Respiratory system

What is an upper respiratory tract infection?

Infection of any part of the upper respiratory tract e.g. sinuses, nasal passages, pharynx, and larynx is upper RTI. Infection of the specific areas of the upper respiratory tract can be named specifically. Examples are rhinitis (inflammation of the nasal cavity), sinus infection (sinusitis or rhinosinusitis), common cold (nasopharyngitis), laryngitis (inflammation of the larynx), laryngotracheitis (inflammation of the larynx and the trachea) and tracheitis (inflammation of the trachea).

Common cold

Common cold is usually a viral infection of the upper respiratory tract that affects predominately the nasal part of the respiratory tract. Simply viral infection of the nasal passage is common cold.

Etiology: Commonly viral (rhinovirus, corona virus etc), sometimes bacterial (Haemophilus influenza, Streptococcus pneumonia).

Symptoms: Nasal blockage, rhinorrhoea (runny nose), sneezing etc.

Sign: Nasal mucosa is congested.

Investigation: Usually not required. If the nasal discharge is purulent then it should be sent for C/S.

Diagnostic tools

1. Patient complaints of nasal blockage, rhinorrhoea, sneezing etc.

2. No history of fever.

3. Patient's appetite is normal.

Management

1. Antihistamine is the mainstay of treatment. There is no difference between individual antihistamine, better to use antihistamine which is effective/tolerable for the patient (detect from patient's history). 2nd generation antihistamines are prefarable (see below).
2. Nasal decongestant-Xylometazoline, norephedrine or pseudoe phedrine provides short term relief of symptoms (3 to 10 hours).

3. 3. Antibiotic- if purulent nasal discharge or fever for more than 7 days.

Comparison of first and 2nd generation antihistamine

First generation antihistamine	Second generation antihistamine
These are-promethazine, chlorpheniramine	These are-cetirizine, levocetirizine, loratadine, ebastine, fexofenadine, rupatadine
Cross blood brain barrier	Cannot cross blood brain barrier
Potent blockers of H1, α1and muscarinic receptors	Selective H1-receptor antagonists
Potential side effects, mainly sedation, dizziness and drowsiness	Do not cause significant side effects
Avoid in glaucoma, BPH, IHD patients	Can be used in glaucoma, BPH, IHD patients
No data for long term use	Cetirizine, levocetirizine, loratadine, desloratadine and fexofenadine can be used for long term (6 to 18 months).

Allergic rhinitis

Diagnostic tools

1. Sudden attack of sneezing, nasal obstruction and profuse nasaldischarge on exposure to dust, pollen or eating some allergen food.

2. History of similar attack with the exposure of same allergen.

Management

1. Mainstay of treatment is avoidance of allergen.

2. Antihistamine should be given when symptom already started.

3. Nasal steroid spray e.g. Beclomethason diproprionate, fluticasone or budesonide-these should be given when allergen cannot be traced and patient experience repeated attack.

4. Sodium cromoglycate nasal spray-can prevent an attack.

5. Systemic steroid -in which symptoms are severe.

Acute pharyngitis

Diagnostic tools

1. Patient complaints-sore throat, discomfort in throat, painful, irritating, non-productive cough, difficulty in swallowing of food, sometimes horse voice or loss of voice

2. On examination-oro-pharynx-congested, pus point may be present.

3. Investigation-throat swab for culture and sensitivity.

Management

1. Povidone-iodine mouth wash (1%)-10 ml should dilute in in half glass warm water then gargeling 4 times daily for 7 days. In severe cases aspirin water gargling is helpful.

2. Oral antibiotic-that covers the Gram positive bacteria e.g. levofloxacin, amoxicillin-clavulanic acid, cephradine, cefuroxime etc.(change the antibiotic according to C/S report).

3. Avoid cold exposure e.g. cold drink.

Sinusitis

Maxillary sinusitis is more common than frontal sinusitis.

Diagnostic tools

1. Headache particularly frontal headache or pain over the maxillary sinus.

2. Purulent nasal discharge.

3. On examination-tenderness may be present over the frontal or maxillary sinus.

4. Investigation-x-ray PNS (O/M view) may reveal mucosal thickening, air-fluid levels, and complete opacification of the involved sinus. Nasal discharge should be sent for C/S.

Management

1. Antibiotic covering the Gram positive bacteria like levofloxacin, azithromycin, amoxicillin etc, needs to change according to C/S report.
2. Nasal decongestant- xylometazoline.
3. Analgesics to reduce headache e.g. paracetamol, ibuprofen, naproxen etc.

Acute lower respiratory tract infections

Acute lower respiratory tract infections include pneumonia (infection of the lung alveoli), as well as infections affecting the airways such as acute bronchitis and bronchiolitis.

Diagnostic tools (acute bronchitis and bronchiolitis)

1. Symptoms- fever, productive cough, breathlessness.

2. On examination-patient usually febrile, bilateral ronchi and creps present.

3. CXR (P/A)- usually normal.

4. The clinical features are not due to asthma, COPD or heart failure.

5. Sputum should be sent for Gram staining and C/S.

Management

1. Antibiotic-usually require, antibiotic having Gram positive organism coverage should be the choice (like amoxicillin + clavulanic acid combination, levofloxacin, azithromycin, moxifloxacilin etc) then change according to C/S report.

2. Bronchodilator-oral and/or inhaler (mainstay to control cough and breathlessness).

3. Paracetamol for fever.

Pneumonia (Community acquired pneumonia, CAP-patient acquire pneumonia in the community)

Diagnostic tools

1. Fever (high grade) with cough with sputum (rusty).

2. Chest pain- pleuritic (pain increase on inspiration and cough).

3. On examination -feature of consolidation like bronchial breath sound present, vocal resonance increased etc.

4. Chest x-ray (P/A)-consolidation present.

5. Sputum for Gram staining and C/S (this will reveal offending organism and antibiotic sensitivity pattern).

Management

1. Empirical antibiotic (should be changed according to C/S)

A) Uncomplicated CAP (antibiotic for 5 days is usually adequate)

Amoxicilin 500 mg 8 hourly or

Clarithromycin 500 mg 12 hourly

Flucloxacillin 2 gram daily if suspect Staphylococcus.

B) Severe CAP (duration for 2 weeks, in case of atypical bacteria 4-6 weeks)

(Commonly use regimen for severe pneumonia is ceftriaxone 1gm 12 hourly and oral clarithromycin 500 mg 12 hourly).

2. NSAID like naproxen to releive chest pain.

N:B: Practically IV antibiotic should be given if patient is old age, immuncompromised patient (DM, CKD, CLD, taking cytotoxic drugs like anticancer drugs, MTX, sulfasalazin, azathioprine, steroid), significant systemic symptoms (fever, anorexia etc).

Haemoptysis

Management

1. Assessment -it is mandatory to assess the patient (by pulse, blood pressure, respiration, urine output), whether shock present or not and severity of bleeding. Usually haemoptysis is not severe.

2. Blood grouping and cross matching should be done for every patient.

3. Diagnosis and treatment of the underlying cause (common cause of haemoptysis in clinical practice is bronchial carcinoma and pulmonary tuberculosis) is the main treatment. For diagnosis-

a) CBC and CXR (P/A) is usually enough to diagnose cause of haemoptysis.

b) CT guided FNAC of lung mass or bronchoscopy may require to diagnose the cause of haemoptysis.

c) Echocardiogram to diagnose mitral stenosis with PH.

4. Upright position or on the side of the lesion if known

5. O2 inhalation high flow 4-6 L/minute (if require)

6. IV fluid normal saline (if require to maintain IV channel or if blood pressure is low).

7. Blood transfusion (if patient is in shock or hemoglobin below 8 gm/dl).

8. Treatment of the underlying cause.

Bronchiectasis

Diagnosis tools

1. Patient complaint-productive cough, profuse in amount, SOB, fever if concomitant infection present. Patient may have history of suppurative pneumonia, pulmonary tuberculosis, measeles in past.

2. On examination-clubbing present and coarse crepitation present in affected part of the lung or both lungs.

3. Investigation-chest X-ray-ring shadow present (but in advanced stage), sputum C/S to identify infection and antibiotic sensitivity pattern.

Management

A) Physiotherapy-duration 5-10 minutes. Once or twice daily.

i) Drained lobe should be upper most.

ii) Deep breathing followed by forced expiratory maneuvers (the active cycle breathing technique).

iii) Percussion of the chest wall with cupped hands.

iv) Devices (positive expiratory pressure mask).

B) Antibiotic-required larger dose & longer duration (1-2 weeks) according to sputum C/S.

Empirically amoxicillin, levofloxacin, azithromycin, clarithromycin, when suspect Pseudomonas-ciprofloxacin, ceftazidim may be given.

C) Haemoptysis-managed by treatment of the underlying infection. In severe cases percutenous embolisation of the bronchial circulation.

D) Surgical treatment- Indication

i) Young patient

ii) Confined to single lobe or segment on CT

iii) In progressive form of bronchiectasis resection of the destroyed areas of the lung.

E) Airflow obstruction-inhaled bronchodilator (salbutamol) & corticosteroid (beclomethasone).

N: B: In practice 1) Bronchodilator (inhaler salbutamol & ipratropium bromide combination). 2) Antibiotic and 3) Treatment of the underlying cause (like pulmonary TB) are the main treatment of bronchiectasis.

Pulmonary tuberculosis

Diagnostic tools

1. Patient presented with fever, cough, weight loss and loss of appetite.

2. On examination-patient usually febrile, crepitation (particularly posttussive crepitation, which persist after cough) may be present in both or single lung or apical region of the lung.

3. Investigation-sputum 2 samples (one spot and one early morning) for AFB, may reveal acid fast bacilli, chest x-ray (P/A)-may reveal patchy opacity etc. Xene expert MTB test-can confirm diagnosis of pulmonary TB and rifampicin resistance quickly.

Treatment of tuberculosis

1. Category-I or category-II anti tubercular drugs.

Category	Patient selection
Category-I	• New smear +Ve PTB pt. • New smear -Ve PTB pt. • Extra-pulmonary TB pt. • Concomitant/associated AIDS
Category-II	• Sputum smear +Ve PTB with H/O treatment of more

	than one months. • Relapse. • Treatment failure after Cat. I. • Treatment after default. • Others

Who should offer category I and category-II

Category	Patient selection
Category-I	• New smear +Ve PTB pt. • New smear -Ve PTB pt. • Extra-pulmonary TB pt. • Concomitant/associated AIDS
Category-II	• Sputum smear +Ve PTB with H/O treatment of more than one months. • Relapse. • Treatment failure after Cat. I. • Treatment after default. • Others

Standardized treatment regimen for each category (Adult)

Category -1 management

Pre-treatment wt (kg)	Intensive phase	Continuation phase
	Daily (First 2 months)	Daily (Next 4 months)
	Numbers of 4FDC tablets	Numbers of 2 FDC tablets
30-37	2	2
38-54	3	3
55-70	4	4
>70	5	5

Category -II management

Pre-treatment wt	Intensive phase	Continuation phase

(kg)	Daily (First 3 months)	Daily (First 2 months)	Daily (Next 5 months)	
	Numbers of 4FDC tablets	Injection Streptomycin	Numbers of 2 FDC tablets	Numbers of Ehambutol (400 mg) tablets
30-37	2	500 mg	2	2
38-54	3	750 mg	3	3
55-70	4	1 gm*	4	4
>70	5	1 gm*	5	5

4FDC means- 4 fixed drug combination. These 4 drugs are….

1. Rifampicin (R) 150mg
2. Isoniazide (H) 75 mg
3. Ethumbutal (E) 400 mg
4. Pyrazinamide (Z) 275 mg

2 FDC means – 2 fixed drug combination. These 2 drugs are-

1. Rifampicin (R) 150 mg
2. Isoniazid (H) 75 mg.

Q. Why 4 drugs are used in intensive phase?

Ans: To kill rapidly proliferating Mycobacteria.

Q. Why 2 drugs are used in continuation phase?

Ans: To kill the dormant bacteria.

Indication of steroid in management of tuberculosis

Absolute indication

1. Tubercular meningitis
2. Tubercular pericarditis
3. Genitourinary tuberculosis
4. Adrenal tuberculosis
5. Pott's disease

Relative indication

1. Tubercular serositis (pleural effusion, Ascites)
2. Lymph node TB.

Duration of antitubercular drugs in tuberculosis in different sites

1. Pott's disease (9-12 months)
2. Tubercular meningitis (12 months)
3. Lymph node TB (6-9 months)

N:B: It is better to refer the patient to the DOTs corner, with mention category of treatment after diagnosis of tuberculosis, as follows-

To

DOTs center

This is a case of pulmonary TB. Please supply category-I antiTB drugs for 6 months.

With regards

Following advice should be given to the patient taking antitubercular drugs

১। টিবির ঔষধ খাবার পর প্রসাব, পায়খানা, থুথুর রং কমলা হবে, এতে ভয়ের কিছু নাই।

২। চোখ ও প্রসাব হলুদ, বমি, পেট ব্যাথা হলে ঔষধ বন্ধ করে দ্রুত ডাক্তারের পরামরশ নেবেন।

৩। শরীরে লাল দানা, গুটি দেখা দিল্ ঔষধ বন্ধ করে দ্রুত ডাক্তারের পরামরশ নেবেন।

৪। চোখে দেখতে কোন সমস্যা হলে, ঔষধ বন্ধ করে দ্রুত ডাক্তারের পরামরশ নেবেন।

৫। পায়ের বৃদ্ধাংগুল ফুলে গেলে/ব্যাথা হলে, ঔষধ বন্ধ করে দ্রুত ডাক্তারের পরামরশ নেবেন।

৬। ডাক্তারের পরামরশ ছাড়া কখনই ঔষধ বন্ধ করবেন না।টিবির ঔষধের ডোজ সমাপ্ত না করলে, মারাত্নক সমস্যা হতে পারে।

Antitubercular drug induced hepatitis

Diagnostic tools

1. History of taking anti TB drugs (usually <12 weeks duration).

2. Yellow coloration of eye & urine.

3. Anorexia, nausea & vomiting.

4. Investigation- S. bilirubin- increased, SGPT-increased, alkaline phosphatase- normal, exclusion of other causes of hepatitis- by HBsAg, AntiHAV, AntiHEV and USG of hepato billiary system.

Management

Treatment is symptomatic

1. Stop the antiTB drugs till hepatitis subside.

2. Complete bed rest.

3. Diet- normal.

4. Domperidone 10 mg 8 hourly and ondasetron 8 mg 2-3 times daily to control nausea and vomiting.

5. Avoidance of other hepatotoxic drugs like paracetamol, NSAID etc.

Tips:

a) Usually recurrence do not occur in drug induce hepatitis. So, all the antitubercular drugs can restart together, in case of severe hepatitis we can start with less hepatotoxic drug like isoniazid and gradually others.

b) Antitubercular drugs should be restarted when patient symptomatically well and S. bilirubin and SGPT become normal.

c) Where there is no scope to do S. bilirubin and SGPT then antitubercular drugs can be restarted 14 days after the urine or eye become normal.

Asthma

Medicines of asthma can be classified as

A) Relievers (bronchodilator)-those drug relax smooth muscles. Relievers are-

1. Short acting beta 2 agonist (salbutamol)

2. Short acting xanthines (aminophylline) and

3. Anticholinergic (ipratropium)

B) Preventers (antiinflamatory medicine)-those reduce or reverse inflammation in the airways, prevent the initiation of inflammation after exposure to trigger factors and prevent asthma episodes. Preventers are-

1. Corticosteroid (oral or inhaled)

2. Leukotrines antagonists (montelukast)

3. Xanthines (aminophylline and theophylline) also have some weak anti-inflamatory effects.

4. Cromones (e.g. sodium cromoglycate)

C) Protectors (symptom controllers)- are long acting bronchodilators with weak antiinflammatory properties, which prevent recurrence of attacks particularly nocturnal symptoms. Those are- 1. Long acting beta 2 agonist (salmetrol)

2. Long acting xanthines (theophyllines) and

3. Sustained release salbutamol.

In market available inhalers are-

1. Salbutamol inhaler (reliever)-should prescribe in asthma patient who have symptoms like cough, breathlessness.

2. Salbutamol and ipratropium bromide combination inhaler (reliever) - should prescribe in smoker (having productive cough) asthma patient; because ipratropium bromide reduces mucous secretion so reduce sputum production.

3. Beclomethasone inhaler (preventer) - should prescribe in asthma patient who has frequent attack. Beclomethasone will prevent asthma attack.

4. Salmetrol and fluticasone combination inhaler (preventer and protector) - it’s a costly inhaler, should be given in patient who experience frequent attack, attack is usually prolonged, not controlled easily and patient is able to buy it.

Main treatment of asthma is

1) Bronchodilation

2. Identify and avoidance of the allergen that precipitate/aggravate asthma.

Before giving treatment of asthma it is mandatory to classify the severity of asthma patient. For treatment purposes patient may classify as

1. Need only oral therapy-occasional cough on exposure to dust, cold etc but examination of lungs is normal. can be managed by oral theophyline and/or montelukast.

2. Need inhaler-frequent symptoms, bilateral ronchi present (inhaler salbutamol).

3. Need hospital admission-acute severe asthma

4. Need ICU support-life threatening asthma.

N.B:

1. Bronchodilator inhaler (salbutamol) is the first and best

treatment of asthma, because inhaler has no systemic side

effects (e.g. palpitation, tremor of the hands) and acts directly

on lungs.

2. But proper technique of use of inhaler should be shown to

the patient. Respochamber helps to take the inhaler easily.

2. Oral brochodilator therapy (salbutamol, theophylline) has

systemic side effects and efficacy lower than inhaler.

Following advice should be given to the asthma patient:

Dc‡`k

1) aygcvb/ZvgvK/R`©v/¸j e¨envi Ki‡eb bv|

2) †h Lvevi †L‡j (†e¸b, Bwjk gvQ, Miæi gvsm, VvÛv Lvevi LvIqv BZ¨vw`) A_ev hv Ki‡j (ayjvevwj‡Z †M‡j, dz‡ji Kv‡Q †M‡j BZ¨vw`) k¦vm Kó/ Kvwk †e‡o hvq, †m¸‡jv Gwo‡q Pj‡Z n‡e|

3) k¦vm Kó/ Kvwk K‡g †M‡j Bb‡njvi wb‡Ri cÖ‡qvRb g‡Zv †b‡eb|

4) k¦vm Kó/ Kvwk †e‡o †M‡j evi evi Bb‡njvi wb‡eb, GgbwK 5 wgwbU ci ci Bb‡njvi †bqv hvq |

5) Cortan/ Deltasone/ Decason RvZxq Ilya KL‡bvB wPwKrm‡Ki civgk© Qvov Lv‡eb bv |

6) wb‡Pi f¨vKwmb¸wj w`‡q †b‡eb- Influenza vaccine, Pneumococcal Vaccine.

Acute severe Asthma

Diagnostic tools

1. Patient may be diagnosed case of asthma.

2. Patient usually complaint-gradual onset of severe, breathlessness, cough, patient may unable to talk due to breathlessness.

3. On examination-pulse >110/minute, respiratory rate- >25 breaths/ minute, may be cyanosed, bilateral poly phonic rhonchi present, but chest may be silent.

Management

1. Diet- normal

2. O2 inhalation 2-4 L/minute

3. Propped up position

4. Nebulization with normal saline 1.5 cc + salbutamol solution 0.5 cc + ipratropium bromide solution 0.5 cc stat. and 20 minutes interval for 1-2 hour then 1-4 hourly.

5. Inj. Hydrocortisone 100 mg 2 vial IV stat. then 1 vial IV 4-6 hourly.

6. Inhaler salbutamol (100 µgm) 1 puff stat. & 2 hourly

7. Tab. Theophylline 200 mg 1 tablet stat and 12 hourly.

8. Tab. Montelukast 10 mg 1 tablet at night.

9. If not controlled with above treatment-intravenous aminophylline drip (Infusion 5% DA 500 + Inj. Aminophylline 2 amp. iv@ 30-35 drops per minute stat. (Aminophylline is a narrow therapeutic index drug, so always try to avoid it).

10. Intravenous magnesium may be necessary (Inj. Nalepsin ½ bottle iv @ 8 drops per minute stat and BD for 3 days). (renal function should check before giving magnesium).

11. Identification and treatment of the cause of exacerbation.

Tips:

* IV hydrocortisone can be replaced by oral steroid after 24-48 hours.

* After controlling symptoms omit the oral steroid first, then oral theophylline and monteleukast. Inhaler should be continued.

* Bronchodilator (salbutamol) inhaler relieves breathlessness and cough and mainstay of treatment of acute stage.

* Steroid inhaler (beclomethasone) prevents attack; need to prescribe who experience frequent attack.

COPD

Before giving treatment of COPD it is mandatory to classify the severity of COPD patient. For treatment purposes patient may classify as

1. Need only oral therapy-occasional SOB on exertion, examination of lungs-vesicular with prolonged expiration, few or no ronchi. Can be managed by oral theophyline

2. Need inhaler-frequent symptoms (SOB & cough), bilateral ronchi present (inhaler salbutamol).

3. Need hospital admission-acute exacerbation of COPD.

4. Need ICU support-life threatening attack.

N:B: Inhaler is the first and best treatment option in COPD, because no systemic side effects and acts directly on lungs. Oral therapy has systemic side effects and efficacy lower than inhaler. But proper technique of use of inhaler should be shown to the patient. Use of a respochamber to take inhaler is much easier for the patient.

Indication of antibiotic in COPD patient

1. If patient have fever

2. Recent increase in volume of cough

3. If patient complaints productive cough, which is foul smelling, purulent

4. If patient have other systemic symptom like anorexia, vomiting etc.

Following advice should be given to the COPD patient:

Dc‡`k

1) aygcvb/ZvgvK/R`©v/¸j e¨envi Ki‡eb bv|

2) k¦vm Kó/ Kvwk K‡g †M‡j Bb‡njvi wb‡Ri cÖ‡qvRb g‡Zv †b‡eb |

3) k¦vm Kó/ Kvwk †e‡o †M‡j evi evi Bb‡njvi wb‡eb, GgbwK 5 wgwbU ci ci Bb‡njvi †bqv hvq |

4) Cortan/ Deltasone/ Decason RvZxq Ilya KL‡bvB wPwKrm‡Ki civgk© Qvov Lv‡eb bv| wb‡Pi f¨vKwmb¸wj w`‡q †b‡eb- Influenza vaccine, Pneumococcal Vaccine.

Acute exacerbation of COPD

Diagnostic tools

1. Age > 40 years and patient usually smoker or SLT (jorda, gul etc) users

2. Patient complaint-severe breathlessness with cough, fever may be present.

3. On examination-pulse > 100/minute, respiratory rate- > 25/ minute, patient may be cyanosed, breath sound vesicular with prolonged expiration, bilateral rhonchi & creps present.

Management

1. Diet- normal

2. O2 inhalation 1-2 L/minute

3. Propped up position

4. Nebulization with normal saline 1.5 cc + salbutamol solution 0.5 cc + ipratropium bromide solution 0.5 cc stat. and 20 min interval for 1-2 hour then 1-4 hourly.

5. Injection hydrocortisone 100 mg 2 vial IV stat. then 1 vial IV 4-6 hourly.

6. Inhaler salbutamol & ipratropium bromide combination 2 puff stat. & 2 hourly.

7. Theophylline 200 mg BD (better avoid in acute condition due to narrow therapeutic index).

8. Antibiotic

N.B:

* IV hydrocortisone can be replaced by oral steroid after 24-48 hours.

* Antibiotic should be other than the previous one that was used in last 3 months.

* After controlling symptoms omit the oral steroid first, then oral theophylline and monteleukast. Inhaler should be continued.

* Bronchodilator (salbutamol) inhaler relieves breathlessness and cough and mainstay of treatment.

* Steroid inhaler (beclomethasone) prevents attack; need to prescribe who experience frequent attack.

Pneumothorax

Diagnostic tools

1. Sudden onset of severe unilateral chest pain and SOB.

2. On examination-respiratory rate increased, cyanosis may be present, shock may be present, breath sound absent and hyperresonant percusiion in the affected side.

3. Investigation-CXR (P/A)-revealed increase translucency, loss of vascular markings and collapse lung margin.

Management

1. Bed rest.

2. O2 inhalation 2-4 L per minute.

3. Treatment of the underlying cause if any e.g. pnemonia, COPD etc.

4. Primary pneumothorax, in which the lung edge is less than 2 cm from the chest wall and the patient is not breathless, normally resolves without intervention.

5. Water sealed drainge (percutaneous needle aspiration)- Indication:

i. In young patient presenting with a moderate or large spontaneous primary pneumothorax.

ii. Immediate decompression prior to definitive therapy (IT tube drainge) in tension pneumothorax.

iii. In open or close pneumothorax- patient age <50 years with pneumothorax >15% of hemithorax or significant dysponea.

6. Intercostal tube drainge

i) Tension pneumothorax.

ii) Pneumothorax with underlying chronic lung disease e.g. COPD.

iii) In open or close pneumothorax -patient age >50 years with >15 % of hemithorax or significant dysponea.

iv) When >2.5 L air aspirated or pneumothorax persists after percuteneous needle aspiration (water seal drainage).

7. Surgery in pneumothorax: - pleurodesis. (Can be achieved by pleural abrasion or parietal pleurectomy at thoracotomy or thoracoscopy). Indications are

i) In all patient following a second pneumothorax.

ii) Following first episode of primary pneumothorax.

Advice:

1. Stop smoking

2. Avoid flying 1-2 weeks following full inflation of lung.

3. Diving should avoid, unless a surgical pleurodesis has sealed the lung to the chest wall.

Empyema thorasics

Diagnostic tools

1. Patient presente with productive cough, foul smelling.

2. On examination-temperature raised, clubbing present, features of pleural effusion present.

3. Investigation-CXR (P/A)-features of pleural effusion.

4. Diagnosis confirm by aspiration of pus from pleural cavity. Aspirated pus and sputum should be sent for Gran stain, AFB stain and C/S.

Management

1. Draining of the pus- intercostal tube drainge.

2. Antibiotic for 1-4 weeks-intravenous co-amoxiclav or cefuroxime plus metronidazole (change according to C/S)

3. Surgical intervention- if IT tube not providing drainge, when the pus is thick or loculated.

4. Surgical decortication of lung - if gross thickening of the visceral pleura is preventing re-expansion of lung.

Sarcoidosis

Diagnostic tool

1. Most of the case diagnose in routine chest X-ray-BHL (bilateral hilar lymphadenopathy). Patient may present with -fever, cough, chest pain, SOB, joint pain etc.

2. On examination-erythema nodosum.

3. Investigation-CXR (P/A)- bilateral hilar lymphadenopathy. Lymphopenia is characterestics. Diagnosis is confirmed by bronchoscopy which demonstrate a ‘cobblestone’ appearance of the mucosa, and bronchial and transbronchial biopsies usually show non-caseatin granuloma.

Management

1. Avoid sun light exposure

2. NSAID for erythema nodosum. A short course of glucocorticoids may be given.

3. Steroid- prednisolone 20-40 mg/day

Indication:

a) Symptoms severe

b) Hypercalcaemia

c) Pulmonary impairement

d) Renal impairement

e) Uveitis

4. Inhaler corticosteroid in asymptomatic parenchymal sarcoid

5. Topical steroid for mild uveitis

6. Severe disease - MTX 10-20 mg / week

-Azathioprine 50-150 mg/day

-Specific TNF alpha inhibitor

7. Cuteneous sarcoid

b) Chloroquine

c) Hydroxychloroquine

d) Low dose thalidomide

Pulmonary hypertension

Diagnostic tools

1. PH presents insidiously and is often diagnosed late. Typical symptoms include breathlessness, chest pain, fatigue, palpitation and syncope.

2. On examination- elevation of the JVP, parasternal heave, loud pulmonary component of the second heart sound and a right ventricular third heart sound. Signs of interstitial lung disease or cardiac, liver or connective tissue disease may suggest the underlying cause.

3. Investigation-PH is suspected if an ECG shows a right ventricular ‘strain’ pattern or a chest X-ray shows enlarged pulmonary arteries, peripheral pruning and right ventricle enlargement. Doppler assessment may estimate the pulmonary artery pressure, right heart catheterization confirm diagnosis and guide therapy.

Management (management should be in specialized center)

1. O2 inhalation

2. All patient should be anticoagulant with warfarin

3. Diuretic

4.Digoxin-in patients who develop atrial tachyarrhythmias.

5. Specific treatment

a) High dose calcium channel blocker e.g. amlodipine

b) Prostaglandins such as epoprostenol (prostacyclin) or iloprost therapy

c) PDE inhibitor- sildenafil

d) Oral endothelin antagonist- bosentan

6. Atrial septostomy

7. Pulmonary thromboendarterectomy

8. Heart- lung transplantation.

9. All patient should avoid excessive physical activity, woman should avoid pregnancy.

10. Avoid nitrates, betablocker, cyclizine.

11. Pneumococcal and influenza vaccination.