# Evidence Search Service Results of your search request

## Adherence to starter enteral feeding protocols in intensive care for covid-19

**ID of request:** 26416  
**Date of request:** 27th November, 2020  
**Date of completion:** 30th November, 2020

If you would like to request any articles or any further help, please contact:  Jennifer Manders at [Jennifer.Manders@uhb.nhs.uk](mailto:Jennifer.Manders@uhb.nhs.uk)

Please acknowledge this work in any resulting paper or presentation as: Evidence search: Adherence to starter enteral feeding protocols in intensive care for covid-19. Jennifer Manders. (30th November, 2020). BIRMINGHAM, UK: University Hospitals Birmingham (UHB) Library and Knowledge Service.

**Sources searched**  
ClinicalKey (1)  
EMBASE (3)  
Google Scholar (2)  
MEDLINE (5)  
PubMed (1)

**Date range used** (5 years, 10 years): Last 2 years   
**Limits used** (gender, article/study type, etc.): Adult patients.   
**Search terms and notes** (full search strategy for database searches below):

**Databases searched: MEDLINE, EMBASE, CINAHL, Cochrane Library, PubMed, NICE Evidence, ClinicalKey, Google Scholar**

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### [B. Search History](#SearchHistory)

## A. Original Research

1. **Challenges of Maintaining Optimal Nutrition Status in COVID‐19 Patients in Intensive Care Settings**  
   Nicole Minnelli RD Lisa Gibbs MS Journal of Parenteral and Enteral Nutrition 2020;44(8):1439-46.

Abstract The coronavirus disease 2019 (COVID‐19) pandemic has threatened patients, healthcare systems, and all countries across the globe with unprecedented challenges and uncertainties. According to the latest literature, most patients with COVID‐19 have mild symptoms that do not require hospital admissions, and only a small percentage of those hospitalized require intensive care. In the intensive care unit (ICU), a registered dietitian nutritionist (RDN) assists the critical care team by formulating, executing, and monitoring the nutrition strategies and interventions to meet the unique requirements of extremely sick patients. However, because of the novelty of COVID‐19, the situation is fluid and guidelines continue to be developed and updated. This article discusses the interim guidelines available for the nutrition support of ICU COVID‐19 patients and the challenges the critical care team and RDN may face from a nutrition standpoint.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=4073415dafd5c0272a9a819d3639ed5a)

1. **Early nutrition protocol during Covid-19 pandemic**  
   Bursi S. Clinical Nutrition ESPEN 2020;40:511-512.

Rationale: At the end of February 2020 the first SARS-COV2 related pneumonia was diagnosed in Italy and soon the disease spread all over the country. It is well demonstrated that malnutrition is related to worse outcomes in many acute and chronic diseases and that ICU stay is often associated to worsening of nutritional status leading to ICU acquired weakness. Peculiar COVID-19 clinical feature is the Cytokine Storm leading to a Systemic Inflammatory Response Syndrome with multiple organ impairment and metabolic imbalances. Other typical symptoms that may worsen nutritional status are anosmia, ageusia, anorexia and diarrohea. The most of hospitalized patients needed some kind of respiratory therapy, ranging from oxygen delivering nasal cannulae to mechanical ventilation if ARDS or respiratory failure occurred. In the early phases of the pandemic our Clinical Nutrition Unit at the Maggiore Hospital in Bologna (Italy) developed a protocol for early nutrition treatment for COVID-19 inpatients: the aim was to provide a useful tool, fast and easy to perform in Intensive Care Units (ICUs) and general medicine wards. <br/>Method(s): Publication from Scientific Association on Clinical Nutrition in ICU and Internal Medicine setting were searched online on PubMed. Recently published recommendations and guidelines regarding Clinical Nutrition and micronutrient function in COVID-patients were also screened and evaluated. Upon these bases we developed a specific Nutritional Protocol for COVID-19 inpatients. <br/>Result(s): The multistep protocol considered three different scenarios depending on the route of nutrient administration: oral feeding, enteral feeding via nasogastric tube, parenteral nutrition. The protocol was intended to be used by non nutrition specialists to start early nutrition therapy (ideally in the first 24-48 hours of hospitalization) We decided to use hypercaloric and high-protein Oral Nutrition Supplements, enteral formulas and parenteral formulas to restrict fluids, all enriched with immunomodulatory components (i.e. omega-3 fatty acids EPA and DHA). Due to high vitamin and trace elements requirements during acute stress every patient should be provided with thiamine and with one high dose intramuscular injection of vitamin D. <br/>Conclusion(s): During the recent COVID-19 pandemic the importance of continuous clinical updating, flexibility and adaptation to new clinical settings was crucial to develop an Early Nutrition Protocol; this was intended to be a fast and easy to use tool to help non-nutritionist physicians in performing a first nutritional assessment in a large number of patients in emergency setting. Disclosure of Interest: None declared<br/>Copyright &#xa9; 2020

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f7509566c78e74bb4ecf91c416774dff)

1. **Easy-to-prescribe nutrition support in the intensive care in the era of COVID-19**  
   Aude de Watteville Clinical Nutrition ESPEN 2020;39:74-8.

Summary Background & aims COVID-19 pandemic had resulted in a massive increase in the number of patients admitted to intensive care units (ICUs). This created significant organizational challenges including numerous non-specialist ICU caregivers who came to work in the ICU. In this context, pragmatic protocols were essential to simplify nutritional care. We aimed at providing a simple and easy-to-prescribe nutritional protocol and evaluated its usefulness with questionnaires sent to physicians involved in the care of ICU COVID-19 patients. Methods A simplified nutrition protocol was distributed to all physicians (n = 122) of the ICU medical team during COVID-19 pandemic. Clinical dieticians estimated energy targets for acute and post-acute phases at patient's admission and suggested adaptations of nutrition therapy. More complex situations were discussed with clinical nutrition doctors and, if required, a clinical evaluation was performed. To further facilitate the procedure, a chart with prescription aids was also distributed to the whole medical ICU team. At the end of the current pandemic wave, a 13-item questionnaire was emailed to the ICU medical team to obtain their opinion on the suggested nutritional therapy. Results Answers were received from 81/122 medical doctors (MDs) (66% response rate), from intensive care physicians (41%), anaesthesiologists (53%) and MDs from other specialties (6%). Thirty-two percent of MDs felt that their knowledge of nutrition management was insufficient and 45% of the physicians surveyed did not face nutrition management in their daily practice prior to the pandemic. The initially proposed nutritional protocol, the chart with prescription aids and the suggested nutritional proposals were considered as useful to very useful by the majority of physicians surveyed (89.9, 90.7 and 92.1% respectively). The protocol was followed by 92% of MDs, and almost all participants (95%) were convinced that adaptations of nutritional therapy had beneficial effects on patients’ outcomes. Conclusions Nutritional therapy in critically ill COVID-19 patients is a challenge and the implementation of this specific pandemic simplified nutritional protocol was assessed as useful by a great majority of physicians. Pragmatic and simplified protocols are useful for ensuring the quality of nutritional therapy and could be used in future studies to assess its actual impact on the clinical outcomes of COVID-19 patients.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=770f5c5eb25e48f0650ea460350b2827)

1. **Gastrointestinal Manifestations of COVID-19: Impact on Nutrition Practices.**  
   Aguila Enrik John T. Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition 2020;35(5):800-805.

Although Coronavirus disease 2019 (COVID-19) is primarily a respiratory disease, growing evidence shows that it can affect the digestive system and present with gastrointestinal (GI) symptoms. Various nutrition societies have recently published their guidelines in context of the pandemic, and several points emphasize the impact of these GI manifestations on nutrition therapy. In patients with COVID-19, the normal intestinal mucosa can be disrupted by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, and this could result in GI symptoms and a compromise in nutrient absorption. Optimization of oral diet is still recommended. However, given the GI effects of COVID-19, a fraction of infected patients have poor appetite and would not be able to meet their nutrition goals with oral diet alone. For this at-risk group, which includes those who are critically ill, enteral nutrition is the preferred route to promote gut integrity and immune function. In carrying this out, nutrition support practices have been revised in such ways to mitigate viral transmission and adapt to the pandemic. All measures in the GI and nutrition care of patients are clustered to limit exposure of healthcare workers. Among patients admitted to intensive care units, a significant barrier is GI intolerance, and it appears to be exacerbated by significant GI involvement specific to the SARS-CoV-2 infection. Nevertheless, several countermeasures can be used to ease side effects. At the end of the spectrum in which intolerance persists, the threshold for switching to parenteral nutrition may need to be lowered.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=23e636b0aff5f0e2293d60b2d2fc8bd9)

1. **How the Covid-19 epidemic is challenging our practice in clinical nutrition-feedback from the field**  
   Thibault R. European Journal of Clinical Nutrition 2020;:No page numbers.

The viral epidemic caused by the new Coronavirus SARS-CoV-2 is responsible for the new Coronavirus disease-2019 (Covid-19). Fifteen percent of the Covid-19 patients will require hospital stay, and 10% of them will need urgent respiratory and hemodynamic support in the intensive care unit (ICU). Covid-19 is an infectious disease characterized by inflammatory syndrome, itself leading to reduced food intake and increased muscle catabolism. Therefore Covid-19 patients are at high risk of being malnourished, making the prevention of malnutrition and the nutritional management key aspects of care. Urgent, brutal and massive arrivals of patients needing urgent respiratory care and artificial ventilation lead to the necessity to reorganize hospital care, wards and staff. In that context, nutritional screening and care may not be considered a priority. Moreover, at the start of the epidemic, due to mask and other protecting material shortage, the risk of healthcare givers contamination have led to not using enteral nutrition, although indicated, because nasogastric tube insertion is an aerosol-generating procedure. Clinical nutrition practice based on the international guidelines should therefore adapt and the use of degraded procedures could unfortunately be the only way. Based on the experience from the first weeks of the epidemic in France, we emphasize ten challenges for clinical nutrition practice. The objective is to bring objective answers to the most frequently met issues to help the clinical nutrition caregivers to promote nutritional care in the hospitalized Covid-19 patient. We propose a flow chart for optimizing the nutrition management of the Covid-19 patients in the non-ICU wards.<br/>Copyright &#xa9; 2020, The Author(s), under exclusive licence to Springer Nature Limited.

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1. **Nutrition in critically ill patients with COVID-19: Challenges and special considerations**  
   Nicole Arkin; Kumar Krishnan; Marvin G. Chang and Edward A. Bittner Clinical Nutrition: official journal of the European Society of Parenteral and Enteral Nutrition 2020;39(7):2327-28.

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1. **Nutrition management for critically and acutely unwell hospitalised patients with coronavirus disease 2019 (COVID‐19) in Australia and New Zealand**  
   Lee‐anne S. Chapple PhD Kate Fetterplace BNutDiet Varsha Asrani MHSc Aidan Burrell MBBS Nutrition & Dietetics 2020;77(4):426-36.

Abstract Coronavirus disease 2019 (COVID‐19) results from severe acute respiratory syndrome coronavirus 2 (SARS‐CoV‐2). The clinical features and subsequent medical treatment, combined with the impact of a global pandemic, require specific nutritional therapy in hospitalised adults. This document aims to provide Australian and New Zealand clinicians with guidance on managing critically and acutely unwell adult patients hospitalised with COVID‐19. These recommendations were developed using expert consensus, incorporating the documented clinical signs and metabolic processes associated with COVID‐19, the literature from other respiratory illnesses, in particular acute respiratory distress syndrome, and published guidelines for medical management of COVID‐19 and general nutrition and intensive care. Patients hospitalised with COVID‐19 are likely to have preexisting comorbidities, and the ensuing inflammatory response may result in increased metabolic demands, protein catabolism, and poor glycaemic control. Common medical interventions, including deep sedation, early mechanical ventilation, fluid restriction, and management in the prone position, may exacerbate gastrointestinal dysfunction and affect nutritional intake. Nutrition care should be tailored to pandemic capacity, with early gastric feeding commenced using an algorithm to provide nutrition for the first 5–7 days in lower‐nutritional‐risk patients and individualised care for high‐nutritional‐risk patients where capacity allows. Indirect calorimetry should be avoided owing to potential aerosol exposure and therefore infection risk to healthcare providers. Use of a volume‐controlled, higher‐protein enteral formula and gastric residual volume monitoring should be initiated. Careful monitoring, particularly after intensive care unit stay, is required to ensure appropriate nutrition delivery to prevent muscle deconditioning and aid recovery. The infectious nature of SARS‐CoV‐2 and the expected high volume of patient admissions will require contingency planning to optimise staffing resources including upskilling, ensure adequate nutrition supplies, facilitate remote consultations, and optimise food service management. These guidelines provide recommendations on how to manage the aforementioned aspects when providing nutrition support to patients during the SARS‐CoV‐2 pandemic.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e9e9d1a855019158bf105b5e8a4795c2)

1. **Nutrition Therapy in Critically Ill Patients With Coronavirus Disease 2019.**  
   Martindale Robert JPEN. Journal of parenteral and enteral nutrition 2020;:No page numbers.

In the midst of a coronavirus disease 2019 (COVID-19) pandemic, a paucity of data precludes derivation of COVID-19-specific recommendations for nutrition therapy. Until more data are available, focus must be centered on principles of critical care nutrition modified for the constraints of this disease process, ie, COVID-19-relevant recommendations. Delivery of nutrition therapy must include strategies to reduce exposure and spread of disease by providing clustered care, adequate protection of healthcare providers, and preservation of personal protective equipment. Enteral nutrition (EN) should be initiated early after admission to the intensive care unit (ICU) using a standard isosmolar polymeric formula, starting at trophic doses and advancing as tolerated, while monitoring for gastrointestinal intolerance, hemodynamic instability, and metabolic derangements. Intragastric EN may be provided safely, even with use of prone-positioning and extracorporeal membrane oxygenation. Clinicians should have a lower threshold for switching to parenteral nutrition in cases of intolerance, high risk of aspiration, or escalating vasopressor support. Although data extrapolated from experience in acute respiratory distress syndrome warrants use of fiber additives and probiotic organisms, the lack of benefit precludes a recommendation for micronutrient supplementation. Practices that increase exposure or contamination of equipment, such as monitoring gastric residual volumes, indirect calorimetry to calculate requirements, endoscopy or fluoroscopy to achieve enteral access, or transport out of the ICU for additional imaging, should be avoided. At all times, strategies for nutrition therapy need to be assessed on a risk/benefit basis, paying attention to risk for both the patient and the healthcare provider.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=edc562424983bbde2e2b38ac708da45a)

1. **Nutritional Care in Relation to COVID-19.**  
   Delaney Emer British journal of nursing (Mark Allen Publishing) 2020;29(19):1096-1103.

The following article was written after the initial wave of the COVID-19 pandemic in the UK. On reflection of clinical practice during this time, it was noted by the ICU team that the majority of ventilated patients appeared to have lost weight during their stay. Unfortunately, there was no ability to weigh patients during the pandemic, so this weight loss was a subjective observation. Regardless, this observation lead the ICU dietitian to retrospectively audit prescribed versus delivered feed. It was found that only 10% of admissions received the prescribed daily volume of feed within the first 7 days of admission. A further 6% of admissions were within 10% of achieving daily prescribed target volumes. The main reasons for this were proning patients, high gastric residual volumes and the overwhelming nature of the pandemic. Three areas of practice have been highlighted that will improve feed delivery should a second wave occur. 1. A nasojejunal team comprising 20 members of the ICU multidiciplinary team will be established to insert bedside nasojejunal tubes in all ICU patients on admission. 2. All proned patients will be enterally fed and practice adjusted as per British Dietetic Association recommendations. 3. The international enteral feeding guidelines regarding hypocaloric feeding for the first 7 days will not be followed due to minimal clinical evidence for the ICU COVID-19 demographic.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=3fff3f13865a46cf05bb90bab3c60989)

1. **Nutritional Support in Coronavirus 2019 Disease.**  
   Stachowska Ewa Medicina (Kaunas, Lithuania) 2020;56(6):No page numbers.

The epidemic that broke out in Chinese Wuhan at the beginning of 2020 presented how important the rapid diagnosis of malnutrition (elevating during intensive care unit stay) and the immediate implementation of caloric and protein-balanced nutrition care are. According to specialists from the Chinese Medical Association for Parenteral and Enteral Nutrition (CSPEN), these activities are crucial for both the therapy success and reduction of mortality rates. The Chinese have published their recommendations including principles for the diagnosis of nutritional status along with the optimal method for nutrition supply including guidelines when to introduce education approach, oral nutritional supplement, tube feeding, and parenteral nutrition. They also calculated energy demand and gave their opinion on proper monitoring and supplementation of immuno-nutrients, fluids and macronutrients intake. The present review summarizes Chinese observations and compares these with the latest European Society for Clinical Nutrition and Metabolism guidelines. Nutritional approach should be an inseparable element of therapy in patients with COVID-19.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=c084e2088a550436700c047531023927)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=a525eb7b835e04a0411eb6a55391326d)

1. **Prise en charge nutritionnelle des patients de reanimation ayant une infection au SARS-CoV-2Nutritional support for critically ill patients suffering from SARS-CoV-2 infection**  
   Pardo E. Praticien en Anesthesie Reanimation 2020;24(4):218-224.

Patients with severe cases of COVID-19 are at high nutritional risk during their ICU stay. Prolonged immobilization associated with an exacerbated systemic inflammatory response is a major provider of ICU-acquired muscle weakness. Early enteral nutrition is recommended to gradually reach the energy target of 25 kcal/kg/day and protein target of 1.3 g/kg/day around D4. The occurrence of a Refeeding syndrome should be closely monitored. In case of feeding intolerance refractory to a prokinetic treatment, complementary or total parenteral nutrition is advised, favouring new generation mixed lipid emulsions (containing fish oil) and regular monitoring of triglyceridemia. Nutrition care of critically ill patients should be carried out with limited procedures that may pose a risk of contamination for the healthcare staff.<br/>Copyright &#xa9; 2020

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fe8f287b269b1d09d23db856b2e7631e)

1. **Relevant Nutrition Therapy in COVID-19 and the Constraints on Its Delivery by a Unique Disease Process.**  
   Patel Jayshil J. Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition 2020;35(5):792-799.

Worldwide, as of July 2020, >13.2 million people have been infected by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus. The spectrum of coronavirus disease 2019 (COVID-19) ranges from mild illness to critical illness in 5% of cases. The population infected with SARS-CoV-2 requiring an intensive care unit admission often requires nutrition therapy as part of supportive care. Although the various societal guidelines for critical care nutrition meet most needs for the patient with COVID-19, numerous factors, which impact the application of those guideline recommendations, need to be considered. Since the SARS-CoV-2 virus is highly contagious, several key principles should be considered when caring for all patients with COVID-19 to ensure the safety of all healthcare personnel involved. Management strategies should cluster care, making all attempts to bundle patient care to limit exposure. Healthcare providers should be protected, and the spread of SARS-CoV-2 should be limited by minimizing procedures and other interventions that lead to aerosolization, avoiding droplet exposure through hand hygiene and use of personal protective equipment (PPE). PPE should be preserved by decreasing the number of individuals providing direct patient care and by limiting the number of patient interactions. Enteral nutrition (EN) is tolerated by the majority of patients with COVID-19, but a relatively low threshold for conversion to parenteral nutrition should be maintained if increased exposure to the virus is required to continue EN. This article offers relevant and practical recommendations on how to optimize nutrition therapy in critically ill patients with COVID-19.

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### Full text papers

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### Guidance on searching within online documents

Links are provided to the full text of each document. Relevant extracts have been copied and pasted into these results. Rather than browse through lengthy documents, you can search for specific words as follows:

**Portable Document Format / pdf / Adobe**  
Click on the Search button (illustrated with binoculars). This will open up a search window. Type in the term you need to find and links to all of the references to that term within the document will be displayed in the window. You can jump to each reference by clicking it.

**Word documents**  
Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

## B. Search History

|  | **Source** | **Criteria** | **Results** |
| --- | --- | --- | --- |
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| 2. | Medline | (Coronavirus).ti,ab | 37758 |
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| 4. | Medline | (SARS-COV-2).ti,ab | 20023 |
| 5. | Medline | ("Severe acute respiratory syndrome coronavirus 2").ti,ab | 7022 |
| 6. | Medline | ("2019 Novel").ti,ab | 1007 |
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| 22. | Medline | ("gastrostomy tube\*").ti,ab | 2654 |
| 23. | Medline | ("Percutaneous Endoscopic Gastrostomy").ti,ab | 3207 |
| 24. | Medline | ("PEG tube\*").ti,ab | 870 |
| 25. | Medline | ("NG tube\*").ti,ab | 406 |
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| 30. | Medline | ("enteral tube\*").ti,ab | 806 |
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| 57. | EMBASE | ("NG tube\*").ti,ab | 955 |
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| 59. | EMBASE | ("bolus feed\*").ti,ab | 248 |
| 60. | EMBASE | ("Balloon Gastrostomy").ti,ab | 44 |
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| 62. | EMBASE | ("enteral tube\*").ti,ab | 1276 |
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| 67. | CINAHL | \*CORONAVIRUS/ | 714 |
| 68. | CINAHL | (SARS-COV-2).ti,ab | 3458 |
| 69. | CINAHL | ("Severe acute respiratory syndrome coronavirus 2").ti,ab | 1309 |
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| 82. | CINAHL | ("enteral nutrition").ti,ab | 4120 |
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| 84. | CINAHL | ("nasogastric tube\*").ti,ab | 1583 |
| 85. | CINAHL | ("nasojejunal tube\*").ti,ab | 78 |
| 86. | CINAHL | ("gastrostomy tube\*").ti,ab | 1081 |
| 87. | CINAHL | ("Percutaneous Endoscopic Gastrostomy").ti,ab | 1133 |
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| 90. | CINAHL | "Radiologically Inserted Gastrostomy" | 0 |
| 91. | CINAHL | ("bolus feed\*").ti,ab | 71 |
| 92. | CINAHL | ("Balloon Gastrostomy").ti,ab | 11 |
| 93. | CINAHL | (Enteral ADJ2 pump\*).ti,ab | 35 |
| 94. | CINAHL | ("enteral tube\*").ti,ab | 483 |
| 95. | CINAHL | (81 OR 82 OR 83 OR 84 OR 85 OR 86 OR 87 OR 88 OR 89 OR 90 OR 91 OR 92 OR 93 OR 94) | 11858 |
| 96. | CINAHL | (80 AND 95) | 6 |

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