Servir, 2(7), e30180
DOI:10.48492/servir0207.30180

A INTERVENÇÃO DO ENFERMEIRO DE REABILITAÇÃO NA DESCANULAÇÃO EFICIENTE DO DOENTE CRÍTICO: PROTOCOLO DE SCOPING REVIEW

THE INTERVENTION OF REHABILITATION NURSE IN PROMOTING EFFICIENT DECANNULATION OF CRITICALLY ILL PATIENTS: SCOPING REVIEW PROTOCOL

LA INTERVENCIÓN DE LA ENFERMERA DE REHABILITACIÓN EN LA DECANULACIÓN EFICIENTE DEL PACIENTE CRÍTICO: PROTOCOLO DE REVISIÓN DEL ALCANCE

Ana Sofia Castro Correia[1]
Catarina Oliveira[2]
Abílio Teixeira[3]
Inês Rocha[4]

[1]Centro Hospitalar e Universitário de Santo António, Porto, Portugal (anasofiacastrocorreia@hotmail.com)
https://orcid.org/0000-0001-6432-4846
[2]Escola Superior de Saúde de Santa Maria, Porto, Portugal; Centro Hospitalar Universitário de Santo António, Porto, Portugal (20210550@santamariasaude.edu.pt) | https://orcid.org/0000-0001-7654-5697
[3]Escola Superior de Saúde de Santa Maria, Porto, Portugal; CINTESIS- Centro de Investigação em Tecnologias e Serviços de Saúde, Porto, Portugal (abilio.teixeira@santamariasaude.pt)
https://orcid.org/0000-0003-3753-5714
[4]Escola Superior de Saúde de Santa Maria, Porto, Portugal; CINTESIS- Centro de Investigação em Tecnologias e Serviços de Saúde, Porto, Portugal (ines.rocha@santamariasaude.pt)
https://orcid.org/0000-0001-6265-987X

Corresponding Author

RECEIVED: 16th March, 2023
ACCEPTED: 9th October, 2023
PUBLISHED: 1st November, 2023

2023

RESUMO

Introdução: A ventilação mecânica prolongada está associada a dificuldade de desmame ventilatório e é considerada indicação de traqueostomia em cuidados intensivos. A presença de traqueostomia, apesar de facilitadora do desmame ventilatório, pode ser originária de outras complicações para o doente, pelo que, a descanulação deverá ser célere. Deve ter uma abordagem interdisciplinar e o enfermeiro de reabilitação pode assumir um papel preponderante.

Objetivo: Mapear as evidências disponíveis sobre a intervenção de reabilitação na descanulação do doente crítico.

Métodos: Esta scoping review seguirá a estratégia PCC e as recomendações PRISMA® do JBI®. Pretendemos responder à questão: "Qual a intervenção do enfermeiro especialista em enfermagem de reabilitação para uma descanulação eficiente nos doentes traqueostomizados em cuidados intensivos?". A pesquisa será realizada nas bases de dados MEDLINE, CINAHL® Complete, Cochrane Database of Systematic Reviews, MedicLatina, Nursing & Allied Health Collection, Scopus®, Web of Science, ProQuest, RCAPP, OpenGrey, MedNar e Google Scholar. Dois revisores independentes avaliarão os estudos obtidos, com análise dos seus títulos, resumos e posteriormente texto integral, com recurso a um terceiro revisor caso existam divergências.

Conclusão: Espera-se que esta revisão forneça informação para a criação de um protocolo que oriente a tomada de decisão de reabilitação, na descanulação.

Palavras-chave: enfermagem; reabilitação; traqueostomia; ICU

ABSTRACT

Introduction: Prolonged mechanical ventilation is associated with difficult ventilatory weaning and considered an indication for tracheostomy in intensive care. The presence of a tracheostomy, despite facilitating ventilator weaning, may originate other complications for the patient, so decannulation should be performed as soon as possible. Must, also, have an interdisciplinary approach and the rehabilitation nurse can play a leading role.

Objective: To map the available evidence on the intervention of rehabilitation in decannulation of critically ill patients.

Methods: This scoping review will follow the PCC strategy and the PRISMA® recommendations by JBI®. We intend to answer the question: "What is the intervention of the specialist nurse in rehabilitation for efficient decannulation in tracheostomized patients, in intensive care?". The search will be performed in MEDLINE, CINAHL® Complete, Cochrane Database of Systematic Reviews, MedicLatina, Nursing & Allied Health Collection, Scopus®, Web of Science, ProQuest, RCAPP, OpenGrey, MedNar and Google Scholar databases. Two independent reviewers will evaluate the studies obtained, analyzing their titles, abstracts, and afterwards, full text, using a third reviewer if there are discrepancies.

Conclusion: It is expected that this review will provide information for the creation of a protocol, which guides the decision making of rehabilitation nursing in decannulation.

Keywords: nursing; rehabilitation; tracheostomy; ICU

RESUMEN

Introducción: La ventilación mecánica prolongada se asocia a destete ventilatorio difícil y se considera indicación de traqueotomía en cuidados intensivos. La presencia de una traqueotomía, a pesar de facilitar el destete ventilatorio, puede originar otras complicaciones para el paciente, por lo que se debe realizar la decanulación lo antes posible Debe tener un enfoque interdisciplinario y la enfermera rehabilitadora puede tener un papel protagonista.

Objetivo: Mapear la evidencia disponible sobre la intervención de rehabilitación en la decanulación de pacientes críticos.

Métodos: Esta revisión de alcance seguirá la estrategia PCC y las recomendaciones PRISMA® del JBI®. Pretendemos responder a la pregunta: "Cuál es la intervención de la enfermera especialista en enfermería rehabilitadora para la decanulación eficiente en pacientes traqueostomizados en cuidados intensivos?". La búsqueda se realizará en las bases de datos MEDLINE, CINAHL® Complete, Cochrane Database of Systematic Reviews, MedicLatina, Nursing & Allied Health Collection, Scopus®, Web of Science, ProQuest, RCAPP, OpenGrey, MedNar y Google Scholar. Dos revisores independientes evaluarán los estudios obtenidos, analizando sus títulos, resúmenes y posteriormente el texto completo, recurriendo a un tercer revisor si existen discrepancias.

Conclusión: Se espera que esta revisión proporcione información para la creación de un protocolo, que oriente la toma de decisiones de rehabilitación en la decanulación.

Palabras Clave: enfermería; rehabilitación; traqueotomía; UCI

Introduction

Critical patients are described as those whose survival is dependent on advanced means of monitoring and therapy, caused by failure or dysfunction of one or more organs (Vincent & Creteur, 2019). Regardless their physical or geographic characteristics, all critically ill patients have severe organ dysfunctions (or risk of developing it) require ICU admission and must be cared by experienced intensivists (Vincent & Creteur, 2019).

Mechanical ventilation is one of the therapies used in life support when there is ventilatory failure or inability to promote it. The process of releasing the patient from invasive artificial ventilation (ventilation weaning) is not always a simple procedure, and sometimes become a difficult ventilatory weaning (Burns et al., 2021). Ventilatory weaning can be described as the translation from mechanical to spontaneous ventilation. Two ventilatory weaning classification systems are frequently used in ICUs, the WIND system (Weaning according to a New Definition) or the ICC (International Consensus Conference) (Jeong et al., 2018). Given the small number of publications with the WIND classification, this study will consider the ICC classification to describe weaning groups. It is important, for this study, to clarify the definitions of difficult and prolonged weaning. According to the ICC classification, difficult weaning is considered the one that is successful after more than one day of trying, but not more than one week. Prolonged weaning is the one that doesn´t end seven days after the first attempt (Beduneau et al., 2017). The prolonged use of a tracheal intubation can cause numerous complications: oral mucosa injury, vocal cords damage, tracheal stenosis or dilation, respiratory infections, muscle loss (including respiratory muscles), increased length of stay and hospital costs, and increased morbidity and mortality (Touman & Stratakos, 2018). To minimize these events and optimize the ventilatory weaning, a tracheostomy (TQ) is sometimes performed (Ghattas et al., 2021; Medeiros et al., 2019; Raimondi et al., 2017).

The prolonged presence of a TQ tube may have negative consequences for patients: dysphagia, granulomas development and hemorrhage (Fernandez-Bussy et al., 2015). Therefore, cannulas should be removed as soon as possible.

Decannulation is a process of removing a tracheostomy tube (Everitt, 2016). This process is considered one of the steps in weaning from mechanical to spontaneous ventilation (Singh et al., 2017).

The existence of an interdisciplinary team, including nurses, in the preparation and decision-making of decannulation is associated with a greater success of the procedure (Gundogdu et al., 2017; Thomas et al., 2017). Evidence suggests that early mobilization and rehabilitation is crucial for successful ventilator weaning and decannulation (Costi et al., 2022; Jin et al., 2021; MacIntyre, 2019). In Intensive Care Units (ICUs), nurses are important in the ventilatory weaning process and, therefore, in decannulation (Jin et al., 2021; Outeiro & Soares, 2021).

Given the above information, the following guiding questions arose for this study:

In tracheostomized patients, admitted in ICU, what is(are) the rehabilitation intervention(s) that promote successful decannulation?

What conditions should be evaluated, prior to decannulation of the critically ill patient, for successful decannulation.

An initial search was performed on International Prospective Register of Systematic Reviews (PROSPERO), JBI® and Open Science Framework (OSF) and no reviews were found on the subject, in progress or already developed.

The main objective of this review is to map the available evidence on the intervention of rehabilitation in decannulation of critically ill patients. The information found aims the development of a protocol that supports the rehabilitation intervention during decannulation.

1. Theoretical Framework

Weaning from Mechanical Ventilation is an interdisciplinary concern in critically ill care. Whenever it is prolonged, costs and risk of complications increase (Beduneau et al., 2017).

TQ is a surgical procedure that involves placing a tube into patient's trachea. It is considered one of the oldest surgical procedures ever described (Mehta & Mehta, 2017), which gained expression in ICUs, in 1950, during the polio epidemic (Mehta & Mehta, 2017). Later, Ciaglia (1985) developed a derivation to the surgical technique, performing a percutaneous TQ. Over the past few years, this technique has undergone changes and improvements (Mehta & Mehta, 2017). Surgical TQ refers to the placement of a tracheal cannula, after dissection and incision in the tracheal wall, while percutaneous TQ involves blunt dissection of the pre-tracheal tissue, followed by dilation using a guidewire, and insertion of a tracheal cannula, using the Seldinger technique (Raimondi et al., 2017). This procedure, in critically ill patients, associated with ventilator weaning, promotes sedation weaning, communication improvement, a gradual decrease in ventilatory support, a better airway clearance and active participation in the rehabilitation process through the increase of autonomous breathing work, which enables a minor loss of muscle mass (Shinn et al., 2019).

The process of weaning the tracheostomized patient to a state of spontaneous breathing through the upper airways, with removal of the cannula, is called decannulation. This simple procedure requires almost perfect coordination of brain, swallowing, coughing, phonation and use of respiratory muscles (Singh et al., 2017).

The need to maintain a TQ should be assessed daily. Decannulation should be performed as soon as possible (Mehta & Mehta, 2017).

Evidence shows that the sooner decannulation occurs, the greater the chances of success. There is a growth curve in the success of decannulation, when performed up to 3 months after TQ (40.8%), a deceleration of this curve up to 12 months (63.9%) and a plateau up to 24 months (65%) (Ishizaki et al., 2022). This evidence reinforces the importance of early intervention in tracheostomized patients, ventilatory weaning and subsequent decannulation.

Several methods are presented on how to proceed with decannulation (Mehta & Mehta, 2017). Many of them involve the implementation of weaning/decannulation protocols. Despite the relevance and importance of this process, there is no universally accepted protocol for its implementation (Singh et al., 2017). Evidence on the topic, published by rehabilitation nurses is also scarce. One of the 2001 guidelines, for ventilator weaning, relates to the importance of creating weaning protocols, designed to be implemented in ICU by non-medical health professionals (respiratory therapists and nurses). According to the authors, there is clear evidence that these professionals can execute protocols and improve clinical results, reducing costs with the treatment of critically ill patients (MacIntyre, 2001).

2. Methods

This review will be conducted in accordance with the JBI® methodology for scoping reviews (Peters et al., 2022).

2.1. Review Questions

In tracheostomized patients, admitted in ICU, what is(are) the rehabilitation intervention(s) that promote successful decannulation?

What conditions should be evaluated, prior to decannulation of the critically ill patient, for successful decannulation.

The research questions were developed using the vocabulary found in a preambular research.

2.2. Inclusion Criteria

Participants: This scoping review will consider studies that include critically ill patients, aged over 18 years, whose tracheostomy was performed in the context of difficult or prolonged ventilatory weaning and who have undergone rehabilitation.

Considering that this review aims to support the development of a protocol for decannulation of critically ill adults, studies in the pediatric population (age less than 18 years) will be excluded. Studies whose patients have undergone a tracheostomy procedure due to surgery (scheduled or not) in the context of maxillofacial or otorhinolaryngological pathology will also be excluded. These patients are decannulated at the joint recommendation of the ICU team and the surgeon, due to the type of surgery, the purpose of the tracheostomy tube in the recovery from the surgical procedure and the presence/absence of edema or scar tissue (Littlewood et al., 2021).

Concept The main concept of interest is decannulation.

Context: This review will include patients admitted in a level three ICU.

2.3. Types of sources

This review will consider experimental and quasi-experimental studies, including randomized controlled trials, non-randomized controlled trials, before- after studies, and interrupted time series studies, analytical observational studies, including prospective and retrospective cohort studies, case-control, analytical cross- sectional, descriptive observational, including case series, individual case reports and cross-sectional descriptive studies. Qualitative studies will also be included, including but not limited to designs such as qualitative description and action research. Systematic reviews that meet the inclusion criteria will also be included.

2.4. Search strategy

A preliminary search was performed, limited to Medline via PubMed and CINAHL (Cumulative Index to Nursing and Allied Health Literature) via EBSCOhost, to identify evidence on the topic of decannulation. In the analysis of the vocabulary present in titles, abstracts, and keywords, used to describe the subject under study, was carried out. The search strategy of this review aims to map published and unpublished evidence. Therefore, controlled vocabulary such as MeSH (Medical Subject Headings)/DECS (Descriptors in Health Sciences) and keywords in natural language will be included (Table 1). A language-related search filter will be applied and evidence in Portuguese, English, French and Spanish will be selected. No time limitation will be considered. We will review the reference lists of selected evidence for additional sources of information and evaluate the full text according to the inclusion criteria. The databases to be consulted will be MEDLINE via PubMed, CINAHL via EBSCOhost, Cochrane Database of Systematic Reviews, MedicLatina and Nursing & Allied Health Collection, Web of Science and Scopus. We will include a search for grey literature and unpublished material in scientific repositories, such as RCAAP, OpenGrey, ProQuest, Mednar and Google Scholar. A summary of the research strategy can be found in Table 2.

Table 1 – Vocabulary for defining the research question and PCC

	Terms under study	MeSH / DeCS	Natural language
Participants	Patients with tracheostomy	Tracheostomy	Respiratory stoma
Concept	Decannulation		Decannulation; Tracheostomy weaning; Tracheostomy removal; Tracheostomy decannulation.
Context	ICU	Critical care; Intensive care; Intensive care unit; Intensive care units; ICU; Critical illness.	

Source: Prepared by the authors (2023)

Table 2 – Scoping Review 's Research Strategy

1	Introductory search without identifying a scoping review on the topic: Decannulation of critical ill patients after difficult/prolonged ventilatory weaning
2	Identification of the most used and appropriate words/ indexing terms for the selected databases – MeSH/ DeCS terms and NCBI: MeSH database.
3	Construction of the boolean expression.
4	Search in two recommended databases: MEDLINE (via PubMed) and CINAHL (via EBSCOhost).
5	Analysis of words/indexing terms present in the titles and abstracts of the obtained evidence.
6	Search in other databases, applying the respective boolean expression.
7	Gray literature search.
8	Exportation of the evidence to EndNote® online with WoS version (Clarivate Analytics, US) reference management software.
9	Checking and removing duplicate literature.
10	Application of inclusion criteria: articles in Portuguese, English, Spanish and French.
11	Analysis of evidence according to title and abstract by two independent reviewers.
12	Analysis of evidence according to the full text by two independent reviewers.
13	If there are disagreements in the evidence selection, the third independent reviewer will be consulted.
14	Analysis of references from the selected evidence in the full text reading stage.
15	Data extraction and analysis according to the form developed by the reviewers.
16	Presentation of the obtained data.

Source: Adapted from Peters and collaborators (2020)

According to PRISMA-ScR, the search strategy in the Medline, via PubMed database, carried out on November 25, 2022, is presented in table 3.

The protocol of this scoping review is registered in Open Science Framework with the following DOI: 10.17605/OSF.IO/SDBXH.

Table 3 – Medline search strategy via PubMed

Line Code	Search terms	Results
# 17	#14 AND #15 AND #16	693
# 16	#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13	5.768
# 15	#1 OR #2 OR #3 OR #4 OR #5 OR #6	653.783
# 14	Tracheostomy [MeSH Terms]	8.614
# 13	Tracheostomy rehabilitation	1.260
# 12	Tracheostomy decannulation protocol	114
# 11	Decannulation protocol	187
# 10	Tracheostomy decannulation	1.283
# 9	Tracheostomy removal	1.392
# 8	Tracheostomy weaning	982
# 7	Decannulation	2.964
# 6	Critical Ill*	63.495
# 5	Critical Illness [MeSH terms]	37.213
# 4	ICU	169.705
# 3	Intensive care unit* [MeSH terms]	102.373
# 2	Intensive Care	611.740
# 1	Care, critical [MesH terms]	65.205

Source: Prepared by the authors (2022)

2.5. Study selection

The results will be managed in EndNote® online with WoS version (Clarivate Analytics, US). Prior to the selection of the evidence found with the search strategy, the duplicated literature will be eliminated. The titles and abstracts will be evaluated by two independent reviewers, according to the inclusion criteria. Potentially relevant sources will be retrieved in full-text and their citation details will be transcribed into a data extraction table (Table 4). During this process, the differences found between the two reviewers will be managed through discussion and a third reviewer can be consulted, if necessary. The final report not only will incorporate the reasons for excluding full-text sources of evidence that do not meet the inclusion criteria, but it also will include the PRISMA-ScR diagram (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) and the description of all process (Tricco et al., 2018).

Table 4 – Data Extraction Tool

AUTHOR(S)	
PUBLICATION YEAR	
PLACE OF PUBLICATION/ JOURNAL	
COUNTRY OF ORIGIN/ PUBLICATION	
PURPOSE OF THE STUDY/ RESEARCH QUESTION	
POPULATION SIZE/ RECRUITMENT CONTEXT	
METHODOLOGY/ TYPE OF STUDY	
REHABILITATION INTERVENTION (WEANING PROCEDURE; EVALUATION AND MONITORING)	
RESULTS	
MAIN CONCLUSIONS	
COMMENTS	

Source: Prepared by the authors (2022)

2.6. Data extraction

Data will be extracted by using an instrument developed for this purpose, which includes relevant information to the review question, such as details about the participants, concept, context, methodology adopted and key findings. An outline of the data extraction instrument can be found in Table 2. The preliminar data extraction instrument will be modified and revised, if necessary, during the data extraction process, and the changes will be explained in the final review. Any diferences found between the two reviewers will be managed through discussion or with a third reviewer for a tiebreak. If appropriate, article authors will be contacted to request missing or additional data.

2.7. Data analysis and presentation

This scoping review will gather the evidence found using a descriptive summary and content analysis. The descriptive summary will describe the characteristics of the included studies (study design, year of publication, characteristics of the study populations and geographic location) and will be presented in a table form. Content analysis will be presented in narrative form and will highlight the rehabilitation nurse interventions in decannulation of critically ill patients, in order to describe and clarify the findings of the review in this context. Guidelines for future research will also be presented.

Conclusion

With the development of this review, we hope to organize the evidence available on the subject for the subsequent elaboration of a guiding protocol for rehabilitation actions in the decannulation process.

Conflict of Interests

There is no conflict of interest in this project.

Funding
No funding was received by any author of this protocol.

References
Beduneau, G., Pham, T., Schortgen, F., Piquilloud, L., Zogheib, E., Jonas, M., Grelon, F., Runge, I., Terzi, N., Grange, S., Barberet, G., Guitard, P. G., Frat, J. P., Constan, A., Chretien, J. M., Mancebo, J., Mercat, A., Richard, J. C. M., & Brochard, L. (2017). Epidemiology of weaning outcome according to a new definition the WIND study. American Journal of Respiratory and Critical Care Medicine, 195(6), 772–783. https://doi.org/10.1164/RCCM.201602-0320OC

Burns, K. E. A., Rizvi, L., Cook, D. J., Lebovic, G., Dodek, P., Villar, J., Slutsky, A. S., Jones, A., Kapadia, F. N., Gattas, D. J., Epstein, S. K., Pelosi, P., Kefala, K., & Meade, M. O. (2021). Ventilator weaning and discontinuation practices for critically ill patients. JAMA, 325(12), 1173–1184. https://doi.org/10.1001/jama.2021.2384

Ciaglia, P., Firsching, R., & Syniec, C. (1985). Elective percutaneous dilatational tracheostomy. Chest, 87(6), 715–719. https://doi.org/10.1378/chest.87.6.715

Costi, S., Brogneri, A., Bagni, C., Pennacchi, G., Beneventi, C., Tabbì, L., Dell'Orso, D., Fantini, R., Tonelli, R., Beghi, G. M., & Clini, E. (2022). Rehabilitation of difficult-to-wean, tracheostomized patients admitted to specialized unit: Retrospective analyses over 10-years. International Journal of Environmental Research and Public Health, 19(5), 2982–2992. https://doi.org/10.3390/ijerph19052982

Everitt, E. (2016). Managing the weaning of a temporary tracheostomy. Nursing Times, 112(20), 17–19.

Fernandez-Bussy, S., Mahajan, B., Folch, E., Caviedes, I., Guerrero, J., & Majid, A. (2015). Tracheostomy tube placement. Journal of Bronchology & Interventional Pulmonology, 22(4), 357–364. https://doi.org/10.1097/LBR.0000000000000177

Ghattas, C., Alsunaid, S., Pickering, E. M., & Holden, V. K. (2021). State of the art: Percutaneous tracheostomy in the intensive care unit. Journal of Thoracic Disease, 13(8), 5261–5276. https://doi.org/10.21037/jtd-19-4121

Gundogdu, I., Ozturk, E. A., Umay, E., Karaahmet, O. Z., Unlu, E., & Cakci, A. (2017). Implementation of a respiratory rehabilitation protocol: Weaning from the ventilator and tracheostomy in difficult-to-wean patients with spinal cord injury. Disability and Rehabilitation, 39(12), 1162–1170. https://doi.org/10.1080/09638288.2016.1189607

Ishizaki, M., Toyama, M., Imura, H., Takahashi, Y., & Nakayama, T. (2022). Tracheostomy decannulation rates in Japan: A retrospective cohort study using a claims database. Scientific Reports, 12(1), 19801–19809. https://doi.org/10.1038/s41598-022-24174-w

Jackson, M., & Cairns, T. (2021). Care of the critically ill patient. Surgery (Oxford), 39(1), 29–36. https://doi.org/10.1016/j.mpsur.2020.11.002

Jeong, B.-H., Lee, K. Y., Nam, J., Ko, M. G., Na, S. J., Suh, G. Y., & Jeon, K. (2018). Validation of a new WIND classification compared to ICC classification for weaning outcome. Annals of Intensive Care, 8(1), 115–123. https://doi.org/10.1186/s13613-018-0461-z

Jin, Y., Di, J., & Wang, X. (2021). Early rehabilitation nursing in ICU promotes rehabilitation of patients with respiratory failure treated with invasive mechanical ventilation. American Journal of Translational Research, 13(5), 5232–5239.

Littlewood, C. G., Jebril, A., Lowe, D., Konig, R., Groom, P., & Rogers, S. N. (2021). Factors contributing to delayed decannulation of temporary tracheostomies following free tissue reconstructive surgery for head and neck cancer. British Journal of Oral and Maxillofacial Surgery, 59(4), 472–477. https://doi.org/10.1016/j.bjoms.2020.09.019

MacIntyre, N. R. (2001). Evidence-based guidelines for weaning and discontinuing ventilatory support. Chest, 120(6), 375S-395S. https://doi.org/10.1378/chest.120.6_suppl.375S

MacIntyre, N. R. (2019). Early mobilization of patients on mechanical ventilation: Worth the effort and expense? Respiratory Care, 64(1), 112–113. https://doi.org/10.4187/respcare.06801

Medeiros, G. C. de, Sassi, F. C., Lirani-Silva, C., & Andrade, C. R. F. de. (2019). Critérios para decanulação da traqueostomia: Revisão de literatura. CoDAS, 31(6). https://doi.org/10.1590/2317-1782/20192018228

Mehta, C., & Mehta, Y. (2017). Percutaneous tracheostomy. Annals of Cardiac Anaesthesia, 20(5), 19–25. https://doi.org/10.4103/0971-9784.197793

Outeiro, R. M., & Soares, S. (2021). A enfermagem de reabilitação e o desmame ventilatório numa unidade de cuidados intensivos. Revista Portuguesa de Enfermagem de Reabilitação, 4(2), 57–63. https://doi.org/10.33194/rper.2021.177

Peters, M. D. J., Godfrey, C., McInerney, P., Khalil, H., Larsen, P., Marnie, C., Pollock, D., Tricco, A. C., & Munn, Z. (2022). Best practice guidance and reporting items for the development of scoping review protocols. JBI Evidence Synthesis, 20(4), 953–968. https://doi.org/10.11124/JBIES-21-00242

Peters, M. D. J., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. JBI Evidence Synthesis, 18(10), 2119–2126. https://doi.org/10.11124/JBIES-20-00167

Raimondi, N., Vial, M. R., Calleja, J., Quintero, A., Cortés, A., Celis, E., Pacheco, C., Ugarte, S., Añón, J. M., Hernández, G., Vidal, E., Chiappero, G., Ríos, F., Castilleja, F., Matos, A., Rodriguez, E., Antoniazzi, P., Teles, J. M., Dueñas, C., … Nates, J. L. (2017). Evidence-based guidelines for the use of tracheostomy in critically ill patients. Journal of Critical Care, 38, 304–318. https://doi.org/10.1016/j.jcrc.2016.10.009

Shinn, J. R., Kimura, K. S., Campbell, B. R., Sun Lowery, A., Wootten, C. T., Garrett, C. G., Francis, D. O., Hillel, A. T., Du, L., Casey, J. D., Ely, E. W., & Gelbard, A. (2019). Incidence and outcomes of acute laryngeal injury after prolonged mechanical ventilation. Critical Care Medicine, 47(12), 1699–1706. https://doi.org/10.1097/CCM.0000000000004015

Singh, R. K., Saran, S., & Baronia, A. K. (2017). The practice of tracheostomy decannulation—A systematic review. Journal of Intensive Care, 5(1), 38. https://doi.org/10.1186/s40560-017-0234-z

Thomas, S., Sauter, W., Starrost, U., Pohl, M., & Mehrholz, J. (2017). Time to decannulation and associated risk factors in the postacute rehabilitation of critically ill patients with intensive care unit-acquired weakness: a cohort study. European Journal of Physical and Rehabilitation Medicine, 53(4), 501–507. https://doi.org/10.23736/S1973-9087.16.04400-2

Touman, A. A., & Stratakos, G. K. (2018). Long-term complications of tracheal intubation. In Tracheal Intubation. InTech. https://doi.org/10.5772/intechopen.74160

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., … Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Annals of Internal Medicine, 169(7), 467–473. https://doi.org/10.7326/M18-0850

Vincent, J.-L., & Creteur, J. (2019). The critically ill patient. In Critical Care Nephrology (pp. 1-4.e1). Elsevier. https://doi.org/10.1016/B978-0-323-44942-7.00001-7

World Health Organization. (2021, November 10). Rehabilitation. https://www.who.int/news-room/fact-sheets/detail/rehabilitation