ROTATION DESCRIPTION FOR THE
PULMONARY INPATIENT SERVICES (7800) – PGY 1
http://pulmonary.medicine.duke.edu/

ROTATION DIRECTOR: Harvey Marshall MD
Telephone: 668-0381

Hours: 7am-7pm M-F with an alternating weekend rounding schedule

GENERAL PULMONARY SERVICE:
Overview:
The inpatient General Pulmonary (7800) Inpatient Service is designed to teach the house staff about the care of the acutely ill patients with pulmonary disorders who require hospitalization. The intern’s primary responsibility is to provide the necessary general medical care of patients on the service and in so doing increase their core skills in the practice of internal medicine.

The educational objectives of this rotation are:
- Educate the trainee about the diagnosis and management of a number of pulmonary diseases including COPD/asthma exacerbation, pneumonia, interstitial lung disease, cystic fibrosis, pulmonary neoplasms, pulmonary embolism, pulmonary hypertension, and recovery from acute lung injury (Patient Care, Medical Knowledge).
- Establish principles of literature review to assure disease management standards are being met (Practice-Based Learning and Improvement).
- Interaction of the trainee with other health care professionals to develop and implement a treatment plan for the patient (Interpersonal Skills and Communication, Professionalism).
- Exposure of the trainee to the larger context of the health care system in regards to resource and economic management (Systems-Based Practice).

Teaching methods used to attain these goals include:
- Review by the faculty of the trainee’s history and physical examination, plan of therapy and evaluation of laboratory and other diagnostic data
- Didactic teaching sessions by fellow/attending held 3 times per week. Topics: diagnosis and management of PAH, types of ILD, etc.
- Hands on performance of the following procedures: thoracentesis, central venous line placement, and arterial blood draws
- Daily review of radiological material
- Weekly interdisciplinary conference with radiology and pathology
• Designated times devoted to the interpretation of specific diagnostic procedures and tests such as: pulmonary function tests, thoracentesis, and arterial blood gas analysis.
• Opportunities for interacting with other trainees within internal medicine and other disciplines.

Responsibilities:
• Under the guidance of the fellow, perform a thorough evaluation and develop a treatment plan for all patients that are admitted to the General Pulmonary service (Patient Care, Medical Knowledge)
• Coordinate implementation of this treatment plan with other health care professionals including other physicians, nursing staff, respiratory therapy, and physical/occupational therapy (Interpersonal Skills and Communication, Professionalism, Systems-based Practice)
• Review most recent literature to confirm that patients are receiving the best treatment practice (Medical Knowledge, Practice-Based Learning and Improvement)
• Perform all procedures (e.g. thoracentesis) on patients admitted to the General Pulmonary service under the direct supervision of the fellow and attending physician (Patient Care, Professionalism)

Educational Resources:
Asthma/COPD


**Pneumonia**


**Interstitial lung disease**


**Pulmonary hypertension**


**Pulmonary embolism**


**Sarcoidosis**

**Cystic Fibrosis**
Flume PA, O'Sullivan BP, Robinson KA, Goss CH, Mogayzel PJ Jr, Willey-Courand DB, Bujan J, Finder J, Lester M, Quittell L, et al.; Cystic Fibrosis Foundation, Pulmonary


The mix of diseases entities likely to be encountered on this rotation include COPD, asthma, sarcoidosis, lung cancer, cystic fibrosis, pulmonary embolism, pulmonary hypertension, pulmonary fibrosis, pneumonia

The characteristics of the patients seen on this rotation include
There is significant diversity amongst the patients on the pulmonary service with regard to patient age, [young adult (e.g., cystic fibrosis) to elderly (e.g., end stage COPD)], gender, and race. The majority of the patients on the pulmonary service have an exacerbation of a chronic pulmonary disease with a minority presenting with an acute process (e.g., pneumonia or pulmonary embolus).

The types of clinical encounters with these patients include:
• Acute inpatient admissions
• Long term stay facility (sites for chronic care)
• Critical Care Inpatient

The procedures performed include:
Arterial puncture, central venous line placement, and thoracentesis.

Pathological material encountered will likely include:
Cytological analysis of pleural and bronchoalveolar lavage fluid, transbronchial and transthoracic needle aspirates, pleural biopsies, transbronchial and surgical lung biopsies.

The services provided include:
• Diagnostic testing for acute and chronic complaints
• Therapeutic Interventions and Advice
• Preventive Care / Screening
- Psychosocial Support and Counseling
- Nutritional Support
- Physical and Occupational Therapy
- Spiritual Services
- Pain Management and Palliative Care
- Patient Education and Counseling

The trainees will be evaluated by:
- Written evaluation
- Individual verbal feedback
- Direct Observation and Feedback of individual skills / procedures

Supervision of the trainees by faculty is accomplished by:
- Review by the faculty of the house officer’s history and physical examination, plan of therapy and evaluation of laboratory and other diagnostic data
- Direct Observation of Procedures and Skills
- Case Review and Discussion at weekly Interdisciplinary Chest Conference

Assumption of graduated responsibility for the care of patients is monitored by:
- Review by the faculty of the resident’s history and physical examination, plan of therapy and evaluation of laboratory and other diagnostic data
- Direct Observation of Procedures and Skills
- Case Review and Discussion at Conferences

Health promotion activities include:
- Direct, Individualized Counseling by physician staff
- Direct, Individualized Counseling by Nursing Staff, Dieticians, Pharmacists and other multidisciplinary health care personnel.
- Patient Education Written Materials

Concerns for and training to respond to the patients cultural, socioeconomic, ethical, occupational, environmental, and behavioral problems are addressed by:
- Direct supervision and involvement of faculty in challenging situations in the clinical setting.
- Consultative support by spiritual leaders, ethics counsels
- Consultative support by psychology and psychiatry colleagues
- Consultative support by social workers, occupational counselors and colleagues with expertise in environmental hazards

Leadership skills are developed by:
- Role Modeling by Faculty
- Establishment of Mentor-relationships between faculty and trainees
• Self-Directed Study with Mentorship
• Delegation of Teaching Roles to Trainees
• Opportunities for mentor-relationships between trainees of different levels of training

**Training in clinical research methodology is fostered by:**
• Direct involvement of trainees in faculty directed research projects

**Training in basic science underpinning of disease is addressed by:**
• Didactic training in pathophysiology and mechanism of disease

**Training in the critical appraisal of the literature is addressed by:**
• Self-Directed Learning with Mentorship
• Didactic Sessions in Evidence Based Clinical Practice

**Evaluation of the trainees documentation of their observations in the medical record is monitored by:**
• Direct Review with comment and co-signature by attending faculty
• Feedback on individual write-ups (either verbal or in writing)

**Evaluation of the trainees professional interpersonal relations and humanistic care of patients is assessed by:**
• Direct Observation of provider-patient interactions with feedback on performance (either verbal or in writing)

**Trainees are provided the opportunities to interact with support health care professionals by:**
• Multidisciplinary Team Structure in the clinical environment (providers of different specialties caring for patients together in the context of a single environment or multidisciplinary team)
• Consultative Service that provides or requests input from other services
• Multidisciplinary Team Rounds
• Opportunities to observe or work with support health care professionals in their own setting
INTERN GUIDELINES FOR THE PULMONARY INPATIENT SERVICES

A. Daily Rounds

Shifts begin at 7 AM and end at 7 PM. Please arrive promptly at 7 AM to receive sign out from the night call resident. Rounds begin at 7:30 a.m. on 7800. Secure a computer cart prior to beginning rounds.

B. General Description of the Pulmonary Service

1) 2 teams (general pulmonary and lung transplant).
2) Rounding team to include attending physician, fellow, physician assistant (on transplant), and intern.
3) 2012-2013 pulmonary service rounding attending physicians are:

<table>
<thead>
<tr>
<th>Pulmonary Transplant</th>
<th>General Pulmonary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmer</td>
<td>Kussin</td>
</tr>
<tr>
<td>Reynolds</td>
<td>Tapson</td>
</tr>
<tr>
<td>Martinu</td>
<td>Govert</td>
</tr>
<tr>
<td>Morrison</td>
<td>Marshall</td>
</tr>
<tr>
<td>Todd</td>
<td>Fulkerson</td>
</tr>
<tr>
<td>Snyder</td>
<td>Hargett</td>
</tr>
<tr>
<td>Gray</td>
<td>Que</td>
</tr>
<tr>
<td>Norfolk</td>
<td>Powers</td>
</tr>
<tr>
<td>Albon</td>
<td>Morrison</td>
</tr>
</tbody>
</table>

4) Other physicians whose patients are admitted to the general pulmonary service: Piantadosi, Noble, Wahidi, Shofer, Mahmood, Kraft, Meltzer, Lugogo, and Huang.
5) Terry Fortin, a cardiologist who works with Dr. Tapson, will also frequently admit PAH patients to the General Pulmonary service.
6) Patients that are admitted to the transplant service include: post-transplant patients, transplant evaluations and, on occasion, pre-transplant patients that are active on the transplant list.
7) Interns are to rotate services half-way through their 4 week block.

C. Policies for Patient Admissions

1) The gen pulm and transplant fellow should be aware of all scheduled admissions. When you are contacted about admitting a patient, call the fellow to discuss the treatment plan after you see the patient unless it has already been outlined to you in advance.
2) ER admissions to the service, particularly at night, are usually coordinated by the attending physician. Any questions regarding these patients should be directed to the attending.

3) Make sure that the attending physician who is rounding on the service (not the patient’s primary outpatient pulmonologist) is delineated on the admission orders.

4) Utilize care maps and CPOE order sets for patients admitted with the diagnoses of pneumonia, COPD/asthma exacerbation and cystic fibrosis. We follow strict CMS-approved guidelines for the management and treatment of pneumonia. Please follow them!

5) A quality initiative to perform admission screening of high risk MRSA-colonized groups (residents of SNFs, outside and in-patient hospital transfers, and recently hospitalized patients) is mandated for 7800. It is your responsibility to identify these patients upon admission and follow this protocol.

6) Use the universal admission forms located in eBrowser for your admission H & P.

7) The intern caps after 5 admissions after which patients are admitted by the pulmonary fellow (or attending) during the day shift (7A-7P). The night float resident admits from 7P-7A. Please write all admissions on the chalkboard in the 7800 workroom to assure that the hand-off of admissions is done in a smooth manner.

D. Step-Down Beds

1) All admissions to step-down beds (7810-7816) must be cleared and coordinated by the pulmonary fellows. There are strict admitting criteria for these beds. Almost all admissions are true step-down patients coming from a Duke ICU and not “step-up” patients coming from the ER or an OSH. The one exception being patients that are on chronic ventilation at home.

2) The charge nurse should also be made aware before a patient is transferred to these step-down beds as they must assure adequate staffing is available.

3) Initial orders for patients transferred from the MICU should be written by the transferring MICU resident. Orders for patients that are transferred from other units are to be written by the admitting intern.

4) The admitting intern is responsible for writing the transfer note. This is often better done with the patient still in the ICU as the staff there would be familiar with the patient and can provide a more complete history.

5) Changes in mechanical ventilation should be discussed with the fellow and confirmed by RT.
E. Daily Routine

1) Rounds usually last from 7:30-10:00.
2) Secure a computer cart prior to rounds so that orders can be entered on CPOE as well as enabling the viewing of lab, procedure, and X-ray results. If problems arise with the rolling computer carts (i.e. “they keep crashing”), please notify either myself or the 7800 nurse manager (Jill Hanson) so repairs can be initiated in a timely manner. DHTS is supposed to check these carts on a daily basis. They ask that we please plug these carts into an AC outlet after rounds and at night to assure power for the computers to receive updates to the system.
3) Communicate all orders that represent significant changes in patient care (e.g., IV med changes, supplemental O₂) directly to the patient’s nurse.
4) Immediately after rounds are complete, call to schedule procedures and consults. Make sure that AM labs are also checked if not already done so on rounds.
5) Let the attending (and fellow) know at the beginning of the rotation which days will be your clinic days. The fellow will need to cross-cover the service on these days.
6) Progress Notes: Interns are required to write daily progress notes. Write these notes in SOAP format. There is a template in eBrowser in which notes can be entered electronically. Keep notes concise (1/2 to 3/4 page should be the norm). Please date and time your notes. The attending physician is required to review and sign these notes on a daily basis.
7) Patient census: interns cap at 10 patients (no difference from any other medicine service).
8) Conferences: Attendance is mandatory at the weekly Interdisciplinary Chest conference (Wednesday 8:30-9:30 in the radiology conference room) and Medicine Grand Rounds. Rounding through these conferences is not to be permitted. Please notify me (anonymously if you’d like) if there are breeches in this policy.
9) Check-out rounds for general pulmonary are usually sometime between 5:00-6:00 PM. The transplant service afternoon rounds are at 4:00pm. The attending will and fellow will review with you the events of the day and inform of any potential overnight admissions to the service.
10) A complete sign-out should be given to the night float resident at 7PM. Similarly, the night float should provide you with a comprehensive summary of the overnight events when you return in the morning.
11) Only one intern is assigned to the pulmonary services (general pulmonary and transplant) for the weekend. The transplant and gen pulm intern rotate weekends off. The intern should always round on their respective service with the weekend fellow rounding with the attending alone on the other service.
12) All significant changes in the patient’s clinical status should be directly communicated to the pulmonary fellow ± attending physician (i.e., DON’T DO IT ALONE!). This includes RRTs, transfers to the ICU due to clinical decompensation, other unanticipated major clinical problems, and patient deaths.
F. Nursing and Ancillary Staff

1) Nursing: Jill Hanson (page ID # 970-0380) is the 7800 nurse manager. For each shift, there is a charge nurse assigned. This nurse has supervising responsibilities for the day to day patient care activities on the unit and should be notified of all admissions to the unit. They usually participate in morning rounds.

2) Patient Resource Manager (PRM): Lindsy Anthony (page ID # 970-8996) is the assigned PRM for both pulmonary services. For pulmonary transplant patients, the lung transplant coordinators will also assist in discharge planning. The PRM is usually present on morning rounds.

3) A dedicated respiratory therapist is assigned to 7800 and is also usually present on morning rounds particularly when we round on the step-down patients. Their office is located in room 7846.

4) Pharmacists: Helene Jernigan and Rebecca Richard are the pharmacists for 7800 and will occasionally round on the Gen Pulm service. Neha Patel is the lung transplant pharmacist (page ID # 970-3596). Roy Pleasants, a pharmacist with a dual appointment to Campbell University and Duke, frequently rounds on the general pulmonary service with students.

5) Physical therapy: Tamara Klintworth is usually in charge of coordinating PT for 7800 patients. A number of our patients, particularly those transferred from the MICU, require extensive strength and endurance training. In addition, we utilize PT for chest physiotherapy (most notably in CF patients) and ambulatory O₂ saturation measurements (i.e., the need for supplemental O₂). When they are consulted, please be specific about what needs are to be addressed.

G. Discharges

1) Communicate anticipated home health needs to the PRM as soon as possible. Home O₂, IV Rx, PT/OT usually takes a minimum of 1-2 days planning ahead of time.

2) Discharge huddles comprised of the charge nurse, PRM, and MDs (intern and/or fellow) are held daily at 1:15 PM.

3) The PRMs also coordinate patient transfers to rehabilitation and skilled nursing facilities (SNFs). These transfers take a significant amount of time and effort on their part. Please assist them in making sure that all necessary paperwork is filled out well in advance.

4) The discharge instruction sheet (located in the browser) and medication scripts should be filled out the night prior to discharge. The attending physician will review them on rounds the next day prior to discharge.

5) Transportation: Make sure that patients are aware of their pending discharge and have transportation home.

6) On the day of discharge (after the attending physician has rounded on the patient), a discharge order should be written (make sure that IV heplocks are D/C at this time). Then, place the chart in the order bin so that the HUC can process the discharge. Our
goal is to have patients discharged by 11 AM to allow scheduled admits to arrive on the floor at a reasonable hour.

**H. Pulmonary Hypertension (PAH) Patients and IV vasodilators:**

1. Many of our severe PAH patients are undergoing continuous infusion therapy with IV prostacyclins (Epoprostenol or Treprostinil). They are delivered via central venous catheters, usually a Hickman catheter with a portable infusion pump. Continuous uninterrupted infusion is mandatory. Cessation of these agents can result in acute hemodynamic collapse and respiratory failure. Accordingly, certain quality assurance programs are in place to prevent this from occurring. Namely, to prevent inadvertent disconnection of vasodilator therapy, the connection to the central line should be labeled and secured. Therefore, no blood can be drawn from a single lumen Hickman catheter being used for infusion nor can other infusions be given via this line.

2. If a patient’s Hickman catheter becomes occluded or is displaced, a peripheral IV can be utilized until an emergent PICC line is placed.

3. Doses of these agents should only be changed by the pulmonary attending, fellow, or members of the pulmonary hypertension team (including Kim Osborne). Orders must include a) cartridge concentration; b) written in ml/24 and mg/kg/min.

4. Initiation of IV prostacyclins prior to central line placement is to be done using a PICC line. Initiation of therapy is done with the patient in “step-down” status (the larger step-down rooms for vent patients is not required). Patients whose hemodynamic status is tenuous should have IV vasodilators initiated in the MICU.

5. There is a significantly increased incidence of sudden death in patients with PH. While this often occurs for unknown reasons it can also be more likely to occur in certain clinical circumstances. Specifically, sudden changes in preload must be avoided in these patients. Drugs which can suddenly drop preload (e.g., NTG and diuretics) should be used cautiously. Conversely, agents that increase preload also carry great risk. Therefore, IV fluids and IV medications should be used judiciously. Give considerable attention to IV fluid orders and IV medications and their volumes and infusion rates in these patients.

6. A significant number of PAH patients are also on chronic coumadin therapy of low intensity to obtain an INR in general not above 2.0. Anticoagulation may be held temporarily while the patient is in the hospital undergoing invasive procedures. Accordingly, this must be appropriately anticipated, sometimes reversed which should be discussed with the fellow or staff since we do not want to create a
thrombogenic state. Additionally, we must remember to reinitiate Coumadin therapy at the time of discharge.

I. Cystic Fibrosis Patients

1. Please remember that cystic fibrosis is a systemic disease. While patients may be in the hospital primarily for respiratory infection or respiratory insufficiency, attention must be given to their other systems affected by cystic fibrosis including their sinuses and especially their gastrointestinal tract (e.g. pancreatic enzymes).

2. You will find the CF care map (CPOE) to be of great assistance. It will assist you in the day-to-day orders of the many issues that must be addressed.

3. Antibiotic orders are individualized on a case basis. It is helpful to review the patient’s last hospitalization as well as the most recent cystic sputum culture to identify the organisms (w/ respective antibiotic sensitivity pattern) that are colonizing the patient’s airways (e.g., Pseudomonas sp, MRSA). The 7800 pharmacists are quite helpful with assistance in determining the correct antibiotic dosing regimen. However, Dr. Kussin usually admits the patient with a pre-determined antibiotic plan.

4. Drug interactions and allergies are common in this patient population. Be cognizant of this when selecting antibiotics or making changes in their dosing. Drug levels of aminoglycosides and vancomycin should always be checked.

PULMONARY TRANSPLANT SERVICE

OVERVIEW:
The Pulmonary Transplant Service at Duke is a busy clinical teaching service. The work is challenging, but offers tremendous learning opportunities from your patients. There is structured teaching on the rotation, but patient-based independent learning is also critical.

OBJECTIVES:
1) To become an integral part of the team that cares for the inpatients on the 7800 Pulmonary Transplant Service and to assist in making decisions in the care of the patients.

2) For the intern to be exposed to the care of pulmonary transplant patients, and to become a competent and caring physician in the needs of patients with pulmonary disorders.
3) To gain expertise in the field of transplantation medicine, understanding the immunosuppression and the risk of infection and rejection.

***All pulmonary transplant selection criteria and protocols are posted on the Duke Intranet site. Use the dropdown menu of “Select a Policy” to select DUH Transplant Services. From that webpage, there is a link to Lung Transplant. You can select either the selection criteria or the protocol book. This is updated yearly and an important resource for the team.

DUTIES OF THE INTERN:

A. General Description of the Pulmonary Transplant Service

- Team of attending physician, fellow, advance practice provider (APP, which is either a PA or NP), pharmacist and intern.
  Interns will be assigned to one of the two teams (pulmonary or pulm transplant) at the start of the rotation.

Daily Schedule:

- **Morning Handoff** – Meet the night float resident in the 7800 physician workroom at 7:00am daily to receive handoff on the pulmonary transplant patients and any new admission to the pulmonary transplant service that came in overnight.

- **Work Rounds** – The multi-disciplinary transplant rounds begin after night float sign out every day on 7800. The intern will be responsible for presenting their patients on rounds and participating actively in the plan of care. It is a good habit to communicate orders that represent significant changes in patient care (e.g., IV med changes, supplemental O2) directly to the patient’s nurse.

- Immediately after rounds are complete, call to schedule procedures and consults.
  Make sure that AM labs are also checked.

- **Evening Rounds** – The pulmonary attending and fellow will conduct evening rounds at 4 pm to update everyone on the events of the day.

- **Evening Handoff** – Meet the night float resident in the 7800 workroom at 6:30pm each evening to give handoff on the pulmonary transplant patients. Prior to handoff time, update the physician handoff list located on e-browser. Keeping the list up to date with the patient’s information including code status and “to do” items overnight is essential to providing safe patient care. The night float resident will provide cross coverage for the transplant service overnight and will also do night time admissions to the transplant service.

- **Call-schedule** – There is no overnight call on this rotation. The pulmonary transplant intern will be responsible for daytime admissions to the transplant service as will be further described below.

- **Patient caseload** – The care of the inpatients will be divided between the
inpatient physician assistant(s) and the pulmonary intern. In general, the pulmonary intern is expected to follow up to 10 inpatients per day with the APP individuals covering the remainder. The number of patients assigned to the intern may be decreased given the size of the service and the complexity of the patients. The interns will be assigned cases designed to maximize the educational value of their rotation. The inpatient APP is an important resource of information for the housestaff. They have extensive transplant experience.

- **Back-up Resources** – All significant changes in a patient’s clinical status should be directly communicated to the pulmonary fellow ± attending physician (i.e., DON’T DO IT ALONE!). This includes transfers to the ICU due to clinical decompensation, other unanticipated major clinical problems, and, in particular, patient deaths. The attendings and fellows on this service are very involved in the patient care and decision making. Please involve the attending and fellow if you have any patient concerns.

- **Conferences** – The pulmonary transplant interns are expected to attend the regularly scheduled housestaff noon lectures provided by the internal medicine housestaff office. In addition, they are expected to attend the Wednesday morning 8:30 am multi-disciplinary pulmonary conference with the pulmonary, radiology, and pathology staff. They will also be required to attend the pulmonary transplant team listing meetings that are held on Tuesdays at 9 am in the surgery conference room on the 7th floor HAFS. In addition to these mandatory conferences, they will be encouraged to attend the Tuesday noon pulmonary fellows conference and the pulmonary research conference.

  **Grand Rounds** – Friday morning 8AM. You are expected to attend while on Pulmonary Transplant Rotation.

- **Outpatient pulmonary transplant clinic** – Pulmonary transplant clinics are held in the afternoons Monday through Thursday in 2F/2G Duke South. The transplant intern is expected to attend at least 1 outpatient clinic per week in order to gain appreciation for the outpatient management of lung transplant recipients. The intern will have the opportunity to see approximately 3-4 outpatients in each clinic 1:1 with a transplant attending. The outpatient experience will expose the intern to a broader range of patients compared to the inpatient service. This will be designed to teach the intern the basics of outpatient management of lung transplantation as well as the process of referral and evaluation.

**Admissions:**

- The pulmonary transplant intern will admit new patients to the pulmonary transplant service during the hours of 7am to 7pm. Interns must leave the hospital no later than 9pm, and ideally around 7pm, hence it will be the responsibility of both the outgoing intern and the incoming
night float to identify and appropriately delegate work that remains at change of shift such that work hour restrictions are not violated.

- All admissions are accepted through the pulmonary attending. The intern will be notified by the attending, ER, or fellow about an admission.
- If the admission was anticipated, often the pulmonary attending or fellow will have communicated some information to the intern with respect to the presenting problem and/or plan.
- After seeing each new admission, the intern should ensure that all plans are discussed with the appropriate attending or fellow.
- Patients need to be seen within 30 minutes of being called if in the emergency department and within 30 minutes of arrival to the floor if a direct admission from clinic or a transfer from an outside hospital.
- Admitting a patient includes taking a detailed history and performing a thorough physical examination. In addition, an electronic History and Physical must be entered into e-browser and orders placed in CPOE.
- Utilize care maps and CPOE order sets for patients admitted with the diagnoses of pneumonia, COPD/asthma exacerbation and cystic fibrosis.
- Night admissions are done by the night float resident and will be signed out to the accepting team in the morning.
- The pulmonary transplant fellow is your first line of back up. There is also a pulmonary fellow assigned to general pulmonary that is available for emergencies. The attending is available as well. Beyond this, there are always two residents and one pulmonary fellow in the MICU.

Admissions to the step-down unit

- All admissions to step-down beds must be cleared and coordinated by the pulmonary fellows. Almost all admissions are true step-down patients coming from a Duke ICU and not from the ER or OSH.
- The charge nurse should also be made aware before a patient is transferred to step-down as they must assure staffing is available.
- Admission orders for patients transferred from the MICU should be written by the transferring MICU resident. Orders for patients that are transferred from other units are to be written by the admitting intern.
- The admitting intern is responsible for writing the transfer note. This is often better done with the patient still in the ICU: vital signs are recorded in the computerized flowchart called CareDoc, which is only accessible in the ICU. The nurses can help you access it.
- Changes in mechanical ventilation should be discussed with the fellow and confirmed with RT.

Discharges:

- Discharge dictations will be done by the pulmonary fellows.
- Interns will be responsible for completing the discharge paperwork on patients
they are following.

- Communicate with the patient, family, PRM, and the inpatient lung transplant coordinator every day about discharge plans and follow-up needs.
- Transplant patients have a short discharge summary sent by email to the transplant coordinator. This can be done by the intern, fellow, PA or attending. Please clarify who will be sending this email if one of your patients is being discharged. All post-transplant coordinators can be contacted by one email: Pulmonary PostLungCoordinator in outlook.

**Documentation:**

- A Duke Electronic History and Physical Admission database must be completed on every patient admitted by the intern. Every section of the database must be completed and on the chart prior to the intern leaving the hospital.
- All H&P’s must be signed, dated and timed by an attending within 24 hours of admission.
- The H&P must be complete (including pain score and functional status).
- Interns are expected to write detailed daily progress notes on the inpatients they are following.

**Days Off:**

- An average of one day off per week will be given. Days off are not optional.

**Other:** **Key points for the care of Pulmonary transplant patients:**

a) If they are admitted from clinic, these patients usually come with an email from their coordinator with their updated home medications and with the plan. Make sure the fellow or attending forward you that email. However, it is always prudent to check the meds with the patient again, as most of these patients know their meds very well. Most of the time, this patient can continue their home medical regimen.

b) Think about stopping anticoagulation and making NPO for possible procedure (bronch) the next day.

c) Check magnesium with morning labs (very easily hypomagnesemic due to medications).

d) Medication side-effects and interactions are very common. The transplant pharmacist is an excellent resource for you.

e) If admitted for respiratory problems: send sputum for bacterial cultures, fungal cultures, AFB cultures, and cystic fibrosis culture (specifying that this is a pulmonary transplant patient); send nasal washings for respiratory viral battery; send blood cultures prior to antibiotic initiation; send urine for legionella and pneumococcal antigen.

f) Almost always order CMV DNA by PCR with the morning labs.

g) Choice of antibiotics, if treating respiratory infections: look at their prior
sputum and BAL microbiology results to see prior pathogens and sensitivities. Depending on their history and exposures, these patients can have regular community-acquired pathogens as well as highly resistant organisms.

h) Order Prograf (FK-506) or Cyclosporine level to be drawn at 7am the next morning (2hrs prior to their dose at 9am) – unless this was just checked in clinic.

i) Careful with IV fluids!!! These patients don’t drain fluid off their lungs very easily. You should not give IVF unless required for resuscitation or severe dehydration; and the boluses should be 250-500cc max (unless this is a crashing hypotensive patient getting intubated anyway).

Core Competencies on the 7800 Pulmonary Transplant Service

**Patient Care** – Your main goal while on Pulmonary Transplant Rotations is to provide care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. The Duke University Medical Center Lung Transplant Program provides comprehensive health care service to lung transplant candidates and recipients from the time of their initial referral to the program until death. The program has an international reputation for its ability to manage the most complex of patients while maintaining survival outcomes that are consistently above the national average. The lung transplant team is a group of highly specialized professionals that includes surgeons, pulmonologists, infectious disease physicians, nurses, physical therapists, respiratory therapists, social workers, psychologists, pharmacists, and financial experts. The program is supported by Duke University Hospital’s outstanding inpatient and outpatient facilities, radiology, and laboratory services.

- The attending, fellow, physician assistant, and intern on the team should work together as advocates for each patient. Pulmonary transplant patients frequently have complex histories and medical problems. Take ownership for the care of your patients and strive to provide them the best possible care. This will often involve coordinating consultations, diagnostic tests and therapy.

- You will see a broad variety of problems while on the service, not just lung disease but also a wide range of internal medicine problems. There is an appendix at the end of this document that includes some of the conditions that you will encounter on the pulmonary transplant service.

- Care should involve prompt bedside history and physical within 30 minutes of hearing about a patient from the emergency department or upon learning that a patient has arrived on the floor.
• Important diagnostic tests and urgent therapy (IV fluids, antibiotics etc.) should be ordered promptly. If you encounter problems getting a specific test or consultation, please discuss with the attending and/or fellow.

• The pulmonary transplant team will assess each patient daily with daily examination and documentation of daily notes. Sick patients may need to be assessed more than once per day. Any patient (including cross-cover patients) needs a note to describe a change in status.

• When a patient becomes critically ill, the MICU or rapid response team should be alerted in a timely fashion with appropriate clinical information relayed to the unit team. In addition, the pulmonary transplant fellow or attending should be notified of any significant worsening in clinical status.

• Housestaff should spend as much time as possible at the patient’s bedside. Exams should be careful and accurate.

**Medical Knowledge** –

• Understand the role of lung transplant or heart-lung transplant in the spectrum of the state of the art treatments for endstage cardiopulmonary disease, and recognize the role of alternative therapies such as lung volume reduction in emphysema and vasodilators in pulmonary hypertension

• Understand when patients with various endstage lung disease should be referred for lung or heart-lung transplant, and recognize how to utilize transplant to offer maximal benefit in terms of life quality and expectancy

• Identify the criteria for the appropriate selection of patients for lung or heart-lung transplant therapy, including absolute and relative contraindications to transplant

• Evaluate issues of controversy such as mechanical ventilation, age, and prior transplantation in the selection of candidates for lung or heart-lung transplantation.

• Compare and evaluate the relative advantages and disadvantages of various pharmacological, nonpharmacological, and biological immunosuppression techniques. Understand the evidence based approach to selection of immunosuppressive agents employed by the Duke University Lung Transplant Program
• Recognize the clinical, radiographic, and histological features of acute and chronic rejection. Understand potential treatments of acute and chronic pulmonary rejection and the immunological effects of these treatments.

• Recognize the major posttransplant complications other than rejection, including ischemia-reperfusion lung injury, anastomotic complications, infections (bacterial, viral, fungal, mycobacterial), and posttransplant malignancy.

• Recognize cytomegalovirus as a common opportunistic pathogen posttransplant, including diagnostic modalities and therapeutic treatments, including risks and benefits of various alternative treatment strategies.

Practice-Based Learning and Improvement –
• While on Pulmonary Transplant, housestaff should remain mindful of the quality of the care they provide. This involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.

• When errors are noted, these should be reported through the error-reporting systems in place. When in doubt, the chief resident should be notified.

• If there are systems improvements that the housestaff discover, particularly in the realm of safety, these should be shared with the pulmonary transplant attending as well as the medicine chief resident.

• Application of medical knowledge should be an active pursuit while on Pulmonary Transplant. Critical appraisal behind the medical evidence (or lack-thereof) should be an important part of the rotation.

Interpersonal and Communication Skills –
• Housestaff on the pulmonary transplant service should always practice the most respectful and clear communication with colleagues, staff, patients and families. The goal is effective information exchange for the betterment of patient care.

• Interns on the pulmonary transplant rotation are expected to communicate frequently with the different members of the multi-disciplinary transplant team. Each member has extensive transplant experience and the ability to provide helpful and educational material to the housestaff as they learn to care for transplant patients.

• The intern should communicate with the inpatient lung transplant coordinator to minimize any potential errors in communication from the outpatient clinic to the inpatient team and back to the outpatient team at the time of discharge.
• Do your best to remain empathetic. Listening is often the best tool you can use. Echo the emotion of the person with whom you are communicating.

• Hand-offs from intern-to-intern and intern to physician assistant are an essential part of patient care and should be taken seriously. Detail should be provided about any expected results that need to be followed or on any outstanding issues that will need attention.

• Questions to consultants should be clearly articulated with pertinent history provided. Think in advance about why you are calling (for a second opinion, for a procedure, to help make the diagnosis, for expert opinion, for a therapy that needs approval...)

• Daily notes must be written by the intern on every patient they are following and should clearly reflect any new events that have occurred. Try to not make these redundant. The physical exam and pertinent labs should always be included in the note. Discharge plans should also be included.

**Professionalism** –

• Duke Pulmonary Transplant Service, as with all of your medicine rotations, demands a high level of professionalism as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

• Professional attire and demeanor are expected. Scrubs may be worn, but only at night on call. Even when post-call, regular clothes must be worn after 7AM.

• Treat all patient confidential medical information in accordance with HIPAA. Patient records and outside documents should be maintained in the chart outside the patient room. Documents should not be left in workrooms, call rooms, or any conference rooms used for rounds.

• Learn the names of the nurses with whom you work and always treat them as colleagues and members of the care team.

• Be respectful to all members of the team.

**Systems Based Practice** is manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.
• Resident teams will partner with Lung Transplant Coordinators, Patient Resource Managers, Social Workers, nurses, physical and occupational therapists, pharmacists and other health professionals to provide comprehensive and effective care for patients on Pulmonary Transplant Service.

Appendix:
Diseases You May See on Pulmonary Transplant Service:
• Pulmonary: respiratory failure, COPD, PE, pneumonia, ILD, lung cancer, allograft rejection
• Cardiac: CHF, chest pain, a fib
• Dermatology: drug rxn, skin cancers
• Gastroenterology: GI bleeding, cholangitis, cholecystitis, diverticulitis, bowel ischemia
• Liver: End-stage liver disease, fulminant hepatic failure
• Hematology: Anemia, HIT, leucopenia, lymphoproliferative disorders
• Endocrine: DM management, adrenal insufficiency, thyroid dysfunction
• General: Management of Electrolyte disorders (K, Na, Ca), Failure to thrive, falls, syncope, delirium, peri-operative risk management

Infectious:
• Viral: cmv, influenza, RSV, parainfluenza
• Bacterial: pneumonia with a wide variety of pathogens, UTI, cellulitis
• Fungal: Candidemia, invasive candidiasis, aspergillus, wide range of pulmonary fungal infections

REFERENCES:
***Please note: The pulmonary transplant service has a sharepoint site off the Pulmonary Division sharepoint site. There are recent articles posted there in PDF format

***All pulmonary transplant selection criteria and protocols are posted on the Duke Intranet site. Use the dropdown menu of “Select a Policy” to select DUH Transplant Services. From that webpage, there is a link to Lung Transplant. You can select either the selection criteria or the protocol book. This is updated yearly.