Evidence Based Clinical Practice Guidelines for the use of Tracheostomy in the Critically Ill Patient: Preliminary Results

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Introduction - I

• Tracheostomy is one of the oldest surgical procedures known to man
  – References in the *Rigveda* written over 3,000 years ago

• It remains as one of the most frequent procedures performed in the ICU
  – Performed in 15-27% of ventilated patients

• However, no clinical practice guidelines are currently available
Therefore, The Pan-Americana and Iberian Federation of Critical Care Medicine (FEPIMCTI) decided to generate an evidence-based practice guidelines to help practitioners in their daily clinical activities.

The participating Federation Societies included:

- USA, Mexico, Panama, Colombia, Venezuela, Ecuador, Chile, Argentina, Brazil, and Spain
Methods - I

• **Team:**
  - 26 critical care specialists experts in tracheostomy from 10 FEPIMCTI Societies participated in the development of the guidelines
  - A professional librarian and a methodologist/clinical epidemiologist developed the search strategy

• **Questions:**
  - Each theme was assigned to two experts
  - The experts developed the PICO questions
Methods - II

- **PICO questions focused on:**
  - **P** - population was adult critically ill patient in the ICU
  - **I** - intervention was tracheostomy (surgical and percutaneous)
  - **C** – comparator was endotracheal intubation and surgical versus percutaneous tracheostomy
  - **O** – outcomes were all metrics associated with tracheostomy (LOS, complications, mortality)

- **Grading of Evidence and Recommendations:**
  - We used the GRADE system
    - Strong (1) or Weak (2) recommendations
    - Level of evidence A - Good, B – Moderate, C – Poor, D – Very poor
Methods - III

• Search from 1988-2015:
  – MEDLINE through PUBMED
  – Cochrane Database of Systematic Reviews (CDSR)
  – Cochrane Central Register of Controlled Trials (CENTRAL)
  – Database of Abstracts of Reviews of Effects (DARE)
  – National Health Service Economic Evaluation Database (NHS EED)
  – Database of the Literatura Latinoamericana y del Caribe en Ciencias de la Salud (LILACS)

• We used 250 references out of 430 manuscripts found
Limitations:

- The comparison of the surgical and percutaneous techniques is limited because these are no unique techniques.
- The percutaneous tracheostomies can be performed using:
  - The Ciaglia Techniques:
    » Multiple dilatation
    » Single dilatation
    » Ballon dilatation
  - The Griggs Technique:
    » Forceps dilatation
  - The Fantoni Technique:
    » Translaryngeal technique
  - The Frova Technique:
    » Rotational dilatation
  - Others such as the Ambesh technique, Schachner technique, etc.
- Quality of research published
Most Important Questions?
Is tracheostomy better than prolonged intubation in the general critically ill ventilated patient?

- There is not enough evidence to make a recommendation regarding the use of tracheostomy in this group of patients

- **Recommendation:**
  - No recommendation
Question/Recommendation - 2

• Is the open surgical tracheostomy technique better than the percutaneous tracheostomy?
  – There is no difference in complications and mortality between surgical and percutaneous tracheostomies.
    • Although there is significant advantage of the percutaneous technique regarding infections with the multi-dilatation technique, this is not seen in the most recent studies and the multi-dilator technique has been replaced by the single dilation approach
  – Recommendation:
    • We do not recommend a specific technique (open versus percutaneous) with the objective of reducing mortality or complications (Grade -1B)
    • We suggest that the technique (open versus percutaneous) be chosen based on the training and skills of the operator, best clinical judgment and local practice (Grade 2D)
Question/Recommendation - 3

• Which is the best percutaneous tracheostomy technique?
  – There is no evidence of the superiority of any particular technique in multiple studies and meta-analysis
  – **Recommendation:**
    • We **do not** recommend a specific percutaneous tracheostomy technique (Grade -1B)
    • We **suggest** that the percutaneous technique be chosen based on the training and skills of the operator, best clinical judgment and local practice (Grade 2D)
Question/Recommendation - 4

• Does bedside percutaneous tracheostomy have lower complication rate than tracheostomy in the operating room?
  – There is evidence of a higher number of complications when the procedure is performed in the operating room
    • It has been suggested that this is associated with the need for transportation outside the ICU
  – Recommendations:
    • We suggest to perform percutaneous tracheostomy at bedside (Grade 2D)
Question/Recommendation - 5

• Does percutaneous tracheostomy reduce LOS compared to surgical surgical tracheostomy?
  – There is no evidence of LOS reduction when PDT is performed

  – Recommendation:
    • No recommendation
Question/Recommendation - 6

• Is percutaneous tracheostomy less expensive than surgical tracheostomy?
  – There is moderate to low quality evidence that the PDT is a less expensive procedure compared to surgical tracheostomy performed in the operating room

  – Recommendation:
    • We suggest to perform PT at bedside in order to reduce costs (2-C)
When is the ideal time to perform a tracheostomy?

- Early tracheostomy reduces ventilators days but does not reduce mortality

- **Recommendations:**
  - We recommend to perform early tracheostomy to reduce ventilator days in the ICU (Grade 1B)
What is the minimal requirement to consider an operator “expert” or “independent”?

There is no evidence to determine what is an “expert” operator.

Only one randomized single center study has shown no complication differences between “experienced” (>6 procedures) and “inexperienced” operators (<6 procedures) (Nates et al. 2000)

It is clear that the number of procedures is not the only variable that should determine competency.

Several societies have provided a minimal number of procedures as benchmark to be consider competent

The ATS and the ERS between 5 to 10; CHEST >20 (expert opinion)

Recommendation:

No recommendation of a number cutoff
Question/Recommendation - 9

• Who should do the percutaneous tracheostomies?
  – There is no evidence of better performance of one
group of specialists over others (e.g., head and
neck surgeons, general surgeons, intensivists)

  – **Recommendation:**
    • We *suggest* that el specialist that performs a PT has
      received previous formal training (2D)
Does the use of U/S or bronchoscopy during the tracheostomy procedure reduce complication rates?

- There is no evidence that these tools reduce complications rates or significantly improve the procedure.

- Recommendations:
  - No recommendation
Which is the ideal tracheostomy technique?

- There is no evidence of complication or mortality advantage of one over another technique among the different tracheostomies currently available.
- PT has been shown to have a lower cost than ST in the operating room, it is performed earlier,

Recommendation:

- We suggest to give preference to the percutaneous approach given its cost-effectiveness and logistical advantages (Grade 2D).
Preliminary Conclusions

• There is no current significant evidence to endorse one technique, whether surgical or percutaneous, over another

• However, given the logistical differences and cost-effectiveness advantages (lower cost with same complication rate than surgical), we concluded that PT should be the procedure of preference in the ICU until new evidence supports the contrary