

PROTOCOL

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# Tracheostomy decannulation methods and procedures in adults: a systematic scoping review protocol

John Kutsukutsa<sup>1\*</sup> , Tivani Phosa Mashamba-Thompson<sup>2</sup> and Yougan Saman<sup>3</sup>

## Abstract

**Background:** The indications for and the number of tracheostomy procedures has increased with advances in critical care. Studies are indicating likely continued increase in number of tracheostomies. Despite the important benefits of a tracheostomy, its presence is associated with adverse health complications and lowered patient quality of life. Hence, it must be decannulated as soon as it is no longer indicated in a safe and effective manner. There is, however, no agreed universal standard of care for tracheostomy decannulation (TD) in adults. The aims of our study are to systematically map the literature on the decannulation process, reveal knowledge gaps and inform further research.

**Methods:** The search strategy of this systematic scoping review will involve the following electronic databases: PubMed/MEDLINE, Google Scholar, Union Catalogue of Theses and Dissertations (UCTD) via SABINET Online and WorldCat Dissertations and Theses via OCLC. Articles will also be searched through the "Cited by" search as well as citations included in the reference lists of included articles. Studies from the databases will be title screened and duplicates removed followed by a parallel two-independent reviewer screening of abstracts followed by full articles of selected studies both guided by eligibility criteria. We will extract data from the included studies and the emerging themes will be analysed. The relationship of the emerging themes to the research question will be critically examined. The quality of the included studies will be determined by Mixed Method Appraisal Tool (MMAT). We will use NVIVO version 10 to extract the relevant outcomes and thematic analysis of the studies.

**Discussion:** We anticipate to find studies that highlight evidence and preference as well as acceptability of TD methods and procedures. We hope to expose knowledge gaps and inform future research. Findings will be disseminated electronically, in print and through peer presentation, conferences and congresses.

**Systematic review registration:** Our systematic review has been registered in PROSPERO: CRD42017072050.

**Keywords:** Tracheostomy decannulation, Weaning, Methods and procedures

## Background

The indications for tracheostomies have expanded and the rate at which the procedure carried out has also increased with the advancement of critical care [1–4]. It is estimated that up to 10% of intensive care unit (ICU) patients will require a tracheostomy [5]. This is in addition to the tracheostomies done by various surgical specialities outside of critical care. Although timing of

tracheostomy in ICU is still debated [6, 7], it is leaning towards early tracheostomy spurred on by some studies showing benefits of early tracheostomy [8]. In spite of this increase, there is no consensus on the standard approach to its reversal (tracheostomy decannulation) thereby relegating decisions to expert opinion and institutional protocols [9–11]. In a recent survey, non ENT health professionals involved in airway care had a low level of self-rated comfort with tracheostomy tube care [12]. All these may imply patients being exposed to non-scientific, risky decannulation practises or finding themselves under the care of non-ENT health

\* Correspondence: [jkutsukutsa@gmail.com](mailto:jkutsukutsa@gmail.com)

<sup>1</sup>Department of Otorhinolaryngology Head & Neck Surgery, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, 5th Floor, Room 550 Main Building, Durban 4001, South Africa

Full list of author information is available at the end of the article

care workers who may not feel comfortable decannulating them.

Article 26 of the United Nations Convention on the Rights of Persons with Disabilities obliges member states to 'take effective and appropriate measures, including through peer support, to enable persons with disabilities to attain and maintain maximum independence, full physical, mental, social and vocational ability, and full inclusion and participation in all aspects of life' [13]. Regaining verbal communication is one of the benefits of TD which allows attainment of these goals. Decannulation improves patient comfort, perceived physical appearance in addition to improved speech and swallowing [14–17]. It is therefore prudent to have tracheostomy decannulation (TD) as soon as it is no longer indicated in a safe and effective manner.

Tracheostomy decannulation has a risk of failure with fatal consequences if not managed appropriately. Experts in different settings have different opinions and approaches to TD [18]. This raises the question of whether we understand what is available well enough to design and carry out further research that speaks to all. It is our contention that this systematic scoping review will better our understanding of the decannulation process, expose knowledge gaps and stimulate research to fill in the gaps. We therefore aim to explore evidence on methods and procedures for tracheostomy decannulation in adults. Our objectives are the following:

- To highlight evidence base for the different methods and procedures for TD
- To determine the preference of method and procedures for TD in adults
- To determine the acceptability (to patients and health care workers) of method and procedures for TD in adults

Systematically mapping the available evidence for TD methods and procedures will cascade into better outcomes for tracheostomy patients through enhanced understanding and more scientific approaches to TD.

## Methodology

### Systematic scoping review

We will conduct a systematic scoping review of peer-reviewed and grey literature on the methods and procedures of TD in adults. The review will include a quality assessment. This review will be guided by Arksey and O'Malley's [19] scoping review framework which stipulates the following steps:

1. Identifying the research question
2. Identifying relevant studies
3. Study selection

4. Charting the data
5. Collating, summarising and reporting the results

### Identifying the research question

The research question is, what is the evidence available for the different methods and procedures for TD in adults?

The sub research questions are as follows:

1. What is the preference of method and procedures for tracheostomy decannulation in adults?
2. What is the acceptability of TD methods and procedures?

### Eligibility of research question

The study has used the Population Intervention Comparator Outcomes (PICO) framework to determine the eligibility of research question as illustrated in Table 1 below.

### Identifying relevant studies

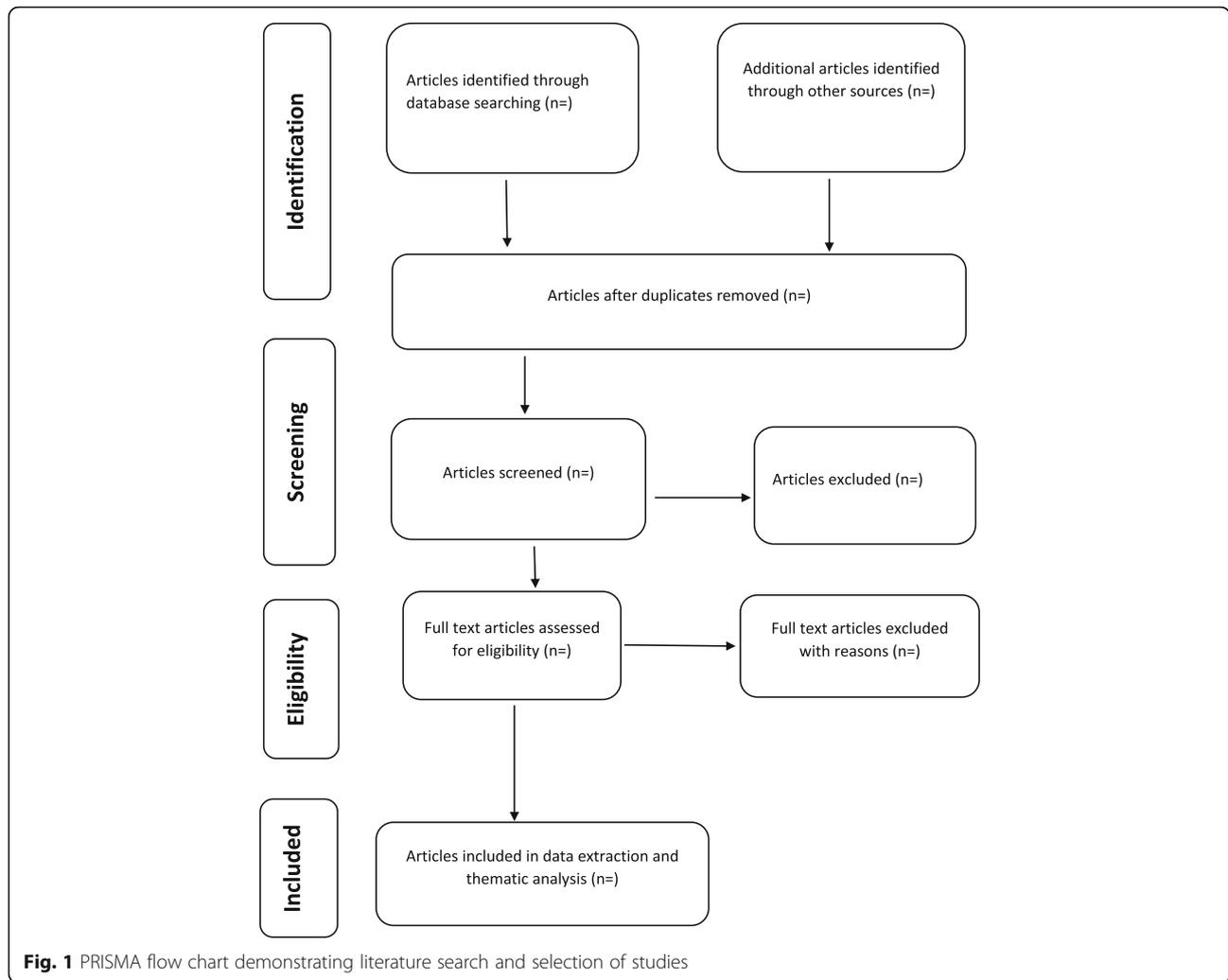
Primary studies with a clear empirical base utilising qualitative, quantitative and mixed methods published in peer-reviewed journals as well as in grey literature addressing the research question will be included. An electronic search of the following databases will be conducted: PubMed/MEDLINE, Google Scholar, Union Catalogue of Theses and Dissertations (UCTD) via SABINET Online and World Cat Dissertations and Theses via OCLC. Websites such as the World Health Organisation (WHO) and governmental websites will be searched for policies and guidelines for TD. Studies will be identified by searching literature published in any language from January 1985 to date. A hand search through the main published texts used in otorhinolaryngology teaching and practise will also be conducted.

Articles will also be searched through the 'Cited by' search as well as citations included in the reference lists of included articles. The search terms will include tracheostomy, decannulation, weaning, procedures, methods, complications and adults. After searching, duplicates will be removed and the studies will be screened against the inclusion and exclusion criteria.

**Table 1** PICO Framework

Criteria	Determinants
Population	Adults with tracheostomies
Intervention	Tracheostomy decannulation
Comparison	Absence of TD
Outcomes	Primary—evidence for procedures and methods Secondary—preference and acceptability: successful decannulation, reduced complications of long-term tracheostomy and increased comfort by health care workers in undertaking the procedure





**Table 3** Data charting table form

Author and date
Journal full reference
Aims or research questions
Recruitment context/study population
Sampling method
Study design
Theoretical background
Data collection methods used
Data analysis employed
Intervention (TD)
Intervention outcomes (methods and procedures: evaluation, removal and monitoring; preference, acceptability)
Most relevant finding
Level of evidence
Conclusions
Comments

effective guidelines that are practical in low- to medium-income countries for specific patient groups.

**Quality appraisal**

The Mixed Method Appraisal Tool (MMAT)-version 2011 [20] will be used to determine quality of the studies. For appraising a qualitative study, we will use section 1 of the MMAT, for a quantitative study, we will use section 2 for randomised controlled, section 3 for non-randomised, and section 4 for descriptive studies. For a mixed methods study, we will use section 1 for appraising the qualitative component, the appropriate section for the quantitative component (2 or 3 or 4) and section 5 for the mixed methods component. The tool will be used to examine the appropriateness of aim of study, adequacy and methodology, study design, data collection, study selection, data analysis, presentation of findings, author’s discussions and conclusions. The results from scrutiny of above mentioned aspects will determine quality of resultant article.

## Discussion

Tracheostomy decannulation marks a significant point in-patient rehabilitation post a frequently severe illness. It marks the return to normal or near normal phonation with improved communication, improved physical appearance and elimination of potential health complication of having a tracheostomy. A recent systematic review by Santus et al. [21] focussed on assessing predictor factors of successful decannulation and to propose a predictive score to help clinicians in choosing decannulation timing. Another more recent systematic review by Singh et al. [10] focussed on objective criteria for decannulation. Both studies concluded there is need for higher evidence research around the subject; we however aim to map literature around the whole process, contextualise it according to its themes to allow a better understanding thereby exposing knowledge deficits from which the higher evidence research can be built on.

Tracheostomy in children is different from tracheostomy in adults in terms of indications and decannulation time although the complications are similar [22]. This systematic scoping review focuses on decannulation in adults regardless of the indication for tracheostomy. It includes all studies from January 1985 to date because studies published prior are unlikely to reflect or include aspects pertaining to percutaneous dilatational tracheostomy which was first published in that year. It is anticipated that the results of this systematic scoping review will contribute to safe and effective rehabilitation of patients with tracheostomies.

## Abbreviations

ICU: Intensive care unit; MMAT: Mixed Method Appraisal Tool; PICO: Population Intervention Comparator Outcomes; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; TD: Tracheostomy decannulation

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## Availability of data and materials

All data generated or analysed during this study will be included in the published systematic scoping review article and will also be available upon request.

## Authors' contributions

JK conceptualised the study and prepared the draft proposal under the guidance and supervision of TPM-T and YS. All three authors contributed to the development of the background and planned output of the research as well as the design of the study. TPM-T contributed to the development of the methods relating to the review and synthesis of data including the sifting and data extraction process. JK prepared the manuscript, and TPM-T and YS reviewed it. All three authors contributed to the reviewed draft version of the manuscript and approved the final version.

## Ethics approval and consent to participate

Not applicable.

## Consent for publication

Not applicable.

## Competing interests

The authors declare that they have no competing interests.

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## Author details

<sup>1</sup>Department of Otorhinolaryngology Head & Neck Surgery, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, 5th Floor, Room 550 Main Building, Durban 4001, South Africa. <sup>2</sup>Discipline of Public Health, University of KwaZulu-Natal, Durban 4001, South Africa. <sup>3</sup>Department of Otorhinolaryngology Head & Neck Surgery, University of KwaZulu-Natal, Durban 4001, South Africa.

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