

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Protocol for a Systematic Review on Effective Patient Positioning for Rapid Sequence Intubation
AUTHORS	Sivajohan, Asaanth; Krause, Sarah; Hegazy, Ahmed; Slessarev, Marat

VERSION 1 – REVIEW

REVIEWER	Minville, Vincent Département d'Anesthésie et de Réanimation, Centre Hospitalier et Universitaire de Toulouse
REVIEW RETURNED	12-Apr-2022

GENERAL COMMENTS	<p>In this manuscript, “Protocol for a Systematic Review on Effective Patient Positioning for Rapid Sequence Intubation”, the authors want to evaluate the effect of different patient positions in the context of Rapid Sequence Intubation on the ease of intubation, safety, and patient outcome(s). I have the following comments and concerns.</p> <p>MAJOR COMMENTS/CONCERNS:</p> <ol style="list-style-type: none">1. “Patient-centred outcomes (desaturation episodes/hypoxemia events, hypoxia, lowest oxygen saturation, aspiration events, duration of mechanical ventilation, ventilator-free days, ICU-free days, overall mortality etc.)” difficult to have in mannequins’ studies. It is difficult to mix human and mannequin studies. High fidelity simulation2. It is difficult to compare specialty of physician performing intubation (anesthesiologist, emergency room doctor, medical learner, etc.). It is well known that anesthesiologists are the reference for intubation. Thus, the same study with an intubation performed by different physician could lead to different results.3. The primary endpoint is unclear. The purpose of this systematic review is to evaluate the effect of different patient positions in the context of Rapid Sequence Intubation on the ease of intubation, safety, and patient outcome(s). However, outcomes of interest include desaturation episodes, aspiration events (+volumes), duration of ventilation, mortality, time to intubation, successful first-pass intubation, and rating of laryngoscopic view.4. The statistical analysis should be developed. <p>MINOR COMMENTS/CONCERNS:</p> <p>Abstract: (ER, ICUs) explain abbreviations References should be updated.</p>
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REVIEWER	Danguy des Déserts, Marc Hopital d'Instruction des Armees Clermont-Tonnerre, Anaesthesia and Intensive Care Unit
REVIEW RETURNED	17-Apr-2022

GENERAL COMMENTS	<p>Thank you for giving me the opportunity to review this manuscript. The authors present here a protocol for a systematic review concerning the different patient positions during rapid sequence intubation.</p> <p>This question is relevant because there is no consensus and no systematic review concerning this topic.</p> <p>The overall quality of the manuscript is good, nevertheless I have some comments :</p> <p>- Major comments :</p> <ul style="list-style-type: none"> - a date of end of screening is missing in the type of studies, page 7, line 47 - please indicate whether anaesthesiologists include only physicians or physicians and nurses anaesthesists, page 8, line 5 - please precise how you will consider studies comparing two non-conventional patient positions : included in the analysis or not ? and how will you compare them ? page 8, line 44 - please provide more details in the outcomes used : what is duration of ventilation ? mortality in which interval ? rating of laryngoscopic view : Cormack grading ? POGO score ? page 8 line 55. The outcomes page 8 and page 10 are not similar, please match them. - the list of keywords used is not given, page 9, line 9 - no search in the grey literature is planned but could be implemented, page 9, line 12 - the type of material used (Macintosh laryngoscope or videolaryngoscope ; stylet or bougie) is of crucial importance in intubation, and can directly influence patient positioning. Implementing these data in the data extraction seems important to correctly analyse the results. <p>- Minor comments :</p> <ul style="list-style-type: none"> - a space is missing between aspiration and [1,2], page 5, line 15 - Comrack-Lehane > Cormack-Lehane, page 10 line 57
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Prof. Vincent Minville, Département d'Anesthésie et de Réanimation, Centre Hospitalier et Universitaire de Toulouse

Comments to the Author:

In this manuscript, "Protocol for a Systematic Review on Effective Patient Positioning for Rapid Sequence Intubation", the authors want to evaluate the effect of different patient positions in the context of Rapid Sequence Intubation on the ease of intubation, safety, and patient outcome(s). I have the following comments and concerns.

MAJOR COMMENTS/CONCERNS:

1. “Patient-centred outcomes (desaturation episodes/hypoxemia events, hypoxia, lowest oxygen saturation, aspiration events, duration of mechanical ventilation, ventilator-free days, ICU-free days, overall mortality etc.)” difficult to have in mannequins’ studies.

It is difficult to mix human and mannequin studies. High fidelity simulation

Thank you for raising this critical issue. Our decision to include both mannequin and human subjects was based on our assumption from the initial literature screen that the literature on our research question would be sparse. We hope that by including studies conducted on mannequins we will be able to capture more studies and provide a more robust picture. We agree that it will be difficult to find patient-centered outcomes in mannequin studies. However, we think these studies will provide great value by reporting on procedural outcomes such as the time taken to intubation, glottic score, and successful first-pass intubation. We have made an amendment to the manuscript under the heading “Types of Outcome” to explicitly state which outcomes will pertain to mannequin versus human studies and have copied it below:

“Our primary outcomes of interest are patient safety outcomes which include hypoxemia, desaturation, aspiration, length of mechanical ventilation, ventilator-free days, ICU-free days, and hospital mortality. Our secondary outcomes of interest aim to examine procedural outcomes such as the glottic view, time to intubate, successful first-pass intubation, and aspiration volume. Given that we cannot assess our primary patient safety outcomes in mannequin studies, we will only assess for secondary outcomes in these studies. In human studies both primary and secondary outcomes will be evaluated.”

In our sensitivity analysis we plan to assess the consistency of results between both study designs (human and mannequin) to determine the effect of study design. We have made an amendment to our manuscript and have copied it below:

“In addition, with sufficient data, to ensure the consistency of results we will perform a sensitivity analysis based on the type of study design (human or mannequin).”

2. It is difficult to compare specialty of physician performing intubation (anesthesiologist, emergency room doctor, medical learner, etc.). It is well known that anesthesiologists are the reference for intubation. Thus, the same study with an intubation performed by different physician could lead to different results.

Thank you for raising this issue. We will ensure in our study that we specify the same physician speciality should be used for intubation in both the intervention and control group so we can minimize the issue of skill disparity between groups. This revision was added to the exclusion criteria and copied below:

“(3) The speciality of the physician performing RSI differs between intervention and control group”
 In addition, we will stratify the reporting and the analysis of the outcomes by physician speciality to examine potential disparity in skills with anesthesiologists as the reference if the data is sufficient. We have made an amendment to the “Data Synthesis” and the newly added “Sensitivity Analyses” paragraph to reflect these changes.

3. The primary endpoint is unclear. The purpose of this systematic review is to evaluate the effect of different patient positions in the context of Rapid Sequence Intubation on the ease of intubation, safety, and patient outcome(s). However, outcomes of interest include desaturation episodes, aspiration events (+volumes), duration of ventilation, mortality, time to intubation, successful first-pass intubation, and rating of laryngoscopic view.

Thank you for bringing this critical issue up – to be more clear the purpose of our study is to understand the impact of patient positioning in the context of RSI primarily on objective patient safety outcomes which include hypoxemia, desaturation, aspiration, duration of ventilation and mortality. Our secondary outcome of interests are procedural outcomes such as the time taken to intubate,

successful first-pass intubation and the rating of laryngoscopic view. We have updated our aims statement to explicitly state our two outcome categories of interest and have copied it below as well: “The purpose of this systematic review is to evaluate the effect of different patient positions in the context of Rapid Sequence Intubation on patient safety outcomes and procedural outcomes.”

4. The statistical analysis should be developed.

Thank you for raising this important issue. We have made some amendments in the section titled “Data Synthesis” outlining how we will stratify the summary of outcomes and report categorical and continuous variables.

In addition, we have made an amendment outlining the process to conduct a meta-analysis if we end up identifying enough studies with sufficient data to perform a meta-analysis. We have copied the section below addressing this:

“While we do not anticipate enough studies with similar methodology and outcomes, if we do encounter sufficient data, we will perform a meta-analysis using Review Manager 5.3 provided by the Cochrane Collaboration (Oxford, United Kingdom) and report heterogeneity using the I² statistic, where values >50% indicated moderate heterogeneity. A random-effects model will be used when combined studies demonstrated at least moderate heterogeneity.”

Lastly, we have added a section titled “Sensitivity Analysis” to address this concern as well. The contents of this section have been copied below:

“If the data is sufficient, we will perform sensitivity analyses on the speciality of the physician performing intubation and the material used during intubation to elucidate the effect of these characteristics on patient safety and procedural outcomes during RSI. In addition, with sufficient data, to ensure the consistency of results we will perform a sensitivity analysis based on the type of study design (human or mannequin).”

MINOR COMMENTS/CONCERNS:

Abstract: (ER, ICUs) explain abbreviations

Thank you for pointing this out we edited the abstract accordingly and explained the abbreviation in paragraph 1 of the introduction.

References should be updated.

Thank you for pointing this out – Our references have been updated to have the same line spacing as the paper. All references are cited using them BMJ Open citation style on our reference manager (Zotero)

Reviewer: 2

Dr. Marc Danguy des Déserts, Hopital d'Instruction des Armees Clermont-Tonnerre

Comments to the Author:

Thank you for giving me the opportunity to review this manuscript.

The authors present here a protocol for a systematic review concerning the different patient positions during rapid sequence intubation.

This question is relevant because there is no consensus and no systematic review concerning this topic.

The overall quality of the manuscript is good, nevertheless I have some comments :

- Major comments :

- a date of end of screening is missing in the type of studies, page 7, line 47

Thank you for pointing this out. We have added a line establishing the end date of screening where you indicated (under “Types of Studies” in the Methodology section)

- please indicate whether anaesthesiologists include only physicians or physicians and nurses anaesthesists, page 8, line 5

Thank you for raising this issue. We have specified that we will only include physician anaesthesiologists

- please precise how you will consider studies comparing two non-conventional patient positions : included in the analysis or not ? and how will you compare them ? page 8, line 44

Thank you for highlighting this important issue. We will report the findings of these studies in our results section as they can provide important information on the effectiveness of each position in relation to each other. However, since they lack a common control they cannot be included in the sensitivity analysis with studies that use the supine position as a control. We have now made a revision to the “Comparator” section to outline this and have pasted the amendment below:

“Studies comparing two non-conventional positions will be reported and compared individually in relation to each other but will not be included in any sensitivity analysis.”

- please provide more details in the outcomes used : what is duration of ventilation ? mortality in which interval ? rating of laryngoscopic view : Cormack grading ? POGO score ? page 8 line 55. The outcomes page 8 and page 10 are not similar, please match them.

Thank you for raising this concern. We have made some changes listed to the outcomes such as rewording “duration of ventilation” to “length of mechanical ventilation (days)” to ensure its clear that we intend to track how long the average patient spent on mechanical ventilation after the procedure. We also specified we will be measuring hospital mortality to capture the portion of patient who die during their stay at the hospital. We also specified that we will be using the Cormack – Lehane grade of view to rate the laryngoscopic view. Lastly, we specified the objective measures to define desaturation episodes (decrease in SpO₂ >3%) and Hypoxemia (SpO₂ <90%) and have removed hypoxia as an outcome of interest given its relative similarity to hypoxemia and the lack of tissue oxygen monitors in clinical practise. We have updated the outcomes on page 8 to match the outcomes on page 10. Thank you for raising this issue, it has helped add clarity and focus to our outcomes of interest.

- the list of keywords used is not given, page 9, line 9

Thank you for bringing this up. Since our list of key MeSH keywords was quite expansive, we did not list them in this paragraph in order to keep the paragraph brief. For transparency though we will attach the full search strategy for all our databases, which include a list of our MeSH keyterms in lines 1-7 for each database search.

- no search in the grey literature is planned but could be implemented, page 9, line 12

Thank you for bringing this to our attention. We considered incorporating a search of the grey literature as it could include more studies in our review. However, because grey literature is often not peer-reviewed, we thought it may compromise the quality of the systematic review. In addition, because of the lack of indexing in most grey literature, we presumed it would be difficult to perform a truly comprehensive review.

- the type of material used (Macintosh laryngoscope or videolaryngoscope ; stylet or bougie) is of crucial importance in intubation, and can directly influence patient positioning. Implementing these data in the data extraction seems important to correctly analyse the results.

Thank you for addressing this – we agree that the materials used during intubation can be of crucial importance during RSI. We will include a category in the Study Characteristics paragraph, page 9 (under heading “Data Extraction”) to include materials used in intubation.

- Minor comments :

- a space is missing between aspiration and [1,2], page 5, line 15

Thank you pointing this out - a space has been added here.

- Comrack-Lehane > Cormack-Lehane, page 10 line 57
 Thank you highlighting this - the spelling has been fixed.

Reviewer: 1
 Competing interests of Reviewer: no conflict of interest

Reviewer: 2
 Competing interests of Reviewer: I have no competing interests to declare.

Editor(s)' Comments to Author (if any):

- Please include the dates of the search in the abstract and in the main Methods section.
 Thank you for highlighting this issue – the dates of the search have been included in both the abstract and main methods section

- Please end the paper with an Ethics and Dissemination section, as per our guidelines for protocols.
 Thank you for addressing this – we have included a section describing the ethics and dissemination at the end of the paper.

- Please include an example of the full search strategy for one database as a supplementary file.
 Thank you for pointing this out – we will include a full search strategy as a supplementary file

VERSION 2 – REVIEW

REVIEWER	Minville, Vincent Département d'Anesthésie et de Réanimation, Centre Hospitalier et Universitaire de Toulouse
REVIEW RETURNED	02-Sep-2022

GENERAL COMMENTS	This is an interesting protocol for a critical topic. The patient positioning is still a matter of debate (supine or (Head down position or Head-up position). The major limitation is probably the lake of date (or studies) aiming at this specific point.
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