Objective:
To compare standard endotracheal intubation to the two-person face-to-face intubation technique in both the reclining and the sitting positions.

Methods:
Study Design
Randomized prospective trial.

Participants and Setting
34 paramedic students and 21 first and second year medical students at an academic medical center.

Interventions
- All subjects were given a short instructional video followed by small group practice sessions for the various techniques.
- Paramedic students received eight to twelve practice sessions for standard technique and two practice sessions for both face-to-face seating and reclining techniques.
- Medical students were given one practice session for standard technique and one practice session for face-to-face seating technique. They were not taught the face-to-face reclining technique.
- Subjects were trained and tested using a Macintosh blade on a standard full-body intubating mannequin placed on a height-adjustable paramedic stretcher.
- Subjects were then tested on the different techniques:
  - Paramedic students were tested on all techniques approximately one week later.
  - Medical students were tested on the standard and face-to-face techniques later the same day.

Measurements
- Each subject performed the procedures in random order while being video-recorded.
- Raters reviewed the video data and measured the time from the moment the laryngoscope touched the mannequin until the first attempt to pass the endotracheal tube.
- Raters also noted the number of times the subjects clicked the teeth.

Outcomes Measured
- The percent failure to intubate for each procedure.
- The percent completed intubations at 15, 20, and 30 seconds.
- The number of times the teeth were clicked.
- The percentage of students who prefer each procedure.

Data Analysis
- Cochran Q test
- Chi Square

Laryngoscopist's Role in the Two-Person Sitting Technique

Results:
- Of the 55 subjects, 53 (33 paramedics and 20 medical students) completed the trials on video. (Two had incomplete videos).
- Of the sitting face-to-face intubations were successful, whereas five (9%) of standard intubations were missed, P = 0.025.
- Although all paramedic students were successful performing the face-toface face-to-face intubation, they were significantly less successful completing the procedure at 15 and 30 seconds compared to either of the other techniques, P < 0.05.
- Only one medical student clicked the teeth using the standard intubation technique.

PERCENT SUCCESSFUL INTUBATIONS FOR PARAMEDIC STUDENTS AT VARIOUS TIMES

<table>
<thead>
<tr>
<th>Technique</th>
<th>Standard Set to Face</th>
<th>Face-to-Face</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 seconds</td>
<td>97</td>
<td>87</td>
</tr>
<tr>
<td>20 seconds</td>
<td>97</td>
<td>100</td>
</tr>
<tr>
<td>30 seconds</td>
<td>100</td>
<td>95</td>
</tr>
</tbody>
</table>

P = 0.025

PERCENT SUCCESSFUL INTUBATIONS FOR MEDICAL STUDENTS AT VARIOUS TIMES

<table>
<thead>
<tr>
<th>Technique</th>
<th>Standard Set to Face</th>
<th>Face-to-Face</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 seconds</td>
<td>25</td>
<td>16</td>
</tr>
<tr>
<td>20 seconds</td>
<td>25</td>
<td>89</td>
</tr>
<tr>
<td>30 seconds</td>
<td>75</td>
<td>75</td>
</tr>
</tbody>
</table>

P = 0.06

PERCENTAGE OF MISSED INTUBATIONS

<table>
<thead>
<tr>
<th>Technique</th>
<th>Paramedics</th>
<th>Medical Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Set to Face</td>
<td>27%</td>
<td>26%</td>
</tr>
<tr>
<td>Face-to-Face</td>
<td>0%</td>
<td>10%</td>
</tr>
</tbody>
</table>

P = 0.001

PERCENT PREFERENCE FOR EACH TECHNIQUE

<table>
<thead>
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<th>Technique</th>
<th>Paramedics</th>
<th>Medical Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Set to Face</td>
<td>56%</td>
<td>10%</td>
</tr>
<tr>
<td>Face-to-Face</td>
<td>54%</td>
<td>90%</td>
</tr>
</tbody>
</table>

P = 0.025

Discussion:
Advantages of the Sitting Position

- Oral pharyngeal volume is greater, making successful intubations more likely.
- Pre-oxygenation in the sitting position prolongs the time to desaturation, especially in obese patients.
- Preferred position for many patients in respiratory distress, i.e., COPD patients. Contraindicated in patients with spinal cord injuries.
- Airway from passive degradation may be lessened.

Advantages of Using Two People

- Stress of difficult intubation shared.
- Free hand for suctioning.
- Apnealaryngeal task suggested the face-to-face techniques were more successful when performed with two people.

Disadvantages of the Sitting Position

- May not be practical during CPR for or for some groups of patients.
- May be more difficult for shorter laryngoscopists.
- May require more time to position patients before intubation.

Disadvantages of Using Two People

- Requires coordination between people.
- Requires a second person to be available.

Conclusion:
- Subjects were more successful and faster at performing the two-person siting face-to-face endotracheal technique than either the standard or two-person reclining face-to-face technique.
- Subjects rated the two-person siting face-to-face technique easiest to perform.

Limitations:
- Mean age not human subjects.
- Novice vs. experienced intubators.
- Long term retention not evaluated.

References:
- Stoney Brook University Medical Center. Stoney Brook, New York.