Common Presenting Conditions and Opportunistic Infections in Paediatric HIV
Conditions common in HIV positive children but ALSO common in ill HIV negative children

- Chronic ear infection
- Persistent or recurrent diarrhoea
- Severe pneumonia
- Tuberculosis (all kids with TB need to get HIV test)
- Bronchiectasis
- Failure to thrive
- Severe malnutrition
Conditions common in HIV positive Children but **UNCOMMON** in HIV negative Children

<table>
<thead>
<tr>
<th>Condition</th>
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<tbody>
<tr>
<td>Severe/recurrent bacterial infection</td>
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<tr>
<td>Persistent or oral thrush</td>
</tr>
<tr>
<td>Bilateral painless parotid swelling</td>
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<tr>
<td>Generalised lymphadenopathy other than inguinal</td>
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<tr>
<td>Hepatosplenomegaly</td>
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<tr>
<td>Persistent or recurrent fever</td>
</tr>
<tr>
<td>Neurological dysfunction</td>
</tr>
<tr>
<td>Herpes zoster-single dermatome</td>
</tr>
<tr>
<td>Persistent generalised dermatitis not responding to treatment</td>
</tr>
</tbody>
</table>
Conditions VERY SPECIFIC to HIV+ Children

- Pneumocystis jirovecii pneumonia (PCP)
- Oesophageal candidiasis
- Extrapulmonary cryptococcosis
- Invasive salmonella infection
- Lymphoid interstitial pneumonitis (LIP)
- Lymphoma
- Kaposi’s sarcoma
- Herpes zoster affecting several dermatomes
Conditions Common to the Following Systems:

1. Respiratory
2. Gastrointestinal
3. Skin
4. Central Nervous System
## 1. Common Respiratory Conditions

<table>
<thead>
<tr>
<th>Condition</th>
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<tbody>
<tr>
<td>Severe/ recurrent or chronic pneumonia</td>
</tr>
<tr>
<td>Pneumocystis carinii (jirovecii) pneumonia</td>
</tr>
<tr>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Bacterial ear infections</td>
</tr>
<tr>
<td>Lymphoid interstitial pneumonitis</td>
</tr>
<tr>
<td>Chronic lung disease especially bronchiectasis</td>
</tr>
</tbody>
</table>
Community Acquired Pneumonia (CAP)

Suspect pneumonia in children:
- Fever
- Cough
- Respiratory distress (breathlessness and chest recessions)
- Refusal to feed or drink
- May become cyanosed
- Chest pain may be present
## Community Acquired Pneumonia (CAP)

### Causes:

<table>
<thead>
<tr>
<th>Age</th>
<th>Organisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2mo</td>
<td>Gram -ve bacteria, Group B Strep, S. aureus, C. trachomatis, viruses, PCP</td>
</tr>
<tr>
<td>2 mo – 5 years</td>
<td>S. pneumoniae, H. influenzae, S. aureus, viruses, PCP</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>As for 2mo – 5yr AND M. pneumoniae and C. pneumoniae, PCP</td>
</tr>
</tbody>
</table>
Community Acquired Pneumonia (CAP)

**TREATMENT:**

**Out-patient**
- Amoxycillin (5 days)

**Inpatient**
- IV Ampicillin + Gentamicin (5-7 days) **OR**
- Cefuroxime/Cefotaxime/Ceftriaxone (5-7 days)
- Oxygen, Fluids, Monitoring
- Investigations
  - CXR, Bloods, Tuberculin Skin Test (PPD) + AFB (GW, Sputum), & TB culture, (nasopharyngeal aspirate for ? PCP)
Empirical ABO Treatment

Empirical Antimicrobial Therapy For Paediatric Pneumonia

<table>
<thead>
<tr>
<th></th>
<th>Ambulant</th>
<th>Hospitalised</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 mo.</td>
<td>Recommended hospitalize all children less than Less than 2 months of age</td>
<td>1. Ampicillin/penicillin iv + aminoglycoside iv or 2. Ceftriaxone/cefotaxime iv</td>
</tr>
<tr>
<td>3mo.-5yrs</td>
<td>1. Amoxicillin po high dose</td>
<td>1. Ampicillin iv/amoxicillin po high dose or 2. Cefuroxime/amoxicillin-clavulanic acid po or iv</td>
</tr>
<tr>
<td>5yrs onwards</td>
<td>1. Amoxicillin po high dose</td>
<td>1. Ampicillin iv/amoxicillin-clavulanic acid po iv or 2. Cefuroxime iv/amoxicillin-clavulanic acid po or iii</td>
</tr>
<tr>
<td></td>
<td>2. Macrolide po (erythromycin/clarithromycin/azithromicyn)- if suspect Mycoplasma pneumoniae or Chlamydia spp.</td>
<td>3. Cefotaxime/ceftriaxone iv Add: cloxacillin if suspect Staphylococcus aureus</td>
</tr>
</tbody>
</table>

- Add cotrimoxazole if PCP is suspected in an HIV-exposed child < 1 yr of age or in any HIV-infected child not taking PCP prophylaxis and NOT on HAART.
- Add a macrolide if *C. trachomatis* is suspected in children < 6 months
**Pneumocystis jirovecii Pneumonia (PCP)**

Suspect a PCP infection if the child:
- <12 months old
- Has severe tachypnoea
  - (> 50 breaths/minute in infants, >40 breaths/minute in children)
- Is dyspnoeic
- Has few crackles relative to degree of dyspnoea and decreased breath sound intensity on auscultation
- Has cyanosis

Begin treating for PCP immediately on suspicion (in addition to usual treatment of pneumonia), even if the HIV status of the child is not yet known.
**Pneumocystis jirovecii Pneumonia (PCP)**

- Requires admission
- Maximal oxygen supplementation
- NPO for first 24-48hrs / NGT feeds
- Cotrimoxazole
  - **Loading** dose 10mg/kg IVI or 20mg/kg oral
  - **maintenance** of 5mg/kg qid X 21days
- Prednisone 1mg/kg tapered x 14 days (up to 21d)
- Adequate fluids, but do not over hydrate!
**Pneumocystis jirovecii** Pneumonia (PCP)

<table>
<thead>
<tr>
<th></th>
<th>Primary PCP</th>
<th>Secondary PCP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>3-6 months</td>
<td>&gt; 1 year</td>
</tr>
<tr>
<td><strong>CD4</strong></td>
<td>Any CD4</td>
<td>&lt; 15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 200</td>
</tr>
<tr>
<td><strong>Nutrition</strong></td>
<td>Often good</td>
<td>Often wasted</td>
</tr>
<tr>
<td><strong>Stigmata of HIV</strong></td>
<td>Often absent</td>
<td>Often present</td>
</tr>
</tbody>
</table>

- **Dosage of Co-trimoxazole**: 150mg/m² Trimethoprim component daily or 3X a week (~5mg/kg/dose of Trimethoprim component)
- Co-trimoxazole syrup=40mg Trimethoprim and 200mg Sulfamethoxazole per 5ml
- Co-trimoxazole tablet=80mg Trimethoprim and 400mg Sulfamethoxazole
- **Alternative**: Dapsone 2mg/kg/dose daily
- Or 4mg/kg/dose weekly
Lymphoid Interstitial Pneumonitis (LIP)

- Age usually greater than 2 years

- Suggestive CXR findings:
  - bilateral reticulonodular infiltrates
  - mediastinal lymphadenopathy
  - indistinguishable from miliary TB

- Child with slowly progressive hypoxia, tachypnoea and exertion fatigue.

- Child with clubbing and enlarged parotid glands
Parotid enlargement is one of the minor HIV-related conditions in children; it is rarely seen in adults.
LIP Treatment

No treatment for asymptomatic LIP

Symptomatic LIP - i.e. oxygen sats < 92% or developing signs of cor pulmonale:

- Prednisone 2mg/kg x 4 weeks then taper dose.
- Need to exclude PTB and/or treat prior to steroid use
- Indication for HAART – to decrease need for steroid
Acute Otitis Media (AOM)

- **Frequent** childhood illness
- **Aetiology** –
  - *S. pneumoniae*,
  - *non-typable Haemophilus influenzae*
  - and *Moraxella catarrhalis*
- **HIV** –
  - recurrent / persistence (chronic)
  - (WHO Stage II condition)
OTITIS MEDIA

Wicking the child's ear dry in chronic otitis media
Acute Otitis Media (AOM)

- **Initial ABO treatment**
  - Amoxicillin
  - high dose - 90mg/kg/day x 5-7 days

- **Analgesia**
  - Paracetamol
  - 10-15mg/Kg per dose 8 hourly)
Acute Otitis Media

Failed Initial Therapy:

- Amoxycillin-clavulanate, plus additional amoxyllin (to a total dose of amoxycillin of 90 mg/kg/day) divided into 2 or 3 doses for 5-7 days failed therapy with amoxycillin alone.

- Ceftriaxone, intravenous (IV) or intramuscular (IM), 50-75 mg/kg once daily for 3 days. This is also recommended in the case of isolate of known high-level antibiotic resistance and in severe presentations, e.g. threatened mastoiditis.
Chronic Suppurative Otitis Media

- Dry mopping
- Commonly caused by Pseudomonas Spp
- Most oral antibiotics don’t cover Pseudomonas
- Use oral Ciprofloxacin (± Macrolide)x10-14 days
- ART
- ENT opinion if not responding to above measures
2. Common Gastrointestinal Conditions

- Oral candidiasis (thrush) - Uncommon in children who are HIV negative
- Oesophageal candidiasis
- Herpes stomatitis
- Acute diarrhoea
- Chronic diarrhoea
Oral Candidiasis

• Common paediatric finding in young infants
• The most common fungal infections among HIV-infected children are caused by Candida species
• Oral thrush and diaper dermatitis occur among 50%–85% of HIV-infected children
• Candida albicans is the most common cause of mucosal and oesophageal candidiasis.
Oral Candidiasis

Median Rhomboid Glossitis

Angular Cheilitis
Oropharyngeal Candidiasis (OPC) Treatment

• Oral
  – Nystatin 6hrly
  – Daktarin oral gel tds
  – Fluconazole 3-6mg/kg daily x 7-14 days

• Oesophageal
  – Fluconazole 3-6mg/kg daily x 7-14 days
  – Low dose Amphoteracin B (0.3mg/kg/day)x> 7 days

• Systemic
  – Amphoteracin B (0.5-1.5mg/kg/day)x> 2-3 weeks
Herpes Stomatitis

- Caused by Herpes simplex virus
- Affects the oral cavity
- Difficulty in feeding
- Needs admission if child not drinking - > will dehydrate

**Acyclovir** oral dose in:
- > 2yrs 400mg 8hrly/ 200mg 5x day for 10 days
- < 2yrs half dose: 200mg 8hrly for 10 days
Gastroenteritis

- Malabsorption
  - G/E – viral, bacterial, fungal, parasitic
- Antibiotic associated super-infection
- Acute Vs Chronic (< or > 2 weeks)
- Other – e.g. TB abdomen/MAC
**Acute Gastroenteritis**

**In-patient**
- IVI rehydration
- Exclude UTI in all cases of chronic GE, consider in others
- Treat electrolyte disturbances – Na/K
- Continue oral feeds and maintain nutrition
- Antibiotics for other co-existing indication (not acute GE)

**Out-patient**
- Oral rehydration
- Continue oral feeds and maintain nutrition
Chronic Gastroenteritis

Out-patient?

- Rehydration and treat electrolyte problems - Na/K
- Search for cause - Stools for mc&s + parasites + Clostridium Difficle and lactose test. Urine for mc&s
- Remember abdominal TB or MAC (abdo sonar +/- CT scan)
- Bowies regime – Trial of Genta/Metronid/Cholestyr
- Continue oral feeds and maintain nutrition

In-patient
### 3. Common Skin Conditions

- Pruritus papular urticaria
- Severe molluscum contagiosum
- Severe candidiasis or nappy rash, which may ulcerate
- Widespread warts
- Severe chicken pox or shingles due to varicella zoster virus
- Severe scabies, which may involve the whole body
- Severe tinea capitis (ringworm)
- Severe impetigo
- Severe seborrhoeic dermatitis
Skin Conditions

If a relatively common condition is:

• ATYPICAL or
• SEVERE & EXTENSIVE or
• REFRACTORY TO CONVENTIONAL Rx or
• RECURRENT

THEN CONSIDER AN UNDERLYING IMMUNE DEFICIENCY
Skin Conditions

INFECTIOUS:

• Scabies (*Sarcoptes scabiei*):
• Molluscum contagiosum (*DNA pox virus*)
• Human Papillomavirus (*HPV*)
• Shingles (*Varicella-Zoster*)
• Dermatophytosis eg *Tinea capitis*
Scabies

- Ascabiol
- Sulphur ointment 5%
Extensive Human papilloma virus infection

Management
• Podophylin
• Electrocautery
• Cryocauterity
• Surgery
• Imiquimod (Aldara)
• ART
Molluscum Contagiosum

- Cryotherapy
- Laser

- Curetage
- Recurs
- HAART
CHICKEN POX
Shingles

- Acyclovir
- Adequate Analgesic: Paracetemol/ibuprofen
- Cold compresses
- Calomine lotion
Ringworm

- Whitfield ointment
- Griseofulvin
IMPETIGO

**Causes:**
- Staph. aureus
- Strep. pyogenes

**Treatment:**
- Mupirocin (Bactroban) topical
- Flucloxacillin oral
Skin Conditions

INFLAMMATORY NON-INFECTIONOUS

- Seborrhoeic Dermatitis
- Eosinophilic Folliculitis
- Atopic Dermatitis
- Psoriasis (uncommon)
Seborrhoeic Dermatitis

- Betamethasone valerate 0.1% in aqueous cream
- Emollients-Ung emulsificans (UE)
- Topical Steroids
- Topical antifungals

- Antifungal shampoo twice weekly
- Grizeofulvin po for 6-8 weeks
DERMATITIS (Skin Rash)

- Betamethasone valerate 0.1% in aqueous cream
- Wash with UE (emulsifying ointment)
- Emoillent
Papular Pruritic Eruption

- Hypersensitivity to insect bites

**Management:** Avoidance of insect bites

HAART

PPE often leaves behind persisting changes in pigmentation. On dark skin, hypopigmentation may catch the eye (left), whereas on white skin, hyperpigmentation may be more striking.

Picture Credit: Dr. Sirisathana

www.aids-images.ch
4. CENTRAL NERVOUS SYSTEM (CNS)

**Direct effect of virus**
- HIV Encephalopathy

**Indirect effect**
- Secondary to illnesses and therefore delayed development

**Opportunistic infections**
- Viral, bacterial, fungal, parasitic meningitis

**Neoplasia**
- Lymphoma, Kaposi Sarcoma
CNS Presentations

- Bacterial meningitis
- TBM
- Cryptococcus
Bacterial Meningitis

- Fever, headache, nausea, vomiting
- Neck stiffness, photophobia, irritability, altered level of consciousness, convulsions
- Babies: poor feeding, lethargy, apnoea, bulging fontanelle

- Most common causes: *Strep. Pneumoniae* (Pneumococcus), *Haemophilus influenzae*, *Neisseria meningitidis* (Meningococcus)
Bacterial Meningitis.

- LP: if there are no focal signs or papilloedema
- CSF protein raised, glucose low, polymorphonuclear cells and positive bacterial culture
- IVI Ceftriaxone 100mg/kg daily, in neonates Ampicillin and Gentamicin
- Treat shock, fever and exclude and treat hypoglycaemia
TBM (TB Meningitis)

- Polymorphs initially, then lymphocytes, low glucose and increased protein
- CSF ADA not sensitive or specific
- Start empiric anti-TB treatment on clinical suspicion
- CSF mycobacterial culture: gold standard, 4-6 weeks
Cryptococcus Meningitis

- Uncommon in children, occurs in older children with very low CD4 counts
- Typical features of meningism are often absent
- Fever, headache, nausea, vomiting
- Decreased level of consciousness, behaviour changes or even psychosis
- Focal signs and seizures may be present
Cryptococcus...

- CSF: cell counts may be in normal range or mildly raised, glucose low, protein raised, high opening pressure
- Positive Cryptococcus neoformans culture
- Positive Indian ink, not sensitive
- CSF cryptococcal antigen test, sensitive, remains positive for long

**Treatment:**
- Amphotericin B
- Fluconazole
Meningococcal Meningitis
HIV Encephalopathy

- Indicates advanced clinical disease (WHO IV)
- HAART indicated with good but variable result and reversibility

**Diagnosis:**

- Take a good birth history
- Slow achievement or loss of milestones or loss of intellectual ability
- Acquired microcephaly
- Acquired symmetrical motor deficits in an alert child - increased tone, pathologic reflexes, ataxia, gait disturbances, paresis
- CSF is normal or has non-specific findings
- CT scan shows diffuse brain atrophy
- Rule out CNS infections/conditions
Opportunistic Infections

- Infections which do not occur normally in children with healthy immune systems
- Term used for AIDS defining infections/ all infections seen in HIV-infected children.
“BCGosis”

- BCG (Bacille Calmette Guerin)
- Routine vaccine at birth
- Given to **ALL** babies
- “BCGosis” = “BCGitis” may be localized or generalized (disseminated)
- Occurs in both HIV infected and non-infected children
- May occur prior to HAART or as IRIS
Adverse Reactions to BCG

Local: abscess, ulceration, keloid formation

Regional: lymphadenitis, fistulation, osteitis

Systemic: disseminated BCGosis

Other: lupus vulgaris, erythema nodosum, iritis
BCG Adenitis
Lymphadenitis after AZT/3TC
Treatment of BCGitis

- **INH + Rifampicin + Ethambutol** X6 months
- Disseminated BCG may require longer treatment
- Does not respond to Pyrazinamide (PZA)
- Large swellings that are fluctuant may need aspiration.
- Usually respond to medical management.
- Uncommonly referred to surgeons.
- If unsure consult a Paediatrician or ID expert
Mycobacterium Avium Complex Disease (MAC)

- M. avium
- M. intracellulare
- M. paratuberculosis
- Disseminated infection with MAC in pediatric HIV infection rarely occurs in infancy
- Frequency ↑ with age and declining CD4 count,
MAC Risk in Children

Age-related CD4+ cell counts levels considered as high risk for MAC warranting consideration of prophylaxis are:

- <750/μL among HIV-infected children <1 yr old
- <500/μL for children aged 1–2 years
- <75/μL for children aged 2–6 years; and
- <50/μL for children aged >6 years
Signs & Symptoms of disseminated MAC

- Recurrent fever
- Weight loss or failure to thrive,
- Night sweats
- Fatigue
- Chronic diarrhoea
- Malabsorption
- Abdominal pain - persistent or recurrent
- Lymphadenopathy, hepatomegaly, and splenomegaly
Laboratory abnormalities include

- Anemia
- Leukopenia,
- Neutropaenia
- Thrombocytopenia.
- Serum chemistries are usually normal, although certain children might have elevations in Alkaline Phosphatase (ALP) or Lactate Dehydrogenase (LDH).
Diagnosis of MAC

- Definitive diagnosis is accomplished by isolation of the organism from the BLOOD or from BIOPSY SPECIMENS from normally sterile sites (e.g. bone marrow, lymph node, or other tissues).
- Multiple mycobacterial blood cultures over time might be required to yield a positive result.
Treatment of MAC

- Consult a pediatric infectious disease specialist
- Combination therapy with a minimum of 2 drugs is recommended (Macrolide + Ethambutol)
- May add third drug especially initially such as Aminoglycoside for in-hospital patients OR Ciprofloxacin
- Azithromycin may be used instead of Clarithromycin but more expensive
- Clarithromycin has interactions with ART therefore use Azithromycin

Monotherapy with a macrolide results in emergence of high-level drug resistance within weeks!
Drugs

- Macrolide (azithromycin, clarithromycin)
- Ethambutol
- +- Rifabutin

Consider aminoglycoside (amikacin, streptomycin)
Consider quinolone (ciprofloxacin)
| Prophylaxis | Azithromycin weekly | Clarithromycin bd | Or Rifabutin | Give if CD4 < 50 cells/μl | Discontinue if CD4 > 100 cells/μl | No data available about the benefits of giving prophylaxis if GIT and respiratory colonisation detected |
QUESTIONS?
What I Will Do Differently

1.
2.
3.
With thanks to: