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Evidence-Based Nursing Interventions for the Prevention and Management of Aspiration Pneumonia: An Updated Review

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Abstract:

Background: Aspiration pneumonia is a pulmonary infection caused by inhalation of oropharyngeal or gastric material into the lower respiratory tract. It is associated with significant morbidity and mortality, particularly in vulnerable populations such as the elderly and those with neurological or swallowing disorders. Effective nursing interventions and interdisciplinary care are critical in its prevention and management.

Aim: To review evidence-based nursing interventions and interdisciplinary approaches for the prevention and management of aspiration pneumonia.

Methods: A comprehensive review of current literature was conducted, focusing on diagnostic, preventive, and therapeutic strategies. The role of multidisciplinary teams, including nursing staff, speech-language pathologists, and dietitians, was highlighted. Particular attention was given to screening tools, antibiotic regimens, and the impact of nutrition and hydration management.

Results: Aspiration pneumonia is most prevalent among patients with neurological impairments and advanced age, with silent aspiration being a key contributor. Effective interventions include thorough clinical evaluations, use of screening tools for dysphagia, timely initiation of antibiotics, and tailored dietary modifications. Positioning, suctioning, and oral hygiene practices were identified as crucial nursing roles. Collaborative approaches involving speech therapy and nutrition optimization further reduced aspiration risks and improved patient outcomes.

Conclusion: Nursing interventions, combined with interdisciplinary collaboration, play a pivotal role in the prevention and management of aspiration pneumonia. Early identification of at-risk patients, adherence to evidence-based practices, and proactive health education for caregivers are essential to minimizing complications and recurrence.

Key Words: Aspiration pneumonia, nursing interventions, dysphagia, prevention, multidisciplinary care, oral hygiene, antibiotics

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Introduction:

Aspiration pneumonia represents an infectious pulmonary condition that develops following the introduction of oropharyngeal fluids into the lower respiratory tract. The aspirated material may include oropharyngeal secretions, particulate matter, or gastric contents, with a high bacterial load in the aspirate being essential for the development of infection. In contrast, if the inhaled fluid is sterile—such as gastric fluid with low pH that eliminates bacterial colonies—it results in aspiration pneumonitis, which is characterized as a chemical injury that does not necessitate antibiotic therapy. However, aspiration pneumonia requires appropriate antibiotic treatment for resolution. The mortality rate associated with aspiration pneumonia is influenced significantly by the volume and bacterial content of the aspirate, with rates reported to reach as high as 70% in severe cases [1][2][3][4].

Nursing Diagnosis

Patients with aspiration pneumonia may present with a variety of clinical symptoms, including dyspnea, chest discomfort, cough, decreased oxygen saturation, tachycardia, tachypnea, fever, and foul-smelling sputum. These clinical manifestations underscore the need for timely assessment and intervention by nursing professionals to prevent complications and improve outcomes.

Causes

The failure of natural defense mechanisms, such as glottis closure and the cough reflex, increases the risk of aspiration. Several risk factors contribute to this condition, including altered mental status, neurological disorders (e.g., stroke, dementia), esophageal motility disorders, prolonged vomiting, and gastric outlet obstruction. While organisms like *Streptococci*, *Haemophilus influenzae*, and gram-negative bacilli are commonly implicated in community-acquired pneumonia, the microbial etiology of aspiration pneumonia is often contingent on the content of the aspirate. A prospective study of 95 patients identified gram-negative bacilli as the causative agents in 49% of cases, followed by anaerobes such as *Fusobacterium*, *Bacteroides*, and *Peptostreptococcus*, accounting for 16% of cases. In hospital-acquired cases, *Pseudomonas aeruginosa* and other gram-negative organisms are frequently involved [5][6][7].

Risk Factors

Aspiration pneumonia (AP) is associated with various risk factors, including advanced age, cerebrovascular disease (termed "post-stroke pneumonia"), drug overdose, alcohol use disorder, seizures, and sedative medication use. Additional risk factors include central nervous system disorders (e.g., head trauma, intracranial masses, dementia, amyotrophic lateral sclerosis, Parkinson's disease, and pseudobulbar palsy), poor mobility or bedridden status, esophageal conditions (e.g., strictures, motility disorders, cancers, and gastroesophageal reflux disease), and medical interventions such as tracheostomy and nasogastric tube placement. Furthermore, muscular diseases like inflammatory myopathies, bulbospinal muscular atrophy, and oculopharyngeal muscular dystrophy contribute to an increased likelihood of AP [8][9][10].

Advanced age is notably associated with AP, often due to "silent" microaspirations, which may not exhibit overt clinical symptoms. Among hospitalized pneumonia patients aged 70 or older, dysphagia prevalence is reported at 91.7%, with silent aspiration observed in over 50% of cases. Nonetheless, frailty, poor nutritional status, and impaired mobility are considered more accurate predictors of AP risk than chronological age. Stroke patients are particularly vulnerable, with AP occurring in 3–50% of cases, and

silent aspiration seen in 40–70% of those affected. Similarly, 11% of hospitalized individuals with Parkinson's disease or dementia may develop AP within three months. The condition is also frequently observed in patients with multiple sclerosis, motor neuron diseases, Huntington's disease, Down syndrome, and cerebral palsy [8][10]. Patients with head and neck cancers are at heightened risk, with up to 70% developing AP over their lifetime due to tumor-related or treatment-related factors. Poor oral health further exacerbates the risk, as it increases bacterial colonization in oropharyngeal secretions, providing sufficient bacterial load for inoculation, even with minimal aspiration. A case-control study identified poor oral hygiene as a definitive risk factor for pneumonia, especially among hospitalized patients [10]. These insights emphasize the critical role of multidisciplinary care, including nursing interventions, in mitigating the risk of aspiration pneumonia.

Assessment of Aspiration Pneumonia

Clinical evaluation of aspiration pneumonia should emphasize common symptoms such as the sudden onset of dyspnea, fever, and hypoxemia. These symptoms are often accompanied by radiological evidence of infiltrates in the gravity-dependent areas of the lungs. The site of involvement is influenced by the patient's position during aspiration. In patients who aspirate while upright, the lower lobes of the lungs are typically affected, whereas the superior lobes are involved when aspiration occurs in the recumbent position. A thorough assessment of vital signs is critical, given the rapid onset of hypoxia. In cases of severe infection, additional indicators such as hypotension and tachycardia may be present.

Diagnostic Evaluation

The diagnosis of aspiration pneumonia requires a high degree of clinical suspicion, particularly in critically ill hospitalized individuals. Early initiation of antibiotic therapy is crucial in suspected cases. While radiologic imaging is essential to confirm the diagnosis, it should not delay the administration of treatment. Standard imaging modalities include chest X-rays, chest computed tomography (CT), and chest ultrasonography, all of which aim to identify pulmonary infiltrates. The differentiation between aspiration pneumonia and community-acquired pneumonia (CAP) can be challenging, as many cases of aspiration involve unwitnessed events or silent microaspirations during sleep. Not all overt aspiration events result in aspiration pneumonia; for instance, high-volume gastric content aspiration often leads to aspiration pneumonitis instead of pneumonia. Guidelines from the British Thoracic Society recommend specific diagnostic procedures for patients suspected of aspiration pneumonia, including chest radiographs to detect pulmonary infiltrates. Chest CT scans are recommended in cases where X-rays are inconclusive or when alternative diagnoses, such as pulmonary embolism, must be ruled out. Microbiological analysis of sputum and blood should be conducted prior to antibiotic initiation whenever feasible to avoid delaying treatment. Additional laboratory tests—such as serum electrolytes, albumin, liver enzymes, and complete blood counts—are suggested to evaluate the systemic response rather than to confirm the diagnosis [8].

Medical Management

Effective treatment of aspiration pneumonia necessitates antibiotic therapy. In community-acquired cases, amoxicillin or ampicillin/sulbactam is the preferred treatment. Alternative options, such as macrolides like azithromycin, are considered in regions where pneumococcal resistance is below 25%. For patients with penicillin allergies, respiratory fluoroquinolones such as levofloxacin or moxifloxacin can be prescribed. In certain instances, cephalosporins paired with macrolides or doxycycline may also be utilized [11]. Preventive strategies should be multifaceted and involve interdisciplinary collaboration. Speech-language pathologists and dietitians play a pivotal role in improving swallowing and cough reflexes. Nursing staff and oral hygienists contribute to reducing the bacterial load in the oral cavity, while nutritionists ensure proper hydration and caloric intake, particularly when patients are prescribed modified food and liquid consistencies [8].

Screening and Preventive Measures

Patients at risk of aspiration syndromes must be identified before the occurrence of overt aspiration or pneumonia. Clinical evaluation by nurses and triage personnel is instrumental in recognizing

individuals at high risk. Various screening tools are available to detect aspiration risk, though no single tool has proven superior. For frail elderly patients without apparent risks, simple screening methods can be employed during initial medical encounters. One study proposed four screening questions to assess aspiration risk:

1. Do you cough or choke when eating or drinking?
2. Does eating take longer than it used to?
3. Have you altered your diet due to swallowing difficulties?
4. Does your voice change after eating or drinking?

An affirmative response to any of these questions indicates potential swallowing impairment. This tool demonstrated high sensitivity and a specificity of 80.4%, making it an accessible option for healthcare personnel without specialized training [12].

Advanced Diagnostic and Interventional Strategies

Definitive diagnosis of aspiration typically involves a videofluoroscopy swallowing study (VFSS), a modified barium swallow test. The presence of barium below the true vocal cords confirms aspiration. If no cough or throat clearing accompanies the event, it is classified as silent aspiration. However, aspiration, especially microaspiration, is often episodic and may not be detected through a single VFSS study [8]. Interventional techniques such as the chin-tuck maneuver can provide physical support to the pharyngolaryngeal musculature, reducing aspiration risk during swallowing. Additionally, mechanical oral care using toothbrushes—rather than chlorhexidine rinses—has been shown to lower the incidence of aspiration pneumonia and associated mortality. The use of non-foaming fluoride toothpaste is recommended to further minimize aspiration risks [8].

Nutrition and Hydration Management

Modifications to food texture and fluid viscosity are common preventive measures in patients with impaired swallowing. Although effective in reducing aspiration risk, these changes may increase the likelihood of malnutrition and dehydration, particularly in patients with dementia. Thickened liquids can leave pharyngeal residue, which may elevate the risk of subsequent aspiration. Smaller portions, such as a teaspoon at a time, are advised to reduce this residue. Enteral feeding is recommended for patients who are unable to achieve an adequate oral intake for over three days or meet less than half of their nutritional requirements for more than ten days [8]. Maintaining a balance between adequate nutrition and minimizing aspiration risk is crucial for optimal patient outcomes.

Nursing Management:

Effective nursing management for aspiration pneumonia focuses on ensuring airway protection and maintaining optimal respiratory and nutritional status. Nursing interventions include suctioning to clear pharyngeal residue and administering supplemental oxygen as needed to maintain adequate oxygenation. The patient should be positioned upright to facilitate respiratory function and reduce the risk of aspiration. Regular monitoring of vital signs is crucial to identify early signs of deterioration. A swallow screen must be performed before initiating oral feeding to ensure safe swallowing mechanisms are intact. Additionally, nurses should oversee the provision of adequate hydration and nutrition, adjusting dietary plans as necessary to suit the patient's swallowing capacity. Administering prescribed antibiotics promptly is essential to address the infection effectively.

When to Seek Assistance:

Clinical scenarios requiring immediate escalation of care include significant oxygen desaturation, hypotension, respiratory distress, exacerbation of coughing, or the development of a fever. Prompt recognition and intervention in these cases are vital to prevent complications and ensure patient safety.

Outcome Identification:

Desired outcomes in managing aspiration pneumonia include the patient's ability to consume food and liquids without aspiration, the absence of coughing episodes during or after meals, and the maintenance of stable respiratory function. The achievement of normal vital signs without evidence of hypoxia reflects the successful resolution of the condition.

Monitoring:

Continuous monitoring is a cornerstone of managing aspiration pneumonia. Nurses must regularly assess the patient's vital signs, including respiratory rate and oxygen saturation, to detect changes in respiratory status. Urine output should be evaluated to monitor hydration levels, while dietary intake must be tracked to ensure sufficient caloric and nutritional provision, considering any dietary modifications.

Coordination of Care:

The management of aspiration pneumonia necessitates a collaborative interprofessional approach involving a range of healthcare professionals. The team typically includes a nurse practitioner, primary care physician, internist, infectious disease expert, radiologist, pulmonologist, speech-language pathologist, nutritionist, and pharmacist. In addition to addressing the pneumonia, preventive strategies must be emphasized to reduce the recurrence of aspiration events. These strategies include elevating the head of the bed, closely monitoring oxygen levels, and ensuring routine oral cavity suctioning for patients with swallowing impairments. Proactive measures to identify patients at risk for aspiration pneumonia are critical in mitigating poor outcomes. Clinical nurses play a pivotal role by utilizing high-sensitivity screening tools to detect swallowing impairments. Speech-language pathologists contribute by confirming the diagnosis and providing tailored swallowing recommendations to minimize aspiration risks. Nurses also ensure patients understand and adhere to these recommendations. Clinical nutritionists ensure patients meet their hydration and caloric needs, even on modified diets, while clinical pharmacists assist in optimizing medication regimens to reduce sedative side effects and facilitate appropriate drug formulations, such as crushing pills when necessary. The synergistic collaboration of this interprofessional team is instrumental in reducing the incidence of aspiration pneumonia and enhancing the overall clinical outcomes for affected patients.

Health Teaching and Health Promotion:

Health education is a crucial component of the comprehensive care plan for patients recovering from aspiration pneumonia, particularly in enhancing the role of caregivers. Caregivers must be educated on proper feeding techniques to minimize the risk of further aspiration. This includes ensuring the patient is consuming appropriately textured foods and liquids suited to their swallowing capabilities. Additionally, caregivers should be trained on optimal patient positioning during and after meals. Maintaining the patient in an upright posture while feeding and for a designated period post-feeding is essential to prevent regurgitation and subsequent aspiration. These educational interventions empower caregivers to participate actively in promoting patient safety and recovery.

Discharge Planning:

Discharge planning for patients recovering from aspiration pneumonia focuses on preventing recurrence and ensuring continuity of care. Patients and caregivers must be instructed to maintain an elevated head-of-bed position while eating and sleeping to reduce the risk of aspiration during meals and nocturnal periods. Compliance with prescribed antibiotic regimens is emphasized to ensure complete resolution of the infection and to prevent antibiotic resistance. Nutritional management is another critical aspect, with clear guidelines provided to ensure the correct consistency of solids and fluids is consumed. These dietary modifications aim to optimize swallowing safety while meeting nutritional needs. Adequate hydration and caloric intake should be prioritized to support the patient's recovery and overall health. Mobility is also encouraged as part of the discharge plan, as physical activity not only improves respiratory function but also reduces the risk of complications such as pulmonary stasis and deconditioning.

Nursing Interventions for Home Care:

Nursing interventions in the home care setting aim to maintain the patient's recovery trajectory and prevent further complications associated with aspiration pneumonia. One of the primary responsibilities of home care nurses is reinforcing education on feeding practices tailored to the patient's swallowing abilities. This involves demonstrating safe feeding techniques to caregivers and providing strategies for managing patients who may experience choking or coughing during meals. Nurses also monitor the patient's adherence to dietary recommendations, ensuring modifications to food and fluid consistency are followed and appropriately adjusted as swallowing function improves. Positioning interventions play a pivotal role in preventing aspiration. Nurses ensure patients and caregivers understand the importance of maintaining an upright posture during feeding and for at least 30 minutes post-meal. They also educate on the use of supportive devices, such as wedge pillows, to maintain head elevation while the patient sleeps. Regular assessments of the home environment are conducted to identify and address any barriers to implementing these recommendations effectively. Medication management is another critical area, with nurses monitoring compliance with antibiotic regimens and addressing any side effects or challenges related to medication administration. Nurses also educate caregivers on recognizing signs of infection recurrence, such as fever or worsening respiratory symptoms, and the importance of seeking prompt medical attention in such cases.

Hydration and nutritional support are integral to home care nursing. Nurses assist in developing hydration plans tailored to the patient's needs, encouraging fluid intake through safe swallowing practices. They also collaborate with dietitians to ensure the patient's dietary plan meets caloric and nutritional requirements without compromising swallowing safety. Encouraging mobility forms a significant part of the care plan. Nurses design individualized activity programs that promote physical movement, emphasizing gradual increases in activity levels to prevent fatigue while enhancing respiratory function and overall well-being. This intervention also reduces the risk of complications such as deep vein thrombosis and pressure ulcers. Through ongoing education, monitoring, and support, home care nurses play a vital role in fostering a safe recovery environment for patients with aspiration pneumonia. By collaborating with caregivers and other healthcare professionals, they help ensure patients receive holistic care that minimizes risks and promotes long-term health outcomes.

Challenges Facing Nursing Care Plan for Aspiration Pneumonia

The development and implementation of an effective nursing care plan for aspiration pneumonia are complex and face numerous challenges. These difficulties stem from various factors, including patient-specific characteristics, resource limitations, and the inherent complexities of managing aspiration-related conditions.

- **Patient-Specific Factors**: One of the primary challenges arises from the diversity in patient presentations. Aspiration pneumonia commonly affects vulnerable populations such as the elderly, individuals with neurological impairments, and critically ill patients. These groups often have comorbidities, such as dysphagia, reduced mobility, or cognitive impairments, which complicate care planning. For example, patients with swallowing dysfunction may require customized feeding strategies and dietary modifications, yet adherence to these plans can be inconsistent due to patient noncompliance or a lack of caregiver understanding. Furthermore, silent aspiration, which occurs without overt symptoms, can go undetected and exacerbate the condition. Early identification of such episodes requires vigilance and skilled assessment, which may be hindered in resource-constrained settings.
- **Resource Constraints**: Limited healthcare resources pose a significant barrier to effective nursing care plans. Staffing shortages in both acute and home care settings may reduce the ability to provide comprehensive patient education and close monitoring. Nurses are often tasked with high patient-to-staff ratios, limiting the time available for individualized care and follow-ups. Additionally, access to diagnostic tools, such as videofluoroscopy swallowing studies, is restricted in some regions, delaying definitive diagnosis and appropriate interventions. In resource-limited environments, access to specialized support services, such as speech-language pathology or nutritional counseling, is often inadequate, leaving nurses to manage complex cases without multidisciplinary input.

- **Caregiver Education and Compliance**: Educating caregivers on aspiration prevention is another persistent challenge. Many caregivers lack the medical knowledge necessary to grasp the importance of proper feeding techniques, patient positioning, and adherence to dietary recommendations. Despite efforts to provide detailed instructions, compliance is frequently hindered by the caregivers' competing responsibilities, language barriers, or resistance to changing established routines. This issue is particularly critical in home care settings, where the absence of professional supervision increases the likelihood of errors in care execution.
- **Prevention and Recurrence**: Preventing recurrence of aspiration pneumonia requires strict adherence to preventive strategies, yet achieving this goal remains difficult. Modifying the viscosity of fluids or texture of food, while essential for swallowing safety, often leads to reduced patient satisfaction, malnutrition, or dehydration. Balancing adequate nutrition with swallowing safety is a delicate task that requires continuous assessment and adjustment. Additionally, ensuring compliance with head-of-bed elevation during meals and sleep may be impractical for some patients, particularly those with mobility issues or cognitive impairments.
- **Psychosocial and Emotional Challenges**: Patients recovering from aspiration pneumonia often experience significant emotional and psychosocial stress, such as fear of choking, reduced social interaction, and dependency on caregivers. These factors can lead to anxiety, depression, or withdrawal, which negatively impact the recovery process. Nurses face the challenge of addressing these psychological needs while managing the clinical aspects of care. Moreover, the emotional burden on caregivers may lead to burnout, further complicated care delivery.
- **Interprofessional Collaboration**: Aspiration pneumonia care requires coordinated efforts from a multidisciplinary team, including physicians, speech therapists, dietitians, and pharmacists. However, communication gaps and inconsistent care coordination can hinder the seamless integration of interventions. Nurses often act as the central point of contact, yet they may face challenges in facilitating collaboration among various specialists, particularly in fragmented healthcare systems. In conclusion, managing aspiration pneumonia through a nursing care plan is fraught with challenges that require multifaceted solutions. Addressing these issues demands not only enhanced training for nurses but also systemic changes, such as better resource allocation, improved caregiver education programs, and strengthened interprofessional collaboration. By overcoming these barriers, healthcare teams can improve outcomes and the quality of care for patients at risk of or recovering from aspiration pneumonia.

Conclusion:

Aspiration pneumonia remains a significant clinical concern, particularly among high-risk populations such as the elderly and those with neurological or swallowing impairments. The condition necessitates timely and effective management strategies to mitigate its associated morbidity and mortality. Nursing care is central to this effort, with interventions focused on early detection, prevention, and collaborative treatment approaches. The cornerstone of prevention lies in thorough assessments, including the use of validated dysphagia screening tools, and proactive measures such as maintaining optimal patient positioning and ensuring proper oral hygiene. Regular suctioning, when needed, and the strategic use of dietary modifications, including altering food texture and liquid viscosity, contribute to reducing aspiration risks. While these interventions are effective, they must be balanced with efforts to prevent malnutrition and dehydration, particularly in vulnerable patients such as those with dementia. Interdisciplinary collaboration is essential for comprehensive care. Speech-language pathologists are invaluable in improving swallowing function, while dietitians ensure adequate nutrition and hydration. Pharmacists optimize medication regimens to minimize sedative effects that can impair protective reflexes. Nurses act as the linchpin of this team, coordinating care, educating caregivers on safe feeding techniques, and closely monitoring patient outcomes. Advanced diagnostic tools, such as videofluoroscopy swallowing studies, provide critical insights into swallowing impairments and guide individualized interventions. Preventive strategies, such as elevating the head of the bed and regular oral cavity suctioning, are simple yet effective measures to reduce recurrence. In conclusion, managing aspiration pneumonia requires a holistic approach that integrates evidence-based nursing practices with multidisciplinary support. Empowering caregivers

through education further ensures continuity of care and enhances patient safety, underscoring the need for a coordinated effort to address this complex clinical challenge.

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التدخلات التمريضية المبنية على الأدلة للوقاية من الالتهاب الرئوي الشفطي وإدارته: مراجعة محدثة

الملخص:

الخلفية: الالتهاب الرئوي الشفطي هو عدوى رئوية ناتجة عن استنشاق مواد من الفم والبلعوم أو المعدة إلى الجهاز التنفسي السفلي. يُرتبط بمعدلات عالية من الاعتلال والوفيات، لا سيما بين الفئات الضعيفة مثل كبار السن والمصابين باضطرابات عصبية أو مشاكل في البلع. تُعد التدخلات التمريضية الفعالة والرعاية التخصصية المشتركة ضرورية للوقاية من هذا النوع من الالتهاب الرئوي وإدارته.

الهدف: استعراض التدخلات التمريضية المبنية على الأدلة والأساليب متعددة التخصصات للوقاية من الالتهاب الرئوي الشفطي وإدارته.

الطرق: تم إجراء مراجعة شاملة للأدبيات الحالية، مع التركيز على استراتيجيات التشخيص والوقاية والعلاج. وتم تسليط الضوء على دور الفرق متعددة التخصصات، بما في ذلك طاقم التمريض وأخصائي علاج النطق وأخصائي التغذية. كما أُعطي اهتمام خاص لأدوات الفحص، وبروتوكولات المضادات الحيوية، وتأثير إدارة التغذية والترطيب.

النتائج: الالتهاب الرئوي الشفطي هو الأكثر شيوعًا بين المرضى الذين يعانون من اضطرابات عصبية وكبار السن، حيث يُعد الاستنشاق الصامت أحد المساهمين الرئيسيين. تشمل التدخلات الفعالة التقييمات السريرية الدقيقة، واستخدام أدوات الفحص لتحديد صعوبات البلع، والبدء الفوري في استخدام المضادات الحيوية، وتعديلات غذائية مخصصة. وتم تحديد أهمية ممارسات التمريض مثل تعديل وضعية المرضى، وشفط الإفرازات، والعناية بنظافة الفم. كما ساهمت الأساليب التعاونية التي تشمل علاج النطق وتحسين التغذية في تقليل مخاطر الشفط وتحسين النتائج الصحية للمرضى.

الخلاصة: تلعب التدخلات التمريضية، إلى جانب التعاون متعدد التخصصات، دورًا محوريًا في الوقاية من الالتهاب الرئوي الشفطي وإدارته. يُعد التعرف المبكر على المرضى المعرضين للخطر، والالتزام بالممارسات المبنية على الأدلة، والتعليم الصحي الاستباقي لمقدمي الرعاية من الأمور الأساسية لتقليل المضاعفات ومنع تكرار المرض.

الكلمات المفتاحية: الالتهاب الرئوي الشفطي، التدخلات التمريضية، صعوبات البلع، الوقاية، الرعاية متعددة التخصصات، نظافة الفم، المضادات الحيوية