MMC Difficult Airway Response Team
Code White-DART
Code Blue-DART

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Why DART team?

• Multiple Root Cause Analysis events involving airway-related deaths. Problems identified:
  – Institutional planning
  – Resources (equipment, protocols, expertise)
  – Lack of interdepartmental cooperation and agreement in how to manage these events

• Low frequency but high acuity/high risk events
Some examples of Airway Events

• Difficult airway in a patient with acute respiratory failure leading to cardiac arrest
• Failed intubation requiring cricothyroidotomy
• Tracheostomy malposition with airway obstruction

…a standard, organized institutional approach is needed
There is existing expertise at MMC...

But we want expertise delivered *every time* in an organized manner

- Better equipment availability and support staff presence
- Cooperative shared algorithm
- Team training for multi-departmental groups
Practice Guidelines for Management of the Difficult Airway
An Updated Report by the American Society of Anesthesiologists
Task Force on Management of the Difficult Airway

PRACTICE Guidelines are systematically developed recommendations that assist the practitioner and patient in making decisions about health care. These recommendations may be adopted, modified, or rejected according to clinical needs and constraints and are not intended to replace local institutional policies. In addition, Practice Guidelines developed by the American Society of Anesthesiologists (ASA) are not intended as standards or absolute requirements, and they are not considered as specific outcomes. Practice Guidelines are subject to revision as warranted by the evolution of medical knowledge, technology, and practice. They provide basic recommendations that are supported by a synthesis and analysis of the current literature, expert and practitioner opinion, open-forum commentary, and clinical feasibility data.


Updated by the Committee on Standards and Practice Parameters, Jeffrey B. Apfelbaum, M.D. (Chair), Chicago, Illinois; Charles A. Haggard, M.D., Houston, Texas; and selected members of the Task Force on Management of the Difficult Airway: Robert A. Parker, M.D. (Chair), Seattle, Washington; Gary D. Smith, M.D., Corvallis, Oregon; Donald P. Chang, M.D., Sacramento, California; Richard T. Cohen, Ph.D., Woodside, Washington; and David G. Nicholouk, Ph.D., Bethesda, Washington. The previous update was developed by the American Society of Anesthesiologists Task Force on Difficult Airway Management: Robert A. Parker, M.D. (Chair), Seattle, Washington; Jonathan L. Brewster, M.D., San Diego, California; Frederick A. Barry, M.D., Charleston, Virginia; Gary D. Smith, M.D., Houston, Texas; Anthony R. Bone, M.D., Bethesda, Maryland; Richard T. Corr, M.D., Woodside, Washington; Gail E. Fiddler, M.D., Jackson, Mississippi; David G. Nicholson, Ph.D., Bethesda, Washington; and Abdulrahman Alnour, Chicago, Illinois.

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Difficult Airway Response Team (DART)

The Difficult Airway Response Team (DART) responds for the management of ADULT patients who are having difficulty being ventilated following standard intubation algorithms, or when the Code team feels a higher level of care, expertise, and equipment are needed. The DART is activated after a Code is called; therefore, all members of the Code team are already present. Additional DART responders include physicians from the Trauma Surgery and Otolaryngology teams. The DART uses specialized equipment contained on the BLUE DART CARTS, which are strategically located throughout the hospital and brought to patient’s bedside. Over the last two years at The Johns Hopkins Hospital, there were an average of 525 codes and 59 DART responses called per year.

You can activate the Difficult Airway Response Team by calling **5-4444**. When you call, please
DART team activation – call 2345

- Failed attempt by an experienced intubator with difficult BMV or inadequate oxygenation
- Disrupted airway and failing oxygenation or ventilation, or need for additional resources
- Displaced tracheostomy with airway compromise and/or inability to intubate
- Crisis situation with inadequate airway equipment outside ICU/OR/ED environment
Code White or Blue - DART?

• Code White DART:
  – Potential difficult airway compromised, but no hemodynamic compromise, respiratory status is manageable. Don’t need the Code Team, or
  – Resuscitation under way but only DART resources are needed (ie, a code in ED or SCU, with adequate staff already present but need airway help)

• Code Blue DART:
  – CPR with difficult airway, or an airway emergency likely to rapidly degrade into a resuscitation scenario. Need Code Team backup or immediate assistance
DART Team Members

• Anesthesia team - (leader - airway)
• CCM or EM attending (leader – resuscitation)
• Trauma surgery senior resident (in-house)
• Trauma surgery attending (rapidly available)
• ENT attending (available)
• RRT Supervisor and hemodynamics RRT
• SCU Coordinator and bedside RN
The DART response

• Everyone has a role
• Mutual respect and formal, closed-loop communication are ideal
• Follow the algorithms
• Do not delay placement of a surgical airway when indicated.
Role of CCM or EM Attending

- Inpatient – CCM. Emergency Department – EM
  - Support each other when multiple emergencies exist
- Primary management of the patient – ie, BP, medications, etc
- Initial airway manager – then defer to anesthesia
- Trach replacement if appropriate
- Manage CPR event if necessary
- Advises anesthesia on calling for surgical airway (ie, failing hemodynamics/SpO2)
- Post-DART management
Role of Anesthesia Team

• Primary AIRWAY manager
• Ventilates
• Attempts endotracheal intubation
• Calls for surgical airway
• Post-DART management in surgical areas
Role of Trauma Resident and Attending

• Prepares immediately for surgical airway
• Performs surgical airway when the intubation is declared failed by anesthesia
• ENT is paged to the scene for backup surgical support and for pediatric surgical airway
Non-Physician roles

- SCU coordinator: meds, triage, primary nursing care of the compromised patient
- Patient RN: Provides history and assists with nursing care
- Hemo RRT: Manages DART cart
- RRT Supervisor: Assists with airway management
DART Team – role and responsibilities of CCM/EM

• Do you have to go to the ED/ward if called?
  – Yes, but can be dismissed by EM/CCM if not needed

• Why?
  – Sometimes there is only 1 EM attending, and 2 emergencies…
  – Sometimes there is only 1 CCM attending, and 2 emergencies
DIFFICULT AIRWAY ALGORITHM
Main airway algorithm

Needs intubation

Unresponsive? Near death?
- Yes
  - Go to crash airway algorithm
- No
  - Predict difficult airway?
    - Yes
      - Go to difficult airway algorithm
    - No
      - RSI
        - From difficult airway algorithm
          - Attempt intubation
            - Successful?
              - Yes
                - Post-intubation management
              - No
                - Failure to maintain oxygenation?
                  - Yes
                    - Go to failed airway algorithm
                  - No
                    - ≥3 attempts at OTI by experienced operator?
                      - Yes
                        - Go to failed airway algorithm
                      - No
                        - Go to failed airway algorithm
Overview: DART airway

Unconscious, unreactive, near death

Yes
- Go to crash airway algorithm
  - Fails
    - Go to failed airway algorithm

No
- Difficult airway?
  Yes
    - Go to difficult airway algorithm
      - Fails
        - Go to failed airway algorithm
  No
    - RSI
      - Fails
        - Go to failed airway algorithm
“Crash Airway”

1. Crash airway
2. Maintain oxygenation
3. Intubation attempt successful?
   - Yes: Post-intubation management
   - No: Unable to bag ventilate?
      - Yes: Go to failed airway algorithm
      - No: Succinylcholine 2 mg/kg IVP
         - Attempt intubation
         - Successful?
            - Yes: Post-intubation management
            - No: Failure to maintain oxygenation?
               - Yes: 3 attempts by experienced operator?
               - No: Go to failed airway algorithm
“Difficult Airway”

1. Difficult airway predicted
   - Failure to maintain oxygenation?
     - Yes: Go to failed airway algorithm
     - No: BMV or EGD predicted to be successful?
       - Yes: Intubation predicted to be successful?
         - Yes: RSI*
         - No: Post-intubation management or RSI
       - No: Awake DL, FO, or VL successful?
         - Yes: ILMA, FO or VL*, Cricothyrotomy, BNTI
         - No: Go to main airway algorithm
   - Call for assistance
“Failed Airway”

1. Failed airway criteria

2. Failure to maintain oxygenation?
   - Yes: Extra-glottic device may be attempted
   - No: Call for assistance

3. Extra-glottic device may be attempted

4. Cricothyrotomy

5. Choose one of:
   - Flexible or rigid endoscopy
   - Video laryngoscopy
   - Extra-glottic device
   - Cricothyrotomy
   - Optical device

6. If contraindicated

7. Cuffed ETT placed?*
   - Yes: Post-intubation management
   - No: Arrange for definitive airway management
Top of Cart

- Storz monitor
- Storz module
- Storz headlamp
Top Drawer

- Silicone fluid
- Scope defogger
- Swivel elbow
- Lithium batteries
- Surgilube
- Williams Airways 9&10
- 10cc luer lock
- 20cc luer lock
- Tongue depressor
- Q tips
- Nebulizer
Second Drawer: Meds & Blades

- Storz Blades 0-4 and D blade
- Atomizer
- Americaine
- 2% viscous lido
- Nasal spray
- 2% lido jelly
- 10cc slip tip
- Filter straws
- 4% lido
- 1.5% lido w/ epi
- Phenylephrine 1ml
- 1% lido
Third Drawer: Tubes

- ETT 5-9 cuffed
- ETT 2.5-6 uncuffed
- McCoy Laryngoscope
- Stylets adult and pedi
- Ballard suction
- EtCO2 detector
- 8” Kelly clamp
Fourth Drawer: LMAs

- LMA classic 3-5
- Fastrach LMA 3-5
- Fastrach ETT 6-8
- Fastrach stabilizer
Fifth Drawer: Storz intubating scope

- Storz fiberoptic scope
- Scope camera head
- Light source
- Valves & caps
- Memory card reader
Bottom Drawer: Procedural kits/catheters

- Melker crich kit
- Portex 8.0 trach tube
- Blue Rhino perc tray
- Open trach tray
- ENK jet ventilator
- Bougie
- Aintree 19f/ 56cm
- Soft tip extra firm 100 cm
- Exchange cath 19f/ 83 cm
- Exchange cath 8f/ 45 cm
- Sheridan tube changer 4.8
- Sheridan tube changer 3.3
DIFFICULT AIRWAY ALGORITHM

1. Assess the likelihood and clinical impact of basic management problems:
   A. Difficult Ventilation
   B. Difficult Intubation
   C. Difficult with Patient Cooperation or Consent
   D. Difficult Tracheostomy

2. Actively pursue opportunities to deliver supplemental oxygen throughout the process of difficult airway management

3. Consider the relative merits and feasibility of basic management choices:
   A. Awake Intubation
   B. Non-Invasive Technique for Initial Approach to Intubation
   C. Preservation of Spontaneous Ventilation

4. Develop primary and alternative strategies:

   A. AWAKE INTUBATION
      Airway Approached by
      Non-Invasive Intubation
      Invasive
      Airway Access
      Succes$*$
      Fail
      Cancel
      Case
      Consider Feasibility
      of Other Options
      Invasive
      Airway Access

   B. INTUBATION ATTEMPTS AFTER INDUCTION OF GENERAL ANESTHESIA
      Initial Intubation
      Attempts Successful*
      Initial Intubation
      Attempts UNSUCCESSFUL
      FROM THIS POINT
      ONWARDS CONSIDER:
      1. Calling for Help
      2. Returning to Spontaneous
         Ventilation
      3. Awakening the Patient

      Face Mask Ventilation Adequate
      Face Mask Ventilation Not Adequate
      Consider / Attempt LMA
      LMA Adequate*
      LMA Not Adequate
      or Not Feasible
      Emergency Pathway
      Ventilation Not Adequate,
      Intubation Unsuccessful
      Call for Help
      Emergency Non-Invasive Airway Ventilation*
      Successful Ventilation*
      Fail
      Invasive
      Airway Access
      Consider Feasibility
      of Other Options
      Awake
      Patient

   * Confirm ventilation, tracheal intubation, or LMA placement with arterial CO$_2$
   a. Other options include but are not limited to: surgery utilizing face mask or LMA anesthesia, local anesthesia intubation or regional anesthesia blockade (neuraxial or peripheral). Patient's airway will not be problematic. Therefore, these options may be of limited value if the step in the algorithm has been reached via the Emergency Pathway.
   b. Invasive airway access includes surgical or percutaneous tracheostomy or cricothyotomy.
   c. Alternative non-invasive approaches to difficult intubation include (but are not limited to): use of different laryngeal masks, LMA, and/or fiberoptic intubation, including stylet or tube changer, tight bend, scope intubation, and blind nasal or oral intubation.
   d. Consider re-preparation of the patient for awake intubation or considering surgery.
   e. Options for emergency non-invasive airway ventilation include (but are not limited to): right bronchoscope, esophageal tracheal combs, ventilation, or tracheal jet ventilation.

Fig. 1
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How will the DART be monitored?

• DART simulation will be performed through the Hannaford Center for Safety, Innovation and Simulation (“Sim Center”)
• The Code Committee will review every DART activation, with feedback to the DART committee and Department Chiefs as requested.