Complete Summary

GUIDELINE TITLE

Nasotracheal suctioning — 2004 revision & update.

BIBLIOGRAPHIC SOURCE(S)

American Association for Respiratory Care. Nasotracheal suctioning--2004 revision & update. Respir Care 2004 Sep;49(9):1080-4. [62 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: American Association for Respiratory Care (AARC). AARC clinical practice guideline. Nasotracheal suctioning. Respir Care 1992 Aug;37(8):898-901.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Pulmonary disease

GUIDELINE CATEGORY

Management
Treatment

CLINICAL SPECIALTY

Critical Care
Emergency Medicine
Family Practice
Geriatrics
Internal Medicine
Nursing
Pediatrics
Pulmonary Medicine

INTENDED USERS

Respiratory Care Practitioners

GUIDELINE OBJECTIVE(S)

- To improve the consistency and appropriateness of respiratory care and serve as a guide for education and research
- To provide clinical practice guidelines on nasotracheal suctioning

TARGET POPULATION

Patients of all ages requiring maintenance of a patent airway and removal of saliva, pulmonary secretions, blood, vomitus, or foreign material from the trachea and nasopharyngeal area

This guideline applies to patients in a wide variety of settings, including critical care, emergency room or department, inpatient acute care, extended care and skilled nursing facility care, home care, and outpatient or ambulatory care.

INTERVENTIONS AND PRACTICES CONSIDERED

Nasotracheal suctioning

MAJOR OUTCOMES CONSIDERED

Not stated

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Consultants to the Working Group may review the initial draft of the guideline. After completion by the Working Group, the draft is reviewed by the entire Steering Committee and then by a Review Panel (i.e., persons engaged in all facets of the delivery of respiratory care who have volunteered to review drafts of the Guidelines before publication).

The 2004 Update was approved by the 2003 Clinical Practice Guideline (CPG) Steering Committee.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Procedure

Nasotracheal suctioning (NTS) for tracheal aspiration is a component of bronchial hygiene therapy.

Description/Definition

NTS is intended to remove accumulated saliva, pulmonary secretions, blood, vomitus, and other foreign material from the trachea and nasopharyngeal area that cannot be removed by the patient's spontaneous cough or other less invasive procedures. NTS has been used to maintain a patent airway thus ensuring adequate oxygenation and ventilation and avoiding intubation that was solely intended for the removal of secretions.

NTS refers to the insertion of a suction catheter through the nasal passage and pharynx into the trachea without a tracheal tube or tracheostomy (although a nasopharyngeal airway may be used) in order to aspirate accumulated secretions or foreign material.

The clearance of secretions is accomplished by application of subatmospheric pressure applied to a sterile, flexible, multi-eyed catheter on withdrawal only. Appropriate subatmospheric pressures are

- Neonates: 60-80 mm Hg
- Infants: 80-100 mm Hg
- Children: 100-120 mm Hg
- Adults: 100-150 mm Hg

Negative pressures should not exceed 150 mm Hg as higher pressures have been shown to cause trauma, hypoxemia, and atelectasis.

Settings

NTS is performed in a wide variety of settings, and this guideline applies to patients of all ages.

- Critical care
- Emergency room or department
- Inpatient acute care
- Extended care and skilled nursing facility care
- Home care
- Outpatient or ambulatory care

Indications

The need to maintain a patent airway and remove saliva, pulmonary secretions, blood, vomitus, or foreign material from the trachea in the presence of:

- Inability to clear secretions when audible or visible evidence of secretions in the large/central airways that persist in spite of patient's best cough effort. This is evidenced by one or more of the following

    - Visible secretions in the airway
    - Chest auscultation of coarse, gurgling breath sounds, rhonchi, or diminished breath sounds
    - Feeling of secretions in the chest (increased tactile fremitus)
    - Suspected aspiration of gastric or upper airway secretions
    - Clinically apparent increased work of breathing
    - Deterioration of arterial blood gas values suggesting hypoxemia or hypercarbia
    - Chest radiographic evidence of retained secretions resulting in atelectasis or consolidation
    - Restlessness
- To stimulate cough or for unrelieved coughing
- To obtain a sputum sample for microbiological or cytological analysis

Contraindications

Refer to the "Contraindications" field or see the original guideline document.

Hazards/Complications

Refer to the "Potential Harms" field or see the original guideline document for information.

Limitations of Method

- NTS is a blind procedure with inherent risks (refer to complications).
- Risks are increased in a combative or uncooperative patient.
- Duration of application of subatmospheric pressure, or suction, should be limited to no greater than 15 seconds.
- Controversy exists concerning possible overuse of this procedure.

Assessment of Need

- Personnel should perform a baseline assessment for indications of respiratory distress and the need for NTS as recognized by presenting indications listed above. This should include but not be limited to:
    - Auscultation of chest
    - Monitor patient's heart rate
    - Respiratory rate
    - Cardiac rhythm
    - Oxygen saturation
    - Skin color and perfusion
    - Personnel should assess effectiveness of cough.
- Prepare the patient for the procedure by providing an appropriate explanation along with adequate sedation and pain relief as needed.

Assessment of Outcome

Effectiveness of NTS should be reflected by assessing patient post suction for:

- Improved breath sounds

- Removal of secretions
- Improved blood gas data or pulse oximetry
- Decreased work of breathing (decreased respiratory rate or dyspnea)

Resources

- Equipment:
    - Vacuum source
    - Calibrated, adjustable regulator
    - Collection vessel and connecting tubing
    - Sterile, flexible, multiple-eyed suction catheter of appropriate caliber
    - Sterile disposable gloves
    - Sterile water and cup
    - Water-based lubricant and/or normal saline
    - Local anesthetic is sometimes used to reduce discomfort.
    - Nasopharyngeal airway when frequent NTS is required
    - Resuscitation bag with mask

  In the acute care setting, with initiation of NTS, or when working with the unstable patient, the following are recommended:

    - Electrocardiogram (EKG) monitor
    - Oxygen (hyperoxygenation with appropriate delivery device as indicated)
    - Personnel protective equipment for Standard Precautions
    - Stethoscope
- Personnel:
    - **Level I** caregiver may be the provider of service *after* Level II personnel have established need by patient assessment and the first NTS episode has been completed. Level I personnel must demonstrate:
        - Knowledge of proper assembly and use of equipment
        - Knowledge of upper airway anatomy and physiology
        - Ability to recognize secretion retention on auscultation
        - Ability to monitor vital signs and assess patient's condition and response to procedure
        - Ability to recognize and respond to adverse reactions and complications of procedures
        - Ability to employ technique of cardiopulmonary resuscitation when indicated
        - Ability to evaluate and document procedure effectiveness and patient response
    - **Level II** provider initially assesses the patient, determines the need for NTS, and evaluates response to and effectiveness of first episode. **Level II** personnel have all the skills of Level I providers plus:
        - Knowledge and understanding of patient's disease, goals, and limitation of NTS
        - Recognition and understanding of basis of pathophysiology
        - Ability to perform initial treatment and be available to troubleshoot the procedure
        - Ability to modify techniques and equipment and take definitive action in response to adverse reaction

        - Ability to detect adverse reactions and avoid patient harm by employing techniques of cardiopulmonary resuscitation with mechanical airway adjuncts and bag-mask devices
        - Knowledge of basic electrocardiogram (EKG) and dysrhythmia recognition
        - Knowledge of signs and symptoms of decreased cardiac output, oxygenation, and perfusion
        - Ability to teach Level I and lay personnel providing home care
    - Home care should be provided by lay personnel trained and knowledgeable in
        - Proper assembly and use of equipment
        - Correct positioning of patient
        - Proper suctioning technique
        - Signs and symptoms of respiratory distress
        - Assessment of patient response to procedure
        - Response to adverse reaction
        - Care and cleaning of equipment

Monitoring

The following should be monitored before, during and following the procedure.

- Breath sounds
- Skin color
- Breathing pattern and rate
- Pulse rate, dysrhythmia, electrocardiogram (EKG) if available
- Color, consistency, and volume of secretions
- Presence of bleeding or evidence of physical trauma
- Subjective response including pain
- Cough
- Oxygenation (pulse oximeter)
- Intracranial pressure (ICP), if equipment is available
- Laryngospasm

Frequency

Nasotracheal suctioning should be performed by a skilled caregiver when indicated and when other methods to remove secretions from airway have failed.

Infection Control

- The Centers for Disease Control and Prevention (CDC) Guidelines for Standard Precautions should be adhered to.
- All equipment and supplies should be appropriately disposed of or disinfected.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Improved bronchial hygiene
- Effective nasotracheal suctioning, resulting in improved breath sounds and blood gas data or pulse oximetry, removal of secretions, and decreased respiratory rate.

POTENTIAL HARMS

- Mechanical trauma (mucosal hemorrhage, tracheitis, epistaxis from laceration of nasal turbinates, and perforation of the pharynx)
    - Laceration of nasal turbinates
    - Perforation of the pharynx
    - Nasal irritation/bleeding
    - Tracheitis
    - Mucosal hemorrhage
    - Uvular edema
- Hypoxia/hypoxemia
- Cardiac dysrhythmias/arrest
- Bradycardia
- Increase in blood pressure
- Hypotension
- Respiratory arrest
- Uncontrolled coughing
- Gagging/vomiting
- Laryngospasm
- Bronchoconstriction/bronchospasm
- Discomfort and pain
- Nosocomial infection
- Atelectasis
- Misdirection of catheter
- Increased intracranial pressure (ICP)
    - Intraventricular hemorrhage
    - Exacerbation of cerebral edema
- Pneumothorax

CONTRAINDICATIONS

CONTRAINDICATIONS

Listed contraindications are relative unless marked as absolute.

- Occluded nasal passages
- Nasal bleeding
- Epiglottitis or croup (absolute)
- Acute head, facial, or neck injury
- Coagulopathy or bleeding disorder
- Laryngospasm
- Irritable airway
- Upper respiratory tract infection
- Tracheal surgery
- Gastric surgery with high anastomosis
- Myocardial infarction
- Bronchospasm

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Controversy exists concerning possible overuse of nasotracheal suctioning.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Association for Respiratory Care. Nasotracheal suctioning--2004 revision & update. Respir Care 2004 Sep;49(9):1080-4. [62 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1992 Aug (revised 2004 Sep)

GUIDELINE DEVELOPER(S)

American Association for Respiratory Care - Professional Association

SOURCE(S) OF FUNDING

American Association for Respiratory Care (AARC)

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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This is the current release of the guideline.

This guideline updates a previous version: American Association for Respiratory Care (AARC). AARC clinical practice guideline. Nasotracheal suctioning. Respir Care 1992 Aug;37(8):898-901.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American Association for Respiratory Care (AARC) Web site.

Print copies: Available from the American Association for Respiratory Care (AARC), CPG Desk, 11030 Ables Ln, Dallas, TX 75229-4593; Web site: www.aarc.org.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on November 30, 1998. The information was verified by the guideline developer on December 15, 1998. This NGC summary was updated by ECRI on March 21, 2005.

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