Delayed Sequence Intubation

General

Delayed Sequence Intubation (DSI) is the preferred method of intubation for TAMU EMS. DSI is an emergency airway management procedure which allows for increased preoxygenation and denitrogenating prior to intubation. It is particularly useful in patients who are experiencing AMS, agitated delirium, have low saturation, and require intubation. The DSI procedure differs from Rapid Sequence Intubation (RSI) by separating the administration of the induction agent from the administration of the paralytic. The induction agent, typically Ketamine, allows the continuation of spontaneous breathing and the retention of airway reflexes to promote increased oxygenation.

Indications

- Patients with saturation < 94% requiring intubation
- Conscious or semi-conscious patients who are not compliant or responsive with preoxygenation attempts prior to intubation

Contraindications

- Any patient with a secure airway and adequate oxygenation and ventilation
- Inadequate personnel or other resources to safely carry out procedure
- RSI procedure should be utilized for patient with $SpO_2 \geq 94\%$ and holding requiring emergent airway management

Considerations

- Maximum of 2 intubations attempts are allowed
- DSI is not a rushed procedure and requires time and personnel to accomplish

Procedure

This procedure is best accomplished in an organized fashion with a similar approach as “pit crew” CPR. Provider roles should be assigned during preparation and all equipment should be obtained and ready. Suggested roles are airway assistant, intubator, drug administrator and someone to monitor vitals.

1. Prepare, position and oxygenate
    a. Prepare for the procedure and assign roles
    b. Monitoring equipment should be applied: ECG, Pulse Ox, BP, EtCO2
    c. Patients should be sat up at a 15-30 degree angle on the stretcher
    d. Oxygenate - NRB, BVM, CPAP plus NC at 15 LPM, the goal is 100% oxygen for duration of equipment preparation and sedation. No less than 3 minutes for denitrogenation
2. Equipment check/preparation
    a. All necessary medications should be drawn up and labelled
    b. Intubation equipment should be checked and prepared: BVM, PEEP, ET tube in 3 sizes, 10 ml syringe, EtCO2 adapter, c-collar, ET tube holder/securing device, Nasal Cannula, Suction, etc…
    c. Backup airway should be selected and available
3. Sedation and Pre-Oxygenation

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a. NC should be applied at 15 lpm if not already done, continue other oxygen therapies as needed
b. Sedation
    i. **Ketamine** 2 mg/kg slow IV/IO
        1. Preferred unless patient is hypertensive

    OR

    ii. **Etomidate** 0.3 mg/kg IV/IO Max dose 30 mg
        1. Use if patient is **hypertensive**
c. Position patient in ear to sternal notch position (pad behind the head to accomplish this position)
d. Apply BVM with face mask at maximal oxygen flow leaving NC in place
e. Increase PEEP as needed to achieve maximal SPO_2%
f. Upon reaching $SPO_2 \geq 94\%$, begin 3-minute countdown to allow for complete denitrogenation

    *If $SPO_2 \geq 94\%$ cannot be obtained, the DSI procedure should be aborted and indication for RSI should be assessed

4. Paralysis
    a. **Rocuronium** 1 mg/kg IV/IO
5. Intubation
    a. Perform Intubation following adequate paralysis
    b. If saturation drops below 94%, discontinue intubation attempt and Pre-Oxygenate until $SPO_2 \geq 94\%$ and restart 3-minute countdown
6. Confirm and Secure
    a. Confirm tube placement
    b. Secure ET tube and apply cervical collar
7. Post-intubation management
    a. **Ketamine** 1 mg/kg IV/IO
        i. Preferred if patient is hypotensive
        ii. Ketamine provides analgesic effects and additional analgesia is not needed
    b. **Midazolam** 5 mg OR 0.1 mg/kg slow IV/IO
    c. **Fentanyl** 1 – 2 mcg/kg max of 200 mcg slow IV/IO