The Use of Non-Invasive Ventilation at the End of Life

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Conflict of Interest

I have no real or perceived conflict of interest that relates to this presentation. Any use of brand names is not in any way meant to be an endorsement of a specific product, but to merely illustrate a point of emphasis.
Objectives

• Understand the concepts of and indications for non-invasive ventilation
• Discuss the basic ethical principles based upon ethical principles
• Identify the ethical issues associated with end of life patients with regard to non-invasive ventilation
• Discuss the benefits and disadvantages of using non-invasive ventilation in patients at the end of life
• Discuss the benefit-burden ratio in relation to using non-invasive ventilation in patients at the end of life
Case Scenario

- A 15 year old male is admitted with end-stage chronic kidney disease
  - Past medical history: anoxic brain injury at birth, severe developmental delay, cerebral palsy, gastrostomy tube for feeding
  - Clinical presentation: fever, high heart rate, high respiratory rate, short of breath, work of breathing increased, bluish tinge to lips and nail beds
  - Diagnosis: acute respiratory failure due to pneumonia; kidney function nil
  - Advance directive on file: do not intubate
    - Joseph lives in a long-term care facility
    - Family rarely visits but retains guardianship
    - Advance directive written two years ago when Joseph was diagnosed with chronic kidney disease
Case Scenario

- Physician recommends non-invasive positive pressure ventilation (NIPPV)
- Respiratory Therapist is concerned that the use of NIPPV is akin to “cheating” the DNI order
- Ethical concern: Is it ethically appropriate to use a non-invasive form of mechanical ventilation to an end-of-life patient with a DNAR or DNI?
  - Futile treatment?
  - Beneficent?
  - Violation of DNI/DNAR order?
  - Burdens vs. Benefits?
Non-Invasive Ventilation

- Defined
  - Application of positive pressure through a mask
- Interfaces
  - Nasal pillows or cannula; mask (full-face or nasal)
- Uses
  - Prevent intubation due to hypoxic respiratory failure
  - Stent open the airway in diseases like OSA (CPAP)
Principles of Medical Ethics

- Four basic principles
  - Autonomy
  - Justice
  - Beneficence
  - Non-maleficence

- Major problem:
  - Which principle gets “top billing”?
  - Does one principle trump another?
Practitioner Biases

- Prior experiences with similar patients
- Prior experiences with physician
- Personal feelings about end of life care
  - Religious beliefs
  - Moral obligations
  - Personal value system
Definitions

- **DNI**
  - Do not intubate

- **DNAR**
  - Do not attempt resuscitation
  - Why is this different from DNR?

- **Living will**
  - A document created by the patient prior to and in anticipation of end-of-life

- **Power of attorney**
  - Surrogate decision maker chosen by the patient prior to and in anticipation of end-of-life
Statement of the Problem

- Is it ethically appropriate to use a non-invasive form of mechanical ventilation to an end-of-life patient with a DNAR or DNI?

- Does “DNI” mean the same as “no mechanical ventilation”?
Arguments for the use of NIPPV at the end of life

- NIPPV alleviates respiratory distress and relieves the shortness of breath
  - Improving comfort is an indirect effect of the alleviation of the shortness of breath
  - Good treatment for reversible lung disease in the DNI/DNAR patient when the acute respiratory failure is not caused by the primary disease
    - e.g. pneumonia acquired by a patient with end-stage renal failure
Arguments for the use of NIPPV at the end of life

- No sedation necessary
  - In the context of requiring ventilatory support
- Improve comfort
  - Easier breathing
Arguments for the use of NIPPV at the end of life

- NIPPV provides additional time for the patient to finalize his/her affairs
  - Removal of CO₂ narcosis allows the patient to be more coherent
- Patient can communicate with loved ones and caregivers
  - Allow time to say goodbye and enjoy the company of others
Arguments against the use of NIPPV at the end of life

- Still a form of life support
  - Improves oxygenation
  - Removal of carbon dioxide
  - Can be set to function as a mechanical ventilator
- NIPPV is contraindicated in some conditions
  - Decreased level of consciousness
  - Excessive secretions
  - Hemoptysis
Arguments against the use of NIPPV at the end of life

- NIPPV will only prolong the dying process
  - Mechanical ventilator approach
- It is inappropriate to prolong life if the patient has already elected to limit life support
  - Does physician know best?
Arguments against the use of NIPPV at the end of life

- False hope
  - Allowing patient and family to believe the patient is “getting better” or “hanging in there”
- The system itself causes discomfort
  - Pressure on face causes breakdown
  - Gastric distension
  - Blowing air can dry out airway/throat
Ethical Issues

- Violates non-maleficence?
  - Definition: do no harm
  - Creating more suffering?
  - Is it ethical to withhold a comfort measure?

- Is it beneficent?
  - What is the perceived “good” of NIPPV?
    - Treating the disease/bridging to recovery
    - Palliation
Ethical Issues

- Paternalistic approach by physicians?
  - Definition: the physician feels they know what’s best for the patient regardless of the patient’s wishes
  - Patients without DNAR orders
  - Patients with DNI orders
- Violation of patient autonomy
  - Advance directive?
- Futility: what’s the burden?
  - Using NIPPV as therapy vs. palliation
Ethical Issues

- Risk:benefit ratio?
  - Risk of death versus questionable benefit of NIPPV
    - Does the burden of the side effects of NIPPV override any potential benefit?
- Who decides?
  - Physician
  - Family
  - Patient
## Categories of life support

<table>
<thead>
<tr>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life support with no limits</td>
<td>Life support with preset limits</td>
<td>Comfort measures only</td>
</tr>
<tr>
<td>Goal to restore to pre-admission health status</td>
<td>Goal to restore to pre-admission health status without using treatments against which the patient has elected</td>
<td>Goal to maximize comfort and minimize pain</td>
</tr>
<tr>
<td>Patient with COPD exacerbation, no previous intubations/hospitalizations and wants maximal treatment</td>
<td>Patient with COPD exacerbation, hx of intubation/ventilation, patient elects against only future invasive ventilation</td>
<td>Patient with COPD exacerbation and end-stage lung CA; prefers comfort measures only</td>
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</tbody>
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Example of Category 1 Situation

- 68-year-old man with severe oxygen-dependent COPD
- Presents to ER with COPD exacerbation (acute-on-chronic respiratory failure)
- Current quality of life acceptable to patient
- Patient wants NIPPV and possible intubation as long as there is a reasonable chance of returning to baseline quality of life
Example of Category 2 Situation

- 68-year-old man with severe oxygen-dependent COPD
- Presents to ER with COPD exacerbation (acute-on-chronic respiratory failure)
- Patient refuses intubation due to the additional burden (and possibility of not weaning from the ventilator)
- Patient accepts NIPPV as long as his current condition is reversible and he can return home to his previous quality of life
Example of Category 3 Situation

- 68-year-old man with severe oxygen-dependent COPD
- Presents to ER with COPD exacerbation (acute-on-chronic respiratory failure)
- Patient is unhappy with his current quality of life
- Patient wishes to be kept comfortable and wants no life-prolonging measures
- Patient has received NIPPV before and wishes to utilize it to gain comfort and communicate with his wife
What happens when the physician and respiratory therapist disagree on the use of NIPPV?
Clinician’s Perspectives

- Sinuff et al studied physician and respiratory therapists’ attitudes of the use of NIPPV at end of life
  - Use of NIPPV in Category 2:
    - 59.6% of MD and 47% of RT agree that NIPPV can provide additive effect to analgesics for relief of dyspnea
  - Use of NIPPV in Category 3:
    - 41.8% of MD and 31.7% of RT agree that NIPPV can provide additive effect to analgesics for relief of dyspnea
Should physicians add NIPPV to the DNAR/DNI discussion (i.e. offer it as an option at end-of-life)?
Clinicians’ Perspectives

- Sinuff et al also asked about including NIPPV in the end-of-life discussion:
  - Physicians’ perspective
    - 62% of MD indicated that NIPPV should be included
  - Respiratory therapists’ perspective
    - 87% of RT indicated that NIPPV should be included
  - Reality
    - Approximately 20% of MD include NIPPV in the end-of-life discussion
    - Fewer than 10% of MD include NIPPV in the treatment plan for comfort measures only patients
General Recommendations

- Dialogue with patient and family
  - Advance directive status
    - Clearly define the legal jargon
    - Clearly define the reality of the resuscitative efforts
  - Clearly explain benefits and risk
    - Contraindications and side effects
      - A minor side effect as perceived by a clinician may be a major side effect as perceived by the patient (e.g. vomiting, nausea, etc)
  - *Informed* consent
    - Does the patient and family *really* understand?
General Recommendations

- Identify the goals of care
  - Include all stakeholders
    - Patient and family
    - The entire care team (RT, RN, MD; maybe social work and clergy)
  - Reversible disease process may respond to NIPPV and other non-invasive treatments to return the patient to the previous quality of life
  - Non-reversible disease process (like COPD) may not respond but dyspnea may be alleviated
General Recommendations

- Communicate the expected outcome
  - Palliative versus curative
    - Will this comfort the patient at the end?
    - Will this reverse the acute process?
    - Does the patient understand the probable outcome?
      - Many patients look at mechanical ventilation/NIPPV as a TREATMENT and not a bridge to recovery or comfort
Recommendations for Joseph

- Identify treatment goals
  - May use the category approach proposed to help identify goals and medical options acceptable to the family based on benefits and burdens
    - Goals of categories 1 and 2 are not an option; Joseph’s condition is terminal and treatment for his kidney disease may be burdensome.
    - Category 3 shifts goals of therapy to palliative
      - Argument to use NIPPV for Joseph:
        - NIPPV may provide the healthcare team time to treat the reversible pneumonia
        - NIPPV may be able to provide a relief of shortness of breath
        - Treating kidney disease might be futile but alleviating shortness of breath is not
      - Arguments against the use of NIPPV for Joseph:
        - Side effects such as gastric distention and skin breakdowns may be painful
        - May prolong the dying process

- Consultant’s Recommendation: institute NIPPV
  - Ethical justification: non-maleficence, beneficence (alleviating distress); no violation of autonomy because DNI/DNAR is not violated
References


Kacmarek RM. Should noninvasive ventilation be used with the do-not-intubate patient? Respir Care 2009;54(2):223-231.


Thank you!

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