

MAMC CONSULTATION SERVICE

Location:

Madigan Army Medical Center

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OVERALL EDUCATIONAL PURPOSE

To provide fellows the opportunity to gain knowledge and clinical experience through exposure to a broad range of outpatient pulmonary disease found in a community setting. Common clinical problems include obstructive lung disease, the solitary pulmonary nodule and pulmonary malignancy, pulmonary infections, interstitial lung disease, and disorders of the pleura and mediastinum.

To provide fellows the opportunity to gain knowledge and clinical competence in common procedures in outpatient pulmonary practice, including the performance and interpretation of pulmonary function testing, thoracentesis, laryngoscopy, and flexible fiberoptic bronchoscopy with transbronchial needle aspiration, endobronchial and transbronchial biopsies.

TEAM STRUCTURE

The fellow is assigned to a single teaching attending for each half-day clinic session.

PRINCIPAL TEACHING METHODS

Case discussion and review

All cases seen by the fellow are reviewed with the attending physician. Fellows are expected to present diagnostic and/or therapeutic plans on each patient and perform relevant literature review on uncommon or complex clinical problems. The attending physician works with the fellow to facilitate development of appropriate clinical assessments and plans, and presents relevant case-based information to advance the fellow's understanding of the pulmonary disease process and management.

Rounds

No formal rounding takes place, as this rotation is performed in the outpatient setting.

Didactics

Periodic lectures on common pulmonary outpatient problems are given by the attending physician for the fellow as the clinic schedule allows. An Accutouch Endoscopy Simulator is also available for fellows to gain additional practice and feedback on their bronchoscopy skills under the supervision of their attending. Fellows are expected to attend Grand Rounds and Respiratory/Critical Care Conference at UW and Harborview every Thursday, and participate and present in a Madigan pulmonary staff journal club periodically scheduled on Friday afternoons. When residents are rotating through the Pulmonary Clinic, fellows are also expected to gain teaching experience by assisting the staff attending in didactic and case based teaching, including scenarios using high fidelity human simulators.

EDUCATIONAL CONTENT

Mix of Diseases

Common causes of dyspnea

Obstructive lung disease, including COPD, bronchitis, and asthma

Pulmonary infection, including tuberculosis

Pulmonary malignancy, both primary and metastatic

Interstitial lung disease

Pulmonary manifestations of systemic diseases, including collagen vascular disease

Pleural and mediastinal disease

Sleep disorders, including obstructive sleep apnea

Patient Characteristics

Patients are active and retired military service members and their families. The demographics of this group are representative of the national population with a higher percentage of minorities.

Types of Clinical Encounters

The vast majority of patients will be seen during scheduled, outpatient clinic visits after referral from a primary care physician. Occasionally, interesting inpatients may be seen by the fellow. The fellow will also perform scheduled outpatient procedures.

Procedures

Common procedures performed include:

Laryngoscopy

Fiberoptic bronchoscopy, including endobronchial / transbronchial biopsies and transbronchial needle aspiration.

Thoracentesis

Services

The Pulmonary Clinic at Madigan Army Medical Center is a full-service referral center with access to all technology and services required for the optimal practice of outpatient pulmonary medicine, including pulmonary function testing, polysomnography, bronchoscopy, and full radiology services.

Principle Educational Materials Used

Recommended Readings

The articles listed below were selected from a Pulmonary/Critical Care Fellows' Syllabus that was last reviewed and approved by the American Thoracic Society Training Committee in Dec 2003. These selections were based upon review of the literature as well as the recommendations of Pulmonary and Critical Care faculty members at the University of Washington, University of Minnesota, and elsewhere. A Madigan Pulmonary syllabus of recent reviews and landmark articles on common pulmonary medicine topics will also be available for rotating fellows.

Asthma

Rowe BH, Bota GW, Fabris L, et al. Inhaled budesonide in discharge from the emergency department: a randomized controlled trial. *JAMA* 1999;281:2119-26. Study found the addition of inhaled steroid to oral steroid at the time of discharge from the emergency department reduced the rate of relapse by about half.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10367823

Haahtala T, Jarvinen M, Kava T, et al. Comparison of a beta-agonist, terbutaline, with an inhaled corticosteroid, budesonide, in newly detected asthma. *NEJM* 1991;325:388-92. This randomized, blinded comparison of the above two drugs was important in establishing inhaled corticosteroids as the first line treatment for asthma.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2062329

O'Driscoll BR, Kalra S, Wilson M, et al. Double-blind trial of steroid tapering in acute asthma. *Lancet* 1993;341:324-7. Study found tapering steroids after treatment with 10 days of steroids for an asthma exacerbation was unnecessary as long as patient was on an inhaled corticosteroid.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8094111

Laviolette M, Malmstrom K, Lu S, et al. Montelukast added to inhaled beclomethasone in treatment of asthma. *AJRCCM* 1999;160:1862-68. This randomized, double-blinded study supports the addition of a leukotriene inhibitor for asthmatics with inadequate symptom control with inhaled corticosteroid alone.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10588598

Malmstrom K, Rodriguez-Gomez G, Guerra J, et al. Oral montelukast, inhaled beclomethasone, and placebo for chronic asthma. A randomized controlled trial. *Ann Intern Med* 1999;130:487-95. Both inhaled steroid and a leukotriene inhibitor were better than placebo. Beclomethasone was significantly better than montelukast in reducing exacerbations and symptoms.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10075616

Lazarus SC, Boushey HA, Fahy JV et al. Long-acting beta2-agonist monotherapy vs. continued therapy with inhaled corticosteroids in patients with persistent asthma: a RCT. *JAMA* 2001;285:2583-93. Switching from low dose ICS to longacting beta2-agonist in patients with well-controlled, persistent asthma increases the risk of treatment failure and asthma exacerbations.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11368732

Busse WW. Anti-immunoglobulin E (omalizumab) therapy in allergic asthma. Review summarizes several large RCT studying the role of anti-IgE antibody in allergic asthma. The use of anti-IgE is associated with decreased frequency of exacerbations, reductions in corticosteroid dose, and improved quality of life in symptomatic patients with moderate to severe allergic asthma.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11704612

Edelman JM, Turpin JA, Bronsky EA, et al. Oral montelukast compared with inhaled salmeterol to prevent exercise-induced bronchoconstriction. A randomized, double-blind trial. *Ann Intern Med* 2000;132(2):97-104. Study found leukotriene blockade has equal efficacy to a beta-agonist for the prevention of EIB and that daily administration is not associated with a reduction in efficacy that is seen with daily dosing of long-acting beta agonists.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10644288

Suissa S, Blais L, Ernst P. Patterns of increasing beta-agonist use and the risk of fatal or near-fatal asthma. *Eur Respir J* 1994;7:1602-9. Nested case control study found increased and escalating use of beta-agonists were associated with an increased risk of death from asthma. Findings suggest poorly controlled asthma should not be managed with increased dosage of beta-agonists alone.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7995388

Lange P, Parner J, Vestbo J, Schnohr P, Jensen G. A 15-year follow-up study of ventilatory function in adults with asthma. *N Engl J Med* 1998;339:1194-200. Noteworthy for being one of the studies showing that a portion of patients with asthma go on to develop fixed airway obstruction.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9780339

Web site for latest treatment guidelines:

<http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm>

Community-acquired Pneumonia

Skerrett SJ. Diagnostic testing for CAP. *Clin Chest Med* 1999;20:531-48. Covers the techniques and yield of non-invasive and invasive diagnostic tests as well as the laboratory diagnosis of specific infections.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10516902

Niederman MS, Mandell LA, Anzueto A, et al. Guidelines for the management of adults with community-acquired pneumonia: diagnosis, assessment of severity, antimicrobial therapy, and prevention. *AJRCCM* 2001;163:1730-54. Latest recommendations from the ATS.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11401897

Bartlett JG, Dowell SF, Mandell LA, et al. Practice guidelines for the management of community-acquired pneumonia in adults. (From the IDSA). *Clin Infect Dis* 2000;31:347-82. Weighing in at 35 pages, this is more a reference than a read. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10987697

ERS Task Force Report. Guidelines for management of adult community-acquired lower respiratory tract infections. European Respiratory Society. *Eur Respir J* 1998;11:986-91. Concise, sensible, well-referenced guideline that places CAP in the context of other LRTI.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9623709

Ruiz M, Ewig S, Torres A, et al. Severe community-acquired pneumonia. Risk factors and follow-up epidemiology. *AJRCCM* 1999;160:923-9. Study out of Barcelona that is the best on this subject in recent years. Key findings were that the epidemiology of severe CAP evolves over time and hence, initial empiric treatment needs to as well. Alcohol abuse was the only independent risk factor for severe CAP, while prior ambulatory antimicrobial therapy was protective, emphasizing the potential benefit of early empiric treatment.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10471620

Ramirez JA, Vargas S, Ritter GW, et al. Early switch from intravenous to oral antibiotics and early hospital discharge: a prospective observational study of 200 consecutive patients with community-acquired pneumonia. *Arch Intern Med* 1999;159:2449-54. Study found early switch safe and cost-effective.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10665893

Ruiz-Gonzales AM et al. Is *Streptococcus pneumoniae* the leading cause of pneumonia of unknown etiology? A microbiologic study of lung aspirates in consecutive patients with community-acquired pneumonia. *Am J Med* 1999;106:385-90. Supports long held belief that most CAP cases of unknown etiology are probably pneumococcal.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10225239

Fine MJ, Auble TE, Yealy DM et al. A prediction rule to identify low-risk patients with community-acquired pneumonia. *NEJM* 1997;336:243-50. Oft-cited prediction rule used in above study by Marrie, et al. incorporates patient demographics, co-morbidities, vitals, labs, and chest film to identify patients likely to do well with outpatient treatment of CAP. Rule difficult to memorize and requires an ABG, but otherwise easy to apply.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8995086

Marrie TJ, Lau CY, Wheeler SL, et al. A controlled trial of a critical pathway for treatment of CAP. CAPITAL Study Investigators. *JAMA* 2000;283:749-55. Instituting a care pathway for CAP resulted in decreased rates of admission of low-risk patients and shorter hospital stays among those admitted without compromising the care of patients.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10683053

Mundy LM, Leet TL, Darst K, et al. Early mobilization of patients hospitalized with community-acquired pneumonia. *CHEST* 2003;124:883-9. A group randomized trial of 458 patients with CAP hospitalized on general medical units found patients undergoing early mobilization had shorter hospital stays without an increase in adverse events compared to usual care.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12970012

Bartlett JG, Gorbach SL. The triple threat of aspiration pneumonia. *Chest* 1975;68:560-66. Classic review of the presentation, pathophysiology, and natural history of chemical pneumonitis, bacterial pneumonia, and airway obstruction resulting from aspiration of toxic fluids, bacteria, and inert matter respectively.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1175415

Metlay JP, Kapoor WN, Fine MJ. Does this patient have CAP? Diagnosing pneumonia by history and physical examination. *JAMA* 1997;278:1440-5. Systematic review found H & P do not reliably predict the presence of pneumonia in acutely symptomatic, ambulatory patients. Physicians' interobserver agreement on exam findings is poor. Article highlights the importance of chest x-rays in diagnosis of pneumonia but the optimal strategy for their use remains unclear.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9356004

Mittl RL, Schwab RJ, Duchin JS et al. Radiographic resolution of community-acquired pneumonia. *Am J Resp Crit Care* 1994;149:630-5. Prospective follow-up of both inpatients and outpatients with diagnosis of CAP is cited as a guide for when to look for endobronchial lesions in the setting of slowly clearing pneumonia. The study found age and multilobar disease were independent predictors of delayed resolution. Radiographic resolution seen in 51% at 2 weeks, 67% at 4 weeks, and 90% at 12 weeks.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8118630

COPD

Overview

Pauwels RA, Buist AS, Calverley PMA et al. Global strategy for the diagnosis, management, and prevention of COPD: GOLD workshop summary. *AJRCCM* 2001;163:1256-76. Supported by the NHLBI and WHO and endorsed by the ATS, the summary is a bit more flexible than the previous ATS guidelines, places greater emphasis on the use of NIPPV during exacerbations, and has revised recommendations for the use of inhaled corticosteroids.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11316667

Supplemental oxygen

Continuous or nocturnal oxygen therapy in hypoxemic COPD. The NOTT group. *Ann Intern Med* 1980;93(3):391-8. Famous multicenter study showing use of continuous oxygen therapy (>17 hr/d) resulted in lower mortality than use of nocturnal therapy (12 hr/d) in pts. with PaO₂ 55 mmHg or PaO₂ 59 mmHg and pulmonary hypertension, right-sided failure, or Hct 55%.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6776858

Long term domiciliary oxygen therapy in chronic hypoxic cor pulmonale complicating chronic bronchitis and emphysema. MRC Working Party. *Lancet* 1981;8222:681-5. Another well-known study showing improved survival with continuous oxygen in hypoxemic COPD patients.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6110912

Tiep BL. Oxygen conserving devices. Up to Date, 7/30/99. Practical review of different modes of O₂ delivery for LTOT.

O'Donohue W Jr., Tiep BL, Carter R. Long-term supplemental oxygen therapy. Up to Date, 1/16/04. Useful review of the indications and requirements for prescribing long-term oxygen therapy.

Stoller JK. Oxygen and air travel. *Respir Care* 2000;45:214-21. Summarizes readily available means of assessing travelers' in-flight oxygen needs.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10771793

Survival

Traver GA, Cline MG, Burrows B. Predictors of mortality in COPD: A 15-year f/u study. *Amer Rev Res Dis* 1979;119:895-902. Ubiquitously-cited study looking at FEV₁ and survival. After controlling for age, the FEV₁ after bronchodilator was the best predictor of survival, but was less predictive in patients over 65. The observed wide variability in survival of individual patients with similar initial FEV₁ values has important implications for patients considering surgical treatments for their COPD.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=453709

Anthonisen NR. Prognosis in COPD: results from multicenter clinical trials. *Am Rev Respir Dis* 1989;140:S95-9. This analysis of previous trials found that COPD patients with hypoxemia had worse survival than non-hypoxemic COPD

patients with equivalent FEV1.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3510578

Inhaled and systemic steroids

Pauwels RA, Lofdahl CG, Laitinen LA, et al. Long-term treatment with inhaled budesonide in persons with mild COPD who continue smoking. NEJM 1999;340:1948-1953. Study of inhaled corticosteroid in smokers with mild COPD showed a modest improvement in FEV1 relative to placebo in the first 6 months, but no benefit during the subsequent 2.5 years.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10379018

Burge PS, Calverley PMA, Jones PW, et al. Randomised, double blind, placebo controlled study of fluticasone propionate in patients with moderate to severe COPD: the ISOLIDE trial. BMJ 2000;320:1297-1303. Use of inhaled steroid did not improve the rate of decline in FEV1 compared to placebo. The Flovent group had a median of 0.99 exacerbations/yr vs. 1.32/yr in the placebo arm. Response to oral steroids given in the run-in phase was not predictive of subsequent benefit from inhaled steroid.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10807619

The Lung Health Study Research Group. Effect of inhaled triamcinolone on the decline in pulmonary function in COPD. NEJM 2000;343:1902-09. Randomized, controlled study followed over 1000 patients for an average of 4.5 yrs and found no difference in rate of decline in FEV1 in the inhaled steroid group. Patients using triamcinolone had, by some measures, fewer symptoms, but also had a greater rate of decline in bone density that is of unknown clinical significance.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11136260

Fan VS, Bryson CL, Curtis JR, et al. Inhaled corticosteroids in COPD and risk of death and hospitalization. AJRCCM 2003;168:1488-94. Prospective cohort study of over 8,000 patients from 7 VA medical centers. The authors defined ICS-users as being on medication at least 80% of the time based on pharmacy records and performed a time-dependent analysis to account for changing ICS use over time. Unlike a number of recent observational studies, this study found the use of ICS was not associated with reduced mortality and exacerbations.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14525798

van der Valk P, Monnikhof E, van der Palen J, et al. Effect of discontinuation of inhaled corticosteroids in patients with COPD. AJRCCM 2002;166:1358-63. Randomized, blinded, placebo-controlled, single-center study of 244 patients with a mean FEV1% predicted of 57% found more patients in the placebo arm experienced an exacerbation over a 6-month follow-up period (57 vs. 47%; hazard ratio for 1st exacerbation 1.5 [CI] 1.1-2.5). Subgroup analysis found benefit derived primarily by patients with baseline FEV1 < 50% predicted.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12406823

Calverley P, Pauwels R, Vestbo J, et al. Combined salmeterol and fluticasone in the treatment of COPD: a RCT. Lancet 2003;361:449-56. Large study found patients receiving combination therapy had some improvement in symptoms and FEV1 compared to using each component individually, but there was no difference in frequency of exacerbations.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12583942

Niewoehner DE, Erbland ML, Deupree RH, et al. Effect of systemic glucocorticoids on exacerbations of COPD. NEJM 1999;340:1941-7. Multicenter, double-blind, placebo-controlled study found modest benefit to use of high-dose intravenous steroids. Steroid group had fewer treatment failures (combined endpoint of death, need for intubation, readmission, or intensification of pharmacologic therapy), and shorter hospital stays, but the primary benefit was in decreasing the need to intensify therapy with use of open-label steroids. No benefit from steroids was present at 6 months of f/u, and 2 week and 8 week courses were equally effective.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10379017

Role of antibiotics

Anthonisen NR, Manfreda J, Warren CPW et al. Antibiotic therapy in exacerbations of COPD. Ann Intern Med 1987;106:196-204. Famous study often cited by proponents of antibiotic use for COPD exacerbations. Randomized, blinded, controlled study found use of antibiotics in the presence of increased dyspnea, increased sputum production, and increased sputum purulence improved outcomes. The improvement was no longer significant, however, after controlling for use of oral steroids.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3492164

Hirschmann JV. Do bacteria cause exacerbations of COPD? vs. Murphy TF, Sethi S, Niederman MS. The role of bacteria in exacerbations of COPD: A constructive view. Both from CHEST 2000;118:198-209. The articles are

presented in a debate format.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10893379

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10893380

Interstitial Lung Disease

Overviews

American Thoracic Society/European Respiratory Society international multidisciplinary consensus classification of the idiopathic interstitial pneumonias. AJRCCM 2002;165:277-304. Written to standardize the diagnostic criteria and terminology for idiopathic interstitial pneumonias, this article nicely summarizes the clinical, radiologic, and histologic features of the ILD alphabet soup.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11790668

Mathieson JR, Mayo JR, Staples CA, Muller NL. Chronic diffuse infiltrative lung disease: comparison of diagnostic accuracy of CT and chest radiography. Radiology 1989;171:111-16. First study to assess accuracy of CT-based diagnosis for patients with ILD. Correctly diagnosed UIP in 89% of cases, sarcoid in 77% of cases, and were, for the most part, less accurate in diagnosing less common diseases. Includes an interesting table of the frequency of selected CT findings observed among the 5 most common ILDs in the study (e.g. pleural fluid/thickening seen in only 9% of UIP cases).

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2928513

Cryptogenic Organizing Pneumonia

Epler GR, Colby TV, McCloud TC, et al. Bronchiolitis obliterans organizing pneumonia. NEJM 1985;312:152-8. Classic article describing idiopathic BOOP (now known as cryptogenic organizing pneumonia)

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3965933

Idiopathic Pulmonary Fibrosis

Douglas WW, Ryu JH, Swensen SJ, et al. Colchicine vs. prednisone in the treatment of IPF: a randomized prospective study. AJRCCM 1998;158:220-5. Study found colchicine and prednisone equally ineffective. Colchicine had less toxicity.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9655733

Ziesche R, Hofbauer E, Wittmann K, et al. A preliminary study of long-term treatment with IFN gamma-1b and low dose prednisolone in patients with IPF. NEJM 1999;341:1264-9. Small study found use of IFN promising in patients with IPF not responding to initial therapy. Results of a multicenter study are pending as of 12/03.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10528036

Raghu G, Depaso WJ, Cain K, et al. Azathioprine combined with prednisone in the treatment of IPF. Am Rev Respir Dis 1991;144:291-6. RCT of prednisone plus imuran vs. prednisone alone found some patients had greater benefit with the combination of drugs, but overall differences between groups did not reach statistical significance. Some current trials of new therapies use this combination in the control group.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1859050

Hunninghake GW, Zimmerman MB, Schwartz DA, et al. Utility of a lung biopsy for the diagnosis of idiopathic pulmonary fibrosis. AJRCCM 2001;164:193-6. Study found pulmonologists and radiologists with expertise in interstitial lung disease reliably made a clinical diagnosis of IPF when compatible clinical and radiologic data were present (only 50% of all IPF cases). Transbronchial biopsy was helpful in 2% of cases and pathologists did not agree on the histologic diagnosis.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11463586

Sarcoidosis

Statement on sarcoidosis. Joint Statement of the American Thoracic Society (ATS), the European Respiratory Society (ERS) and the World Association of Sarcoidosis and Other Granulomatous Disorders (WASOG) adopted by the ATS Board of Directors and by the ERS Executive Committee, February 1999.. AJRCCM 1999;160:736-55.

Comprehensive and relatively readable.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10430755

Lung Cancer

Staging

Mountain CF. Revisions in the international system for staging lung cancer. CHEST 1997;111:1710-1717. The staging revisions were made to better group TNM patterns with similar prognosis and approach to treatment. Includes expected survival for clinically and surgically staged cancer at 1 through 5 years.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9187198

Van Tinteren H, Hoekstra OS, Smit EF, et al. Effectiveness of PET in the preoperative assessment of patients with suspected non-small-cell lung cancer: the PLUS multicentre randomised trial. Lancet 2002;359:1388-93. Efficacy study found addition of PET to conventional work-up decreased futile thoracotomies and the combination of PET and conventional workup was 79% sensitive for identifying futile thoracotomies.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11978336

Gould MK, Kuschner WG, Rydzak CE, et al. Test performance of PET and CT for mediastinal staging in patients with non-small-cell lung cancer. Ann Intern Med 2003;139:879-92. This meta-analysis found a median sensitivity of 85% and specificity of 90% for PET in determining the presence of mediastinal disease in known or suspected NSCLC. PET's median sensitivity improved to 100% and median specificity fell to only 78% in the presence of lymphadenopathy on CT while PET had a median sensitivity of 82% and median specificity of 93% in the absence of lymphadenopathy.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14644890

Fritscher-Ravens A, Davidson BL, Hauber H, et al. Endoscopic ultrasound, PET, and CT for lung cancer. AJRCCM 2003;168:1293-7. This is the largest study to date comparing PET and endoscopic ultrasound with fine-needle aspiration for staging potentially operable patients with known or suspected lung cancer. PET and ultrasound had similar sensitivity and negative predictive value, but ultrasound had 100% specificity. A cost-analysis favored endoscopic ultrasound over PET.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12904322

Parapneumonic Effusion

Light RW, MacGregor MI, Luchsinger PC, et al. Pleural effusions: the diagnostic separation of transudates and exudates. Ann Intern Med 1972;77:507-13. This paper is the basis for using pleural fluid LDH and protein to classify effusions as transudative or exudative.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=4642731

Light RW, Girard WM, Jenkinson SG, et al. Parapneumonic effusions. Amer J Med 1980;69:507-12. The notion that a parapneumonic effusion with pH less than 7.0 or glucose < 40mg/dl is "complicated" and requires drainage is derived from this study. Study included a total of 10 patients (7 with + cultures, 3 with pus). 6 of 10 met the pH criteria and 7 of 9 met the glucose criteria.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7424940

Berger HA, Morganroth ML. Immediate drainage is not required for all patients with complicated parapneumonic effusions. CHEST 1990;97:731-5. Oft-cited retrospective study found 13 of 16 patients with complicated effusions (defined as pH < 7.2 or positive GS or positive culture, but without pus present) had resolution of effusions with antibiotics alone.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2306975

Bouros D, Schiza S, Siafakas N. Utility of fibrinolytic agents for draining intrapleural infections. Sem Resp Infect 1999;14:39-47. Reviews the somewhat limited data indicating use of lytics decreases the need for surgery compared to chest tube drainage alone in patients with empyema and complicated effusions. Patients successfully managed without surgery about 85% of time. Chest tube patency maintained with qid NS flushes in successful trials.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10197396

Wait MA, Sharma S, Hohn J, Dal Nogare A. A randomized trial of empyema therapy. CHEST 1997;111:1548-51. Only randomized trial comparing immediate VATS to tube thoracostomy plus 3 days of daily SK (only 20 patients total). The surgical group had better primary treatment success and earlier hospital discharge, but outcomes of patients randomized to chest tube/lytics was much worse than other reported series, suggesting suboptimal management of those patients. All medical failures were salvageable with VATS.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9187172

Davies CWH, Kearney SE, Gleeson FV, Davies RJO. Predictors of outcome and long-term survival in patients with pleural infection. AJRCCM 1999;160:1682-87. In the absence of frank empyema, tube thoracostomy plus lytics had a

PPV of 93% for successful treatment (i.e. no need for surgery). The presence of pus had a PPV for failure of medical management of 26%. Fluid characteristics, effusion size, and degree of pleural thickening were not predictive of medical failure. Study didn't consider presence of loculations or assess long-term outcomes. In part included because it is a good model of how to optimally manage patients when electing to use chest tube drainage rather than VATS.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10556140

Ashbaugh DG. Empyema thoracis. Factors influencing morbidity and mortality. Chest 1991;99:1162-5. Study of 122 consecutive patients looked at the morbidity and mortality of delaying treatment of empyema. Waiting more than 3 days to place a chest tube, and more than 14 days to proceed to surgical drainage when chest tubes fail, was associated with increased morbidity and mortality.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=2019172

Colice GL, Curtis A, Deslauriers J, et al. Medical and surgical treatment of parapneumonic effusions. CHEST 2000;188:1158-71. "Evidence-based" guideline derived from relatively low quality evidence reflective of above references. Tables summarize study designs, patient populations, and outcomes of the better studies.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11035692

Procedures

Bronchoscopy

Cowl CT, Prakash UBS, Kruger BR. The role of anticholinergics in bronchoscopy. CHEST 2000;118:188-92. RCT found anticholinergics did not improve secretions, reduce the need for topical anesthetic, or improve patient comfort.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10893378

Wang KP. Transbronchial needle aspiration and percutaneous needle aspiration for staging and diagnosis of lung cancer. Clin Chest Med 1995;16:535-52. Focuses on the nuts and bolts of the technique rather than indications, yield, and risks. Diagrams of endobronchial landmarks for different nodes may be of practical use just prior to procedure.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8521707

Weiss SM, Hert RC, Gianola FJ et al. Complications of fiberoptic bronchoscopy in thrombocytopenic patients. Chest 1993;104:1025-8. Established safety of transnasal bronchos in thrombocytopenic patients.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8404159

Herth FJF, Becker HD, Ernst A. Aspirin does not increase bleeding complications after transbronchial biopsy. CHEST 2002;122:1461-4 Prospective study compared 285 patients taking ASA within 24 hrs of TBB to 932 non-ASA users and found no difference in the risk of minor, moderate, or major bleeding.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12377879

Thoracentesis

Jones PW, Moyers JP, Rogers JT et al. Ultrasound-guided thoracentesis: is it a safer method? CHEST 2003;123:418-423. Prospective descriptive study of 605 patients referred for a total of 941 ultrasound-guided thoracenteses. 2.5% sustained a pneumothorax of whom a third received a chest tube; this is a lower incidence than most reported studies without ultrasound guidance, but all procedures were performed by 7 experienced interventional radiologists. As with previous studies, the yield of routine post-procedure films was low in asymptomatic patients; 3 of 907 had a pneumothorax managed with a chest tube. Of note, 2 of 373 patients (0.5%) developed re-expansion pulmonary edema following removal of > 1 liter of fluid. Investigators terminated fluid removal if the patient developed dyspnea or excessive cough.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12576360

Sallach SM, Sallach JA, Vasquez E, et al. Volume of pleural fluid required for diagnosis of pleural malignancy. CHEST 2002;122:1913-17 In this retrospective case series, the yield of thoracentesis for the diagnosis of malignancy was independent of the volume of fluid collected.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12475826

Pulmonary Function Testing

General Reviews

Clinics in Chest Medicine, volume 22, number 4, December 2001 contains reviews on the measurement and interpretation of the entire spectrum of pulmonary function testing. A particular strength is the discussion of how the pathophysiologic changes associated with various disease states are reflected in studies of pulmonary function.

Exercise Testing

Weisman IM, Zeballos RJ. Clinical exercise testing. *Clin Chest Med* 2001;22:679-701. The focus is on cardiopulmonary exercise testing, but this review also briefly summarizes the 6-minute walk, testing for exercise-induced bronchoconstriction, and cardiac stress testing. An excellent starting point for the novice. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11787659

ATS/ACCP Statement on cardiopulmonary exercise testing. *AJRCCM* 2003;167:211-77. Somewhere between a textbook and a clinical review, this article provides more details on CPET than the above Weisman article. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12524257

Sleep Medicine

Sleep Disordered Breathing

Sullivan CE, Berthon-Jones M, Issa FQ et al. Reversal of obstructive sleep apnoea by continuous positive airway pressure applied through the nares. *Lancet* 1981 April 18;1(8225):862-5. First description of CPAP in the treatment of OSA. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6112294

Iber C, O'Brien C, Schluter J, et al. Single night studies in obstructive sleep apnea. *Sleep* 1991;14:383-385. Contrary to the accompanying editorial, this study first documented the effectiveness of split-night studies for the evaluation of OSA and helped establish split-night studies as the standard of care. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=1759089.

Flemons WW, Littner MR, Rowley JA, et al. Home diagnosis of sleep apnea: A systematic review of the literature. *CHEST* 2003;124:1543-79. A summary of where we are with out-of-lab diagnosis of sleep disordered breathing. Although the effectiveness of these methods may be improving, the appropriate usefulness is a moving target as technology advances faster than the publications that follow. <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?CMD=Search&DB=PubMed>

Schwab RJ, Pasirstein M, Pierson R, et al. Identification of upper airway anatomic risk factors for obstructive sleep apnea with volumetric magnetic resonance imaging. *AJRCCM* 2003;168:522-30. Elegant publication demonstrating the anatomy behind sleep disordered breathing – how can a patient with a normal BMI have OSA? How can an overweight patient not have OSA? Don't miss the online supplement. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12746251

Shahar E, Whitney C, Redline S, et al. Sleep-disordered breathing and cardiovascular disease. Cross-sectional results of the Sleep Heart Health Study. *AJRCCM* 2001;163:19-25. One of a number of important articles derived from the landmark Sleep Heart Health Study, this study found even mild OSA (apnea-hypopnea index of ≥ 11) confers a 2.38 relative risk of self-reported CHF independent of other known risk factors. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11208620

Nieto FJ, Young TB, Lind BK, et al. Association of sleep-disordered breathing, sleep apnea, and hypertension in a large community-based study: Sleep Heart Health Study. *JAMA* 2000;283:1829–1836. This landmark study demonstrated that sleep disordered breathing confers a higher risk of hypertension, independent of age, sex, race, weight, BMI, neck circumference, waist-to-hip ratio, alcohol, smoking, favorite NFL team. ... http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10770144

Peppard PE, Young T, Palta M, et al. Prospective study of the association between sleep-disordered breathing and hypertension. *NEJM* 2000;342:1378–84. Even more convincing is the Wisconsin Sleep Cohort Study that demonstrated an independent dose-response relation between sleep-disordered breathing at baseline and the development of *new* hypertension 4 years later. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10805822

Peker Y, Hedner J, Kraiczki H, et al. Respiratory disturbance index: an independent predictor of mortality in coronary artery disease. *AJRCCM* 2000;162:81-6. Small (59 patients) prospective study with 5 years of follow-up found patients with untreated OSA and coronary artery disease were at increased on cardiovascular death. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10903224

Solitary Pulmonary Nodule

Ost D, Fein AM, Feinsilver SH. The solitary pulmonary nodule. *NEJM* 2003;348:2535-42. Concise review of risks and yield of the currently used diagnostic modalities, including PET scans. Unlike some recently published guidelines, the authors consider both clinical suspicion for malignancy and operative risk in making management recommendations. The authors advocate the use of serial CT scans in patients with low probability of cancer as well as patients with intermediate probability with negative additional workup.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12815140

Swenson SJ, Silverstein MD, Ilstrup DM et al. The probability of malignancy in solitary pulmonary nodules. *Arch Int. Med* 1997;157:849-855. Authors developed a prediction model for likelihood of malignancy in indeterminate 4-30mm SPNs. Age, cigarette use, hx of any cancer more than 5 years previously, diameter of SPN, spiculation, and upper lobe location were independent predictors of malignancy. Article includes a table with the odds a SPN is malignant based on the above factors.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9129544

Torrington KG, Kern JD. The utility of fiberoptic bronchoscopy in the evaluation of the solitary pulmonary nodule. *CHEST* 1993;104:1021-1024. Study found low yield for use of FOB in the work-up of radiographic Stage I lung cancer. FOB confirmed the diagnosis of cancer in 30% of cases (no higher yield with use of fluoroscopic guidance), but this did not affect surgical management. Unsuspected synchronous tumor found in only 1% of cases. Study population skewed in that a high proportion (87%) of SPNs were malignant.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8404158

Tuberculosis

ATS Statement: Targeted tuberculin testing and treatment of latent tuberculosis infection. *AJRCCM* 2000;161:S221-S247. Emphasizes restricting testing to patients you intend to treat if positive and defines positive for patients with different risk factors. Recommended duration of INH increased to 9 months. Significant risk of hepatotoxicity with combination INH and rifampin reported since this statement published.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10764341

International Union Against Tuberculosis Committee on Prophylaxis. Efficacy of various durations of isoniazid preventive therapy for tuberculosis: five years of follow-up in the IUAT trial. *Bull WHO* 1982;60:555-64. Noteworthy for being the only study of the efficacy and safety of different durations of INH prophylaxis.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6754120

Stead WW. Management of health care workers after inadvertent exposure to TB: a guide for the use of preventive therapy. *Ann Intern Med* 1995;122:906-12. Based on early TB outbreaks and more recent studies of health care and nursing home exposures, the author makes recommendations for the management of health care workers with heavy exposure to active disease. Specifically, workers with prior positive PPD do not need treatment unless they become symptomatic per the author. Skin test negative workers should receive INH prophylaxis until they are tested for conversion 8 weeks after exposure.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7755225

Blumberg HM, Burman WJ, Chaisson RE, et al. ATS/CDC/IDSA: Treatment of tuberculosis. *AJRCCM* 2003;167:603-662. Comprehensive consensus guide to treatment.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12588714

Bock NN, McGowan JE, Ahn J, et al. Clinical predictors of tuberculosis as a guide for respiratory isolation policy. *AJRCCM* 1996;154:1468-72. Study found upper lobe infiltrate, presence of cavity, self-report of prior positive PPD, and history of TB exposure were predictive of active disease while history of INH prophylaxis was negatively predictive. Basing isolation solely on these criteria, however, would have resulted in 19% of active cases not being isolated.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8912766

ATS Workshop: Rapid diagnostic tests for tuberculosis: what is the appropriate test? *AJRCCM* 1997;155:1804-14. The article focuses on the indications and limitations to use of direct amplification tests (DAT) for rapid diagnosis of TB in smear-positive and smear-negative cases.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9154896

Roth BJ. Searching for tuberculosis in the pleural space. *CHEST* 1999;116:3-4. Reviews use of ADA in work-up of pleural TB.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10424494

<http://www.chestjournal.org/cgi/content/full/116/1/3>

Kirsch CM, Kroe DM, Azzi RL, et al. The optimal number of pleural biopsy specimens for a diagnosis of tuberculous pleurisy. CHEST 1997;112:702-6. Single institution, mostly retrospective study of 30 patients with proven pleural TB found sensitivity of 87% when a single specimen was sent for culture and the remaining 3 to 9 were sent for histology. Only 40% of submitted samples actually contained pleura, and the diagnostic yield was 100% in the 18/30 patients with more than 6 specimens submitted.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9315802

Conde MB, Loivos AC, Rezende VM, et al. Yield of sputum induction in the diagnosis of pleural tuberculosis. AJRCCM 2003;167:723-5 Prospective study of 84 patients with pleural tuberculosis found induced sputum culture was helpful in patients with no infiltrate on CXR; 55% of patients with effusion and clear CXR were culture positive, although only 12% had a rapid diagnosis via positive smears.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12598215

Pathologic materials

A collection of lung pathology images and accompanying study material is available for fellow use during the rotation in the main work area in the Pulmonary Clinic. Fellows are also encouraged to review their specimens with a Madigan pathologist whenever possible.

METHODS USED IN EVALUATING RESIDENT AND PROGRAM PERFORMANCE

At the end of the rotation, the fellow is evaluated in writing and their performance reviewed with them verbally by every attending he or she has interacted with for a significant amount of time. The evaluator rates the resident on a nine-point scale in each component of clinical competence (i.e. patient care, medical knowledge, practice based learning improvement, interpersonal and communication skills, professionalism, system based learning, educational attitudes, leadership, overall clinical competence).

The fellow is given the opportunity to evaluate in writing the quality of the curriculum and the extent to which the educational goals and objectives of the rotation have been met. The fellow also evaluates the teaching competence of each attending with whom he or she has interacted for a significant amount of time.

EXPLICIT LINES OF RESPONSIBILITY FOR CARE OF PATIENTS ON THIS SERVICE

The fellow directly reports to the clinic attending and will discuss all patients seen and evaluated. The clinic attending is ultimately responsible for the care plan, but will provide the fellow the opportunity to develop a diagnostic and/or therapeutic strategy.