Application of Care Bundle in an Elderly Patient with Severe Pneumonia: Nursing Experience

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Abstract

Objective: To report the application and experience of bundled nursing care in an elderly patient with severe pneumonia.

Methods: A case of an elderly patient with severe pneumonia with typical clinical manifestations and treatment response was selected as the study subject. Based on the patient' s specific condition, we developed a personalized bundled nursing care plan, which included: 1. Condition monitoring; 2. Medication nursing care; 3. Airway management; 4. Nutritional support; 5. Oral care; 6. Psychological nursing care; 7. Prone position ventilation; 8. Preoperative and postoperative nursing care for fiberoptic bronchoscopy.

Results: The patient' s condition improved significantly, and quality of life was substantially enhanced. After 19 days, the patient' s condition stabilized, and the patient was transferred from the RICU to the respiratory ward.

Conclusion: Through the personalized bundled nursing care plan, the patient' s condition was significantly improved and quality of life was enhanced, demonstrating the application value of bundled nursing care in elderly patients with severe pneumonia.

Full Text

Bundled Care for an Elderly Patient with Severe Pneumonia: A Nursing Experience

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Abstract

Objective: To share the application and clinical experience of bundled care in an elderly patient with severe pneumonia.
Methods: We selected an elderly severe pneumonia patient with typical clinical manifestations and treatment responses as our study subject. Based on the patient' s specific condition, we developed a personalized bundled care plan that included: (1) disease monitoring; (2) medication nursing; (3) respiratory management; (4) nutritional support; (5) oral care; (6) psychological nursing; (7) prone position ventilation; and (8) preoperative and postoperative care for fiberoptic bronchoscopy.
Results: The patient' s condition improved significantly, with substantial enhancement in quality of life. After 19 days, the patient' s condition stabilized and he was transferred from the RICU to the general respiratory ward.
Conclusion: Through a personalized bundled care plan, the patient' s condition and quality of life improved markedly, demonstrating the value of bundled care for elderly patients with severe pneumonia.

Keywords: Bundled care; Severe pneumonia; Nursing experience

Middle-aged and elderly populations are particularly susceptible to severe pneumonia. As physiological functions gradually decline in these groups and severe pneumonia progresses rapidly with critical manifestations, delayed effective treatment can lead to ventilation dysfunction caused by diffuse inflammation of pulmonary interstitium or parenchyma, subsequently triggering shock, hypotension, delirium, and potentially death from organ failure [1]. During treatment and nursing care, patients often experience stress due to disease burden, ICU noise, poor sputum expectoration ability, and sleep disturbances. Furthermore, severe pneumonia patients require prolonged bed rest, face considerable treatment challenges, and need interventions such as nutritional support and oxygen therapy. The risk of complications including hypotension, pressure ulcers, shock, and respiratory failure remains high during hospitalization, seriously threatening patient safety. Therefore, quality nursing interventions must complement scientific treatment to alleviate disease progression and promote recovery, as numerous studies have confirmed the limited effectiveness of conventional nursing approaches [2-4]. Bundled care, a novel nursing model increasingly used in recent years, has been shown to effectively improve clinical indicators, reduce complications, and accelerate postoperative recovery in severe pneumonia patients [5]. Based on extensive evidence-based support, bundled care offers systematic and predictive benefits with clearly defined implementation outcomes [6]. This article summarizes our nursing experience with this approach.

1 Clinical Data

The patient was a 78-year-old male admitted with a five-day history of fever, cough, and sputum production. Five days prior, after exposure to cold, he de-

veloped fever with a maximum temperature of 39.5°C, accompanied by chills and rigors. The fever lacked a clear pattern and was associated with productive cough of yellow sputum (large volume, easily expectorated), intermittent blood-tinged sputum (bright red, more sputum than blood), and dyspnea with shortness of breath that worsened with exertion. On April 11, 2024, he presented to the emergency department and was admitted to our unit with a diagnosis of "severe pneumonia, Type I respiratory failure." The patient had previously been healthy, denied food or drug allergies, and had a 50-year smoking history.

Admission physical examination revealed: temperature 37.0°C, pulse 96 beats/min, respiration 23 breaths/min, blood pressure 131/68 mmHg. The patient was conscious with cyanotic lips, frequent coughing with expectoration of dark red blood-tinged sputum, and dyspnea. Lung auscultation revealed coarse breath sounds with moist rales in the right lung. Heart rhythm was regular, abdomen was soft without tenderness, and no lower extremity edema was present. After admission, the patient received intensive care and cardiac monitoring with continuous high-flow nasal oxygen therapy. Laboratory tests showed white blood cell count $17.43\$\times 10^{\{9\}/L, redbloodcells5.18\times 10}\{12\}/L, hemoglobin151g/L, platelets234\times 10\hat{}\{9\}/L, neutrophils92.5\_\{2\}\$$ 27.0 mmHg, PaO_2 58.0 mmHg, and lactate 1.7 mmol/L.

Considering severe infection, a multidisciplinary consultation was organized to develop an individualized treatment and nursing plan. Interventions included indwelling urinary catheter, central venous catheter, nasogastric tube, thoracic drainage tube, active hemostasis, anti-infective therapy, sputum reduction and expectoration, bronchodilation, appropriate nutritional support, intravenous albumin supplementation, immune enhancement, circulatory and respiratory function maintenance, hepatic and renal function monitoring, comprehensive pulmonary function training guidance, intermittent prone position ventilation, and complication prevention. The patient underwent eight fiberoptic bronchoscopy procedures during hospitalization. On April 30, 2024, his condition improved and he was transferred to the respiratory ward for continued treatment. The patient' s specific disease progression and symptomatic treatment measures are illustrated in the figures below [Figure 1: see original paper].

2 Nursing Care

2.1 Nursing Assessment

At admission, the patient' s Barthel Index score was 30 points, indicating severe dependence requiring extensive assistance for activities of daily living. The Kolcaba Comfort Scale score was 55 points, reflecting low comfort level. The Self-Rating Anxiety Scale (SAS) score was 61 points, indicating moderate anxiety. Pressure ulcer risk assessment scored 10 points (high risk), while tube dislodgement risk assessment scored 16 points (high risk). The protective restraint assessment was 8 points, VTE risk was high, and NRS2002 nutritional risk screening for chronic disease with complications was 3 points, confirming

nutritional risk.

2.2 Nursing Diagnoses

Based on assessment results and clinical manifestations, nursing diagnoses were established as follows:

1. Ineffective airway clearance: Related to respiratory infection, decreased pulmonary function, weak cough, anxiety/fear, mouth breathing causing viscous secretions, and lack of cough awareness.

2. Impaired gas exchange: Related to reduced effective ventilation area, increased and viscous respiratory secretions, and decreased pulmonary surfactant.

4. Delirium: Related to age >75 years, insufficient disease knowledge, use of restraints, mechanical ventilation, and poor sleep quality.

5. Risk for tube dislodgement: Related to advanced age, improper catheter fixation, position changes, dyspnea, and decreased mobility.

2.3 Nursing Plan

Based on the above assessments and diagnoses, we developed the following nursing plan: maintain appropriate temperature and humidity in the ward to enhance patient comfort; strengthen fundamental nursing care; alleviate psychological issues such as anxiety, depression, and delirium through psychological nursing; improve metabolic status and immune function through nutritional support; and enhance cardiopulmonary function and treatment outcomes while shortening disease duration through guidance on effective coughing and sputum expectoration, comprehensive pulmonary function training, continuous oxygen therapy, intermittent prone position ventilation, and temperature management.

1. Condition monitoring: Provide cardiac monitoring and closely observe vital signs, respiratory status, consciousness, cough/sputum/hemoptysis, and intake/output changes to provide accurate clinical information for physicians promptly.

2. Medication nursing: Elderly severe pneumonia patients typically require multiple medications including antibiotics, expectorants, hemostatics, and sedatives. Nursing staff must administer medications strictly according to physician orders, adhering to the "three checks and eight confirmations" principle while explaining medication importance and precautions to patients and promptly reporting any adverse reactions.

3. Infection prevention: The patient was diagnosed with severe pneumonia and MRSA infection. We strictly implemented hand hygiene and bedside isolation measures, ventilated the room twice daily for 15-30 minutes each time, used air disinfection equipment once daily, regularly replaced disposable items, promptly identified and managed infection signs, and reduced cross-infection

risk. We provided a quiet, comfortable ward environment with appropriate temperature and humidity to ensure adequate rest.

4. Nutritional support: ICU patients often develop malnutrition, which may reduce treatment efficacy and increase complication and mortality rates. Studies show malnutrition occurs in 38%-78% of ICU patients [7]. During hospitalization, this patient had poor appetite and low albumin levels. Following nutritional consultation recommendations, we placed a nasogastric tube for enteral nutrition and adjusted the treatment plan based on albumin monitoring results. On April 19, the patient experienced nausea during feeding and intermittent upper abdominal pain. After gastroenterology consultation, we reduced the proportion of enteral nutrition, increased parenteral nutrition infusion, and added prokinetic agents.

5. Psychological nursing: Early bundled nursing interventions can monitor psychological status changes, provide counseling and intervention, and offer mental support and comfort, helping alleviate anxiety and build treatment confidence [8]. During hospitalization, the patient intermittently exhibited delirium symptoms. While strengthening psychological care, we provided adequate analgesia and rational sedation, standardized sedation depth assessment and adjustment to reduce oxygen consumption, protect organ function, and improve hypoxia status—an intervention with ideal value for improving delirium outcomes and negative emotional states [9].

6. Tube maintenance: Bundled care measures have been proven effective in preventing various tube dislodgements in ICU patients [10]. We monitored the patient' s activity range and positioning to avoid catheter pulling, strengthened patient education about precautions, and conducted hourly checks of restraint sites when protective restraints were used to ensure good circulation, intact skin, and appropriate restraint tightness. We regularly inspected catheters and sterile dressings to ensure clean, dry skin around catheter sites, with all tubes properly secured. Catheter dressing changes required dual staff execution with strict aseptic technique to prevent catheter movement or dislodgement, and unnecessary catheters were removed promptly to prevent catheter-related infections.

7. Respiratory management: Ineffective airway clearance is a life-threatening issue requiring immediate resolution [11]. We enhanced airway humidification to dilute sputum and promote expectoration, performed suctioning operations diligently, strengthened oral care to maintain oral cleanliness and airway patency, and prevented secretion accumulation and obstruction. During enteral nutrition support and prone position ventilation, the head of bed was elevated 30°, with close observation for choking, cough, nausea, and vomiting to prevent aspiration and avoid worsening respiratory infection.

8. Oxygen therapy and prone position ventilation: The patient received continuous high-flow nasal oxygen therapy with appropriate adjustments to oxygen concentration and flow rate per physician orders, accompanied by enhanced airway humidification. Prone position ventilation can improve pulmonary ven-

tilation, optimize ventilation/perfusion ratio, reduce atelectasis, and shorten hospitalization [12]. Starting from the third hospital day, the patient received 6-12 hours of daily prone position ventilation. Before implementation, we thoroughly assessed the patient and performed the procedure under sedation and analgesia, maintaining RASS scores between -2 and -3. Position changes required teamwork to ensure patient safety, maintain tubes, and prevent pressure ulcers. During nasogastric feeding, gastric residual volume was monitored regularly to prevent aspiration, with patient assessments conducted periodically and issues addressed promptly.

9. Temperature management: The patient experienced persistent high fever in the early admission period. We monitored temperature regularly and reported abnormalities promptly, maintained appropriate temperature and humidity for comfort, administered antipyretic medications and physical cooling per physician orders during fever episodes, avoided hypothermia, ensured adequate fluid intake, monitored electrolyte status, and provided light, easily digestible diets to enhance resistance.

10. Activity and rehabilitation: ICU patients affected by critical illness, positioning limitations, and consciousness disturbances not only have increased VTE risk but also high pressure injury incidence rates of 25.3%-31.91%, ranking first among hospitalized patients [13-14], which can also cause severe pain and infection with adverse prognostic effects [15]. Early rehabilitation training guidance, including limb activities, ankle pump exercises, and comprehensive pulmonary function training with gradual intensity progression, can promote pulmonary function recovery and prevent VTE and pressure ulcers.

11. Bronchoscopy preoperative and postoperative care: - **Preoperative:** Fasting for 6 hours with proper preparation and psychological nursing. - **Postoperative:** Maintain comfortable positioning with adequate rest. After 4-6 hours of fasting, allow small sips of warm water; if no choking occurs, advance to warm, cool-temperature foods to avoid pulmonary vascular dilation from high temperatures and prevent aspiration while providing postoperative education. Closely monitor vital signs and symptoms, reporting any abnormalities promptly for appropriate management.

2.5 Nursing Evaluation

Through implementation of multiple fundamental and specialized nursing measures, the patient's PCT, C-reactive protein, PaO_2, and $PaCO_2$ values improved significantly, with symptoms effectively relieved (see [Figure 1: see original paper] through [Figure 3: see original paper]). Activities of daily living increased, anxiety symptoms decreased, and comfort levels improved (see). The scale scores are detailed in showing Barthel, Kolcaba, and SAS assessments.

3 Results and Follow-up

On the third day after transfer to the respiratory ward, nurses visited the patient. He was conscious and coherent, had experienced no delirium symptoms during his respiratory ward stay, showed improved cough and sputum expectoration, and had no dyspnea on exertion. He performed comprehensive pulmonary function training once daily, with a Barthel score of 70 points. One week post-discharge, telephone follow-up revealed the patient was taking oral medications as prescribed, performing pulmonary function training every 3-4 days, had no dyspnea on exertion, and could independently perform activities of daily living. We explained the purpose and significance of pulmonary function training, encouraging continued adherence. The patient was advised to maintain a light, easily digestible diet with adequate nutrition, keep warm to avoid catching cold, avoid crowded places, wear masks when going out, attend regular follow-up appointments, and seek timely medical attention if feeling unwell.

When elderly patients with severe pneumonia and respiratory failure receive conventional fundamental nursing care, poor standardization and lack of systematic procedures among nursing staff can seriously affect clinical outcomes and reduce patient satisfaction. This critically ill patient faced high mortality risk. Through comprehensive assessment and development of an individualized, scientific, and systematic nursing plan, we found that bundled care measures—including psychological nursing, nutritional support, comprehensive pulmonary function training, pre- and postoperative bronchoscopy care, and prone position ventilation—play important roles in the rehabilitation of elderly severe pneumonia patients, alleviating suffering and improving quality of life [16-18]. Therefore, we recommend further promotion and application of the bundled care model in clinical practice to provide quality nursing services for more patients.

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Note: Figure translations are in progress. See original paper for figures.