

# Medical Intensive Care Units

## Physician Operations Manual

### TABLE OF CONTENTS

<b>Overview of Clinical Experience</b> .....	<a href="#">4</a>
Introduction.....	<a href="#">4</a>
Learning Objectives .....	<a href="#">4</a>
Teaching Methods.....	<a href="#">4</a>
Evaluations.....	<a href="#">4</a>
References.....	<a href="#">5</a>
Monthly Quality Assurance/Improvement Review .....	<a href="#">5</a>
<b>Administration, Location and Organization</b> .....	<a href="#">6</a>
Administrative Personnel.....	<a href="#">6</a>
Faculty.....	<a href="#">6</a>
Location .....	<a href="#">6</a>
Organization of MICU Ward Teams .....	<a href="#">6</a>
<b>Physician Responsibilities</b> .....	<a href="#">7</a>
General.....	<a href="#">7</a>
Codes.....	<a href="#">7</a>
Interns .....	<a href="#">7</a>
Residents.....	<a href="#">8</a>
Fellow .....	<a href="#">9</a>
Attending.....	<a href="#">9</a>
<b>Daily Schedule</b> .....	<a href="#">10</a>
<b>Rounds Schedule</b> .....	<a href="#">12</a>
<b>MICU Coverage Responsibilities</b> .....	<a href="#">13</a>
Short Call .....	<a href="#">13</a>
Long Call .....	<a href="#">13</a>
Post Call.....	<a href="#">13</a>
Routine.....	<a href="#">13</a>
Sample Coverage Schedule.....	<a href="#">14</a>

<b>Admission Guidelines and Procedures</b> .....	<a href="#"><u>15</u></a>
Overview.....	<a href="#"><u>15</u></a>
Admissions Originating from the Emergency Department .....	<a href="#"><u>15</u></a>
Transfers from other hospitals .....	<a href="#"><u>16</u></a>
Clinics and floor transfers.....	<a href="#"><u>16</u></a>
Bed availability .....	<a href="#"><u>16</u></a>
Occupancy .....	
Suspension of Admissions by MICU Attending.....	<a href="#"><u>17</u></a>
<b>Night and Weekend Coverage Systems</b> .....	<a href="#"><u>18</u></a>
Weekend Rounds .....	<a href="#"><u>18</u></a>
Intern and Resident Coverage.....	<a href="#"><u>18</u></a>
Pulmonary/Critical Care Fellow .....	<a href="#"><u>19</u></a>
Attending.....	<a href="#"><u>19</u></a>
<b>Chart Documentation</b> .....	<a href="#"><u>20</u></a>
Admission Notes.....	<a href="#"><u>20</u></a>
Daily Progress Notes.....	<a href="#"><u>20</u></a>
Procedure Notes.....	<a href="#"><u>20</u></a>
Transfer/Discharge Notes .....	<a href="#"><u>20</u></a>
<b>Performance Requirements and Recommendations</b> .....	<a href="#"><u>21</u></a>
Communication.....	<a href="#"><u>21</u></a>
Demeanor.....	<a href="#"><u>21</u></a>
Bounce Backs.....	<a href="#"><u>21</u></a>
Problems .....	<a href="#"><u>21</u></a>
<b>Core Curriculum</b> .....	<a href="#"><u>22</u></a>
Overview.....	<a href="#"><u>22</u></a>
Topics.....	<a href="#"><u>22</u></a>
<b>When to Contact the ICU Facilitator</b> .....	<a href="#"><u>23</u></a>
The ICU Facilitator .....	<a href="#"><u>23</u></a>
Procedure when MICU bed occupancy approaches capacity on either campus.....	<a href="#"><u>23</u></a>
ICU Facilitator Functions .....	<a href="#"><u>24</u></a>
<b>When, How and Who to Contact for Organ Donation</b> .....	<a href="#"><u>25</u></a>
Policy .....	<a href="#"><u>25</u></a>
Procedure for patients with brain death or impending brain death.....	<a href="#"><u>25</u></a>
Procedure for Asystolic Deaths (Tissue Donation) .....	<a href="#"><u>25</u></a>
Medical Examiner Cases.....	<a href="#"><u>26</u></a>
<b>Code Blue Cardiopulmonary Resuscitation</b> .....	<a href="#"><u>27</u></a>
HAC MICU Resident.....	<a href="#"><u>27</u></a>

HAC MICU Intern .....	<a href="#"><u>27</u></a>
<b>Internal Transfer Policy</b> .....	<a href="#"><u>28</u></a>
Procedure for stable patients to non-critical care areas .....	<a href="#"><u>28</u></a>
Procedure for patients to other critical care areas .....	<a href="#"><u>28</u></a>
<b>Admission Algorithm</b> .....	<a href="#"><u>29</u></a>
<b>Admission Criteria for the MICU</b> .....	<a href="#"><u>30</u></a>
<b>Discharge Criteria from the MICU</b> .....	<a href="#"><u>31</u></a>
<b>MICU Refusal Documentation Form</b> .....	<a href="#"><u>32</u></a>
<b>MICU Readmission Documentation Form</b> .....	<a href="#"><u>33</u></a>
<b>Ventilator Weaning Protocols</b> .....	<a href="#"><u>34</u></a>
<b>Ventilator Weaning Protocol Orders</b> .....	<a href="#"><u>37</u></a>
Oxygen/PEEP Wean .....	<a href="#"><u>37</u></a>
Rate/Pressure Support Wean .....	<a href="#"><u>38</u></a>
Spontaneous Breathing Trial .....	<a href="#"><u>39</u></a>
<b>Drotrecogin Alpha (Xigris) – Physician Ordering Procedure</b> .....	<a href="#"><u>40</u></a>
<b>Admission Policy of MICU Patients to ENC 6 East CCU</b> .....	<a href="#"><u>41</u></a>

# Medical Intensive Care Units

Information for Physicians at Boston Medical Center

## **Overview of Clinical Experience**{ TC \l1 "Overview of Clinical Experience} *Introduction*{ TC \l2 "Introduction}

Rotation in the Medical Intensive Care Unit (MICU) is designed to provide state of the art care to seriously or critically ill patients in an environment that emphasizes learning, teaching and independence. Residents and interns are exposed to a large spectrum of clinical problems including, but not limited to, respiratory failure with or without mechanical ventilation, ARDS, shock, sepsis, gastrointestinal hemorrhage, diseases related to alcohol or drug excess, HIV-related conditions, pulmonary edema, pulmonary emboli, renal, hepatic or cardiac failure, DKA, fluid, electrolyte or thermic disturbances, CVA or complications of malignancies. The [House Officer](#) admits and manages all patients in the MICU with the supervision of the MICU [Attending/Fellow](#). Additional support is provided by the faculty of the Department of Medicine either as sub-specialists or as primary physicians.

Care is provided in a team format which includes physicians, nurses, respiratory therapists, pharmacists, nutritionists, physical therapists and social workers. This multi-disciplinary approach provides excellent care to patients by capitalizing on the expertise of many services.

### *Learning Objectives*

By the end of their rotation, house staff will be able to evaluate and diagnose the pathophysiological process, anticipate complications and administer treatment to critically ill patients with multi-system disease. Inherent in this process is the development of the thinking patterns required to deliver superior health care employing state of the art technology. In addition, house staff are expected to become proficient in the insertion of central vein catheters, management of ventilators, interpretation of data from Swan-Ganz catheters, the interpretation of CXRs and other radiological examinations. Other commonly performed [procedures](#), such as lumbar puncture, thoracentesis, paracentesis, arterial puncture, contribute to the experience of ward medicine.

### *Teaching Methods*{ TC \l2 "Teaching Methods}

Daily didactic seminars are provided by the MICU Attending and Fellow on the [MICU core curriculum](#). Direct guidance and commentary is afforded daily on chest films. Application of medical knowledge to clinical conditions are provided during work and walk rounds.

### ***Evaluations{ TC \I2 "Evaluations}***

House staff are evaluated by the MICU Attending in oral communication with members of the Residency Program Office and in written reports at the end of the rotation. Due to some split months by Pulmonary/Critical Faculty, some house staff may receive reports with input from more than one Attending. Interim and final oral evaluations may also be provided at the request of the house officer or at the discretion of the Attending.

### ***References{ TC \I2 "References}***

A compendium of critical care articles is located in each of the three Units. Reference texts are located in the MICU for use by the house staff. Summaries representing the [core curriculum](#) will be provided at the didactic teaching sessions. Additional articles are provided for specific problems by the MICU Attending/Fellow.

### ***{ TC \I1 " }Monthly Quality Assurance/Improvement Review{ TC \I2 "Monthly Quality Assurance/Improvement Review}***

The Medical Director/Associate Medical Director, Nurse Manager/Assistant Nurse Manager, Attendings, Fellow and other staff will meet at 4 week intervals to review the following for quality assurance:

- 1) Deaths
- 2) Admission Refusals and outcomes
- 3) Re- admissions (Bounce backs)
- 4) Incident Reports
- 5) Reportable Events/Occurrences
- 6) Organ Donors
- 7) Systems Issues
- 8) Previous period follow up
- 9) Bronchoscopy/Procedures

[Return to Table of Contents](#)

## **Administration, Location and Organization{ TC \I1 "Administration, Location and Organization}**

### ***Administrative Personnel{ TC \I2 "Administrative Personnel}***

Director:	Arthur C. Theodore, MD	Pager: 1211	Office: 84933
Associate Director:	Christine C. Reardon, MD	Pager: 2047	Office: 88636
Nurse Manager HAC:	Liz Tassinari, RN	Pager: 8289	Office: 47265
Assistant HAC:	Patricia Covelle, RN	Pager: 4390	Office: 44392
Nurse Manager ENC:	Paula Danz, RN	Pager: 4897	Office: 85726

The nurse manager's office on HAC is located outside of 5 East MICU  
The nurse manager's office on ENC is located on the 6 E ICU unit.

### ***Faculty{ TC \I2 "Faculty}***

MICU Faculty: Pulmonary/Critical Care Medicine  
Support Staff: Nutritional, Epidemiology, Pharmacy,  
New England Organ Bank Representative: **Robin Ohkagawa**; Beeper 617-473-1290

### ***Location{ TC \I2 "Location}***

#### **Harrison Avenue**

5 East MICU: 10 beds expandable  
Telephone: 414-5825,6,7  
FAX: 414-3114

5 West MICU: 8 beds expandable  
Telephone: 414-4421,2,4  
FAX: 414-4423

#### **East Newton**

6 East ICU (CCU): 8 beds expandable  
Telephone: 638-5910  
FAX: 638-6686

### ***Organization of MICU Ward Teams{ TC \I2 "Organization of MICU Ward Teams}***

#### **Harrison Avenue**

Two separate teams consisting of:

Pulmonary/Critical Care Attending  
Two medical residents (pgy 2/3)  
Two interns (medical/categorical)

#### **East Newton**

One team consisting of:

Pulmonary/Critical Care Attending  
One medical resident (pgy 2/3)  
One medical intern

(Fourth year Medical Student)

(Two) Family Medicine Interns

One MICU-dedicated Pulmonary/critical care fellow is assigned to the Harrison Avenue MICU and one non-dedicated fellow is assigned to the East Newton Campus

[Return to Table of Contents](#)

## Physician Responsibilities{ TC \I1 " Physician Responsibilities}

### General{ TC \I2 "General}

House officers are directly responsible for the medical care of all patients admitted to the MICU Service, but are not responsible for the care of patients boarded in the MICU on other services such as surgery except in the event of life-threatening emergencies.

### Codes{ TC \I2 "Codes}

Harrison Avenue (HA): The long call resident and intern carry the code beepers and respond to [codes in the HA Pavilion](#). The MICU resident is the physician leader who manages and terminates the code, determines disposition, communicates with the primary care/attending physician and family and signs the code record. The intern performs ACLS/BLS, obtains venous access, blood gasses and other blood work and other procedures as necessary.

East Newton: The code beepers are carried by an intern and resident on the CCU service.

### Interns{ TC \I2 "Interns}

- 1) Primary patient
  - a) Coordinates procedures performed by consulting and ancillary services
  - b) Schedules tests and completes requisitions
  - c) Arranges consults
- 2) Note Writing
  - a) [Daily progress notes](#)
  - b) [Transfer notes](#) with **documentation of acceptance by receiving service attending**
- 3) Pre Work Rounds
  - a) Review of overnight events with post call intern, respiratory therapists and nurses
  - b) Correction of urgent/emergent problems
  - c) Recording of patient data from bedside charts to daily progress note
  - d) Physical exam
  - e) Completion of progress note summary
- 4) Reads the films in Radiology Rounds
- 5) Presents on work rounds using the following format:
  - a) Review of events from the previous 24 hours
  - b) Presentation of patient data (running the board)
  - c) Direct examination of the patient
  - d) Synthesis of the data and Impression
  - e) Formulation of medical problem list
  - f) Developing the management plans

- 6) Performance of [procedures](#)
- 7) Management if acute problems
- 8) Night time cross coverage

**Residents{ TC \I2 "Residents }**

- 1) All patient primary care
- 2) Supervision of Interns and Sub-interns
  - a) [Procedures](#)
  - b) Presentations
  - c) Problems
  - d) [Transfer Notes](#)
  - e) Teaching
- 3) Admissions
  - a) Evaluation and [acceptance/refusal](#)
  - b) [Admission/refusal Note](#)
  - c) Listing of refusal on QA/QI performance improvement [refusal review form](#)
  - d) Documentation of Discussion with Fellow/Attending in admission note
  - e) Communication of admission to nurse manager (day) and nursing supervisor (night)
- 4) Discharges
  - a) Identify patients meeting discharge criteria
  - b) Creation and communication of “[bump lists](#)” to night charge nurse
  - c) Dictations and completion of Green Sheet on patients discharged to home or to other facilities
- 5) Pre Work Rounds with Fellow and Respiratory Therapy
  - a) Identify patients meeting [discharge criteria](#) and informing ward secretaries
  - b) Identify patients meeting criteria for [ventilator weaning/extubation](#) and initiating protocols
- 6) Morning Work Rounds
  - a) Presentation of new admissions
  - b) Supervision of Intern/Sub-Intern presentations
- 7) Communication with medical and lay community
  - a) Families/Family meetings
  - b) Primary care physicians
  - c) Nursing
  - d) Fellows and Pulmonary/CCM physicians
- 8) Consultation with social services for patients requiring placement in long term care and rehabilitation institutions
- 9) Evening Walk Rounds
  - a) Present new admissions
  - b) Review data and progress of all patients on the service
  - c) Develop overnight management plans
  - d) Identify patients likely to meet transfer criteria overnight and in the AM
  - e) **Develop Bump list and inform charge nurse**
  - f) Assign [transfer notes](#) to intern/sub-intern
  - g) Identify candidate patients for [weaning/extubation](#) and initiate overnight protocols

***Fellow{ TC \I2 "Fellow}***

- 1) Review of all [admissions](#) with admitting resident
- 2) Supervision of procedures
- 3) Knowledge and experience resource for house staff
- 4) Placement of Swan-Ganz catheters
- 5) Teaching
  - a) Radiology rounds
  - b) [Core curriculum](#)
  - c) Work and walk rounds
- 6) Pre Work rounds
  - a) Leads resident and respiratory therapist
  - b) Assists in problem solving
- 7) Morning Work rounds
- 8) Evening Walk rounds
- 9) Family Communication
- 10) Bronchoscopy

***Attending{ TC \I2 "Attending}***

- 11) Ultimate responsibility for patient care
  - a) Supervises medical management
  - b) Makes final decisions regarding [admissions and transfers](#)
  - c) Leads family meetings
  - d) Assesses acuity and work load of service
- 12) [Suspends admissions](#) if acuity of service compromises patient care
- 13) Evaluating the knowledge and clinical skills of the house staff and fellows
- 14) Teaching
  - a) Core Curriculum
  - b) Radiology rounds
  - c) Work and Walk rounds
  - d) Continuing education to nursing staff, respiratory therapy, pharmacy and other personnel
- 15) Attends Analysis and QA Review

[Return to Table of Contents](#)

## Daily Schedule{ TC \11 "Daily Schedule}

### **6:30-8:00 am: Interns/Sub-interns** (Individual teams)

- 1) Review overnight events from on call intern and resolve overnight issues.
- 2) Collect and record as part of the [daily progress note](#) the previous 24 hour data on all patients on the service.
- 3) The daily progress note consisting of overnight events and system-specific problem list should be initiated and completed on rounds. Complete the note during or after rounds with exam findings and a summary at the beginning of the problem list stating why the patient is in the MICU and what the status is (i.e., improving, deteriorating etc.,)

Note: The nurses have the charts for report between 7 and 7:30. They are unavailable!!

The I/O data may not be available until 7 when the night nurse has totaled the amounts.

Respiratory Therapy is in report from 7 to 7:15 and will come to the unit after report.

### **7:00-8:00 am: Residents, Fellow and Respiratory Therapist** (Combined on HAC)

- 1) Obtain sign outs, examine and review treatment plan on patients admitted overnight.
- 2) Identify all patients meeting [discharge criteria](#) for transfer out of the ICU and notify the ward secretary.
- 2) Visit all ventilator patients and begin [weaning/extubation protocols](#) on all appropriate patients.
- 3) Write [transfer orders](#) and notify the ward secretary of transfers
- 4) Provide guidance to the interns for rounds preparation.

### **8:00-8:20 am: All MICU teams**

- 1) Critical Care Core Curriculum seminar by the faculty and fellow (HAC).
- 1) Radiology rounds with review of all chest and abdominal films (ENC).
- 2) Review of CT/MRI or other scans in radiology (ENC)

### **8:20-8:45 am: All MICU teams**

- 1) Radiology rounds with review of all chest and abdominal films (HAC).
- 2) Review of CT/MRI or other scans in radiology (HAC Individual teams).
- 3) [Critical Care Core Curriculum](#) seminar by the faculty and fellow (ENC).

### **8:45-11:00 am: Individual MICU teams**

- 1) Daily work rounds with nursing, respiratory therapy and ancillary personnel
- 2) Orders should be written during rounds
- 3) Transfers and extubations should be confirmed and executed
- 4) Problem lists can be completed

**11:00 am-5:00 pm: Individual MICU teams**

- 1) Post-call intern and resident relieved of service
- 2) Implementation of plans formulated on morning rounds
- 3) Completion of daily notes
- 4) Discussions with consultants

**5:00 pm-6:30 pm: Individual MICU teams**

- 1) Evening walk rounds with Attendings
- 2) Review of patient status
- 3) Formulation of overnight management plans
- 4) Identify patients who may be transferred overnight ([bump lists](#)) or the following day
- 5) Identify patients who are candidates for [weaning protocols and initiate protocol](#) (hold sedation or change to short acting sedatives [e.g., propofol] and hold tube feedings in the AM. Order respiratory mechanics for the AM.

**6:30 pm-6:30 am: Individual MICU teams**

- 1) Cross-coverage
- 2) Completion of [transfer notes](#) on patients expected to leave over the next 24 h
- 3) Implementation of overnight plans
- 4) Review charts for data collected during the day for presentation on next morning rounds.
- 5) Finish dictations on patients to be [transferred to other facilities](#)

[Return to Table of Contents](#)

## Rounds Schedule{ TC \11 "Rounds Schedule}

	Interns	Residents	Fellows	Attendings
6:00 am				
7:00 am	Pre Rounds	Pre Rounds with Respiratory Therapy		
8:00 am	Core Curriculum			
	Radiology Rounds			
9:00 am	Work Rounds			
10:00 am				
11:00 am				
12:00 am				
1:00 pm				
2:00 pm				
3:00 pm				
4:00 pm				
5:00 pm	Walk Rounds			
6:00 pm				
7:00 pm				

Note: Core curriculum and Radiology Rounds are reversed at ENC

[Return to Table of Contents](#)

## **MICU Coverage Responsibilities{ TC \11 "MICU Coverage Responsibilities}**

### ***Short Call{ TC \12 "Short Call}***

Resident: Evaluates and [admits new patients](#) on an alternate basis with the other team until 3 pm. Stays until [walk rounds](#) are completed and patients have been stabilized. Establishes [bump list](#) and signs out to long call resident on other team.

Intern: Writes [daily progress notes](#). Performs all intern tasks after post call intern has left. Stays until [walk rounds](#) are completed and patients have been stabilized. Responds to all problems until sign out. Signs out to long call intern from other team.

### ***Long Call{ TC \12 "Long Call}***

Resident: Evaluates and admits new patients on an alternate basis with the other team until 3 pm and assumes all evaluations and [admissions](#) thereafter until 7 am. Participates in [walk rounds](#) and establishes a [bump list](#).

Intern: Reads the daily chest x rays in radiology rounds and bedside board during [work rounds](#), summarizes the case on established patients, reads through the problem list and formulates the plan. Performs intern tasks on own team's patients during the day and assumes care of other teams patients after 7 pm. Participates in [walk rounds](#). Responds to all problems.

### ***Post Call{ TC \12 "Post Call}***

Resident: Presents new admissions from the previous 24 hours on [work rounds](#). Summarizes and establishes the plan on the new admissions after they are examined. Completes unfinished notes, phone calls, dictations etc. after work rounds and then is dismissed.

Intern: Reads the bedside board during [work rounds](#), summarizes the case on established patients, reads through the problem list and formulates the plan. Completes unfinished notes, phone calls, etc., after work rounds and then is dismissed

### ***Routine{ TC \12 "Routine}***

Resident: Presents new admissions from the previous day on [work rounds](#). Directs interns, performs procedures and other resident tasks. May participate in or leave prior to walk rounds if all patients are stable and all work has been completed. Signs out to the long call resident.

Intern: Writes daily progress notes and performs all intern tasks. May participate in [walk rounds](#) or leave in the afternoon if all patients are stable and once all work has been completed to the satisfaction of the resident/fellow. Signs out to the long call intern.

***Sample Coverage Schedule{ TC \I2 "Sample Coverage Schedule}***

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Team AB								
Resident	Short	Long	Post	Routine	Short	Long	Post	<b>Off</b>
Resident	Post	<b>Off</b>	Short	Long	Post	Routine	Short	Long
Intern	Routine	Short	Long	Post	<b>Off</b>	Short	Long	Post
Intern	Long	Post	<b>Off</b>	Short	Long	Post	Routine	Short
Team CD								
Resident	Long	Post	Routine	Short	Long	Post	<b>Off</b>	Short
Resident	<b>Off</b>	Short	Long	Post	Routine	Short	Long	Post
Intern	Short	Long	Post	<b>Off</b>	Short	Long	Post	Routine
Intern	Post	Routine	Short	Long	Post	<b>Off</b>	Short	Long

[Return to Table of Contents](#)

## **Admission Guidelines and Procedures{ TC \l1 "Admission Guidelines and Procedures}**

### ***Overview{ TC \l2 "Overview}***

Admissions to the MICU may originate from the Emergency Department, Clinics, from patients already hospitalized at Boston Medical Center or from an outside hospital. **All patients must be accepted by the MICU resident, pulmonary fellow or a Pulmonary Attending prior to transfer to the MICU.** The MICU resident will [oversee the evaluation and/or transfer](#) of the patient. **The resident will discuss all admissions with the Pulmonary/Critical Care Fellow or Attending and document the discussion and acceptance in the medical record.** If the patient has a staff attending, the **resident will notify (and document) that attending** (or designate) of the patient's admission. Upon admission to the MICU, a Pulmonary/Critical Care staff physician becomes the attending of record for all patients. Patients must meet [criteria for admission](#) to the MICU. If a patient is deemed not appropriate, the [MICU Refusal Documentation Form](#) must be completed.

It will be assumed a bed is available even if the MICU is full or [over capacity](#) as patients can be boarded in the SICU or in any of the other ICUs within Boston Medical Center as necessary. The Medical Director and associates of the MICU,CCU and SICU are responsible for making final decisions for the disposition of a patient when the patient load exceeds operational capacity. This person, known as [the facilitator](#), is reachable by beeper 24 hours a day. **Unless the ICU has been closed by the Administrator/Facilitator, it is assumed a bed is available for any admission/transfer.** The nursing supervisor and facilitator should be notified at any time when the bed situation becomes critical.

### ***Admissions Originating from the Emergency Department{ TC \l2 "Admissions Originating from the Emergency Department}***

The majority of admissions originate from the Emergency Department. Residents staffing the ED and the ED Attendings will make the initial determination of MICU admission. In almost all instances, patients called from the ED are clear-cut admissions because of sepsis, respiratory failure, shock, electrolyte abnormalities, nursing and respiratory issues, etc. Every effort should be made to [expedite transfer of all patients](#) who warrant an MICU from the ED to the MICU. The ED resident (or Attending) responsible for the patient will give report directly to the MICU resident. **The MICU resident will defer to the MICU Attending if there is an objection to the admission.**

The ED attending will contact the MICU attending on call and present the rationale for admitting the patient only in the following circumstances:

- 1) Borderline cases

2) The MICU resident or fellow has raised an objection to the admission

**HAC:** The ED will call the MICU resident directly

**ENC:** The ED will call the CCU resident who will designate the case to the MICU resident  
**The MICU Attending will have the final authority to accept or refuse the patient to the MICU and will contact and speak directly with the attending when refusing a patient.**

*Transfers from other hospitals{ TC \I2 "Transfers from other hospitals}*

Patients referred from other hospitals should be accepted expeditiously into BMC. The decision to [accept a transfer](#) can be made by an MICU Attending, Fellow or Resident. At night, the covering resident is often the first person contacted. **If the case is appropriate for the MICU, the resident should accept the case with the condition of bed availability. Immediate contact with the nurse manager/nursing supervisor should be made and if a bed is available in any of the ICU's, that patient should be definitively accepted in transfer immediately unless the resident has been specifically notified by the facilitator that the hospital units are closed.** Once the patient has been accepted, the resident will make any arrangements to receive the patient by notifying the charge nurse or supervisor of the accepting unit, the ED triage nurse, hospital admitting. Even though these are direct admits they may pass through the ED which will simply ensure the stability of the patient before sending him/her to the unit. It is the transferring facilities responsibility to stabilize the patient prior to transfer.

Transfers are admitted to the HAC MICU unless the following conditions are met:

- a) There are no MICU beds on the HAC campus
- b) There is a specific diagnostic or therapeutic modality only available at ENC
- c) The patient belongs to a Firm based at ENC

*Clinics and floor transfers{ TC \I2 "Clinics and floor transfers}*

In virtually all cases patients admitted from a medical clinic or transferred from the floor are done so at the request of a medical attending or designate. Requests to transfer by other services should be referred to the medical or sub-specialty consult for evaluation for appropriateness of transfer. Decompensating patients on the surgical services should be transferred to the SICU for stabilization, however, [transfers from surgical services](#) to the MICU can be made if the Surgical Attending agrees to the transfer. Transfer to the MICU during the night should always include notification of the Attending (or designate) and family. **Prompt attention to notification of the proper parties is usually appreciated (even at 3 A.M.) and avoids uncomfortable situations later.** The resident is responsible for seeing that proper notification has been given, either by the transferring ward team or by the MICU team.

*Bed availability{ TC \I2 "Bed availability}*

Bed availability is always a problem, especially in the winter months. A physically empty bed does not necessarily mean that the bed is available, as there may be a staffing issue or a patient on the other campus or elsewhere waiting to come in. The bed availability is kept by the nurse manager during the day and nursing supervisor at night. Therefore, **after determining a patient is appropriate for MICU admission it is necessary to check with the nurse manager or supervisor before confirming the admission.**

*Suspension of Admissions by MICU Attending{ TC \l2 "Suspension of Admissions by MICU Attending}*

**HAC:** Either MICU attending may suspend admissions to their service, even if beds are available, if in his/her opinion patient safety will be significantly compromised by an additional admission. When closure is warranted under these circumstances, the following will occur:

- 1) MICU attending will **notify the MICU Director and Nurse Manager or Nursing Supervisor**, who will notify the HAC facilitator, the ENC MICU Attending and the HAC Emergency Department of HAC MICU closure.
- 2) Transfer of stable MICU patients to the ENC MICU may be considered **only as a last resort** if the ENC MICU and CCU census and acuity are favorable. Transfers must include:
  - a) **Direct communication** between MICU Attending/Attending and Resident/Resident
  - b) **Approval by the MICU Medical Director** or Associate Medical Director
  - c) **Family and patient informed** of decision to transfer by transferring physician
  - d) Adherence to Intra-hospital transfer policy
- e) The MICU Attending will **review the closure every four hours** and will report the status to the Nurse Manager or Nursing Supervisor.

**ENC:** The Attending will have the authority to suspend admissions to the MICU, even if beds are available, if in his/her opinion patient care will be significantly compromised by an additional admission. When closure is warranted under these circumstances, the following will occur:

- 1) MICU attending will notify the MICU Director or Associate Director, Cardiology Attending(s) and Nurse Manager or Nursing Supervisor, who will notify the ENC facilitator, the HAC MICU Attending and the ENC Emergency Department of ENC MICU closure.
- 2) MICU admissions will be presented to the CCU team accepting admissions. It will be up to the CCU Attending to accept these to his/her service. The Pulmonary Fellow and MICU Attending will provide consultation in these cases.

- 3) Transfer of stable MICU patients to the HAC MICU may be considered **only as a last resort** if the HAC MICU census and acuity are favorable. Transfers must include:
  - a) **Direct communication** between MICU Attending/Attending and Resident/Resident
  - b) **Approval by the MICU Medical Director** or Associate Medical Director
  - c) **Family and patient informed** of decision to transfer by transferring physician
  - d) Adherence to Intra-hospital transfer policy
- 2) The MICU Attending will **review the closure every four hours** and will report the status to the Nurse Manager or Nursing Supervisor.

[Return to Table of Contents](#)

## **Night and Weekend Coverage Systems{ TC \11 "Night and Weekend Coverage Systems}**

### ***Weekend Rounds{ TC \12 "Weekend Rounds}***

On weekends rounds there will not be any core teaching sessions. Pre-rounds will remain the same followed by radiology rounds at 8 am in the ICU Conference Room at HAC (room 523E) and in Radiology at ENC. A Pulmonary/Critical Care Medicine Fellow will conduct work rounds at ENC and an Attending and a second Pulmonary/Critical Care Medicine Fellow will conduct work rounds at HAC, each with a separate team. The Fellows will discuss the service he/she rounded on with the Attending after they have completed work rounds. After the Attending completes rounds on his/her service, he/she will examine the patients and complete chart documentation on the other HAC service and at ENC.

### ***Intern and Resident Coverage{ TC \12 "Intern and Resident Coverage}***

#### Harrison Avenue

Intern and Resident coverage follows a [cycle](#) of short-call, long-call, post-call, routine days with every eighth day as a scheduled day-off (see below). The schedule is staggered so that the long call resident from one team is on overnight with the long call intern from the other team. The short call resident from the post call team receives the first admission after 7 am on an alternating basis with the long call resident from the on call team until 3 pm after which time the long call resident receives all the admissions. Each intern and resident is expected to give appropriate sign-out to the long-call intern and resident respectively prior to leaving; all reasonable work and tests should be completed prior to this sign-out. In instances in which intern(s) is in clinic, appropriate coverage will be arranged either among the four interns on the two MICU teams or using emergency coverage when appropriate.

#### East Newton

Intern and Resident Coverage is provided during weekdays from 6:30 am until 7 pm or until which time the service is under control (i.e., the day's work is completed). The resident will be responsible for admissions until 5 pm, when the overnight CCU resident will be responsible. There will be flexibility to the 5 pm cutoff time, to be determined on an individual case basis. The CCU resident on call will evaluate and admit MICU and provide coverage until 7 am the following day. The overnight CCU resident will sign out new admissions to the MICU resident and Pulmonary Fellow before CCU rounds begin at 7:15.

The **Intern day off** will occur on Thursday and will be covered by a parachute intern. The daily schedule remains the same.

The **Resident day off** will occur on Sundays and will be covered by a resident from an elective service. The Saturday schedule will apply.

*Pulmonary/Critical Care Fellow{ TC \l2 "*

***Pulmonary/Critical Care Fellow}***

Weekend coverage is provided on a rotational basis by the first Pulmonary/CCM Fellows. During the week, the MICU and Consult fellow alternate call for admissions on an every other day basis. Emergent procedures are performed by the pulmonary fellow on call who covered the previous weekend ( Call extends from Friday at 5 pm to the following Friday at 7 am).

***Attending{ TC \I2 "Attending}***

Weekend coverage is provided on a rotational basis by the Pulmonary/CCM Faculty. During the week, the Attendings assigned for the block cover their individual services and therefore alternate call for admissions on an every other day basis. Each Attending covers their own service for emergent procedures.

[Return to Table of Contents](#)

## **Chart Documentation{ TC \11 "Chart Documentation}**

### ***Admission Notes{ TC \12 "Admission Notes}***

All patients admitted to the MICU must have an admission note by the MICU resident in the chart within 24h. Admission notes should conform to the standards set by the medical service. **All admission notes must include a statement documenting discussion and acceptance of the admission with “Dr. Fellow/Attending”.** Any patient admitted under observational status must have his/her disposition determined within 24h of the admission.

### ***Daily Progress Notes{ TC \12 "Daily Progress Notes}***

Progress notes should conform to the standards set by the medical service. Every progress notes **must contain a full Review of Systems** or the reason one cannot be obtained. All progress notes **must contain a brief statement summarizing the status of the patients major problem(s)** (e.g. respiratory failure, pulmonary edema, etc.) **that necessitates care in the MICU.** The problem lists and plans of management for each individual problem should follow the summary statement. **All data and the summary statement should be completed in pre-rounds. The problem list and plans may be completed during or after work rounds.** Daily progress notes should convey to a consultant the major issues, differential diagnosis and management plan.

### ***Procedure Notes{ TC \12 "Procedure Notes}***

All **procedures** performed in the MICU must be documented in the record according to the standards set by the medical service. These include operators, indications, informed consent, patient preparation, anesthesia, technique, equipment, site, patient tolerance, complications and any follow-up studies required to check the success of the procedure ( e.g., x-rays).

### ***Transfer/Discharge Notes{ TC \12 "Transfer/Discharge Notes}***

Transfer notes should conform to the standards set by the medical service. Patients with long MICU length of stays should have a comprehensive note detailing the hospital course, resolved issues and active medical problems and plans. Previous transfer and admission notes may be referred to. Whenever possible **transfer notes should be written the night before transfer**, with an addendum written the following day, if needed. **All transfer notes must contain a statement documenting approval of the transfer by “Dr. MICU Attending” and acceptance by “Dr. Resident/Ward Attending”.**

Patients may be discharged from the MICU to the floors on either campuses as

determined by the FIRM system, TCU (Transitional Care Unit), 7 West Rehab, other institutions or directly home providing they meet the [requirements for discharge](#).

[Return to Table of Contents](#)

## **Performance Requirements and Recommendations{ TC \I1 "Performance Requirements and Recommendations}**

### ***Communication{ TC \I2 "Communication}***

The MICU at HAC is using computer order entry. The ENC will begin computer order entry sometime during the 2001-2002 academic year. With the new system it **is extremely important to communicate orders to the nurse responsible for the patient** that orders have been entered. Otherwise orders may go unnoticed for several hours. Sign outs to colleagues is required and must be complete using include the sign out sheets now in use. Sign outs must include the **bump list** of all patients who may be able to leave the MICU before the next morning. It is imperative to give proper report to colleagues accepting patients who are transferred out of the MICU and to [document acceptance by the Ward Attending.](#)

### ***Demeanor{ TC \I2 "Demeanor}***

Professional behavior is required at all times. This cannot be stressed enough. We receive calls from all services requesting admission to the MICU. It is important to **deal with everyone in a professional and courteous manner even when the request seems unreasonable.** In cases of conflicts, allow the problems to be resolved on the attending level, as described in the admission section.

The admission cut-off times are flexible and are only guidelines. Exceptions in alternating admissions or taking admissions before/after the recommended cutoff times is encouraged. Circumstances in which the admission guidelines are suspended include but are not limited to times when one service is much lighter than the other, after a particularly busy night with overwhelming admissions or a patient is well known by a team member (e.g., a clinic patient). The decision to accept patients out of turn should be made by the admitting residents; **the patient's need for the optimal care should always be foremost in the decision.**

### ***Bounce Backs{ TC \I2 "Bounce Backs}***

Patients who have been discharged from the MICU and return within 72 hours should return to the same MICU team. Patients who have been discharged for longer than 72 hours may be admitted to either team. The [MICU Readmission Documentation form](#) must be completed when this occurs.

### ***Problems{ TC \I2 "Problems}***

Any problems related to the MICU should be brought to the attention of the MICU

Medical Director, Associate MICU Medical Director or Nurse Manager as soon as is reasonably possible so that problems may be dealt with promptly.

## **Core Curriculum{ TC \11 "Core Curriculum}**

### ***Overview{ TC \12 "Overview}***

A series of 20 informal sessions are presented over the course of the 4 week block at Harrison Avenue and 10 supplemental sessions are presented over the two week block at East Newton. These seminars will begin at 8 am every weekday prior to radiology rounds at Harrison Avenue, and will follow 8 am radiology rounds at East Newton. The core curriculum will be supplemented by teaching during radiology, work and walk rounds. This allows for integration of academic information and application of physiologic principles into the practical care of the patient.

### **Topics{ TC \12 "Topics}** (some are presented over 2 days)

Status Asthmaticus and Obstructive Airways disease

Ingestions and Toxins

Vasopressors

GI Bleeding

Acute CNS events

Mechanical Ventilation

Anaphylaxis and Urticaria

ICU Risk Reduction

DKA and HONK

ARDS

Hemodynamic Monitoring

Brain Death

Noninvasive ventilation

Sedatives and Paralytics

Antibiotic Selection in ICU patients

Massive Hemoptysis

Pulmonary Hypertension

Sickle Cell Crisis

Hypertensive Emergencies

Organ Donation

[Return to Table of Contents](#)

## **When to Contact the ICU Facilitator{ TC \l1 "When to Contact the ICU Facilitator}**

What Happens When the Beds are All Full or There is A Problem

### ***The ICU Facilitator{ TC \l2 "The ICU Facilitator}***

There are two designated ICU physician/facilitators, one on each campus. The ICU facilitators rotate between Arthur Theodore, Christine Reardon (MICU), Richard Dennis (SICU), George Philippides (CCU) and Michael Klein (CCU) or their designates. The facilitator is responsible for facilitating access to critical care beds. The facilitator position is staffed by the medical directors of the critical care units or their designees who rotate responsibility on a monthly basis. The facilitator schedule is posted in 523 E on the Harrison Avenue campus and is listed on the hospital administrative on-call list which may be obtained from the operator.

### ***Procedure when MICU bed occupancy approaches capacity on either campus{ TC \l2 "Procedure when MICU bed occupancy approaches capacity on either campus}***

- 1) Apply the Bump list to transfer appropriate patients to a PCU, telemetry or floor bed
- 2) If no patient is eligible for transfer to a non-critical care unit, transfer a stable patient to another critical care unit or admit directly to another critical care unit.
- 3) Patients should be admitted or transferred to the critical care unit best able to meet their needs.
- 4) A patient whose prognosis is poor despite critical care treatment may be transferred to a non-critical care area with notification of his family.
- 5) A patient with DNR status, whose prognosis is poor despite ICU treatment shall not be admitted to an ICU bed without prior permission from that Unit's Medical Director or designee.
- 6) When all critical care units are nearing capacity, or the physician/nursing resources are unable to provide appropriate medical care, the critical care unit facilitator should be notified.

Note: Capacity is defined when **all but two ICU beds in the entire institution are filled** with patients who cannot be moved elsewhere. These two beds usually reside in the ENC CCU and the HAC SICU and are available for code/emergent cath patients and for

trauma respectively. In the event that these two beds are occupied, a plan must be available to transfer these patients expeditiously should they be needed for codes/trauma. In other words, should every bed be full two patients must be able to be discharged from the ICU. In some cases the open beds may reside in the MICU. In this case, these beds are not available for admissions but are kept open to receive transfers from CCU/SICU in case a code, emergent unstable cath, or trauma occurs.

***ICU Facilitator Functions{ TC \I2 "ICU Facilitator Functions}***

- 1) Notifies hospital Administrator and nursing supervisor of potential closing of ICUs to admissions
- 2) Monitors occupancy of the critical care units, PCU and OR schedule to determine admitting capacity
- 3) Communicates with the ICU attending physicians about the occupancy of each critical care unit.
- 4) Alerts ICU attending physician of the potential delay or cancellation in O.R. ICU cases.
- 5) Monitors the potential out of ICU list by each critical care unit.
- 6) Expedites transfers from the intensive care units.
- 7) Communicates with the ED attending physician regarding availability of critical care beds. If no beds are available, the facilitator will notify the hospital administrator on call and recommend closure. During the period of closure, the facilitator will:
  - a) Communicate a transfer time to referring physicians for new patients.
  - b) Monitor requests for transfer of in-patients to a critical care unit.
  - c) Monitor/delay admissions of patients to the critical care beds from outside institutions referred through the Physician Consult Service, ED or other service.
- 8) Will make every effort to find needed critical care beds within the same campus first.
- 9) Inter-campus transfers from one ICU to another shall be entertained as a last resort.

[Return to Table of Contents](#)



## **When, How and Who to Contact for Organ Donation{ TC \11 "When, How and Who to Contact for Organ Donation}**

New England Organ Bank (NEOB) general number: 1-800-446-6362.

NEOB representative to BMC : **Robin Ohkagawa**; Beeper 617-473-1290

### ***Policy{ TC \12 "Policy}***

Federal and State Laws stipulate that all patients, their families or their legal guardians be provided the opportunity to donate organs and or tissue whenever a death occurs.

**There is no exception to this policy, EVER.**

### ***Procedure for patients with brain death or impending brain death{ TC \12 "Procedure for patients with brain death or impending brain death}***

- 1) A referral to the NEOB should be made as soon as it has been determined that a patient has a severe neurologic injury that may progress to brain death.
- 2) The physician of record or designated clinical representative will contact the NEOB.
- 3) The coordinator from the NEOB will respond on site to:
  - a) evaluate the potential donor for medical suitability and provide consultation to hospital staff;
  - b) conduct a family discussion about the opportunity to donate; and
  - c) obtain consent from the legal next of kin, as well as a thorough medical and social history from the family.
- 4) **Staff is reminded not to speak to family about organ donation until after the NEOB has been called.** In accordance with federal regulations, it is the responsibility of the NEOB staff to conduct the family discussion about donation and obtain consent. NEOB will collaborate with hospital staff to decide the most sensitive approach to each family.
- 5) The legal next-of-kin has the right to make the decision regarding organ and tissue donation. The next-of kin order of priority is as follows: (a) spouse, (b) adult son or daughter, (c) parent, (d) adult brother or sister, (e) guardian of the decedent at the time of death or other person authorized to dispose of the body.

### ***Procedure for Asystolic Deaths (Tissue Donation){ TC \12 "Procedure for Asystolic Deaths (Tissue Donation)}***

- 1) All patient asystolic deaths must be reported to the NEOB. This includes all hospital

units, operating room, and labor and delivery. (All births and stillbirths 350 grams and/or greater than 20 week gestation.)

- 2) The physician of record or designated clinical representative is responsible for informing the family of the patient's death, either asystolic death or brain death.
- 3) The record of death (date and time) shall be documented in the patient's record.
- 4) The pronouncing physician or designated clinical representative will contact the NEOB's 24-hour number to make the referral. **A signed donor card or previously expressed wish does not preclude or guarantee organ or tissue donation. Consent by next of kin is required in all cases.**
- 5) The designated representative\* from the Decedent Affairs Office (DAO) will provide the patient's demographic information and a phone number for the nursing unit to the NEOB via the 800 number to determine donor suitability and a contact number for the certifying physician. This information may include:
  - patient's medical record number
  - patient's name
  - patient's age, sex, and race
  - date and time of death
  - cause of death
  - past medical history (e.g. history of cancer, prior transplants, etc.)
  - name and phone number of legal next of kin
  - hospital unit and phone number
  - person reporting death.
- 6) The attending physician or clinical designee will be contacted by the NEOB to obtain pertinent medical history if it is determined to be a suitable donor. Each morning the DAO will verify that all deaths have been reported to the NEOB.
- 7) NEOB will inform the representative of the DAO of the suitability of tissue donation.

\*Representatives for the DAO include Central Administrators, and Nursing Supervisors off shift, weekends and Holidays.

### ***Medical Examiner Cases{ TC \12 "Medical Examiner Cases}***

Referral to the NEOB or the New England Eye & Tissue Transplant Bank is required for asystolic deaths that occur in the Emergency Department or other deaths occurring in the hospital which by law are required to be reported to the Medical Examiner's Office. Examples that require ME referral include suspicious deaths, deaths occurring with 24 hours of admission, deaths related to suicide, homicide or toxic ingestion.

[Return to Table of Contents](#)

## **Code Blue Cardiopulmonary Resuscitation{ TC \l1 "Code Blue Cardiopulmonary Resuscitation}**

### **What to do when a code is called**

#### ***HAC MICU Resident{ TC \l2 "HAC MICU Resident}***

- 1) Respond immediately to the site of the code
- 2) If resuscitation status is unknown, initiate resuscitation
- 3) Manage the code
  - 1) Determine the rhythm(s)
  - 2) Order CPR
  - 3) Order Intubation
  - 4) Order countershocks
  - 5) Order access
  - 6) Order medications and fluids
  - 7) Order ABGs and labs
- 4) Terminates the code
- 5) Determines disposition of the patient to unit AND service
  - 1) All medical service patients requiring ICU services go to the CCU or MICU
  - 2) Surgical service patients requiring ICU services go to the CCU, MICU or SICU
    - 1) Disposition must be in the best interest of the patient
    - 2) Surgical Attending (or designate) must agree with disposition
    - 3) **Release & acceptance of service** from a surgical attending to CCU (Cardiology), MICU (Pulmonary/CCM) or SICU (Surgery/CCM) **must be documented**
- 6) **Communicates status** to the primary care physician and family
- 7) Signs the code record (Signature documents verbal orders followed during code)

#### ***HAC MICU Intern{ TC \l2 "HAC MICU Intern}***

- 1) Perform ACLS or BLS as appropriate
- 2) Establish central or peripheral I.V. access
- 3) Obtains ABGs and other blood work
- 4) Performs any other procedures required

[Return to Table of Contents](#)

## **Internal Transfer Policy{ TC \11 "Internal Transfer Policy}**

How to transfer a patient out of the MICU

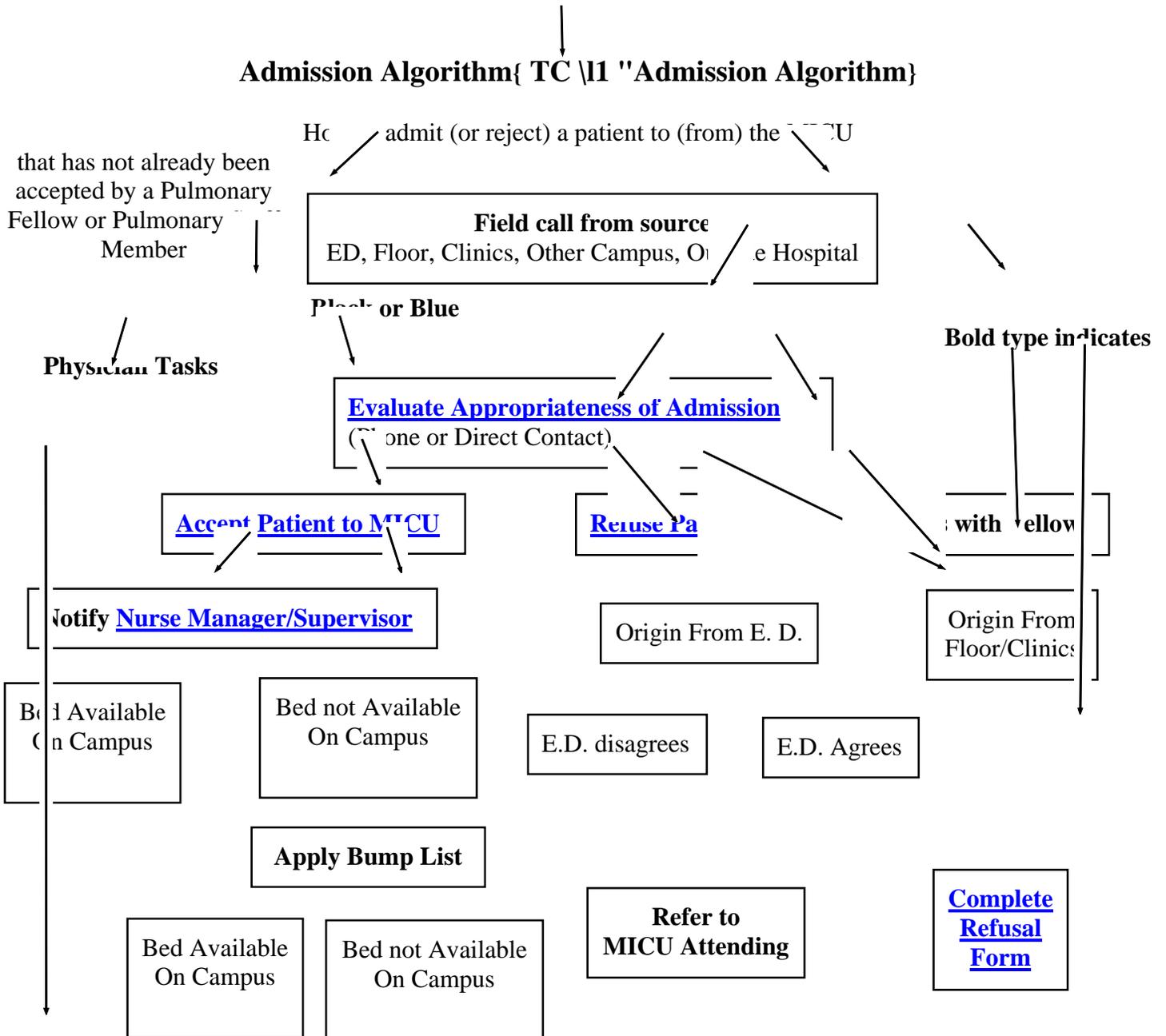
### ***Procedure for stable patients to non-critical care areas{ TC \12 "Procedure for stable patients to non-critical care areas}***

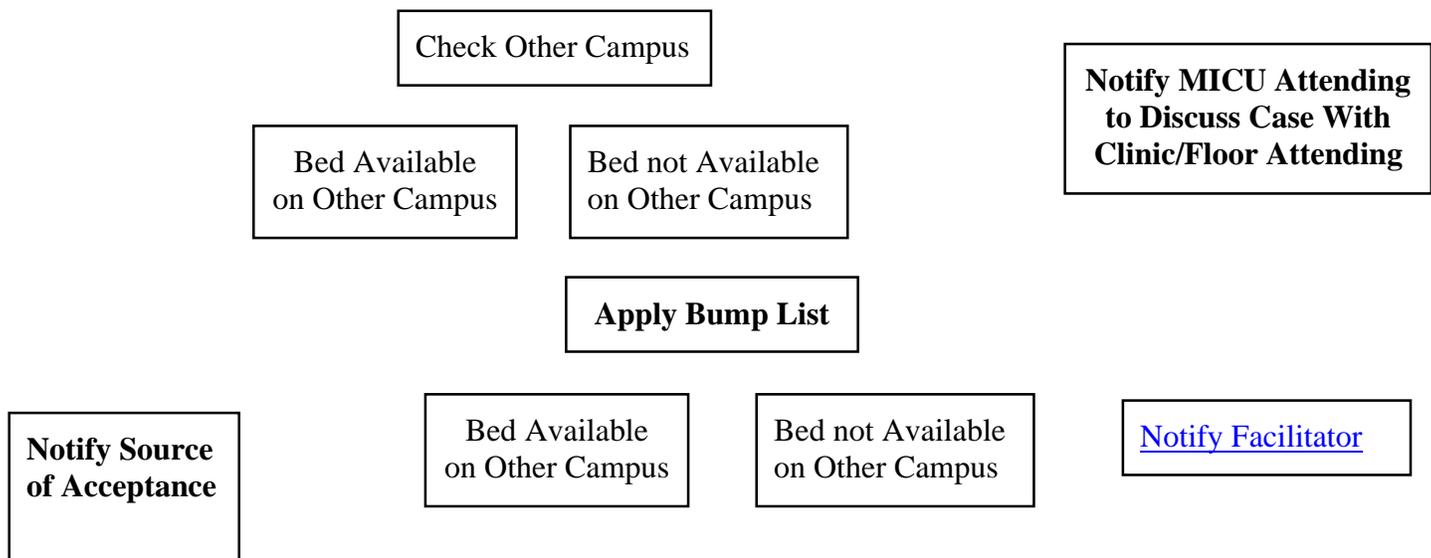
- 1) Identify patients as meeting [discharge criteria](#) from the MICU.
- 1) Discuss with the attending physician who determines the medical necessity for the transfer.
- 2) The attending physician or designee communicates the medical necessity for the transfer including alternatives to the patient/family.
- 3) The attending physician (designee) communicates directly with the receiving attending physician (designee) to discuss the patient's condition and obtain acceptance of the transfer.
- 4) The transferring clinicians are responsible for documenting [transfer notes](#) within the medical record which **must contain a statement documenting approval of the transfer by "Dr. MICU Attending" and acceptance by "Dr. Resident/Ward Attending"**.
- 5) The transferring attending physician or designee writes the order for transfer. The Unit Coordinator is responsible for coordination of transfer paperwork, communication with Patient Access Services, etc..
- 6) The transferring attending physician determines the appropriate mode of transportation.
- 7) The receiving attending physician documents acceptance of the patient by a written note in the medical record.

### ***Procedure for patients to other critical care areas{ TC \12 "Procedure for patients to other critical care areas}***

- 1) Identify patients whose care requirements dictates transfer to another critical care area
- 2) The determination that a patient is stable enough for transfer will be established by the MICU attending in collaboration with the other Attendings involved in the care of the patient.

- 3) The components of care necessary during transfer are the combined responsibility of the MICU Attending or Fellow, ICU nurse, Utilization Management Nurse and Social Worker.
- 4) The transfer proceeds as above 3-8 with the exception that the mode of transportation is by ambulance.





[Return to Table of Contents](#)

### Admission Criteria for the MICU{ TC \11 "Admission Criteria for the MICU}

Patients greater than or equal to fourteen years of age with the following problems or requirements are considered for admission to adult critical care. For all diagnoses and symptomatology, the decision for admission is made on an individual basis, based on bed availability, acuity of the patient, multi disciplinary care requirements, potential benefits and the patient's immediate care needs. This decision will be made by the Unit Director or a MICU Attending Physician in collaboration with house staff and nursing personnel.

1. Criteria: Instability or potential for instability requiring frequent interdisciplinary assessments or intervention including but not limited to:

- 1) Hemodynamic instability
- 2) Respiratory failure or requiring acute respiratory support
- 3) Post cardiac arrest
- 4) Refractory myocardial ischemia or threatening cardiac dysrhythmia
- 5) Acute renal failure requiring renal replacement therapy
- 6) IV Administration of cardiogenic and vasoactive medications
- 7) Indwelling catheter lines for physiological monitoring and/ or treatment, includes transvenous pacemakers, IABP, etc.)
- 8) GI bleeding
- 9) or potential for significant changes in neurological status
- 10) metabolic disturbances
- 11) multiple trauma, including severe tissue injury (ie: burns, Stevens-Johnsons)
- 12) Complicated obstetric patient

- m) Patients post-op from major surgery, or sustaining post-procedure complications
- n) Patients who require preoperative assessment and/or intervention to optimize physiological parameters prior to surgical procedures
- o) Post anesthesia patients, during periods PACU is unavailable

2. As a general guideline, it is recommended that patients are placed according to the following:

ENC SICU - includes cardiothoracic surgery, subarachnoid hemorrhage, IABP

ENC CCU - includes unstable MI, IABP

HP SICU - major trauma, burns

HP MICU - includes pulmonary, complicated obstetrics

HP 5WICU - includes medical and surgical specialties

These guidelines are not all inclusive, exceptions are made based on the needs of a patient.

[Return to Table of Contents](#)

## **Discharge Criteria from the MICU{ TC \11 "Discharge Criteria from the MICU}**

The following are guidelines to be utilized in considering a patient's discharge from the Medical ICU. These guidelines are not all inclusive and other criteria may be considered.

For all diagnosis and symptomatology, the decision will be made on an individual basis, based on bed availability, acuity of the patient, medical and nursing care requirements, potential benefit and patient's immediate hospital needs. This decision will be made by the unit attending/ Medical Director in collaboration with the house staff and nursing personnel.

1. Criteria for discharge to general units:
  - a. Resolution of hemodynamic instability
  - b. Stable respiratory status without mechanical ventilatory support, and the absence of need for intensive respiratory therapy or frequent tracheal suctioning
  - c. Absence of indwelling hemodynamic monitoring lines, excluding CVP catheters or ventriculostomies
  - d. Satisfactory/stable neurological status
  - e. Resolving metabolic disturbances
  - f. Absence of significant active bleeding
  - g. Patients admitted with suicide attempts or drug overdose must have absence of active suicidal/homicidal ideations as determined by psychiatry. Patients not awaiting evaluation by psychiatry may be transferred with 1:1 observation.

- h. Satisfactory stabilization of internal injuries.
- i. If a patient is made "DNAR" following hospital policy, this patient may be moved to a general unit, even if the above guidelines are not met. DNAR patients may be admitted to or remain in the MICU providing a bed is available if they may benefit from another service only provided in the MICU (i.e., nursing, respiratory therapy, etc.).

Patients may not be discharged without the consent of the Attending Physician or Unit Director. Decisions for transferring patients out of the unit will be made on Work Rounds. In the event of full occupancy of the unit, and the prospective admission of a patient who is deemed more in need of critical care, this decision may be made by the critical care resident with input from the Unit Director or Attending Physician.

[Return to Table of Contents](#)

### **MICU Refusal Documentation{ TC \I1 "MICU Refusal Documentation}**

Block \_\_\_\_\_

Date	Patient	Medical Origin Number	Diagnosis and Reason For Refusal	MD Referring	MD Refusing	QA F/U
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[Return to Table of Contents](#)

**MICU Readmission Documentation{ TC \1 "MICU Readmission**

### Documentation}

Block \_\_\_\_\_ Campus \_\_\_\_\_ Dates \_\_\_\_\_

Date	Patient	Medical Number	Origin	Diagnosis and Reason For Readmission	MD Referring	MD Admitting	QA F/U
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[Return to Table of Contents](#)

## **Ventilator Weaning Protocols{ TC \11 "Ventilator Weaning Protocols}**

- I. Purpose: To facilitate the Weaning from mechanical ventilation and subsequent extubation of medical intensive care patients. Weaning trials include:
  - 1) [Oxygen and PEEP](#) Weaning
  - 2) [Ventilator Rate](#) Weaning
  - 3) [Spontaneous Breathing Trials](#) (SBT)
  
- II. Policy:
  - A. A physician's order must be obtained to enroll the patient in the ventilator weaning protocol.
  - B. If at any time the nurse or respiratory care therapist caring for the patient feels the patient's condition disqualifies them from the weaning protocol, the patient shall automatically revert back to previous stable ventilator settings. The reason for ending the wean will be documented. The physician will be notified immediately.
  - C. A physicians's order is mandatory for extubation.
  
- III. Considerations:
  - A. All medical ICU patients requiring mechanical ventilation will be assessed at least daily for eligibility for a ventilator weaning protocol.

B. Eligibility criteria

1. Hemodynamic stability
2. Stable pulmonary function
3. Adequate nutritional status
4. Balanced fluids, electrolytes, and acid-base status
5. Adequate hemoglobin level
6. Free from significant infection

C. Exclusion criteria

1. Hemodynamic instability ie. low cardiac output, arrhythmias
2. Pharmacologic paralysis
3. Serious acid-base disturbance
4. Acute neurologic event: seizures
5. Inadequate pulmonary function
6. Any other condition which may interfere with weaning

IV. Personnel:

Respiratory therapist, nurses, and physicians assigned to the care of patients in the MICU.

V. Procedure:

- A. Each mechanically ventilated patient will be assessed at least daily for **readiness to wean screen**. The results of the daily screen for weaning criteria will be recorded on the ventilator weaning sheet. The criteria to be assessed are:
1. VE (minute ventilation)  $\leq$  15 L/min
  2. FiO<sub>2</sub>  $\leq$  0.70
  3. PEEP  $\leq$  10 cm H<sub>2</sub>O
- The patient must pass all 3 criteria to be considered ready to wean on one of the weaning protocols. If the patient does not meet these criteria, effort is to be made in optimizing PEEP, FIO<sub>2</sub> prior to entering weaning trial. If the patient meets the criteria, they can be entered into one of the weaning trials.
- B. Each mechanically ventilated patient meets the above criteria, he/she is then assessed for **ability to tolerate a spontaneous breathing trial**. The results of this assessment will be recorded on the ventilator weaning sheet based on the following criteria:
1. Awake and responsive? Yes/No
  2. Ability to cough/clear secretions? Yes/No
  3. Off sedation and pressors? Yes/No
  4. Absence of significant fever or V<sub>E</sub> < 10 L/min
  5. PEEP  $\leq$  5 cm H<sub>2</sub>O
  6. PaO<sub>2</sub>/FiO<sub>2</sub> ratio  $\geq$  200 or O<sub>2</sub> sats > 90% on 0.5 FiO<sub>2</sub> or less
  7. f/Vt ratio (Rapid Shallow Breathing Index)  $\leq$  100
- C. The patient must pass all 7 criteria to be considered for spontaneous breathing trial. If the patient meets all criteria, a physician order is obtained for spontaneous breathing trial.
- D. When patients do not meet the criteria required for readiness to wean, they will be assessed for ability to optimize FiO<sub>2</sub>, PEEP, IMV rate, and Pressure support levels to prepare them for weaning.

## VI. Oxygen weaning

- A. Order for oxygen and PEEP weaning is obtained, including a low oxygen tolerance level.
- B. A correlation between SaO<sub>2</sub> and SpO<sub>2</sub> should be done at the onset of weaning.
- C. Oxygen should be weaned incrementally to a level less than 50% prior to weaning PEEP.
- D. If FiO<sub>2</sub> is < 50%, wean the PEEP to level of 5cm H<sub>2</sub>O, in decrements of 2.5 cm H<sub>2</sub>O. PEEP levels should be changed after a reasonable stabilization period of maintaining oxygen saturation levels within tolerance levels. Usually changing PEEP levels every 6-12 hours is recommended.
- E. PEEP should be weaned to a level of 5 cm H<sub>2</sub>O and maintained at this level. Once a PEEP of 5 is reached, oxygen can be weaned further within oxygen saturation tolerance levels.
- F. Oxygen % does not have to reach 21% prior to extubation attempt, but should be < than 50%.
- G. If at any time the oxygen saturation level sustains a drop below the designated tolerance level, the patient should be returned to the previous level of sustained acceptable oxygen saturation.
- H. The physician should be notified regarding progress of oxygen wean.

## VII. Ventilator rate and pressure support weaning

- A. Order obtained for mechanical respiratory rate and/or pressure support wean, with specifications as to goal rate and goal pressure support.
- B. Document arterial or central venous blood gas levels prior to weaning attempt to verify acid-base stability for weaning respiratory rate.
- C. Decrease respiratory rate by 2 breaths per minute and or decrease PS by 2.5 cm each 1.5-2hrs as tolerated to goal.
- D. Monitor the following parameters to insure patient is tolerating the wean:
  - 1. RR/Vt > breaths/min sustained for greater than minutes
  - 2. Oxygen saturation < than 90% for more than 30 seconds
  - 3. Heart rate increased by 20% over baseline
  - 4. Blood pressure increased by 20% over baseline
  - 5. Increased anxiety
  - 6. Use of accessory muscles of respiration
  - 7. Change in cardiac rhythm or new arrhythmia
  - 8. Change in level of consciousness
- E. The patient shall be returned to prior respiratory rate if any of the above parameters are noted.
- F. The physician will be notified of progress during weaning of rate.

## VIII. Spontaneous Breathing Trial

- A. Order obtained for SBT with CPAP, T-piece or PS to keep TV at 0.5 cc/kg (IBW).
- B. Obtain Length of time specified to continue trial before order for extubation or return to previous or other ventilator settings.
- C. Monitor the following parameters to insure patient is tolerating the wean:
  - 1. RR/Vt > breaths/min sustained for greater than minutes

2. Oxygen saturation < than 90% for more than 30 seconds
  3. Heart rate increased by 20% over baseline
  4. Blood pressure increased by 20% over baseline
  5. Increased anxiety
  6. Use of accessory muscles of respiration
  7. Change in cardiac rhythm or new arrhythmia
  8. Change in level of consciousness
  9. Inability to clear secretions
- D. The patient shall be returned to prior respiratory rate if any of the above parameters are noted.
- E. The physician will be notified of progress during weaning of rate.

[Return to Table of Contents](#)

## Ventilator Weaning Protocol Orders{ TC \I1 "Ventilator Weaning Protocol Orders}

### Oxygen/PEEP Wean{ TC \I2 "Oxygen/PEEP Wean}

#### Physician's Orders

1. Goal  $F_iO_2$  \_\_\_\_\_%
2. Goal PEEP \_\_\_\_\_cm
3. Lowest  $O_2$  saturation tolerated \_\_\_\_\_%
4. \_\_\_\_\_ Check ABG/VBG (circle one) at end of:  
 Oxygen Wean  
 PEEP Wean
5. \_\_\_\_\_ Notify Dr. \_\_\_\_\_ at the end of:  
 Oxygen Wean  
 PEEP Wean
6. Stop the breathing trial and return to prior  $F_iO_2$ /PEEP if any of the following occur:  
Respiratory rate > 30 breaths/min for > 2 minutes  
Oxygen saturation < as ordered above for > 30 seconds  
Heart rate increased by 20% over baseline  
Systolic Blood Pressure > 20 % over baseline  
Increased anxiety  
Use of respiratory accessory muscles  
Change in cardiac rhythm  
Change in level of consciousness  
Inability to clear secretions

\_\_\_\_\_ M.D.      Date \_\_\_\_\_      Time \_\_\_\_\_

[Return to Table of Contents](#)

## Ventilator Weaning Protocol Orders

### Rate/Pressure Support Wean{ TC \12 "Rate/Pressure Support Wean}

Physician's Orders

7. Goal rate \_\_\_\_\_ breaths/min

8. Goal Pressure Support \_\_\_\_\_ cm

9. Lowest O<sub>2</sub> saturation tolerated \_\_\_\_\_ %

10. \_\_\_\_\_ Check ABG/VBG (circle one) at end of:

\_\_\_\_ Rate Wean

\_\_\_\_ Pressure Support Wean

11. \_\_\_\_\_ Notify Dr. \_\_\_\_\_ at the end of:

\_\_\_\_ Rate Wean

\_\_\_\_ Pressure Support Wean

12. Stop the breathing trial and return to prior respiratory rate and/or pressure support if any of the following occur:

Respiratory rate > 30 breaths/min for > 2 minutes

Oxygen saturation < as ordered above for > 30 seconds

Heart rate increased by 20% over baseline

Systolic Blood Pressure > 20 % over baseline

Increased anxiety

Use of respiratory accessory muscles

Change in cardiac rhythm

Change in level of consciousness

Inability to clear secretions

\_\_\_\_\_ M.D.      Date \_\_\_\_\_      Time \_\_\_\_\_

[Return to Table of Contents](#)

## Ventilator Weaning Protocol Orders

### Spontaneous Breathing Trial{ TC \12 "Spontaneous Breathing Trial}

Physician's Orders

13. Weaning Mode (choose one)

\_\_\_\_\_ cm Pressure Support

\_\_\_\_\_ cm CPAP

\_\_\_\_\_ % O<sub>2</sub> T piece

14. Length of Time of Trial\_\_\_\_\_

15. Lowest Oxygen Saturation Tolerated\_\_\_\_\_%

16. \_\_\_\_\_ Check Respiratory Mechanics at end of trial

17. \_\_\_\_\_ Check ABG/VBG (circle one) at end of trial

18. \_\_\_\_\_ Notify Dr.\_\_\_\_\_ at the end of trial or \_\_\_\_\_Return to pre-trial vent settings

19. Stop the breathing trial and return to pre-trial vent settings if any of the following occur:

Respiratory rate > 30 breaths/min for > 2 minutes

Oxygen saturation < as ordered above for > 30 seconds

Heart rate increased by 20% over baseline

Systolic Blood Pressure > 20 % over baseline

Increased anxiety

Use of respiratory accessory muscles

Change in cardiac rhythm

Change in level of consciousness

Inability to clear secretions

\_\_\_\_\_ M.D.      Date \_\_\_\_\_      Time \_\_\_\_\_

[Return to Table of Contents](#)

## **DROTRECOGIN ALPHA (XIGRIS) – PHYSICIAN ORDERING PROCEDURE**

**Step 1:** Physician calls Pharmacy to request *Drotrecogin alpha Order Form* and *Criteria for Use Form*. The forms will be faxed to the unit specified by the physician. The forms can also be picked up in person.

**Step 2:** Physician (Critical Care Medicine Attending) insures that patient meets criteria for use, files the completed *Criteria for Use Form* in the patient chart, and contacts another Critical Care Medicine Attending to review the patient and to call Pharmacy with the second approval

**Step 3:** Physician faxes the completed *Drotrecogin Alpha Order Form* to the Pharmacy. After receiving the approval phone call, Pharmacy will prepare the dose and deliver to the nursing unit.

### Critical Care Medicine Attending Physicians

Richard Dennis  
Frederick Millham  
Joel Lopes  
Peter Burke  
William Charash  
Mary Keller  
Armour Forse  
Rie Aihara  
Scot Bateman (Pediatrics)  
George Hardart (Pediatrics)  
Robert Pascucci (Pediatrics)  
Connie Hauck (Pediatrics)

Arthur Theodore  
Michael Jeong  
John Bernardo  
David Rishikof  
Elizabeth Klings  
Marty Joyce-Brady  
Jussi Saukkonen  
Helen Hollingsworth  
Darrell Kotton

Christine Reardon  
Hap Farber  
Fred Little  
George O'Connor  
John Berk  
Hardy Kornfeld  
Anto O'Regan  
David Center  
Robert Walter

### Pediatric Patients

Drotrecogin alpha may be ordered by a Pediatric Critical Care Medicine Attending Physician, however the second approval must come from one of the Adult Critical Care Medicine Attending Physicians on the above list.

## **Admission Policy of MICU Patients to ENC 6 East CCU**

Due to the high volume of MICU (non-cardiac) admissions originating at ENC, there will be a designated MICU team in ENC 6 E ICU starting July 2, 2001. The primary purpose of this service is to decrease the intercampus transfer of patients requiring critical care services by allowing for the care of MICU patients in ENC 6 E ICU (CCU). The maximal number of combined CCU and MICU patients on 6 E will remain at 16.

The ENC MICU will be staffed by a Pulmonary/Critical Care Attending and Fellow and daytime resident and intern 7 days/week from 7 Am to 7 PM. During three months of the year, there will be an additional two interns from the Family Medicine Division who will function as a single intern. Night coverage will be provided by the CCU resident on long call. All floor evaluations and potential ED admissions will be filtered (by page) through the on call CCU resident who will assign the MICU resident to the case if it is non-cardiac.

Admission to the ENC MICU will be determined with the following guidelines:

- 10) Admissions will occur preferentially from the ENC Emergency Department and Wards.
- 11) At least one bed in the 6E ICU be available for emergent admissions either as an open bed or as a bed whose occupant can be discharged expeditiously from the unit.
- 12) Admissions to the ENC MICU may be suspended by the MICU attending if the acuity of the MICU service exceeds the capacity to safely care for patients on the service. In these instances, the CCU attending(s) have the authority to accept or refuse MICU patients on their service (pulmonary will consult and manage them until transfer to the MICU service).
  - 1) Closure of the service by the MICU attending will require communication to the ENC ED, Nurse Manager/Supervisor, Cardiology Attending(s) and ENC facilitator.
  - 2) Closure of the service by the MICU attending will be reviewed every 4-12 hours.
- 13) Admissions to the ENC MICU may be suspended by the Cardiology service (even if the MICU service is open) if the resources of the unit are required by CCU patients.
- 14) Admissions from the ENC ED to HAC MICU will occur only under the following circumstances:
  - 1) The ENC 6 ICU is at capacity and all avenues of opening beds have been exhausted.
  - 2) Services provided by the HAC MICU cannot be provided in the ENC MICU.
  - 3) The MICU or CCU attending has suspended admissions to the ENC MICU.

- 15) Admissions from the HAC ED to ENC MICU will occur only under the following special circumstances:
- 1) The HAC MICU service is at capacity and all avenues of opening beds have been exhausted.
  - 2) Services provided by the ENC MICU cannot be provided in the HAC MICU