

Clerkship Title: CHEST MEDICINE

Location: Rancho Los Amigos Medical Center

Credit Level: Selective B or Elective

Course Director: N. Krishnareddy, M.D.
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Length of time: 4 or 6 weeks (6 weeks preferred)
Dates offered: All year
Number of students: 2
Visiting students from other US medical schools? n/a
Prerequisites: required core Medicine I clerkship (6 weeks)

Place and time to report on first day: Rancho Los Amigos Medical Center
Chest Medicine Service Building
500, Room 61 at 8:00 a.m.

Textbooks/Availability:

- Respiratory Physiology – The Essentials, J. West, Williams & Wilkins, Baltimore, MD, 4th edition, 1990
- Principles of Pulmonary Medicine, W. Weinberger, W.B. Saunders, Philadelphia, PA, 1986
- In addition, an updated reading list is handed out at the beginning of each clerkship. It contains key articles on various aspects of pulmonary medicine.

Learning Objectives – At the conclusion of the clerkship the student should be able to:

- The Clerkship on Chest Medicine is designed to provide an extensive learning experience to the student. The experience involves active participation in patient care, both inpatient and outpatient, covering the evaluation and management of a wide variety of respiratory disorders including pulmonary tuberculosis. The program will provide the opportunity to apply knowledge of the basic sciences and to expand knowledge of clinical syndromes, their diagnosis and management.

The student will participate in patient conferences as well as teaching seminars. All teaching and supervision is conducted by the full-time staff on the service.

Current methods of diagnosis and treatment of tuberculosis will be presented.

The student clerkship at Rancho will provide a rare opportunity to observe the integrated team approach to the care of chronic respiratory disease. This is a unique aspect of patient management that is not often observed in acute hospital settings. This opportunity is currently not available at LAC+USC Medical Center. Acute aspects of disease will be experienced, however, with exacerbations of respiratory failure and other acute complications of chronic disease in the patient population.

The student will be expected to attend all team conferences and follow his patients step-by-step through the rehabilitation process. The attending staff will make every effort to expose the student to the philosophy of chronic care not only in respiratory diseases, but in all chronic illnesses (arthritis, diabetes, neuromuscular disease, cardiac) since, although the tools may be different, the concepts cut across interdisciplinary lines.

Clinical performance will be evaluated by the full-time staff physicians who are USC faculty on the Chest Medicine Service. A member of the faculty will be responsible for the overall program and will plan supplementary sessions and rounds as well as didactic instruction.

Conferences

A conference schedule has been planned to correlate with the patient material seen most frequently on the clinical service at Rancho. Clinical material is weighted by obstructive lung diseases, neuromuscular syndromes producing ventilatory insufficiency and pulmonary tuberculosis.

The conferences emphasize those aspects of pulmonary physiology and pathophysiology pertinent to an understanding of the clinical entities encountered. Clinical conferences emphasize therapeutic approaches based on an understanding of normal physiology and pathophysiologic derangements.

Two to three conferences are scheduled each week. Usually one conference covers physiologic and pathophysiologic topics. The other two conferences cover clinical topics. The topics to be covered in the conferences are outlined below:

Respiratory Physiology

1. Gas exchange/transport
 - a. Ventilation – perfusion (V/Q) relationships
 - i. The effects of airways obstruction on V/Q relationship --- shunting, relative and absolute shunts--- hypoxemia, pulmonary vasoconstriction and pulmonary hypertension.

- ii. The clinical assessment of V/Q relationships and non-uniform distribution of ventilation and how they affect gas exchange in respiratory disorders.
 - iii. Shunt
 - b. CO Elimination – Ventilation
 - i. Alveolar ventilation – hypo and hyperventilation
 - ii. Dead space
 - iii. Acid-base balance
 - c. Pulmonary Diffusion
 - i. Factors influencing the diffusing capacity
 - ii. Loss of pulmonary membrane indicated by a reduced diffusing capacity in emphysema
 - d. Arterial blood gases (ABGs) – essentially all concepts as covered in items a,b,c. Understanding of acid base concepts, and role of ABGs in clarifying gas exchange abnormalities. Understanding and use of the alveolar gas equation in the evaluation of hypoxemia in respiratory disease.
 - e. The Respiratory Muscles
 - i. Anatomy
 - ii. Physiology
 - iii. Clinical assessment of respiratory muscle function
 - iv. Clinical disorders of respiratory muscle function
 - f. Control of Ventilation
 - i. Central drive
 - ii. The spirogram
 - iii. Occlusion pressure
 - iv. Response of central drive to hypercapnia and hypoxia
- 2. Lung Mechanics
 - a. The dynamic characteristics of airways resistance – the relation between lung volume and airways geometry – lung compliance, airway resistance.
 - b. Clinical assessment of pulmonary function testing.

Pulmonary Pathophysiology

1. Pathogenesis and pathophysiology of chronic bronchitis, emphysema and asthma.
2. Pathogenesis and pathophysiology of “restrictive” lung disease, e.g., interstitial processes, chest wall and neuromuscular disorders.

Clinical Pulmonary Disease

1. Pneumonias, lung abscess, empyema.
2. Therapy of chronic bronchitis and emphysema
3. Therapy of asthma; recent developments in pathophysiology and pathogenesis as they apply to therapy.
4. Neuromuscular diseases, most commonly polyneuropathies, poliomyelitis and muscular dystrophies.
5. Sleep apnea syndromes.

Tuberculosis (emphasized during the TB admission conferences)

1. Pathogenesis of tuberculosis.
 2. Detection of tuberculosis
 - a. Skin tests
 - b. Mycobacteriology
 - c. X-ray presentation
 3. Drug therapy of tuberculosis
 - a. Monitoring of possible adverse reactions
 - b. Difficulty problems – drug resistance
 4. Public health aspects of tuberculosis
 - a. Infectiousness
 - b. Communicability
 - c. Contact evaluation
 5. Chemoprophylaxis of tuberculosis
 6. Simulators of tuberculosis
 7. Commonly associated medical problems coexistent with tuberculosis.
- Specific cases of TB are discussed at our Tuberculosis Conference held on Tuesday mornings. Clinical presentations and x-rays are presented.

X-ray Interpretation

1. Review of characteristic and interesting cases from our teaching file.

Other Conferences

1. Consultation conference – Friday, 9:30 a.m. – Interesting cases seen in evaluation on other services. Discussions regarding X-ray interpretation and management issues.
2. Monday, 11:30 a.m. – Infectious Disease/ Chest Medicine/ Endocrine/ Cardiology Conference where difficult and interesting diagnostic or management problems are presented. The student may be expected to present such a case during the week that the Chest Medicine Service is scheduled.

Rounds and Patient Care

The student will be assigned to 6 to 8 patients under direct staff supervision. The attending faculty physician makes rounds daily with the students. The students will be expected to read up on their patients' problems from material included in the reading list handed out at the beginning of the rotation and library research. All histories, physicals and progress notes are to be countersigned by staff. Students will also be involved in pulmonary consultation to have greater exposure to a variety of other disorders which Rancho cares for, e.g., neuromuscular disorders, chest deformities, chronic medical disorders. **There is no night or weekend on-call responsibility for the student.**

Clinics

The student will attend regular Monday Clinic and will be expected to see, evaluate and dictate the chart of at least one patient in depth. This will be reviewed by the attending physician. In addition, the students will accompany the attending in the evaluation of at

least two other patients (hopefully with varying diagnosis so the student sees a wider spectrum of disease).

Evaluation of Student Performance

Evaluation will be conducted by full-time faculty on the service. Two major criteria will be used:

1. Basic application of the student's knowledge and background in general medicine to the workup of patients with clinical respiratory disorders. This will include evaluation of competence in history taking and physical examinations. We emphasize history and physical findings in the initial evaluation of the patient, rather than sophisticated or high-tech diagnostic tools. We emphasize that physical findings often provide clues to the patient's physical condition even before the chest x-ray is reviewed. With adequate exposure, the students should show competence in this area by the end of the rotation.
2. Demonstration by the student application of his/her basic knowledge and clinical concepts to formulating patient care plans, at least in broad outlines. Student may further demonstrate knowledge of commonly used medications by including them in his admission plans and orders. Most important, the student's application of the problem-oriented approach is stressed.

Other criteria for evaluation include:

1. Demonstration of initiative, motivation in patient care, participation in patient workups and medical and allied health team plans.
2. Participation in seminars and demonstration of having read assigned or pertinent material.
3. Rapport with patients; imparting knowledge of disease and medications to patients. Student's ability to explain to patient what are the diagnostic and therapeutic plans.
4. Promptness, attendance at meetings and conferences. Ability to interact and cooperate with nursing and allied health staff.

Procedures

The student will perform those procedures necessary for the care of the patient under supervision of the attending, including:

1. Thoracentesis
2. Arterial puncture for blood gases
3. Skin tests

Indications, types and use of ventilators, physical therapy adjuncts, exercise evaluation, etc. will be included as part of the learning experience.

The student will have the opportunity to observe fiberoptic bronchoscopy as well.

Because of the nature of the problems seen at Rancho, experience with the following diseases can be guaranteed:

1. Chronic bronchitis
2. Emphysema
3. Asthma
4. Community and hospital – acquired pneumonias; aspiration pneumonias; lung abscesses
5. Neuromuscular disease – polio, muscular dystrophy, polyneuropathies, motor neuron disease.
6. Pulmonary tuberculosis

Exposure to the following entities is likely but not guaranteed:

1. Lung carcinoma
2. Diffuse infiltrative (interstitial) diseases
3. Kyphoscoliosis

The following conditions are seen occasionally, but less frequently than the preceding:

1. Adult respiratory distress syndrome (ARDS)

The latter conditions are primarily encountered in the medical intensive care unit. As time permits, the student may wish to participate in bedside rounds in the MICU twice a week. Many of these patients have neuromuscular disorders which predispose to a variety of acute pulmonary and other medical problems.

Exposure to an experience in pulmonary function testing as it applies to the types of disorders mentioned above is assured. Teaching conferences and bedside analysis of arterial blood gases, acid base disturbances, spirometry, lung volumes, and exercise testing studies are conducted on a regular basis. Also, more detailed exposure to studies of lung mechanics and control of ventilation is also available.

The Environmental Health Lab at Rancho provides opportunities to learn principles of aerosol deposition in the lungs and air pollution problems as they relate to acute and chronic changes in lung function. Special arrangements may be made at the student's request.