemic, both clinical practice guidelines and expert opinion are the best available evidence.
- ⇒ The grouping and analysis of results followed methodological rigour for qualitative data and the experience and diversity of the research team increased reliability.

## BACKGROUND

COVID-19 is an infectious disease caused by a highly transmissible virus, the new SARS-CoV-2, which may develop into a severe clinical state of respiratory failure.<sup>1-3</sup> In March 2020, the disease was declared a global pandemic, imposing an extra burden on structures, equipment, inputs and human resources of health services, and this substantially challenged the health systems of several countries.<sup>4,5</sup>

The rapid and drastic changes in the care models imposed by the COVID-19 pandemic increased the workload, causing the relocation of staff and the cancellation of elective services, in addition to the treatment of a new disease. These challenging conditions impacted the performance of health teams to provide safe and quality healthcare. Studies

indicate that increased pressure at work, inadequate staff and worker fatigue are factors that contribute to poor safety. In the COVID-19 pandemic, there was evidence of change in the perception of patient safety, risks in different professional categories and a reduction in notifications of incidents<sup>6–8</sup>

This context highlighted the need to develop strategies and recommendations to face the pandemic. Some institutions such as WHO, the International Society for Quality in Health Care (ISQua) and the Centers for Disease Control and Prevention (CDC) have provided daily updated information, protocols and recommendations to ensure the standardisation of safe and quality care.<sup>6</sup> In addition to institutional publications, the scientific community has committed itself to disseminating experiences, practices and research related to hospitalised patient care in the context of the pandemic, resulting in a high number of publications on the subject. In this context, it has become important to organise the recommendations regarding patient safety. This scoping review seeks to map the recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic.

## METHOD

### Study design

This is a scoping review whose aims, inclusion criteria and methods were specified in advance and which had a registered protocol.<sup>9</sup> It was prepared using the method recommended by the Joanna Briggs Institute,<sup>10</sup> consisting of an exploratory review.<sup>11</sup>

### Eligibility criteria

The research question of this study was elaborated according to the PCC mnemonic combination<sup>12</sup> (P: population—hospitalised patient; C: concept—recommendations for patient safety; C: context—COVID-19 pandemic), with the following guiding question:

- What are the recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic?

The refinement of the articles found was based on pre-established eligibility criteria, which were: documents that present recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic, published in any language, from 2020 onwards, of all age groups and hospital units. The practices described in the documents as imperative to ensure patient safety were considered as recommendations.

Exclusion criteria: studies that did not meet the aim or answer the question, full text unavailable in electronic media, websites/electronic portals with restricted access and research projects.

### Electronic search

The search strategy was developed by the researchers with the support of a librarian with extensive experience in

carrying out reviews and followed the definition of each database/portal or directory, taking place from 1 to 27 April 2021 and updated on 11 April 2022. The descriptors and keywords used were ‘patient safety’, ‘COVID-19’, ‘hospitalisation’, ‘recommendation’ and their variations. The Boolean operator AND and OR was used. The search terms and strategy are detailed in the online supplemental appendix A.

The searches from the beginning took place in the following databases: Medline Complete (PubMed), SCOPUS (Elsevier), EMBASE (Elsevier), ScienceDirect (Elsevier), LILACS (Bireme), CINAHL Complete (EBSCO), IBECs (Bireme); grey literature: Google Scholar and official websites: WHO, CDC Institute for Healthcare Improvement, ISQua, Agency for Healthcare Research and Quality, National Health Services (NHS Improvement), National Institute for Health and Care Excellence, Ministry of Health, National Health Surveillance Agency, Brazilian Society for Quality of Care and Patient Safety and Collaborating Centre for the Quality of Care and Patient Safety.

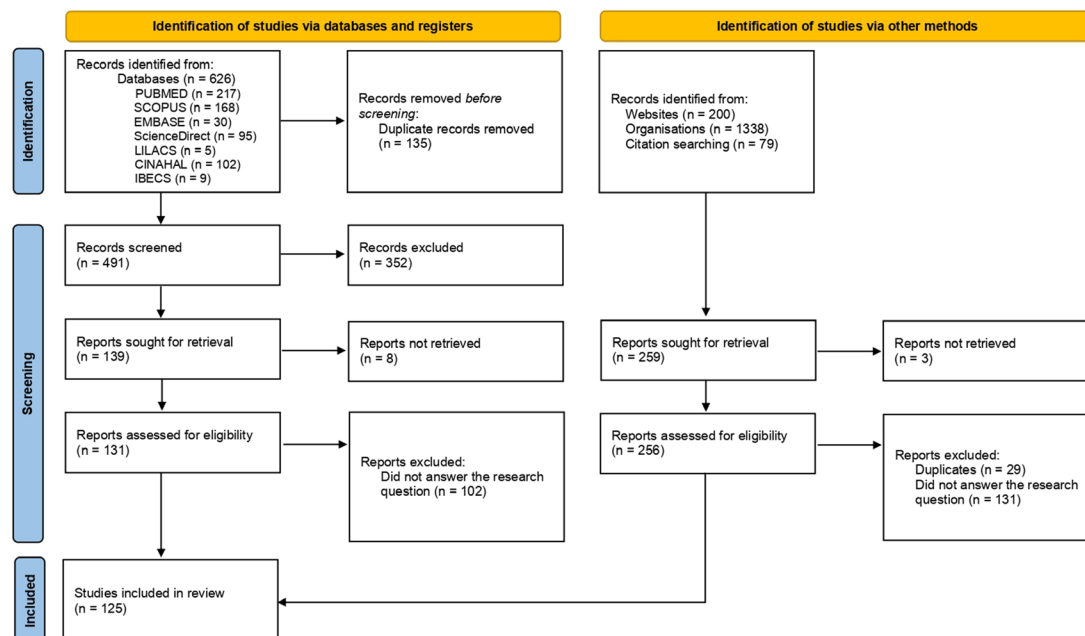
### Data charting process

The exploratory reading of titles and abstracts was performed independently by peer reviewers, classifying the studies that were related to the research question and met the inclusion criteria. Disagreements were resolved by consensus between peers or by the assessment of a third reviewer if the disagreement continued. The preselected studies were then read in full to evaluate the content as to their contribution to the understanding of the studied phenomenon and subsequent data synthesis. The reference lists of articles were then consulted to discover additional studies. All research, decisions and stages were documented and archived by the lead reviewer.

In the data extraction stage, a standardised data abstraction form (online supplemental appendix B) was used. This provided the identification of the essential elements of the studies such as database, author(s), title, DOI/access link, year of publication, country, collection period, study site/institution, aims, methods (type of research, age/age group, sample size, data analysis) and results (hospital sector, patient safety recommendations). Data extraction was performed in pairs with consensus rounds.

### Data analysis and synthesis of results

A descriptive analysis was performed to present the main characteristics of the articles. Qualitative data from the extraction of recommendations were analysed through content analysis, according to the framework of Bardin,<sup>13</sup> covering the pre-analysis, material exploration, data processing, inference and interpretation steps. The units of analysis were grouped by theme and then reviewed in pairs and consensus rounds. After the interpretations, the categories of recommendations, subcategories and the details of each recommendation were defined, through



**Figure 1** Preferred Reporting Items for Systematic Reviews and Meta-Analyses study selection flow diagram.

a reflective process, seeking rigour in terms of the references of the studies.

All analyses were conducted in pairs and discussed in consensus rounds with the review group. A synoptic table with the main characteristics of the studies was elaborated for the compilation and communication of the results, aiming to present an overview of all the material. The recommendations found in the literature were categorised and illustrated.

### Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

## RESULTS

One hundred and twenty-five documents were included (figure 1).<sup>14</sup> The online supplemental appendix C presents a summary, including the main author, year of publication, study origin, objective, method, setting, country and main recommendations presented. Most papers were identified as expert consensus (n=56, 44.8%), followed by literature review (n=35, 28.0%). Many articles described specific recommendations for performing intubation<sup>15–19</sup> or for certain areas, such as psychiatric services,<sup>20–22</sup> orthopaedics,<sup>23</sup> haemodynamic,<sup>24</sup> intrahospital transport,<sup>25</sup> oncology,<sup>26,27</sup> field hospitals,<sup>28,29</sup> paediatrics,<sup>30–34</sup> diagnostic centres,<sup>35–37</sup> inpatient units,<sup>38–43</sup> endoscopy and gastroenterology centres,<sup>44–48</sup> gynaecology and obstetrics,<sup>49–55</sup> emergency units,<sup>56–60</sup> intensive care unit<sup>40 41 56 61–68</sup> and the most common was the surgical centres.<sup>48 61 69–99</sup> Other articles made recommendations for the hospital service as a whole.<sup>19 58 64 100–138</sup> Most documents are from the USA (n=34, 27.2%), followed by Brazil (n=21, 16.8%) and

multicentre studies (n=17, 13.6%). The documents were published in 2020 (n=76, 60.8%), 2021 (n=39, 31.2%) and 2022 (n=10, 8.0%). Table 1 summarises the main features of the items included.

Analysis of the documents revealed specific recommendations, which were later grouped into categories and subcategories. Each recommendation was built from the examined literature, and the online supplemental appendix D presents in detail the basis for the construction of each recommendation, as well as all related references. The data enabled the construction of 46 recommendations for the safety of hospitalised patients, 17 relating to the reorganisation of health services, 11 for airway management, 11 for sanitary and hygiene measures and 3 for communication management (figure 2).

The four recommendations related to personal protective equipment (PPE) have greater specificity and detail and for better visualisation are presented box 1.

### Reorganisation of the health services

The reorganisation of the health services category addresses 17 recommendations related to the flow of patients, the management of human and material resources and the reorganisation of the hospital environment in order to prevent the transmission of COVID-19. It is recommended that all patients are considered suspects<sup>47 70 80 90 91 101 128</sup> and undergo risk stratification<sup>20 21 23 24 27 31 32 36 39 43–47 49 53 66 70 72–74 76 81 85 91 93 100–102 108 110 119 125 126 133 135 139</sup> with a history of clinical and epidemiological data<sup>20 22–24 39 45–47 49 72 81 92 93 95 96 101 124–126 133–135</sup> and a test<sup>20 22 23 26 30 39 48–51 53 61 65 68 72 73 81 84 90 92 96 102 110 119 124 133</sup> of RT-PCR,<sup>23 36 47 69 72 81 87 88 91 96 119 125 126 133 134</sup> ELISA<sup>23 47</sup> or nasal swab<sup>84 95 101</sup> at admission screening,<sup>21 22 36 39 49–51 53 69 95 108 133</sup> in the preoperative period,<sup>23 26 47 48 61 69 72 87 90 95 102 124</sup> in

referrals<sup>31 84</sup> and before non-emergency procedures involving airway approaches.<sup>66 79 95</sup>

Suspected and confirmed patients should be isolated.<sup>20 21 23 30 32 38 40 42 43 50–54 59 60 66 69 76 78 91 96 100–102 104 108 110 119 124 126 129 133 134 139</sup> preferably in single rooms with negative pressure.<sup>65 67 76 79 112 117 120 123 134</sup> If this is not possible, a minimum distance of 1 m should be maintained between beds in collective isolation.<sup>20 32 38 40 53 120 123 128 131 139</sup> Preference should be given to the use of disposable materials in the care of health workers<sup>40 47 70 76 107 129</sup> and a one-way, short and direct route for transport should be used, avoiding contact with patients without COVID-19.<sup>23 31 32 35 38 47 56 60 69 78 89 98 115 134</sup> In case of death, the body must be wrapped in a sheet soaked in a disinfectant solution and placed in the coffin.<sup>101 128</sup>

Aerosol-generating surgeries and procedures must be performed in rooms with negative pressure.<sup>18 19 30 44 46–48 53 62 66 67 69 70 75–77 79 84 87 89 91–94 98 120 128 131 137 139</sup> If this is not possible, for procedures it is recommended to adapt a room that has natural ventilation with open windows with bars,<sup>18 35 56 100 110 120 137 139</sup> high efficiency particulate air filter<sup>44 47 73 84 89 98 112 120 137 139</sup> and doors to other environments must be kept closed.<sup>47 67 70 89 91 100 120 139</sup>

Health professionals must undergo daily risk stratification<sup>20 23 36 39 46 67 93 100 101 124–126 133</sup> and be tested periodically.<sup>19–21 23 34 39 73 87 91 100 125–127 133</sup> Those who are suspected or confirmed must be removed immediately.<sup>20 23 103 118–121 127 139</sup>

To reduce the movement of people, hospitalisations and elective procedures should be suspended,<sup>20 23 26 36 37 40 46 48 51 52 69 72 75 76 84 91 95 96 98 100 101 108 110 124 125 134</sup> the number of professionals in the areas of patients with COVID-19 should be kept to a minimum<sup>15 17 18 23 26 27 33 36 37 46–48 53 60 65 66 70 75 76 78 83–85 90 94 97–100 102 104 139</sup> and family visits to patients should also be restricted.<sup>20–22 32 38 40 46 48 49 52–55 68 81 96 100 101 104 108 119 129 130 135 139</sup>

The teams must be trained<sup>18 25 27 49 54 85 107 125 126 128</sup> regarding measures to avoid self-contamination<sup>21 23 46 101 120</sup>; hand hygiene<sup>17 20 29 46 101 102 126 128</sup>; cleaning of environments,<sup>29 35 126</sup> equipment,<sup>29 35 65 126</sup> furniture and materials<sup>29 35</sup> and waste management.<sup>18 29</sup>

Contaminated equipment and materials must be transported along a one-way route.<sup>25 45 60 66 67 85 101 128</sup>

## Airway management

Eleven recommendations were created regarding the approach to the airways and the prevention of the spread of aerosols. Airway management should be performed early in clinically deteriorating patients,<sup>25 31 40 58 64 67 76 111 117</sup> avoiding emergency procedures.<sup>15 18 31 67 111</sup> Intubation must be carried out soon after,<sup>16 31 94 107 111 118</sup> and airway and upper trunk interventions (thoracotomy, endoscopy) must be performed by the most experienced professional.<sup>15–18 31 40 58 63 65 66 83 84 89 94 97 118 124 129 135</sup>

To prevent the spread of aerosols, it is recommended to avoid manual ventilation with the airway maintenance breathing unit,<sup>16 65 80 94</sup> nebulisation therapies<sup>56 101</sup> and non-invasive ventilation.<sup>16 70 91 107 129</sup> As some of these

**Table 1** Main characteristics of included papers

Paper characteristic	Categories	Results	
		N	(%)
Year of publication	2020	76	60.8
	2021	39	31.2
	2022	10	8.0
Paper source	Citation searching	26	20.8
	Database	29	23.2
	Website (Google Scholar)	31	24.8
	Organisations	39	31.2
Country of origin	USA	34	27.2
	Brazil	21	16.8
	Multicentre	17	13.6
	Italy	8	6.4
	Switzerland	8	6.4
	UK	8	6.4
	China	5	4.0
	Canada	4	3.2
	Singapore	3	2.4
	Spain	3	2.4
	India	2	1.6
	The Netherlands	2	1.6
	Poland	2	1.6
Method	Others	8	6.4
	Consensus of specialists	56	44.8
	Literature review	35	28.0
	Technical note	18	14.4
	Opinion of professional	7	5.6
	Commentary	6	4.8
	Guidelines	6	4.8
	Editorial	2	1.6
	Letter to the editor	2	1.6
	Case report	1	0.8
Hospital setting	Hospital health services	42	33.6
	Surgical centre	33	26.4
	Intensive care unit	11	8.8
	Gynaecology and obstetrics	8	6.4
	Inpatient unit	6	4.8
	Emergency unit	5	4.0
	Endoscopy and gastroenterology centres	5	4.0
	Paediatric	5	4.0
	Tracheal intubation	5	4.0
	Diagnostic centre	3	2.4
	Psychiatry	3	2.4
	Field hospitals	2	1.6
	Oncology	2	1.6
	Haemodynamic	1	0.8
	Intrahospital transport	1	0.8
	Orthopaedics	1	0.8

Continued



**Table 1** Continued

The sum of the methods exceeds 125 as some studies cited more than one method, the most common being a literature review and expert consensus. All types of reviews were classified solely as a literature review. The sum of scenarios exceeds 125 as some documents directed their recommendations to more than one hospital sector. Documents that cited different sectors or did not specify which sectors the recommendations would be applied to, were classified as hospital health services.

procedures are essential, closed systems,<sup>31 65 91 111 117 123</sup> disposable<sup>47 70</sup> and with filter<sup>17 23 31 56 87 92 98 110 118 120</sup> must be used, and are only performed in an environment with negative pressure.<sup>18 48 58 69 71 75 84 85 97 98 100 118</sup> The patient must be sedated for intubation, bronchoscopy and tracheostomy placement.<sup>17 47 56 65 84 85 94 97 114 118 124</sup> Extubation and aspiration should be conducted with strategies to minimise coughing.<sup>47 76 77 80 91 110 117 118</sup>

### Sanitary and hygiene measures

The 11 recommendations related to sanitary and hygiene issues propose that professionals keep their nails short, avoid wearing rings, bracelets, watches and other adornments<sup>37 40 44 58 102 127 137 139</sup>; wear private clothing in the hospital environment<sup>93 110</sup> and take a complete shower after removing the PPE and before putting on clean clothing.<sup>47 70 93 110 111</sup> Patients should clean their skin with soap and water<sup>102 110</sup> and pack their personal clothes in sealed bags.<sup>47 70 102</sup> Everyone (patients, accompanying persons and professionals) must wash their hands frequently, with standard technique, using alcohol products when they are visibly clean or soap and water when they are dirty.<sup>16 20 22 24 28 32-34 38-40 44 47 48 51 55 56 58 59 63 65 73 74 78 80 94 96 99-102 104 105 107 109 112 115 119-124 129-132 135 138 139</sup>

It is recommended that the environment and surfaces are disinfected twice a day and after each aerosol-generating procedure,<sup>21-23 54-56 59 76 77 96 105 107 111 121-123 129 131-134 138 139</sup> and terminal cleaning at each patient rotation.<sup>35 45 154 89 81 261 281 371 39</sup> Equipment must be cleaned after each use<sup>35 40 46 52 74 76 77 105 107 129 132 134 139</sup> and disinfected or sterilised between one patient and another, in the case of shared equipment.<sup>52 69 99 100 123 126 128</sup> To clean and disinfect the environment and equipment, use soap and water<sup>40</sup> or disinfectants containing a quaternary ammonium compound,<sup>49 139</sup> 70% ethyl alcohol,<sup>15 18 20 28 30 31 37 39 40 44 47 49 51 56 57 78 89 97 100 104 105 108 110 118 129 132 134 139</sup> sodium hypochlorite between 0.5% and 1%<sup>15 18 28 30 31 39 40 44 47 51 55 57 78 89 97 100 104 108 110 118 132 134 139</sup> or chlorine between 1% and 5%<sup>20 137</sup>; and sterilise N95 respirators with hydrogen peroxide or ultraviolet-C.<sup>82 100</sup> Hospital clothing should be washed with hot water (60°C–90°C) and soap or a textile decontaminant.<sup>102</sup>

### Personal protective equipment management

Four recommendations related to PPE were created, but each one of them has specific consequences. Health professionals should use PPE properly, following institutional and regulatory agency guidelines.<sup>15-18 20-23 25 26 30-33 35 36 38 41 42 44-48 50-53 56-58 60-69 71 72 74-79 82-92 94 96-98 100-102 104-112 115 117 118 120-125 127-129 131-137 139</sup> Forecasting and provision

must be made for the supply of sufficient quantity and to avoid shortages.<sup>21 24 25 39 42 67 72 99 101 108 112 115 119 125</sup>

All workers must wear a surgical mask in the hospital environment.<sup>23 30 32-34 51-55 57 60 64 69 72-76 80 81 86 89 93 96 102 107 108 112 115 120-124 127-129 133 135-137 139</sup> In the care of suspected or confirmed patients, health professionals must be properly dressed with: respiratory protection masks with a minimum efficiency of 95% in the filtration of particles up to 0.3 µm<sup>15-17 22 23 25 30-33 43 44 46 47 50-53 55-58 61 64 65 69 71-74 76 78 80 82-87 89-91 93 96 97 99 100 102 105 107 108 111 115 118 124-129 134-137 139</sup>; powered air purifying respirator<sup>15 16 25 43 45 58 61 64 65 69 71 74 76 80 84 85 89 90 102 111 115</sup>; disposable head protector<sup>16 17 31 44 47 56 72 76 78 80 87 91 97 100 102 108 112 115 118 125 126 129 139</sup>; long gowns and coveralls, with long, waterproof sleeves<sup>15-17 22 23 30-33 43 44 47 51-53 56 58 60 65 69 71 72 74 78 80 82 84 86 87 91 93 94 96 97 100 102 107 111 112 115 118 121-126 128 129 132 133 135 136 139</sup>; disposable gloves<sup>16-18 22 23 30-33 44 47 51-53 56 60 61 69 71 74 76 82 84 86 87 91 93 96 100 102 107 108 111 112 115 118 120-126 128 129 132 133 136 139</sup>; double gloves<sup>15 16 18 31 43 47 58 61 65 69 74 78 80 84 87 94 97 102 112 118 124 135</sup>; face shield<sup>15-17 31 32 44 46 47 52 53 56 64 69 73 78 83 84 86 87 97 100 102 107 111 115 118 129 135 139</sup>; goggles/eye protection<sup>15 16 22 23 30-33 43 44 46 47 51-53 56 64 71-74 76 78 80 82 84 86 87 89 91 93 96 97 100 102 107 111 112 115 118 120-126 128 129 136</sup>; waterproof shoes, boots or wellies<sup>31 33 79 91 113-116 134</sup> and disposable and waterproof protector for shoes,<sup>16 31 43 47 56 70 72 86 111</sup> in aerosol-generating procedures.<sup>15 17 18 22 23 26 32 35 36 41 44-48 50 51 53 56 58 61 64-66 69 71 73-75 77-80 83-87 89 90 92 97-99 101 102 104-111 115 117 118 120-123 126 129 135 136</sup> transport<sup>17 18 20 25 35 44 45 47 78 80 84 87 89 101 106 109 115 117 133</sup> and in operating rooms.<sup>15 18 26 32 45-48 50-53 61 69 75 77 78 80 83 84 87 97-99 104 105 110 112 115 117 134</sup> Professionals must be trained in the proper management of PPE,<sup>17 18 21 24 25 28 29 31 32 34-38 40 42 44 46 49 51 54 69 76 78 96 100-102 107 108 119 124 132-134 139</sup> including placement and removal in the proper sequence.<sup>17 18 21 38 47 58 59 65 67 70-72 78 94 96 99 118</sup>

Patients and accompanying persons should be instructed in the proper use of PPE.<sup>19 20 24 25 30-32 34-36 44-46 49 51-53 56 64 71 73-75 78 84 87-91 96 100-102 108 115 124 134 139</sup> All patients (patients without COVID-19, and those who are suspected and confirmed for COVID-19) must wear a surgical mask over the face, tracheostomy tube, ventilation face mask, nasal catheter and prongs.<sup>19-25 30-32 34-36 44-46 51-53 56 64 66 71-75 78 84 87 89-91 93 96 97 100-102 108 115 119 124 127 130 134 135 137 139</sup>

### Communication management

For effective communication, three recommendations were made. Guidelines and information on care processes<sup>20 28 46 87 101 128 131</sup> should be developed and disseminated through effective communication strategies<sup>15 17 20 22 26 28 35 49 51 69-71 75 92 103 108 114 116 134</sup> and virtual technological tools.<sup>20 26 30 37 39 58 85 90 101 103 106 116 134</sup> Open communication must be guaranteed to alleviate mental suffering for patients and workers.<sup>101</sup>

### DISCUSSION

Overall, studies have shown that to ensure hospitalised patient safety in the context of the COVID-19 pandemic, it is recommended that hospitals reorganise the hospital

ORGANISATION OF HEALTH SERVICES	
RECOMMENDATIONS REGARDING PATIENT FLOW	<ul style="list-style-type: none"> <li>Immediately isolating suspected or confirmed patients or professionals.</li> <li>Perform risk stratification for all patients, companions/visitors and professionals.</li> <li>Reduce non-emergency admissions and procedures.</li> <li>Restrict the movement of people in the hospital environment.</li> <li>Maintain physical distance.</li> </ul>
RECOMMENDATIONS REGARDING THE REORGANISATION OF THE HOSPITAL ENVIRONMENT	<ul style="list-style-type: none"> <li>Harmonizing the physical environment of the hospital, identifying exclusive areas of care for non-COVID-19 patients separated from suspected or confirmed patients.</li> <li>Provide rooms with negative pressure to perform aerosol-generating procedures. If this is not possible, adapt a room exclusively for this purpose.</li> <li>Reduce contaminable surfaces, keeping the minimum of furniture and equipment required in the procedure rooms.</li> <li>Establish one-way routes for transportation of patients and equipment.</li> </ul>
RECOMMENDATIONS REGARDING THE MANAGEMENT OF HUMAN RESOURCES	<ul style="list-style-type: none"> <li>Training teams to face the pandemic regarding, measures to avoid self-contamination; hand hygiene; cleaning of environments, equipment, furniture and material and waste management.</li> <li>Form specialized teams to treat suspected or confirmed patients.</li> <li>Keep the minimum number of professionals in the environments during the performance of aerosol-generating procedures and ensure that the most experienced professional performs risk procedures.</li> <li>Care for the psychological and emotional well-being of professionals, so that workers feel empowered to speak, ask questions, ask for help and report concerns without fear of repercussions or judgment.</li> <li>Remove or relocate professionals belonging to risk groups or who are sick.</li> </ul>
RECOMMENDATIONS REGARDING THE MANAGEMENT OF MATERIAL RESOURCES	<ul style="list-style-type: none"> <li>Ensure the proper supply and use of equipment and materials, giving preference to the use of disposable materials in the care of patients suspected or diagnosed with COVID-19.</li> <li>Plan in advance the performance of procedures, foreseeing required equipment and materials, providing kits with essential materials for each type of procedure, including PPE and emergency kits, which should be stored in places that are easily accessible and known to everyone.</li> </ul>
RECOMMENDATION REGARDING THE MANAGEMENT OF DEAD BODIES	<ul style="list-style-type: none"> <li>Ensure the isolation of dead bodies from suspected or confirmed patients.</li> </ul>
MANAGEMENT OF AIRWAYS	
RECOMMENDATIONS REGARDING THE PREVENTION OF THE DISSEMINATION OF AEROSOL	<ul style="list-style-type: none"> <li>Separate patients with invasive and non-invasive ventilation.</li> <li>Guide the practice of respiratory etiquette and mask use by the patient, including the nasal catheter.</li> <li>Avoid non-invasive ventilation; if it is imperative, use it only in isolation, maintain minimum oxygen flow, use a ventilator integrated with the expiratory valve and wear a helmet as an interface.</li> <li>Use closed systems with high efficiency particulate air filter in airway access equipment and devices.</li> <li>Avoid nebulization therapies; if inevitable, use inhalation activated system with filter and firmly attach the facial mask.</li> <li>Avoid manual bag-valve-mask ventilation and bag mask; if necessary, make sure that the mask is attached correctly.</li> <li>Avoid transporting patients on mechanical ventilation; if this is inevitable, use disposable closed circuits, vacuum the patient previously, cleaning the condensed water in the respirator and make the transfer as soon as possible.</li> </ul>
RECOMMENDATIONS REGARDING APPROACHING AIRWAYS	<ul style="list-style-type: none"> <li>Approach the airways, mainly in intubation and extubation, in a room with negative pressure and use of PPE by all involved.</li> <li>Perform rapid sequence intubation, preferably by the most experienced professional.</li> <li>Perform early intubation in cases of clinical deterioration of suspected and confirmed patients.</li> <li>Approach the airways using local/regional anaesthesia, sedation or general short-term anaesthesia, or high-dose neuromuscular blockers (avoid atomized local anaesthetics).</li> </ul>
SANITARY AND HYGIENE MEASURES	
RECOMMENDATIONS REGARDING PROFESSIONAL AND PATIENT HYGIENE	<ul style="list-style-type: none"> <li>Frequently perform standard hand hygiene.</li> <li>After the professional removes the PPE and hospital clothing and before putting on clean clothing, take a thorough shower.</li> <li>Maintain hygiene standards of the patient's skin with soap and water.</li> </ul>
RECOMMENDATIONS REGARDING THE HYGIENE OF THE ENVIRONMENT AND EQUIPMENT	<ul style="list-style-type: none"> <li>Perform terminal cleaning at each patient change, preferably with negative or neutral pressure and with the cleaning team wearing PPE.</li> <li>Establish a routine to disinfect environments and surfaces at least twice a day and after procedures generating aerosols, with the cleaning team wearing PPE.</li> <li>Perform cleaning and disinfection or sterilization of all equipment used in the care of suspected or confirmed patients.</li> <li>Perform disinfection or sterilization of the environment, surfaces and equipment with products containing a compound of quaternary ammonium, 70% ethyl alcohol, sodium hypochlorite between 0.5% and 1% or chlorine between 1% and 5%.</li> </ul>
RECOMMENDATIONS REGARDING THE HYGIENE OF THE CLOTHES OF PATIENTS AND PROFESSIONALS AND HOSPITAL CLOTHING	<ul style="list-style-type: none"> <li>Packing the personal clothing of suspected or confirmed inpatients.</li> <li>Provide private use clothing for professionals.</li> <li>Wash hospital clothing used by suspected or confirmed patients with a decontaminant.</li> </ul>
RECOMMENDATIONS REGARDING WASTE DISPOSAL	<ul style="list-style-type: none"> <li>Consider all waste from suspected or confirmed patients as infectious and dispose of it in sealed bio-risk packaging.</li> </ul>
MANAGEMENT OF COMMUNICATION	
RECOMMENDATIONS REGARDING MANAGEMENT OF COMMUNICATION	<ul style="list-style-type: none"> <li>Develop and disseminate guidelines, protocols, directives, and information on the care process.</li> <li>Employ virtual technological tools and strategies for effective communication.</li> <li>Establish open communication with the patient in order to reduce mental suffering.</li> </ul>

**Figure 2** Recommendations for the safety of hospitalised patients.

environment and patient flow and replan the management of human and material resources and of dead bodies. The approach and management of the airways must be carried out in a way so as to prevent the spread of aerosols. Intubation must be performed in rapid sequence, preferably by the most experienced professional, and patients with invasive and non-invasive ventilation must

be separated. Sanitary and hygiene measures must be taken by patients, accompanying persons, professionals and institutions, and the main measure is the correct and frequent washing of hands. Forecast, provision and management of PPE is necessary, and the team, patients and family members must be trained in its use. Finally, guidelines and protocols with information on fighting



## Box 1 Personal protective equipment (PPE) management recommendations

- ⇒ Manage forecast and provision of PPE.
- ⇒ Train the team, patients and family members to wear PPE.
- ⇒ Management of PPE by professionals:
  - ⇒ Correct use of PPE, following institutional and regulatory agency guidelines:
    - ⇒ Masks;
      - ⇒ Respiratory protection mask (particulate respirator), tested for fit, with a minimum efficiency in the filtration of 95% of particles up to 0.3 µm must be worn during surgeries, transport and in the execution of aerosol-generating procedures in suspected or confirmed patients;
      - ⇒ Surgical mask must be routinely worn in the hospital environment;
      - ⇒ Disposable head protector must be worn for performing aerosol-generating procedures and during transport and surgery of suspected or confirmed patients;
      - ⇒ Long gowns and coveralls, with long waterproof sleeves routinely worn in the care of the suspected or confirmed patient are strongly recommended in the performance of surgeries, aerosol-generating procedures and cardiopulmonary resuscitation;
      - ⇒ Disposable gloves must be routinely worn in the direct care of hospitalised patients;
      - ⇒ Face shields routinely worn in the care of suspected or confirmed patients are strongly recommended in aerosol-generating procedures, transport and in the operating room;
      - ⇒ Eye protection/protection goggles routinely worn in the care of suspected or confirmed patients are strongly recommended in aerosol-generating procedures, transport and in the operating room;
      - ⇒ Shoes, boots or overshoes resistant to fluids and easy to routinely decontaminate in the care of suspected or confirmed patients are strongly recommended in procedures that generate aerosols, transport and in the operating room.
  - ⇒ Follow the PPE wearing process, under the supervision of an experienced professional, in the following order: disposable hair cover, N95 respirator tested for adjustment, fluid-resistant gown, two layers of gloves, protection goggles and face shield, fluid-resistant shoe covers.
  - ⇒ Remove PPE in the following order: sanitise hands and remove face shield, protection goggles, fluid-resistant apron, outer gloves, shoe covers and inner gloves; then sanitise hands again and remove the N95 mask and hair cover under the supervision of an experienced professional. Dispose of everything in the recommended place.
- ⇒ Perform the management of PPE by patients and visitors/companions:
  - ⇒ Provide PPE to patients and visitors/companions and instruct them on its correct use.
  - ⇒ All patients (not COVID-19, suspected and confirmed) must wear a surgical mask over the face, tracheostomy tube, ventilation face mask, nasal catheter and prongs.
  - ⇒ Suspected and confirmed patients must wear N95 mask or similar.
  - ⇒ Visitors of patients with COVID-19 should wear a surgical mask, disposable gowns and coveralls and gloves.

the pandemic, with effective strategies for patients and professionals must be developed and disseminated.

The global presence of COVID-19 and the way in which it is transmitted highlight the need for the involvement and rapid responses of individuals and communities in the prevention and control of the pandemic.<sup>140</sup> It is clear that efforts have been made to involve patients and accompanying persons in order to achieve safe care, and this has been seen as one of the factors with the greatest positive impact on the patient's experience. This positive experience, in turn, results in increased patient safety and improves their perception of quality in healthcare.<sup>141 142</sup>

To ensure safe patient care during the pandemic, institutions and frontline professionals needed to quickly adjust to the sudden increase in the number of critically ill patients and the shortage of skilled labour.<sup>143</sup> At the beginning of the pandemic, there was also a shortage of PPE due to high demand, and administrative improvements were highlighted as essential to ensure the supply, distribution and training of health professionals and patients.<sup>24 25 39 101 108 131</sup> A study carried out in Ecuador, Brazil and Colombia identified serious deficiencies in PPE, insufficient training in relation to the prevention of infections and use of PPE and a lack of isolation protocols for health professionals.<sup>144</sup>

To meet the demand, health professionals endured unprecedented pressure. In addition to undergoing long working hours and many hours of training, they faced the fear of becoming infected and/or bringing infection to their families, concern about their own skills and patient safety and the loss of professional colleagues.<sup>143 145 146</sup>

Currently, even with demand regulated and vaccination reaching all continents, the efficient management of the pandemic is still essential. To face similar contexts, hospitals need to devise strategies to increase their capacity for care and, quickly adapt human resources.<sup>147</sup>

The recommendations presented in this review summarise the best practices produced up until now. The thorough search made by the review, involving scientific databases, grey literature and official documents from reference health institutions, together with the rigorously applied method, corroborate the reliability of the data presented and the applicability of the recommendations in the intrahospital context, in the COVID-19 pandemic and in any respiratory epidemic. The review process was performed independently by peer reviewers, and the research team was trained to conduct scoping reviews and developed a prior research protocol.

The primary weakness of this review is that most studies are those of the expert consensus type. Nevertheless, as the context is that of a pandemic, both clinical practice guidelines and expert opinion are the best available evidence. Many studies describing practices and procedures emerged in the research but were excluded because the research question sought recommendations for patient safety. As the qualitative grouping of the data analysis is a subjective process, there may have been some suppression of information. The predominance

of documents of the expert consensus type, analysed in this scoping review, demonstrates the emerging nature of the issue as it is essential to act urgently in order to control the COVID-19 pandemic.<sup>148</sup> This scoping review is the initial step in mapping out recommendations for hospitalised patient safety, and there is a need for further research and an assessment of the effectiveness of these recommendations.

Given the possibility that we will be living together with SARS-CoV-2 and its variants, there is a need to carry out risk management, maintaining the recommendations of safe practices both for reducing transmission to patients and for the protection of health professionals. In this sense, the recommendations mapped in this scoping review serve as a basis for planning and implementing good practices to ensure safe hospital care, during and after COVID-19.

## CONCLUSION

Forty-six recommendations for the provision of safe care to hospitalised patients, with regard to the scenario of the current pandemic have been described in this scoping review. Strategies for change in the organisation of health services to assist infected people have been highlighted, mainly focusing on the proper use of PPE and airway management, practices that have been consolidated throughout the pandemic and which will be reflected in other possible similar future situations. The engagement of everyone involved in the care of hospitalised patients is essential to consolidate the mapped recommendations and provide dignified, safe and quality care.

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## REFERENCES

- Zhu N, Zhang D, Wang W, *et al.* A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 2020;382:727–33.
- Chen N, Zhou M, Dong X, *et al.* Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020;395:507–13.
- Mehta P, McAuley DF, Brown M, *et al.* COVID-19: consider cytokine storm syndromes and immunosuppression. *Lancet* 2020;395:1033–4.
- Pereira EF. A pandemia de Covid-19 Na UTI. *Horizontes Antropológicos* 2021;27:49–70.
- Dos Santos MJ, Martins MS, Santana FLP. COVID-19: instruments for the allocation of mechanical ventilators- a narrative review. *Crit Care* 2020;24:1–10.
- Denning M, Goh ET, Scott A. What has been the impact of Covid-19 on safety culture? A case study from a large metropolitan healthcare trust. *Int J Environ Res Public Health* 2020;17:7034.
- Singh H, Sittig DF, Gandhi TK. Fighting a common enemy: a catalyst to close intractable safety gaps. *BMJ Qual Saf* 2021;30:141–5.
- Jha AK, Prasopa-Plaizier N, Larizgoitia I. Patient safety research: an overview of the global evidence. *Qual Saf Heal Care* 2010;19:42–7.
- Martins MS, Lourenção DC de A, Pimentel RR da S. Recommendations for the safety of hospitalized patients in the context of the COVID-19 pandemic: a scoping review protocol, 2021. Available: <https://osf.io/z7ygi/> [Accessed 18 Nov 2021].
- Peters M, Godfrey C, McInerney P. Chapter 11: Scoping Reviews. In: *JBI Manual for Evidence Synthesis*. JBI 2020.
- Tricco AC, Lillie E, Zarin W, *et al.* PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;169:467–73.
- Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32.
- Bardin L. *Análise de Conteúdo*. São Paulo 2016.
- Page MJ, McKenzie JE, Bossuyt PM, *et al.* The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71.
- Herman JA, Urits I, Kaye AD, *et al.* COVID-19: anesthesia management recommendations. *J Clin Anesth* 2022;79:109840.
- Luo M, Cao S, Wei L, *et al.* Precautions for Intubating patients with COVID-19. *Anesthesiology* 2020;132:1616–8.
- Orser BA. Recommendations for endotracheal intubation of COVID-19 patients. *Anesth Analg* 2020;130:1109–10.
- Cook TM, El-Boghdady K, McGuire B, *et al.* Consensus guidelines for managing the airway in patients with COVID -19. *Anaesthesia* 2020;75:785–99.
- Uppal V, Sondekoppam RV, Landau R, *et al.* Neuraxial anaesthesia and peripheral nerve blocks during the COVID-19 pandemic: a literature review and practice recommendations. *Anaesthesia* 2020;75:1350–63.
- Barnett B, Esper F, Foster CB. Keeping the wolf at Bay: infection prevention and control measures for inpatient psychiatric facilities in the time of COVID-19. *Gen Hosp Psychiatry* 2020;66:51–3.
- Mahgoub N, Agarkar S, Radosta M, *et al.* Inpatient psychiatry unit devoted to COVID-19 patients. *Compr Psychiatry* 2021;107:152237.



- 22 Schultz KM, Miller PB, Stancill L, *et al.* Strategies utilized to prevent and control SARS-CoV-2 transmission in two congregate, psychiatric healthcare settings during the pandemic. *Am J Infect Control* 2022;50:536–41.
- 23 Gilat R, Haunschild ED, Tauro T, *et al.* Recommendations to Optimize the Safety of Elective Surgical Care While Limiting the Spread of COVID-19: *Primum Non Nocere*. *Arthrosc Sports Med Rehabil* 2020;2:e177–83.
- 24 Lauck S, Forman J, Borregaard B, *et al.* Facilitating transcatheter aortic valve implantation in the era of COVID-19: recommendations for programmes. *Eur J Cardiovasc Nurs* 2020;19:537–44.
- 25 Liew MF, Siow WT, Yau YW, *et al.* Safe patient transport for COVID-19. *Crit Care* 2020;24:94.
- 26 Wu V, Noel CW, Forner D, *et al.* Considerations for head and neck oncology practices during the coronavirus disease 2019 (COVID-19) pandemic: Wuhan and Toronto experience. *Head Neck* 2020;42:1202–8.
- 27 Garnica M, Maiolino A. COVID and hematology: special considerations regarding patient safety, gold standard therapies and safety for health care professionals. *Hematol Transfus Cell Ther* 2020;42:111–2.
- 28 Agência Nacional de Vigilância Sanitária. Nota técnica GVIMS/ GGES/ANVISA no 08/2020. Orientações gerais para implantação das práticas de segurança do paciente em hospitais de campanha e nas demais estruturas provisórias para atendimento aos pacientes durante a pandemia de COVID-19, 2020. Available: <https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/nota-tecnica-no-08-de-2020-gvims-gges-anvisa-hospitais-de-campanha.pdf/view>
- 29 Agência Nacional de Vigilância Sanitária. Nota técnica no 69/2020 / SEI / GRECS / GGES / DIRE1 / ANVISA. Orientações gerais sobre Hospital de campanha durante a pandemia Internacional ocasionada pelo coronavírus SARS-CoV-2, 2020. Available: <https://www.gov.br/anvisa/pt-br/arquivos-noticias-anvisa/650json-file-1> [Accessed 13 Sep 2021].
- 30 Chan KJ, Beck C, Chauvin-Kimoff L, *et al.* The acute management of COVID-19 in paediatrics (spring 2021 update), 2021. Available: <https://www.cps.ca/documents/position/the-acute-management-of-paediatric-coronavirus-disease-2019covid-19> [Accessed 6 Sep 2021].
- 31 Terheggen U, Heiring C, Kjellberg M, *et al.* European consensus recommendations for neonatal and paediatric retrievals of positive or suspected COVID-19 patients. *Pediatr Res* 2021;89:1094–100.
- 32 Trisolino G, Origo CE, De Sanctis N, *et al.* Recommendations from the Italian Society of pediatric orthopaedics and Traumatology for the management of pediatric orthopaedic patients during the COVID19 pandemic and post-pandemic period in Italy. *Ital J Pediatr* 2020;46:149.
- 33 Queiroz AP, Santos Cdos, Reis Greice Milena Sant'Ana, *et al.* Hospital admission flow and nutritional support in a cohort of pediatric patients with COVID-19. *Rev Bras Saude Mater Infant* 2021;21:287–92.
- 34 van Veenendaal NR, Deierl A, Bacchini F, *et al.* Supporting parents as essential care partners in neonatal units during the SARS-CoV-2 pandemic. *Acta Paediatr* 2021;110:2008–22.
- 35 Beitzke D, Salgado R, Francone M, *et al.* Cardiac imaging procedures and the COVID-19 pandemic: recommendations of the European Society of cardiovascular radiology (ESCR). *Int J Cardiovasc Imaging* 2020;36:1801–10.
- 36 Desai U, Kassardjian CD, Del Toro D, *et al.* Guidance for resumption of routine electrodiagnostic testing during the COVID-19 pandemic. *Muscle Nerve* 2020;62:176–81.
- 37 San-Juan D, Jiménez CR, Camilli CX, *et al.* Guidance for clinical neurophysiology examination throughout the COVID-19 pandemic. Latin American chapter of the IFCN task force - COVID-19. *Clin Neurophysiol* 2020;131:1589–98.
- 38 de Andrés-Gimeno B, Solís-Muñoz M, Revuelta-Zamorano M. Cuidados enfermeros en El paciente Adulto ingresado en unidades de hospitalización POR COVID-19. *Enfermería Clínica* 2021;31:S49–54.
- 39 Heitzman J, Gosek P. Polish experiences of safety measures involving forensic psychiatric inpatients implemented during the SARS-CoV-2 pandemic. *Front Psychiatry* 2020;11:576703.
- 40 World Health Organization. Clinical management of COVID-19: living guidance, 2021. Available: [https://apps.who.int/iris/bitstream/handle/10665/338871/WHO-2019-nCoV-clinical-web\\_annex-2021.1-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/338871/WHO-2019-nCoV-clinical-web_annex-2021.1-eng.pdf)
- 41 McGrath BA, Ashby N, Birchall M, *et al.* Multidisciplinary guidance for safe tracheostomy care during the COVID-19 pandemic: the NHS national patient safety improvement programme (NatPatSIP). *Anaesthesia* 2020;75:1659–70.
- 42 Białoszewski AZ, Gołab-Beltowicz D, Raulinajtys-Grzybek M. Organization of a hospital ward aimed at admitting patients with SARS-CoV-2: an economic and epidemiological perspective. *Int J Environ Res Public Health* 2021;18:9446.
- 43 Kim YJ, Choe JY, Kwon KT, *et al.* How to keep patients and staff safe from accidental SARS-CoV-2 exposure in the emergency room: lessons from South Korea's explosive COVID-19 outbreak. *Infect Control Hosp Epidemiol* 2021;42:18–24.
- 44 Ang TL, Li JW, Vu CKF, *et al.* Chapter of Gastroenterologists professional guidance on risk mitigation for gastrointestinal endoscopy during COVID-19 pandemic in Singapore. *Singapore Med J* 2020;61:345–9.
- 45 Ang TL. Gastrointestinal endoscopy during COVID-19 pandemic. *J Gastroenterol Hepatol* 2020;35:701–2.
- 46 Ferreira-Silva J, Peixoto A, Rodrigues-Pinto E, *et al.* Implications of COVID-19 for the busy gastroenterologist. *Eur J Gastroenterol Hepatol* 2021;33:319–24.
- 47 Pate BS, Yeola ME, Gawande A, *et al.* Best practices for endoscopic procedures in Covid-19 pandemic. *J Evol Med Dent Sci* 2020;9:3760–6.
- 48 Francis N, Dort J, Cho E, *et al.* SAGES and EAES recommendations for minimally invasive surgery during COVID-19 pandemic. *Surg Endosc* 2020;34:2327–31.
- 49 Centers for Disease Control and Prevention U. Considerations for inpatient obstetric healthcare settings, 2020. Available: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/inpatient-obstetric-healthcare-guidance.html> [Accessed 6 Sep 2021].
- 50 Patrick NA, Johnson TS. Maintaining Maternal-Newborn safety during the COVID-19 pandemic. *Nurs Womens Health* 2021;25:212–20.
- 51 Boelig RC, Manuck T, Oliver EA, *et al.* Labor and delivery guidance for COVID-19. *Am J Obstet Gynecol MFM* 2020;2:100110.
- 52 Stephens AJ, Barton JR, Bentum N-AA, *et al.* General guidelines in the management of an obstetrical patient on the labor and delivery unit during the COVID-19 pandemic. *Am J Perinatol* 2020;37:829–36.
- 53 The ObGProject. COVID-19: the SMFM/SOAP guidelines for labor and delivery, 2020. Available: <https://www.obgproject.com/2020/03/29/covid-19-the-smfm-soap-guidelines-for-labor-and-delivery/> [Accessed 6 Sep 2021].
- 54 Royal College of Obstetricians e Gynaecologists. Coronavirus (COVID-19) infection in pregnancy. *R Coll Obstet e Gynaecol* 2020.
- 55 DiLorenzo MA, O'Connor SK, Ezekwesili C, *et al.* COVID-19 guidelines for pregnant women and new mothers: a systematic evidence review. *Int J Gynecol. Obstet.* 2021;153:373–82.
- 56 Respiratory Care Committee of Chinese Thoracic Society. Expert consensus on preventing nosocomial transmission during respiratory care for critically ill patients infected by 2019 novel coronavirus pneumonia. *Chinese J Tuberc Respir Dis* 2020;43:288–96.
- 57 Abrams ER, Rose G, Fields JM, *et al.* Point-of-Care ultrasound in the evaluation of COVID-19. *J Emerg Med* 2020;59:403–8.
- 58 Brown CA, Mosier JM, Carlson JN, *et al.* Pragmatic recommendations for intubating critically ill patients with suspected COVID-19. *J Am Coll Emerg Physicians Open* 2020;1:80–4.
- 59 Pedicelli A, Valente I, Pilato F, *et al.* Stroke priorities during COVID-19 outbreak: acting both fast and safe. *J Stroke Cerebrovasc Dis* 2020;29:104922.
- 60 Qureshi AI, Abd-Allah F, Al-Senani F, *et al.* Management of acute ischemic stroke in patients with COVID-19 infection: report of an international panel. *Int J Stroke* 2020;15:540–54.
- 61 Bansal A, Goldstein D, Schettle S, *et al.* Institutional preparedness strategies for heart failure, durable left ventricular assist device, and heart transplant patients during the coronavirus disease 2019 (COVID-19) pandemic. *J Thorac Cardiovasc Surg* 2021;162:131–5.
- 62 Bier-Laning C, Cramer JD, Roy S, *et al.* Tracheostomy during the COVID-19 pandemic: comparison of international perioperative care protocols and practices in 26 countries. *Otolaryngol Head Neck Surg* 2021;164:1136–47.
- 63 Brown E, Chan LM. Should chest compressions be considered an aerosol-generating procedure? A literature review in response to recent guidelines on personal protective equipment for patients with suspected COVID-19. *Clin Med* 2020;20:e154–9.
- 64 Cheung JC-H, Ho LT, Cheng JV, *et al.* Staff safety during emergency airway management for COVID-19 in Hong Kong. *Lancet Respir Med* 2020;8:e19.
- 65 Meister KD, Pandian V, Hillel AT, *et al.* Multidisciplinary safety recommendations after tracheostomy during COVID-19 pandemic: state of the art review. *Otolaryngol Head Neck Surg* 2021;164:984–1000.

- 66 Michetti CP, Burlew CC, Bulger EM, *et al.* Performing tracheostomy during the Covid-19 pandemic: guidance and recommendations from the critical care and acute care surgery committees of the American association for the surgery of trauma. *Trauma Surg Acute Care Open* 2020;5:e000482.
- 67 Wax RS, Christian MD. Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients. *Can J Anaesth* 2020;67:568–76.
- 68 Angamuthu N, Geraldine Gagasa E, Baker D, *et al.* Transmission of infection among health care personnel performing surgical tracheostomies on COVID-19 patients. *Surgeon* 2021;19:e304–9.
- 69 BLDM B, Nigri G, Tinelli A. COVID-19: pandemic surgery guidance. *4open* 2020;3:1.
- 70 Coccolini F, Perrone G, Chiarugi M, *et al.* Surgery in COVID-19 patients: operational directives. *World J Emerg Surg* 2020;15:25.
- 71 Dexter F, Parra MC, Brown JR, *et al.* Perioperative COVID-19 defense: an evidence-based approach for optimization of infection control and operating room management. *Anesth Analg* 2020;131:37–42.
- 72 Fader AN, Huh WK, Kesterson J, *et al.* When to operate, Hesitate and Reintegrate: Society of gynecologic oncology surgical considerations during the COVID-19 pandemic. *Gynecol Oncol* 2020;158:236–43.
- 73 Forlenza EM, Chahla J, Forsythe B. Protecting surgical patient safety during the coronavirus disease 2019 (COVID-19) pandemic. *Arthrosc Sport Med Rehabil* 2021;3:e615–8.
- 74 Forrester JD, Nassar AK, Maggio PM, *et al.* Precautions for operating room team members during the COVID-19 pandemic. *J Am Coll Surg* 2020;230:1098.
- 75 George M, Alexander A, Mathew J, *et al.* Proposal of a timing strategy for cholesteatoma surgery during the COVID-19 pandemic. *Eur Arch Otorhinolaryngol* 2020;277:2619–23.
- 76 Givi B, Schiff BA, Chinn SB, *et al.* Safety recommendations for evaluation and surgery of the head and neck during the COVID-19 pandemic. *JAMA Otolaryngol Head Neck Surg* 2020;146:579.
- 77 Heffernan DS, Evans HL, Huston JM, *et al.* Surgical infection Society guidance for operative and peri-operative care of adult patients infected by the severe acute respiratory syndrome Coronavirus-2 (SARS-CoV-2). *Surg Infect* 2020;21:301–8.
- 78 Jessop ZM, Dobbs TD, Ali SR, *et al.* Personal protective equipment for surgeons during COVID-19 pandemic: systematic review of availability, usage and rationing. *Br J Surg* 2020;107:1262–80.
- 79 Awad ME, Rumley JCL, Vazquez JA, *et al.* Perioperative considerations in urgent surgical care of suspected and confirmed COVID-19 orthopaedic patients: operating room protocols and recommendations in the current COVID-19 pandemic. *J Am Acad Orthop Surg* 2020;28:451–63.
- 80 Kaye K, Paprottka F, Escudero R, *et al.* Elective, non-urgent procedures and aesthetic surgery in the wake of SARS-COVID-19: considerations regarding safety, feasibility and impact on clinical management. *Aesthetic Plast Surg* 2020;44:1014–42.
- 81 King JH, Aquino JM, Anzures RG. COVID-19 testing recommendations prior to elective ophthalmic surgeries. *Philipp J Ophthalmol* 2021;15–19.
- 82 Lie SA, Wong SW, Wong LT, *et al.* Practical considerations for performing regional anesthesia: lessons learned from the COVID-19 pandemic. *Can J Anaesth* 2020;67:885–92.
- 83 Massey PA, McClary K, Zhang AS, *et al.* Orthopaedic surgical selection and inpatient paradigms during the coronavirus (COVID-19) pandemic. *J Am Acad Orthop Surg* 2020;28:436–50.
- 84 Mihalj M, Mosbahi S, Schmidli J, *et al.* Providing safe perioperative care in cardiac surgery during the COVID-19 pandemic. *Best Pract Res Clin Anaesthesiol* 2021;35:321–32.
- 85 Panda N, Etheridge JC, Singh T, *et al.* We asked the experts: the who surgical safety checklist and the COVID-19 pandemic: recommendations for content and implementation adaptations. *World J Surg* 2021;45:1293–6.
- 86 Piazza M, Xodo A, Squizzato F, *et al.* The challenge of maintaining necessary vascular and endovascular services at a referral center in Northern Italy during the COVID-19 outbreak. *Vascular* 2021;29:477–85.
- 87 Pieracci FM, Burlew CC, Spain D, *et al.* Tube thoracostomy during the COVID-19 pandemic: guidance and recommendations from the AAST acute care surgery and critical care committees. *Trauma Surg Acute Care Open* 2020;5:e000498.
- 88 Ribeiro R, Wainstein AJA, de Castro Ribeiro HS, *et al.* Perioperative cancer care in the context of limited resources during the COVID-19 pandemic: Brazilian Society of surgical oncology recommendations. *Ann Surg Oncol* 2021;28:1289–97.
- 89 Salica JP, Potilinski C, Querci M, *et al.* A year of living dangerously: challenges and recommendations for safely performing ophthalmic surgery during the COVID-19 pandemic, from start to Finish. *Clin Ophthalmol* 2021;15:261–78.
- 90 Bajunaid K, Sabbagh AJ, Aylan A, *et al.* Consensus statement of the Saudi association of neurological surgery (SANS) on triage of neurosurgery patients during COVID-19 pandemic in Saudi Arabia. *Neurosciences* 2020;25:148–51.
- 91 Şentürk M, El Tahan MR, Szegedi LL, *et al.* Thoracic anesthesia of patients with suspected or confirmed 2019 novel coronavirus infection: preliminary recommendations for airway management by the European association of cardiothoracic Anaesthesiology thoracic subspecialty Committee. *J Cardiothorac Vasc Anesth* 2020;34:2315–27.
- 92 Wexner SD, Cortés-Guiral D, Gilshtein H, *et al.* COVID-19: impact on colorectal surgery. *Colorectal Dis* 2020;22:635–40.
- 93 American College of Surgeons. COVID-19: considerations for optimum surgeon protection before, during, and after operation, 2020. Available: <https://www.facs.org/covid-19/clinical-guidance/surgeon-protection> [Accessed 6 Sep 2021].
- 94 Balakrishnan K, Schechtman S, Hogikyan ND, *et al.* COVID-19 pandemic: what every Otolaryngologist-Head and neck surgeon needs to know for safe airway management. *Otolaryngol Head Neck Surg* 2020;162:804–8.
- 95 Barie PS, Ho VP, Hunter CJ, *et al.* Surgical infection Society guidance for restoration of surgical services during the coronavirus Disease-2019 pandemic. *Surg Infect* 2021;22:818–27.
- 96 Bonano JC, Huddleston JL. Perioperative medical and surgical coronavirus disease 2019 issues: keeping surgeons, operating room teams, and patients safe. *J Arthroplasty* 2021;36:S46–8.
- 97 Bowdle A, Jelacic S, Shishido S, *et al.* Infection prevention precautions for routine anesthesia care during the SARS-CoV-2 pandemic. *Anesth Analg* 2020;131:1342–54.
- 98 Agência Nacional de Vigilância Sanitária. Nota técnica GVIMS/ GGES/ANVISA no 06/2020. Orientações para a prevenção E E controle das infecções pelo novo Coronavírus (SARS-CoV-2) em procedimentos cirúrgicos, 2020. Available: <https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/nota-tecnica-06-2020-gvims-gges-anvisa.pdf/view>
- 99 Bresadola V, Biddau C, Puggioni A, *et al.* General surgery and COVID-19: review of practical recommendations in the first pandemic phase. *Surg Today* 2020;50:1159–67.
- 100 Inglis R, Barros L, Checkley W, *et al.* Pragmatic recommendations for safety while caring for hospitalized patients with COVID-19 in low- and middle-income countries. *Am J Trop Med Hyg* 2020;104:12–24.
- 101 La Regina M, Tanzini M, Venneri F. Patient safety recommendations for COVID-19 epidemic outbreak lessons from the Italian experience 2020.
- 102 Martín-Vaquero Y, González-Sanz A, Muñoz-Martín B. Manejo seguro de la ropa E higiene de la piel en pacientes Y profesionales sanitarios frente a la COVID-19: Scoping review. *Enfermería Clínica* 2021;31:S89–93.
- 103 Ribeiro AP, Oliveira GL, Silva LS. Saúde E segurança de profissionais de saúde no atendimento a pacientes no contexto da pandemia de Covid-19: revisão de literatura. *Rev Bras Saúde Ocup* 2020;45.
- 104 Shao F, Sun P, Tang Z. Cardiopulmonary resuscitation of inpatients with severe COVID-19 pneumonia: the Wuhan experience. *Resuscitation* 2020;152:95–6.
- 105 Skulstad H, Cosyns B, Popescu BA, *et al.* COVID-19 pandemic and cardiac imaging: EACVI recommendations on precautions, indications, prioritization, and protection for patients and healthcare personnel. *Eur Heart J Cardiovasc Imaging* 2020;21:592–8.
- 106 Sociedade Brasileira para a Qualidade do Cuidado e Segurança do Paciente. 10 orientações práticas para O gerenciamento do uso de oxigênio em unidades hospitalares, 2021. Available: [https://drive.google.com/file/d/1C3zyNSB0c-V3\\_3ou-OgssAW13651XfsL/view](https://drive.google.com/file/d/1C3zyNSB0c-V3_3ou-OgssAW13651XfsL/view) [Accessed 13 Sep 2021].
- 107 Sorbello M, El-Boghdady K, Di Giacinto I, *et al.* The Italian coronavirus disease 2019 outbreak: recommendations from clinical practice. *Anaesthesia* 2020;75:724–32.
- 108 Velly L, Gayat E, Quintard H, *et al.* Guidelines: anaesthesia in the context of COVID-19 pandemic. *Anaesth Crit Care Pain Med* 2020;39:395–415.
- 109 Gandhi TK, Singh H. Reducing the risk of diagnostic error in the COVID-19 era. *J Hosp Med* 2020;15:363–6.
- 110 Wilson NM, Norton A, Young FP, *et al.* Airborne transmission of severe acute respiratory syndrome coronavirus-2 to healthcare workers: a narrative review. *Anaesthesia* 2020;75:1086–95.
- 111 Zuo M-Z, Huang Y-G, Ma W-H, *et al.* Expert recommendations for tracheal intubation in critically ill patients with Novel coronavirus



- disease 2019. *Chin Med Sci J* 2020;0:0. doi:10.24920/003724. [Epub ahead of print: 27 02 2020].
- 112 Pan S-C, Hsu M-C, Chang H-H, et al. Prospective health surveillance for COVID-19 among health care workers at a university medical center in Taiwan, January to June 2020. *J Formos Med Assoc* 2022;121:613–22.
- 113 World Health Organization. Care, cleaning and disinfection of high flow nasal cannula, 2022. Available: <https://www.who.int/publications/m/item/care-cleaning-and-disinfection-of-high-flow-nasal-cannula>
- 114 World Health Organization. Care, cleaning and disinfection of invasive mechanical ventilators, 2022. Available: <https://www.who.int/publications/m/item/care-cleaning-and-disinfection-of-nvasive-mechanical-ventilators>
- 115 World Health Organization. Care, cleaning and disinfection of oxygen concentrators, 2022. Available: <https://www.who.int/publications/m/item/care-cleaning-and-disinfection-of-oxygen-concentrators>
- 116 World Health Organization. Care, cleaning and disinfection of pulse oximeters and patient monitors devices, 2022. Available: <https://www.who.int/publications/m/item/care-cleaning-and-disinfection-of-pulse-oximeters-and-patient-monitors-devices>
- 117 Sociedade Brasileira de Anestesiologia. COLETÂNEA SBA COVID-19, 2021. Available: <https://sbahq.org/ebook/>
- 118 Sociedade Brasileira de Anestesiologia.. COLETÂNEA SBA COVID-19, 2022. Available: <https://sbahq.org/ebook/>
- 119 Ministério da Saúde Brasil. Diretrizes para a Atenção Especializada no Contexto da Pandemia de COVID-19, 2021. Available: [https://www.gov.br/saude/pt-br/media/pdf/2021/julho/30/diretrizes-da-atencao-especializada-no-contexto-da-pandemia-de-covid-19-30\\_07\\_2021-1.pdf/view](https://www.gov.br/saude/pt-br/media/pdf/2021/julho/30/diretrizes-da-atencao-especializada-no-contexto-da-pandemia-de-covid-19-30_07_2021-1.pdf/view)
- 120 Agência Nacional de Vigilância Sanitária Brasil. Nota técnica GVIMS / GGTES / ANVISA no 04/2020. Orientações para serviços de saúde: medidas de prevenção E controle que devem Ser adotadas durante a assistência aos casos suspeitos ou confirmados de infecção pelo novo Coronavírus (SARS-CoV-2), 2020. Available: <https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/nota-tecnica-n-04-2020-gvims-ggtes-anvisa-atualizada.pdf/view>
- 121 Ministério da Saúde Brasil. Secretaria de Vigilância em Saúde. Guia de Vigilância Epidemiológica: Emergência de Saúde Pública de Importância Nacional pela COVID-19, 2022. Available: [www.saude.gov.br](http://www.saude.gov.br)
- 122 Centers for Disease Control and Prevention. Interim guidelines for collecting and handling of clinical specimens for COVID-19 testing, 2022. Available: <https://www.cdc.gov/coronavirus/2019-nCoV/lab/guidelines-clinical-specimens.html>
- 123 do PPR, Ventura CAA, Rigotti AR. Linking worker safety to patient safety: recommendations and bioethical issues for the care of patients in the COVID-19 pandemic. *Texto Context - Enferm* 2021;30:1–11.
- 124 Ministério da Saúde Brasil, Agência Nacional de Vigilância. Maternidade na pandemia: O que já se sabe Na gestação em tempos de Covid-19? 2021. Available: <https://www.gov.br/saude/pt-br/assuntos/saude-brasil/combate-ao-coronavirus/noticias/2021/maternidade-na-pandemia-o-que-ja-se-sabe-sobre-a-gestacao-em-tempos-de-covid-19>
- 125 Agência Nacional de Vigilância Sanitária Brasil. NOTA TÉCNICA GVIMS/GGTES/ANVISA no 04/2021 Orientações para vigilância, identificação, prevenção E controle de infecções fúngicas invasivas em serviços de saúde no contexto da pandemia da COVID-19 – Atualizada; 2021.
- 126 National Health Surveillance Agency Brazil. Technical note GVIMS/ GGTES/ANVISA no 05/2021 guidelines for the prevention and control of the spread of multidrug-resistant microorganisms in health services in the context of the COVID-19 pandemic; 2021: 1–37.
- 127 National Health Surveillance Agency Brazil. Technical note GVIMS/GGTES/ANVISA no 07/2020 guidelines for prevention and epidemiological surveillance of sars-cov-2 (covid-19) infections within health services; 2022: 3–94. [https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/nt-07-2020\\_covid-em-servicos-saude\\_atualizada-em\\_09-03-2022.pdf/view](https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/nt-07-2020_covid-em-servicos-saude_atualizada-em_09-03-2022.pdf/view)
- 128 La Regina M, Tanzini M, Fineschi V. Patient safety recommendations for COVID-19 pandemic outbreak 2021.
- 129 Asensio-Samper JM, Quesada-Carrascosa M, Fabregat-Cid G, et al. Practical recommendations for the management of the patient with chronic pain during the pandemic of COVID-19. *Rev Esp Anestesiol Reanim* 2021;68:495–503.
- 130 World Health Organization. WHO recommendations on mask use by health workers, in light of the omicron variant of concern, 2021. Available: [https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC\\_Masks-Health\\_Workers-Omicron\\_variant-2021.1](https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC_Masks-Health_Workers-Omicron_variant-2021.1)
- 131 National Health Surveillance Agency Brazil. Technical Note GVIMS/ GGTES/ANVISA No 07/2020. Guidelines for the prevention and epidemiological surveillance of SARS-CoV-2 (COVID-19) infections within health services, 2020. Available: <https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/nota-tecnica-no-07-de-2020/view>
- 132 World Health Organization. Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed, 2020. Available: <https://apps.who.int/iris/rest/bitstreams/1272420/retrieve>
- 133 Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Higiene das mãos Segundos que salvam vidas; 2021. <https://www.gov.br/anvisa/pt-br/assuntos/noticias-anvisa/2021/higiene-das-maos-segundos-que-salvam-vidas>
- 134 Chavez S, Long B, Koyfman A, et al. Coronavirus disease (COVID-19): a primer for emergency physicians. *Am J Emerg Med* 2021;44:220–9.
- 135 Cho HJ, Feldman LS, Keller S, et al. Choosing wisely in the COVID-19 era: preventing harm to healthcare workers. *J Hosp Med* 2020;15:360–2.
- 136 Cook TM. Personal protective equipment during the coronavirus disease (COVID) 2019 pandemic - a narrative review. *Anaesthesia* 2020;75:920–7.
- 137 European Centre for Disease Prevention and Control. Disinfection of environments in healthcare and non-healthcare settings potentially contaminated with SARS-CoV-2, 2020. Available: <https://echa.europa.eu/covid-19>
- 138 Felten-Barentsz KM, van Oorsouw R, Klooster E, et al. Recommendations for hospital-based physical therapists managing patients with COVID-19. *Phys Ther* 2020;100:1444–57.
- 139 Brazil, National Health Surveillance Agency ANVISA. Technical note GVIMS/GGTES/ANVISA no 04/2020 guidelines for health services: prevention and control measures that must be adopted when assisting suspected or confirmed cases of infection with the new coronavirus (Sars-CoV-2) – updated 2022; 2022: 118.
- 140 Gilmore B, Ndeji R, Tchetchia A, et al. Community engagement for COVID-19 prevention and control: a rapid evidence synthesis. *BMJ Glob Health* 2020;5:e003188.
- 141 Sargent SK, Waldman R. The patient experience and safety. *Obstet Gynecol Clin North Am* 2019;46:199–214.
- 142 Patient Engagement Action Team. Engaging patients in patient safety a Canadian guide engaging patients in patient safety: a Canadian guide the engaging patients in patient Safety-a Canadian guide, 2019. Available: [www.patientsafetyinstitute.ca/engagingpatients](http://www.patientsafetyinstitute.ca/engagingpatients) [Accessed 25 Oct 2021].
- 143 Panda N, Sinyard RD, Henrich N, et al. Redeployment of health care workers in the COVID-19 pandemic: a qualitative study of health system leaders' strategies. *J Patient Saf* 2021;17:256–63.
- 144 Martín-Delgado J, Viteri E, Mula A, et al. Availability of personal protective equipment and diagnostic and treatment facilities for healthcare workers involved in COVID-19 care: a cross-sectional study in Brazil, Colombia, and Ecuador. *PLoS One* 2020;15:e0242185.
- 145 Keeley C, Jimenez J, Jackson H, et al. Staffing up for the surge: expanding the new York City public hospital workforce during the COVID-19 pandemic. *Health Aff* 2020;39:1426–30.
- 146 Troisi A, Nanni RC, Riconi A, et al. Fear of COVID-19 among healthcare workers: the role of neuroticism and fearful attachment. *J Clin Med* 2021;10:4358.
- 147 Wei EK, Long T, Katz MH. Nine lessons learned from the COVID-19 pandemic for improving hospital care and health care delivery. *JAMA Intern Med* 2021;181:1161–3.
- 148 Alwan NA, Burgess RA, Ashworth S, et al. Scientific consensus on the COVID-19 pandemic: we need to act now. *Lancet* 2020;396:e71–2.