**Clinical Librarian Service Search Results**

**Request:** What literature is available on use of CPAP in COVID-19 and nursing patients in the prone position?

**Summary**

A search of good quality resources has identified a lack of literature addressing use of CPAP in COVID-19 and nursing care of patients receiving CPAP whilst they are in the prone position.

Current best evidence appears to be the guidance on the use of non-invasive respiratory support, (NHS England, 6 Apr 2020)1, which provides key recommendations and discusses location and setting of care, tolerability and use of adjuvant pharmacotherapy, CPAP use and device settings, monitoring and SpO2 targets, and appropriate use of PPE.

With regard to nursing care, perhaps the most pertinent information retrieved by the search is the chapter concerning respiratory care of patients and the procedure for CPAP, described in the Royal Marsden Manual of Clinical Nursing Procedures, (2020)5,6

The results listed below are split into two sections. The first contains guidance and evidence-based reviews specifically focused on COVID-19. The second section provides a small selection of literature covering use of non-invasive ventilation, prone positions and nursing care. However, these results are not specific to COVID-19. Further literature is available on prone positioning and nursing care, but this appears to be primarily in infants or in adults with obstructive sleep apnea. Should any of this literature be of interest, it can easily be supplied.

I hope that I have interpreted your request correctly. Please let me know if you would like me to search further.

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**Accessing Articles**

Links are provided where online access to the full-text is available. An OpenAthens username and password may be required for online access to articles. You can register for one here: <https://openathens.nice.org.uk/>

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**Feedback**

Once you have read this report, I would appreciate it if you would complete our online literature search feedback form at:

<https://www.smartsurvey.co.uk/s/LiteratureSearchFeedback20202021/>

This relates to this specific search and will help us to monitor and improve our service.

Many Thanks.

Lisa Lawrence

Clinical Librarian

Lisa.Lawrence4@nhs.net

ext. 88155

**Current at:** 9th April 2020.

**Time taken for search:** 5 hours.

**Please acknowledge this work in any resulting paper or presentation as:**

Evidence Search: LS6 Use of CPAP in COVID-19 and nursing care in prone position. Lisa Lawrence. (09/04/2020). Derby, UK: University Hospitals of Derby & Burton NHS Foundation Trust Library and Knowledge Service.

**Disclaimer:** Please note that the information supplied by the Library and Knowledge Service in response to a literature search is for information purposes only. Every reasonable effort will be made to ensure that this information is accurate, up-to-date and complete. However, it is possible that it may not be representative of the whole body of evidence. No responsibility can be accepted by the Library for any action taken on the basis of this information.

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**Results: COVID-19 specific Guidance & Evidence-Based Reviews**

1. **Guidance for the role and use of non-invasive respiratory support in adult patients with COVID19 (confirmed or suspected).**

**Date:** 6 April 2020, Version 3.

**Source:** NHS England.

**Full Text/URL:**

<https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/specialty-guide-NIV-respiratory-support-and-coronavirus-v3.pdf>

1. **Clinical guide for the management of critical care for adults with COVID-19 during the coronavirus pandemic.**

**Date:** 8 April 2020, Version 2.

**Source:** NHS England.

**Full Text/URL:**

<https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/C0216_Specialty-guide_AdultCritiCare-and-coronavirus_V2_-8-April.pdf>

1. **Estates and Facilities Alert NHSE/I – 2020/001. Use of high flow Oxygen therapy devices (including wall CPAP and high flow face mask or nasal oxygen) during the Coronavirus epidemic – urgent patient safety notice; immediate attention required.**

**Date:** 1 April 2020.

**Source:** MHRA – Medicines and Healthcare products Regulatory Agency.

**Full Text/URL:**

<https://www.cas.mhra.gov.uk/ViewandAcknowledgment/ViewAlert.aspx?AlertID=103013>

1. **Chapter 12 Respiratory care, CPR and blood transfusion.**

**Date:** 2020. [Accessed online 9/4/2020]

**Source:** The Royal Marsden Manual Online, Tenth edition.

**Full Text/URL:**

<https://www.rmmonline.co.uk/manual/c12-sec-0005#c12-sec-0005>

1. **Chapter 12.3 Continuous positive airway pressure (Procedure).**

**Date:** 2020. [Accessed online 9/4/2020]

**Source:** The Royal Marsden Manual Online, Tenth edition.

**Full Text/URL:**

<https://www.rmmonline.co.uk/manual/c12-fea-0005>

1. **Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected.**

**Date:** Interim guidance 13 March 2020.

**Source:** World Health Organization.

**Full Text/URL:**

<https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected>

1. **Surviving Sepsis Campaign: guidelines on the management of critically ill adults with coronavirus Disease 2019 (COVID-19).**

**Author(s):**Alhazzani W, Møller MH, Arabi YM, et al.

**Citation:** Intensive Care Med. 2020 Mar 28 [Epub ahead of print].

See page 18 Ventilatory support.

**Source:** European Society of Intensive Care Medicine.

**Full Text/URL:**

Full guideline: <https://www.esicm.org/wp-content/uploads/2020/03/SSC-COVID19-GUIDELINES.pdf>

Summary and infographic: <https://www.esicm.org/resources/coronavirus-public-health-emergency/#GUIDELINES>

1. **A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version).**

**Author(s):** Jin, Ying-Hui; Cai, Lin; Cheng, Zhen-Shun; Cheng, Hong; Deng, Tong; Fan, Yi-Pin; Fang, Cheng; Huang, Di; Huang, Lu-Qi; Huang, Qiao; Han, Yong; Hu, Bo; Hu, Fen; Li, Bing-Hui; Li, Yi-Rong; Liang, Ke; Lin, Li-Kai; Luo, Li-Sha; Ma, Jing; Ma, Lin-Lu; Peng, Zhi-Yong; Pan, Yun-Bao; Pan, Zhen-Yu; Ren, Xue-Qun; Sun, Hui-Min; Wang, Ying; Wang, Yun-Yun; Weng, Hong; Wei, Chao-Jie; Wu, Dong-Fang; Xia, Jian; Xiong, Yong; Xu, Hai-Bo; Yao, Xiao-Mei; Yuan, Yu-Feng; Ye, Tai-Sheng; Zhang, Xiao-Chun; Zhang, Ying-Wen; Zhang, Yin-Gao; Zhang, Hua-Min; Zhao, Yan; Zhao, Ming-Juan; Zi, Hao; Zeng, Xian-Tao; Wang, Yong-Yan; Wang, Xing-Huan; for the Zhongnan Hospital of Wuhan University Novel Coronavirus Management and Research Team, Evidence-Based Medicine Chapter of China International Exchange and Promotive Association for Medical and Health Care (CPAM)

**Source:** Military Medical Research; Feb 2020; vol. 7 (no. 1); p. 4

**Publication Type(s):** Research Support, Non-u.s. Gov't Practice Guideline Journal Article

**PubMedID:** 32029004

See section 6 – Treatment.

Available at [Military Medical Research](https://mmrjournal.biomedcentral.com/articles/10.1186/s40779-020-0233-6) - from BioMed Central

Available at [Military Medical Research](https://mmrjournal.biomedcentral.com/track/pdf/10.1186/s40779-020-0233-6) - from Unpaywall

**Database:** Medline

1. **Coronavirus disease 2019 (COVID-19)**

**Date:** April 2020.

See Treatment algorithm - section on advanced oxygen/ventilatory support.

**Source:** BMJ Best Practice.

**Full Text/URL:**

<https://bestpractice.bmj.com/topics/en-gb/3000168/treatment-algorithm>

See also separate email

1. **Noninvasive Positive Pressure Ventilation (NPPV) in Adults.**

**Date:** Dec 2018.

**Source:** DynaMed.

**Full Text/URL:** <https://www.dynamed.com/topics/dmp~AN~T483077> See also separate email.

1. **Coronavirus disease 2019 (COVID-19): Critical care issues.**

**Date:** April 2020.

See section - Respiratory Care for the Nonintubated Patient.

**Source:** UpToDate.

**Full Text:** See separate email.

**Results: Further Literature – Not all COVID-19 specific**

1. **Treatment for severe acute respiratory distress syndrome from COVID-19.**

**Author(s):** Michael A Matthay, J Matthew Aldrich, Jeffrey E Gotts.

**Citation:** The Lancet Respiratory Medicine, 2020, ISSN 2213-2600.

<https://doi.org/10.1016/S2213-2600(20)30127-2>.

**Source:** Google.

**Full Text:** <http://www.sciencedirect.com/science/article/pii/S2213260020301272>

1. **Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations.**

**Author(s):** Phua J, Weng L, Ling L, Egi M, Lim CM, Divatia JV, et al.

**Citation:** Published online April 6 2020 doi:.org/10.1016/S2213-2600(20)30161-2.

**Source:** Google.

**Full Text:**

<https://www.thelancet.com/action/showPdf?pii=S2213-2600%2820%2930161-2>

1. **Nasal Injury with Continuous Positive Airway Pressure: Need for "Privileging" Nursing Staff.**

**Author(s):** Naha, Nihaz; Pournami, Femitha; Prabhakar, Jyothi; Jain, Naveen

**Source:** Indian journal of pediatrics; Jul 2019; vol. 86 (no. 7); p. 595-598

**Publication Type(s):** Journal Article

**PubMedID:** 31020593

**Abstract:** OBJECTIVES Use of continuous positive airway pressure (CPAP) in neonates is associated with nasal injury (NI) for which various risk factors related to the neonatal characteristics and properties of interfaces used have been reported. "Privileging" of nursing staff may influence safety and incidence of adverse events. In this prospective cohort study, authors studied the incidence of NI and risk factors for NI in babies requiring CPAP after privileging staff for CPAP care bundles. METHODS All neonates on CPAP over a 6-mo period were included. Standard operating procedures were formulated and staff of NICU (nurses and doctors) were educated at the start of the study and periodically in 6 comprehensive areas of care- encompassing position of head, prongs and cap; nasal suctioning and interruptions in pressure on the nose. The staff who completed the training and evaluation were declared as "privileged". NI (measured by a standard staging) and risk factors were predefined and studied. RESULTS Of the 51 babies who required respiratory supports, 35 required CPAP care. Nine babies (25%) out of 35 who required CPAP had NI (2, 4, 3 babies had stages 1, II and III of NI respectively). Seventy seven percent of babies were cared for by privileged nurses. NI was significantly higher when cared for by non-privileged staff (66% vs. 11%, unadjusted RR = 6.75, 95%CI 2.16-21.09). All other risk factors were not significant. CONCLUSIONS NI was noted in 25% neonates on CPAP, and those cared for by non-privileged staff had higher chances of NI. Quality processes and emphasis on continued monitoring and evaluation of nursing skills may help prevent these untoward complications.

**Database:** Medline

1. **Device Related Pressure Ulcers Pre and Post Identification and Intervention.**

**Author(s):** Clay, Pamela; Cruz, Casey; Ayotte, Keith; Jones, Jeremy; Fowler, Susan B

**Source:** Journal of pediatric nursing; Jan 2018

**Publication Type(s):** Journal Article

**PubMedID:** 29397270

**Abstract:** PROBLEM From 2014 to 2016, device related pressure injuries accounted for 62-81% of all hospital acquired pressure injuries. From January to June 2014, there were 5 BiPAP/CPAP pressure injuries noted, accounting for 3.579 injuries per 1000 ventilator days. In 2015, hospital data revealed that 26.5% of all hospital acquired pressure injuries occurred to prone surgical spine patients. METHODS Collaborative teams including respiratory therapists and operating room staff were convened and crafted new strategies. INTERVENTIONS Adhesive foam dressings on patient faces with BiPAP/CPAP masks and prior to orthopedic spinal surgery were used to prevent device and operating room positioning pressure injuries. RESULTS From July to December 2014 there were 0 BiPAP/CPAP pressure injuries. After interventions in March of 2016 through the remainder of 2016, zero pressure injuries occurred when the adhesive foam dressings were applied to the potential pressure injury areas pre-operatively. CONCLUSIONS We used real time patient data to drive efforts and create a new culture in the pediatric setting that honors critical airway maintenance, operative room positioning, and preventative skin protection.

**Database:** Medline

1. **Non-invasive mechanical ventilation in hypoxemic respiratory failure: Just a matter of the interface?**

**Author(s):** Moerer, Onnen; Harnisch, Lars-Olav

**Source:** Journal of Thoracic Disease; Sep 2016; vol. 8 (no. 9); p. 2348-2352

**Publication Type(s):** Academic Journal

Available at [Journal of Thoracic Disease](http://europepmc.org/search?query=(DOI:10.21037/jtd.2016.08.43)) - from Europe PubMed Central - Open Access

Available at [Journal of Thoracic Disease](http://europepmc.org/articles/pmc5059257?pdf=render) - from Unpaywall

**Database:** CINAHL

1. **Prone position for acute respiratory failure in adults.**

**Author(s):** Bloomfield, Roxanna; Noble, David W; Sudlow, Alexis

**Source:** The Cochrane database of systematic reviews; Nov 2015 (no. 11); p. CD008095

**Publication Type(s):** Research Support, Non-u.s. Gov't Meta-analysis Journal Article Review Systematic Review

**PubMedID:** 26561745

Available at [The Cochrane database of systematic reviews](http://cochranelibrary-wiley.com/doi/10.1002/14651858.CD008095.pub2/full) - from Cochrane Collaboration (Wiley)

Available at [The Cochrane database of systematic reviews](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6464920) - from Unpaywall

**Abstract:** BACKGROUND Acute hypoxaemia de novo or on a background of chronic hypoxaemia is a common reason for admission to intensive care and for provision of mechanical ventilation. Various refinements of mechanical ventilation or adjuncts are employed to improve patient outcomes. Mortality from acute respiratory distress syndrome, one of the main contributors to the need for mechanical ventilation for hypoxaemia, remains approximately 40%. Ventilation in the prone position may improve lung mechanics and gas exchange and could improve outcomes. OBJECTIVES The objectives of this review are (1) to ascertain whether prone ventilation offers a mortality advantage when compared with traditional supine or semi recumbent ventilation in patients with severe acute respiratory failure requiring conventional invasive artificial ventilation, and (2) to supplement previous systematic reviews on prone ventilation for hypoxaemic respiratory failure in an adult population. SEARCH METHODS We searched the Cochrane Central Register of Controlled Trials (CENTRAL; 2014, Issue 1), Ovid MEDLINE (1950 to 31 January 2014), EMBASE (1980 to 31 January 2014), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1982 to 31 January 2014) and Latin American Caribbean Health Sciences Literature (LILACS) (1992 to 31 January 2014) in Ovid MEDLINE for eligible randomized controlled trials. We also searched for studies by handsearching reference lists of relevant articles, by contacting colleagues and by handsearching published proceedings of relevant journals. We applied no language constraints, and we reran the searches in CENTRAL, MEDLINE, EMBASE, CINAHL and LILACS in June 2015. We added five new studies of potential interest to the list of "Studies awaiting classification" and will incorporate them into formal review findings during the review update. SELECTION CRITERIA We included randomized controlled trials (RCTs) that examined the effects of prone position versus supine/semi recumbent position during conventional mechanical ventilation in adult participants with acute hypoxaemia. DATA COLLECTION AND ANALYSIS Two review authors independently reviewed all trials identified by the search and assessed them for suitability, methods and quality. Two review authors extracted data, and three review authors reviewed the data extracted. We analysed data using Review Manager software and pooled included studies to determine the risk ratio (RR) for mortality and the risk ratio or mean difference (MD) for secondary outcomes; we also performed subgroup analyses and sensitivity analyses. MAIN RESULTS We identified nine relevant RCTs, which enrolled a total of 2165 participants (10 publications). All recruited participants suffered from disorders of lung function causing moderate to severe hypoxaemia and requiring mechanical ventilation, so they were fairly comparable, given the heterogeneity of specific disease diagnoses in intensive care. Risk of bias, although acceptable in the view of the review authors, was inevitable: Blinding of participants and carers to treatment allocation was not possible (face-up vs face-down).Primary analyses of short- and longer-term mortality pooled from six trials demonstrated an RR of 0.84 to 0.86 in favour of the prone position (PP), but findings were not statistically significant: In the short term, mortality for those ventilated prone was 33.4% (363/1086) and supine 38.3% (395/1031). This resulted in an RR of 0.84 (95% confidence interval (CI) 0.69 to 1.02) marginally in favour of PP. For longer-term mortality, results showed 41.7% (462/1107) for prone and 47.1% (490/1041) for supine positions, with an RR of 0.86 (95% CI 0.72 to 1.03). The quality of the evidence for both outcomes was rated as low as a result of important potential bias and serious inconsistency. Subgroup analyses for mortality identified three groups consistently favouring PP: those recruited within 48 hours of meeting entry criteria (five trials; 1024 participants showed an RR of 0.75 (95% CI 0.59 to 94)); those treated in the PP for 16 or more hours per day (five trials; 1005 participants showed an RR of 0.77 (95% CI 0.61 to 0.99)); and participants with more severe hypoxaemia at trial entry (six trials; 1108 participants showed an RR of 0.77 (95% CI 0.65 to 0.92)). The quality of the evidence for these outcomes was rated as moderate as a result of potentially important bias. Prone positioning appeared to influence adverse effects: Pressure sores (three trials; 366 participants) with an RR of 1.37 (95% CI 1.05 to 1.79) and tracheal tube obstruction with an RR of 1.78 (95% CI 1.22 to 2.60) were increased with prone ventilation. Reporting of arrhythmias was reduced with PP, with an RR of 0.64 (95% CI 0.47 to 0.87). AUTHORS' CONCLUSIONS We found no convincing evidence of benefit nor harm from universal application of PP in adults with hypoxaemia mechanically ventilated in intensive care units (ICUs). Three subgroups (early implementation of PP, prolonged adoption of PP and severe hypoxaemia at study entry) suggested that prone positioning may confer a statistically significant mortality advantage. Additional adequately powered studies would be required to confirm or refute these possibilities of subgroup benefit but are unlikely, given results of the most recent study and recommendations derived from several published subgroup analyses. Meta-analysis of individual patient data could be useful for further data exploration in this regard. Complications such as tracheal obstruction are increased with use of prone ventilation. Long-term mortality data (12 months and beyond), as well as functional, neuro-psychological and quality of life data, are required if future studies are to better inform the role of PP in the management of hypoxaemic respiratory failure in the ICU.

**Database:** Medline

1. **Use of Heliox Delivered via High-Flow Nasal Cannula to Treat an Infant With Coronavirus-Related Respiratory Infection and Severe Acute Air-Flow Obstruction.**

**Author(s):** Morgan, Sherwin E; Vukin, Kirissa; Mosakowski, Steve; Solano, Patti; Stanton, Lolita; Lester, Lucille; Lavani, Romeen; Hall, Jesse B.; Tung, Avery

**Source:** Respiratory Care; Nov 2014; vol. 59 (no. 11)

**Publication Type(s):** Academic Journal

Available at [Respiratory Care](http://rc.rcjournal.com/cgi/doi/10.4187/respcare.02728) - from HighWire 12 Month Embargo

Available at [Respiratory Care](http://rc.rcjournal.com/content/respcare/59/11/e166.full.pdf) - from Unpaywall

**Abstract:** Heliox, a helium-oxygen gas mixture, has been used for many decades to treat obstructive pulmonary disease. The lower density and higher viscosity of heliox relative to nitrogen-oxygen mixtures can significantly reduce airway resistance when an anatomic upper air-flow obstruction is present and gas flow is turbulent. Clinically, heliox can decrease airway resistance in acute asthma in adults and children and in COPD. Heliox may also enhance the bronchodilating effects of -agonist administration for acute asthma. Respiratory syndromes caused by coronavirus infections in humans range in severity from the common cold to severe acute respiratory syndrome associated with human coronavirus OC43 and other viral strains. In infants, coronavirus infection can cause bronchitis, bronchiolitis, and pneumonia in variable combinations and can produce enough air-flow obstruction to cause respiratory failure. We describe a case of coronavirus OC43 infection in an infant with severe acute respiratory distress treated with heliox inhalation to avoid intubation.

**Database:** CINAHL

1. **Effectiveness of Prone Ventilation in patients with Acute Respiratory Distress Syndrome: a systematic review.**

**Author(s):** Qureshi, Abdul; Cornwell, Chuck

**Source:** JBI Library of Systematic Reviews; Sep 2012; vol. 10 (no. 42); p. 1-12

**Publication Type(s):** Academic Journal

**Database:** CINAHL

1. **Using the prone position for ventilated patients with respiratory failure: a review.**

**Author(s):** Wright, Angie D; Flynn, Maria

**Source:** Nursing in critical care; 2011; vol. 16 (no. 1); p. 19-27

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article Review Systematic Review

**PubMedID:** 21199551

Available at [Nursing in critical care](https://go.openathens.net/redirector/nhs?url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Ffull%2F10.1111%2Fj.1478-5153.2010.00425.x) - from Wiley Online Library Medicine and Nursing Collection 2019 - NHS

**Abstract:** AIMS this review explored the evidence relating to prone positioning in ventilated patients diagnosed with respiratory failure, including acute lung injury (ALI) or adult respiratory distress syndrome (ARDS). BACKGROUND mortality rates for ventilated patients with ALI or ARDS are high, and there is a growing body of evidence suggesting that the position these patients are nursed in may influence clinical outcomes. However, there are no guidelines to inform nursing practice in positioning these patients. METHOD Medline, Scopus, Cinahl and the Cochrane Library databases were searched for original research reports or systematic reviews of evidence between 2000 and 2009. Reference lists of retrieved papers were hand searched and included studies were analysed using the Critical Appraisal and Skills Programme framework. A narrative data synthesis considered the strengths and limitations of studies, and findings were collated and interpreted. RESULTS Application of the search strategy identified a systematic review, currently underway, which has not yet reported and 14 relevant studies eligible for inclusion in this review. Analysis showed considerable variation in study design, but suggests that PaO(2) /FiO(2) ratio, incidence of VAP and mortality may be positively affected by prone positioning. CONCLUSIONS evidence of the clinical benefits associated with prone positioning is inconclusive and provides little guidance for nursing practice. There is a need for further research into the clinical outcomes of prone positioning, and greater understanding of the practicalities of prone positioning critically ill patients is required. RELEVANCE TO CLINICAL PRACTICE nurses have a central role to play in the continual assessment and management of this patient group, including the position they are nursed in, not only to ensure the best clinical outcomes but also to provide care and comfort to the patient and their family. It is therefore important that their nursing practice and interventions are informed by the best available evidence.

**Database:** Medline

1. **Novel uses of noninvasive ventilation.**

**Author(s):** Benditt JO

**Source:** Respiratory Care; Feb 2009; vol. 54 (no. 2); p. 212-222

**Publication Type(s):** Academic Journal

**PubMedID:** NLM19173753

**Abstract:** Noninvasive ventilation (NIV) and continuous positive airway pressure (CPAP) have been used in various unusual settings to assist breathing. NIV is now frequently used to treat exacerbations of chronic obstructive pulmonary disease and chronic respiratory failure in neuromuscular disease. This paper discusses CPAP and NIV for postoperative hypoxemia, preventing intubation in high-risk bronchoscopy, respiratory failure in pandemics, obesity hypoventilation syndrome, and respiratory support during percutaneous endoscopic gastrostomy tube placement.

**Database:** CINAHL

1. **Noninvasive positive pressure ventilation in the intensive care unit: a concise review.**

**Author(s):** Caples SM; Gay PC; Caples, Sean M; Gay, Peter C

**Source:** Critical Care Medicine; Nov 2005; vol. 33 (no. 11); p. 2651-2658

**Publication Type(s):** Academic Journal

**PubMedID:** NLM16276193

Available at [Critical Care Medicine](http://ovidsp.ovid.com/athens/ovidweb.cgi?T=JS&PAGE=fulltext&D=ovft&CSC=Y&NEWS=N&SEARCH=0090-3493.is+and+%2233%22.vo+and+%2211%22.ip+and+%222651%22.pg+or+%2210.1097/01.CCM.0000186768.61570.69%22.di) - from Ovid (Journals @ Ovid) - Remote Access

**Abstract:** Objective: To critically assess available high-level clinical studies regarding use of noninvasive positive pressure ventilation in varied intensive care unit settings. Data Source: Search of pertinent articles within Ovid MEDLINE from 1975 to 2005, CINAHL from 1982 to 2005, EMBASE from 1988 to 2005, and Web of Science from 1993 to 2005.Study Selection: Randomized, controlled clinical trials and cohort studies and observational studies the authors consider important or novel. Data Extraction/synthesis: Performed equally by both authors with the use of an Excel data spreadsheet. Conclusion: There is abundant level I evidence supporting the use of noninvasive positive pressure ventilation in such critical care settings as acute hypercapnic respiratory failure, particularly related to chronic obstructive pulmonary disease, and acute cardiogenic pulmonary edema. We also report on other clinical scenarios in which the data may be somewhat less compelling, but evidence favors a noninvasive positive pressure ventilation trial. Some well designed studies suggest that noninvasive positive pressure ventilation is not an appropriate intervention for patients who have failed endotracheal extubation.

**Database:** CINAHL

1. **Effectiveness of noninvasive positive pressure ventilation in the treatment of acute respiratory failure in severe acute respiratory syndrome.**

**Author(s):** Cheung TMT; Yam LYC; So LKY; Lau ACW; Poon E; Kong BMH; Yung RWH

**Source:** CHEST; Sep 2004; vol. 126 (no. 3); p. 845-850

**Publication Type(s):** Academic Journal

**PubMedID:** NLM15364765

Available at [Chest](http://ovidsp.ovid.com/athens/ovidweb.cgi?T=JS&PAGE=fulltext&D=ovft&CSC=Y&NEWS=N&SEARCH=0012-3692.is+and+%22126%22.vo+and+%223%22.ip+and+%22845%22.pg+or+%2210.1378/chest.126.3.845%22.di) - from Ovid (Journals @ Ovid) - Remote Access

Available at [Chest](http://gateway.proquest.com/openurl?ctx_ver=Z39.88-2004&res_id=xri:pqm&req_dat=xri:pqil:pq_clntid=145298&rft_val_fmt=ori/fmt:kev:mtx:journal&genre=article&issn=0012-3692&volume=126&issue=3&spage=845) - from ProQuest (Health Research Premium) - NHS Version

Available at [Chest](https://www.ncbi.nlm.nih.gov/pubmed/15364765) - from PubMed

Available at [Chest](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7094489/) - from PubMed Central

Available at [Chest](https://doi.org/10.1378/chest.126.3.845) - from doi.org

Available at [Chest](http://journal.chestnet.org/article/S0012369215312289/pdf) - from Unpaywall

**Abstract:** OBJECTIVES: To study the effectiveness of noninvasive positive pressure ventilation (NIPPV) in the treatment of acute respiratory failure (ARF) in severe acute respiratory syndrome (SARS), and the associated infection risk. METHODS: All patients with the diagnosis of probable SARS admitted to a regional hospital in Hong Kong from March 9 to April 28, 2003, and who had SARS-related respiratory distress complications were recruited for NIPPV usage. The health status of all health-care workers working in the NIPPV wards was closely monitored, and consent was obtained to check serum for coronavirus serology. Patient outcomes and the risk of SARS transmission to health-care workers were assessed. RESULTS: NIPPV was applied to 20 patients (11 male patients) with ARF secondary to SARS. Mean age was 51.4 years, and mean acute physiology and chronic health evaluation II score was 5.35. Coronavirus serology was positive in 95% (19 of 20 patients). NIPPV was started 9.6 days (mean) from symptom onset, and mean duration of NIPPV usage was 84.3 h. Endotracheal intubation was avoided in 14 patients (70%), in whom the length of ICU stay was shorter (3.1 days vs 21.3 days, p < 0.001) and the chest radiography score within 24 h of NIPPV was lower (15.1 vs 22.5, p = 0.005) compared to intubated patients. Intubation avoidance was predicted by a marked reduction in respiratory rate (9.2 breaths/min) and supplemental oxygen requirement (3.1 L/min) within 24 h of NIPPV. Complications were few and reversible. There were no infections among the 105 health-care workers caring for the patients receiving NIPPV. CONCLUSIONS: NIPPV was effective in the treatment of ARF in the patients with SARS studied, and its use was safe for health-care workers.

**Database:** CINAHL

1. **Nursing care of patients with severe acute respiratory syndrome in the intensive care unit: case reports in Hong Kong.**

**Author(s):** Lopez V; Chan KS; Wong YC

**Source:** International Journal of Nursing Studies; Mar 2004; vol. 41 (no. 3); p. 263-272

**Publication Type(s):** Academic Journal

**PubMedID:** NLM14967183

**Abstract:** Severe acute respiratory syndrome (SARS) was diagnosed in more than 8437 patients in 25 countries between February and July 2003. During this period the World Health Organisation issued a global alert about SARS and together with the Centre for Disease Control have coordinated their efforts to investigate its pathogenesis and treatment. The outbreak in Hong Kong has been dramatic due to its geographical proximity with Guangdong province, China where the first case of SARS was reported. SARS has been described as a rapidly progressive, sometimes fatal pneumonia with a case fatality rate of 7.6% requiring intensive care. The four case reports illustrate a number of important points concerning the recognition, treatment, management and prevention of SARS, and highlights the importance of considering vigilant assessment and monitoring of patients with SARS. The purpose of this paper is to share our experiences in caring for critically ill patients with SARS in the intensive care unit to nurses globally in order to reduce SARS' morbidity and mortality as well as to protect nurses and other healthcare workers from this disease that is so far threatening the community at large.

**Database:** CINAHL

1. **High continuous positive airway pressure level induces ventilation/perfusion mismatch in the prone position.**

**Author(s):** Mure, M; Nyrén, S; Jacobsson, H; Larsson, S A; Lindahl, S G

**Source:** Critical care medicine; May 2001; vol. 29 (no. 5); p. 959-964

**Publication Type(s):** Research Support, Non-u.s. Gov't Clinical Trial Journal Article

**PubMedID:** 11378604

Available at [Critical care medicine](http://ovidsp.ovid.com/athens/ovidweb.cgi?T=JS&PAGE=fulltext&D=ovft&CSC=Y&NEWS=N&SEARCH=0090-3493.is+and+%2229%22.vo+and+%225%22.ip+and+%22959%22.pg+or+%2210.1097/00003246-200105000-00010%22.di) - from Ovid (Journals @ Ovid) - Remote Access

**Abstract:** OBJECTIVE Gas exchange in patients with adult respiratory distress syndrome is influenced by posture. The combined effect of continuous positive airway pressure and posture has not been investigated. We studied the effect of normal spontaneous breathing, and that of continuous positive airway pressure, on ventilation/perfusion distributions in healthy volunteers while they were in supine and prone positions. SETTING Nuclear medicine department in a university hospital. DESIGN Experimental study. SUBJECTS Sixteen healthy volunteers .INTERVENTIONS In the supine or prone position, the subjects inhaled a technetium-labeled aerosol (technetium-99m diethylenetriamine pentaacetic acid) through a tight-fitting mask. Single photon emission computed tomography images of the lungs were obtained. The subjects then received an intravenous injection of technetium-99m-labeled macroaggregates of albumin, and an identical single photon emission computed tomography imaging was performed. In the group that received continuous positive airway pressure, an end-expiratory pressure of 10 cm H2O was applied during both inhalation and injection. MEASUREMENTS AND MAIN RESULTS During spontaneous breathing, ventilation/perfusion distribution assessed by regression analysis was uniform (i.e., not significantly different from zero) both in supine and prone positions, with a slope of -1.5 +/- 3.5%/cm supine and 1.5 +/- 3.5%/cm prone. During continuous positive airway pressure breathing in the supine position, ventilation/perfusion had a slope of -3.4 +/- 2.4 compared with 8.3 +/- 1.1%/cm in the prone position according to analysis of spatial resolution. CONCLUSION There was a less favorable ventilation/perfusion ratio in the prone position when the subjects were exposed to continuous positive airway pressure of 10 cm H2O.

**Database:** Medline

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**Databases searched:**

* + **Evidence-Based Reviews/Point-of-Care:** Cochrane Library, UpToDate, DynaMed, BMJ Best Practice.
  + **Guidance:** NICE Guidance, selected International Guidelines.
  + **Healthcare Databases:** MEDLINE, CINAHL, PubMed, NICE Evidence.
  + **Other:** Google, Google Scholar, World Health Organization Database of publications on coronavirus disease (COVID-19), NHS England, British Thoracic Society, Royal Marsden Manual of Clinical Nursing Procedures.

**Local Guidance:** Local guidance has not been searched as part of this literature search. However, local guidelines, policies and procedures are available via the red button on the intranet.

**Search Terms:**

|  |  |
| --- | --- |
| ***Subject Headings*** | ***Free Text Words*** |
| Continuous Positive Airway Pressure | 2019nCoV |
| Coronaviridae Infections | 2019-nCoV |
| Coronavirus Infections | COVID\* |
| Critical Care Nursing | “COVID 19” |
| Nursing | COVID-19 |
| Nursing Care | “Corona virus” |
| Nursing Skills | Coronavir\* |
| Prone Position | “Continuous positive airway pressure” |
| Respiratory Care Practice | CPAP |
| Respiratory Insufficiency | Cv19 |
| Respiratory Nursing | Cv-19 |
| Respiratory Therapy | “Inspiratory positive airway pressure” |
|  | nCoV |
|  | “novel CoV” |
|  | “novel coronavirus” |
|  | Nurs\* |
|  | Nursing care |
|  | Pron\* |
|  | Position\* |
|  | SARS-CoV-2 |
|  | sarscov2 |

**Search Limits:** English language, 2000-2020.

**Search History:**

**Search Example:**

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Database** | **Search term** | **Results** |
| 1 | Medline | (COVID\* OR coronavir\* OR "corona virus" OR "2019-nCoV" OR "SARS-CoV-2" OR cv19 OR "cv-19").ti,ab | 14626 |
| 2 | Medline | (covid-19 OR "covid 19" OR "novel coronavirus" OR nCoV OR "CoV 2" OR Cov2 OR sarscov2 OR 2019nCoV OR "novel CoV").ti,ab | 3441 |
| 3 | Medline | (1 OR 2) | 14670 |
| 4 | Medline | (cpap OR "continuous positive airway pressure" OR "inspiratory positive airway pressure").ti,ab | 11673 |
| 5 | Medline | exp "CONTINUOUS POSITIVE AIRWAY PRESSURE"/ | 6869 |
| 6 | Medline | (pron\* position\*).ti,ab | 10930 |
| 7 | Medline | exp "PRONE POSITION"/ | 3952 |
| 8 | Medline | exp "NURSING CARE"/ | 134031 |
| 9 | Medline | exp NURSING/ | 250813 |
| 10 | Medline | (nurs\*).ti,ab | 442805 |
| 11 | Medline | (4 OR 5) | 13723 |
| 12 | Medline | (6 OR 7) | 12271 |
| 13 | Medline | (8 OR 9 OR 10) | 582705 |
| 14 | Medline | (3 AND 11) | 5 |
| 15 | Medline | 3 AND 12 | 6 |
| 16 | Medline | 3 AND 13 | 134 |
| 17 | Medline | exp "RESPIRATORY INSUFFICIENCY"/ | 61748 |
| 18 | Medline | (12 AND 13) | 282 |
| 19 | Medline | (17 AND 18) | 9 |
| 20 | Medline | (3 AND 11 AND 12 AND 13) | 0 |
| 21 | Medline | (11 AND 12) | 50 |
| 22 | CINAHL | (COVID\* OR coronavir\* OR "corona virus" OR "2019-nCoV" OR "SARS-CoV-2" OR cv19 OR "cv-19").ti,ab | 1913 |
| 23 | CINAHL | (covid-19 OR "covid 19" OR "novel coronavirus" OR nCoV OR "CoV 2" OR Cov2 OR sarscov2 OR 2019nCoV OR "novel CoV").ti,ab | 519 |
| 24 | CINAHL | exp "CORONAVIRIDAE INFECTIONS"/ | 3013 |
| 25 | CINAHL | exp "CORONAVIRUS INFECTIONS"/ | 2988 |
| 26 | CINAHL | (22 OR 23 OR 25) | 4012 |
| 27 | CINAHL | (cpap OR "continuous positive airway pressure" OR "inspiratory positive airway pressure").ti,ab | 4660 |
| 28 | CINAHL | exp "CONTINUOUS POSITIVE AIRWAY PRESSURE"/ | 5415 |
| 29 | CINAHL | (27 OR 28) | 7134 |
| 30 | CINAHL | (pron\* position\*).ti,ab | 3596 |
| 31 | CINAHL | exp "PRONE POSITION"/ | 2079 |
| 32 | CINAHL | (30 OR 31) | 4521 |
| 33 | CINAHL | exp "NURSING CARE"/ | 300741 |
| 34 | CINAHL | exp "NURSING SKILLS"/ | 6022 |
| 35 | CINAHL | exp "RESPIRATORY CARE PRACTICE"/ | 231 |
| 36 | CINAHL | exp "CRITICAL CARE NURSING"/ OR exp "RESPIRATORY NURSING"/ | 29217 |
| 37 | CINAHL | exp "RESPIRATORY THERAPY"/ | 48795 |
| 38 | CINAHL | (33 OR 34 OR 35 OR 36 OR 37) | 346669 |
| 39 | CINAHL | (26 AND 29 AND 32 AND 38) | 0 |
| 40 | CINAHL | (26 AND 29 AND 32) | 0 |
| 41 | CINAHL | (26 AND 29) | 10 |
| 42 | CINAHL | (26 AND 32) | 6 |
| 43 | CINAHL | (26 AND 38) | 193 |
| 44 | BNI | (COVID\* OR coronavir\* OR "corona virus" OR "2019-nCoV" OR "SARS-CoV-2" OR cv19 OR "cv-19").ti,ab | 450 |
| 45 | BNI | (covid-19 OR "covid 19" OR "novel coronavirus" OR nCoV OR "CoV 2" OR Cov2 OR sarscov2 OR 2019nCoV OR "novel CoV").ti,ab | 276 |
| 46 | BNI | (44 OR 45) | 450 |
| 47 | BNI | (cpap OR "continuous positive airway pressure" OR "inspiratory positive airway pressure").ti,ab | 448 |
| 48 | BNI | (pron\* position\*).ti,ab | 280 |
| 49 | BNI | (nursing care).ti,ab | 52320 |
| 50 | BNI | (46 AND 47 AND 48) | 0 |
| 51 | BNI | (46 AND 47) | 2 |
| 52 | BNI | (46 AND 48) | 0 |
| 53 | BNI | (46 AND 49) | 4 |

**Search Date: 09/04/2020**

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