You can find fungus everywhere in both indoor and outdoor environments, and half of these fungi can threaten our health. If you find yourself dealing with a fungal infection, many complementary and alternative health options exist for fungal infection treatment.

Atypical MYCOBACTERIUM are obligate saprotrophic aerobes that can be found in the environment in soil, water, vegetables, and even in domestic animals and dairy products. Entry into hosts is usually via the gastrointestinal tract, but also can be via the lungs.

The MAC causes fevers, diarrhea, malabsorption and anorexia, and can disseminate to the bone marrow. Therapy for MAI is typically resistant to standard mycobacterial therapies.

Medicine has little they can do except for very harsh drugs that can destroy the liver and the kidney while hurting a 1000 other functions. When I went to med school we called Amphotericin Amp “HO” Terrible because three uses and your liver is gone.

Antibiotics will kill Susceptible + Good Bacteria Thus Resistant Bacteria and Aggressive MYCOBacterium and Fungus spread into the body and environment.

SNthetic AntiBiotics Destroy the Healthy Bowel Flora and this compromises B Vitamin absorption which leads to depression, dermatitis, dementia, and distorted thinking. Then the witless allopath prescribes another SNthetic for the mental abnormality and this will affect the liver leading to another drug, and another drug, and another drug, and another drug, and another drug, and another drug.

With the cost of bringing a drug to market at over 1.5 million dollars, When will we see the ludicrous folly.
MYCOBACTERIUM are half fungus (hence the MYCO) and half Bacteria. They feed with fungal mycelia and reproduce like bacteria. Many Rickettsia like Rocky Mountain Spotted Fever and Legioner’s disease are similar. They get into the lungs via breath and the Immune System must manage them. Over use of antibiotics and other SINthetic drugs contribute to this lung disease. Many Rickettsia are similar.

This article will show that we all have a multitude of fungi in our lungs.

Fungi in Lungs May Hold Asthma Treatment Clues

Wednesday 20 February 2013 - 12am PST

There was a time when we assumed the insides of our lungs were devoid of life, apart from our own cells helping us breathe. But now we learn that the lung is home to a wide range of organisms, including fungi. A new study finds that people with asthma have a different blend of fungi in their lungs compared to healthy people who do not have asthma, leading the researchers to suggest this could be a useful avenue for developing new treatments.

The team, from the School of Medicine at Cardiff University in the UK, reports the study, the first large one of its kind, in the 5 February online issue of *BMC Infectious Diseases*.

Study leader, Hugo van Woerden from Cardiff University’s Institute of Primary Care and Public Health, says in a statement: "Our analysis found that there are large numbers of fungi present in healthy human lungs. The study also demonstrates that asthma patients have a large number of fungi in their lungs and that the species of fungi are quite different to those present in the lungs of healthy individuals."

He and his colleagues suggest the hundreds of tiny fungal particles they found in the lungs of asthma patients could hold new clues for treating the respiratory illness. For their study, they examined the mucus or sputum of people with and without asthma, drawn from the same community.

They found a total of 136 different species of fungi across both groups, with 90 more common in the people with asthma and 46 more common in the healthy people without asthma.

"Of particular interest was the presence of *Malassezia pachydermatis*, which is known to be associated with atopic dermatitis", notes the team.
Desire’ Treatment protocol for Myco-Bacterium and Lung Fungus

1. Clean up your environment completely
2. Use a scented candle to carry treatment herbs to the lungs, best herbs citronella, teat tree oil, pau d’ arco, oregano oil, garlic, neem, orange oil.
3. Replenish bowel flora
4. Increase immune system, reduce stress + toxicity,
5. Exercise to clean, detox and burn up the lung infection.
6. Avoid sugar, high glycemic foods, synthetic antibiotics,
7. Treat cough and all symptoms with natural products as much as can be done. Load up on natural herbs
8. SCIO Zap fungus, and treat immune deficiency
9. Safe inhalant of OTC antifungal skin sprays with Micafungin, bifonazol, Clotrimazole, Econazole etc
   Spray into a bag inhalant deep into lungs only once a week to kill fungal complications. Not more than 4 times a year. Be careful this is an extreme measure
**Mycobacterium leprae**

- Slow growing, acid fast, rod shaped bacillus
- Discovered in 1873 by Armauer Hansen
- First bacterium to be shown to cause disease in humans
- No in-vitro cultivation
- Humans and armadillo are only known natural hosts

---

**Mycobacterium tuberculosis—Characteristics**

- Gram positive
- Obligate aerobe
- Non-spore-forming
- Non-motile rod
- Mesophile
  - 0.2 to 0.5 x 2-3 μm
- Slow growth time: 15-20 hours
- May contribute to violence
- Lipid-rich cell wall contains mycolic acid—50% of cell wall dry weight
- Responsible for many of this bacterium’s characteristic properties
- Acid fast
- Codifies resistance to detergents, antibiotics

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**Mycobacterium smegmatis colonies on agar medium**
(colony diameter c.1.5-6 mm).

One of the colonies expresses a cloned β-galactosidase gene and converts XGaL from the agar medium to an insoluble blue dye.

---

**Sporulating colonies of Streptomyces glaucescens**
(colony diameter c. 1-4 mm).

This strain produces streptomycin, which was the first antibiotic that was effective against *Mycobacterium tuberculosis*. 
Over Use of Antibiotics has Made Fungal Infections Accelerate

Antibiotics will kill Susceptible + Good Bacteria Thus Resistant Bacteria and Aggressive MYCOBacterium + other Fungus spread into the body + environment.

- via animal waste to soil and water
- to fish, fruits, and vegetables sold as food
- via farm workers and food processors
- via contaminated meat products
- to other animals on the farm
- to the general population, in whom antibiotic-resistant infections and Fungus may develop
SINthetic AntiBiotics Destroy the Healthy Bowel Flora and this compromises B Vitamin absorption which leads to depression, dermatitis, dementia, and distorted thinking. Then the witless allopath prescribes another SINthetic for the mental abnormality and this will effect the liver leading to another drug, and another drug, and another drug, and another drug, and another drug.

ANTIBIOTIC DISRUPTION OF BOWEL FLORA

Antibiotics as a co-factor in AIDS

By: W. Nelson, LPCC, M.D.

ABSTRACT

The antibiotic revolution was touted as one of the best discoveries of modern medicine. There have been however, a derogatory side effects of these antibiotics. The environment has been effected as well as the patients. In this article we look at the disruption of the bowel flora by antibiotics. And theorize about how this disruption of the bowel flora, could be a contributing factor to the AIDS epidemic. The article also reviews the bowel flora in naturopathic terms for treatment and diagnosis.
Anti-Biotics Kill the Friendly Bacteria and the Unfriendly Bacteria not AntiBiotic Resistant, then Fungus Flourishes, Vitamin Absorption is Upset and All Disease has an Open Door

Friendly Bacteria
L. acidophilus, L. salivarius, L. casei, L. thermophilus, B. bifidum, B. longum, etc.

Unfriendly Bacteria
Pathogenic bacteria & fungi, such as Candida albicans, etc.
One scented candle in a room can kill clinging bacteria and fungus on the walls and in the air. Use this as a carrier for herbs. If you use Tea Tree oil, Oregano and Pau D’ Arco oil in the candle it can be carried into the lungs via the air to kill the Mycobacterium.
Eucalyptus, Peppermint, Wintergreen in a candle can increase the vaso-dilation of the lungs to carry the herbs deeper to kill fungus, treat cancer, and or remedy other lung diseases.
Exercise and Conditioning are the best ways to fight Asthma, you must calmly learn to Stuggle Slowly and Overcome the Asthma, Many World Class runners had Asthma as a Child and Learned to Run Through Asthma and Burn away the Lung Fungus.
MYCOBACTERIUM

Atypical MYCOBACTERIUM are obligate saprotrophic aerobes that can be found in the environment in soil, water, vegetables, and even in domestic animals and dairy products. Entry into hosts is usually via the gastrointestinal tract, but also can be via the lungs.

The MAC causes fevers, diarrhea, malabsorption and anorexia, and can disseminate to the bone marrow. Therapy for MAI is typically resistant to standard mycobacterial therapies.

They are half fungus (hence the MYCO) and half Bacteria. They feed with fungal mycelia and reproduce like bacteria. They get into the lungs via breath and the Immune System must manage them. Over use of antibiotics and other SINthetic drugs contribute to this lung disease.

This article will show that we all have a multitude of fungi in our lungs.

MAC bacteria are common in the environment and cause infection when inhaled or swallowed. Symptoms are reminiscent of tuberculosis (TB), and include fever, fatigue, and weight loss. Many patients will have anemia and neutropenia if bone marrow is involved. Pulmonary involvement is similar to TB, while diarrhea and abdominal pain are associated with gastrointestinal involvement. MAC bacteria should always be considered in a person with HIV infection presenting with diarrhea. Recently, M. avium has been found to deposit and grow in bathroom shower heads from which it may be easily aerosolized and inhaled.\(^2\)

"Lady Windermere syndrome" describes infection in the lungs due to MAC.\(^5\) It is named after a character in Oscar Wilde’s play Lady Windermere’s Fan.\(^6\)

The various subspecies of M. avium are prevalent in different areas:

- M. a. avium (MAA) primarily affects birds, but has also been found in ruminant mammals, especially deer.
- M. a. paratuberculosis (MAP) causes paratuberculosis, or Johne’s Disease, and also is usually found in mammals.

MAI is most common in immunocompromised individuals, root canal patients, the over stressed undernourished, or the high SOC Index patients also including senior citizens and those suffering from HIV or cystic fibrosis; however, these diseases, particularly Lady Windermere syndrome, do not require the individual to be completely immunocompromised.
Adjuvant Cytokine Therapy to Treat Pulmonary Mycobacterium Avium Complex Infection

This study has been completed.

Sponsor:
National Institute of Allergy and Infectious Diseases (NIAID)

Information provided by:
National Institutes of Health Clinical Center (CC)

Mycobacterium avium complex (MAC) are ubiquitous organisms that cause isolated pulmonary disease in otherwise healthy patients with yet undefined susceptibilities. Patients typically present with a history of chronic cough, eventually progressing to hemoptysis, fever, and hypoxia. With half or more of all patients failing standard three-drug therapy, this is an insidious disease with a poor prognosis. Under the natural history protocol of nontuberculous mycobacterial infection (NTM; #01-I-0202), 46 patients with diagnosed pulmonary MAC disease are being studied. Numerous studies have suggested that a dysregulation in cytokine production may make these patients susceptible to mycobacterial infection. Cytokines are particularly important in the activation of macrophages, which help to clear mycobacterial infection. Interferon gamma 1b (Actimmune) and GM-CSF (Leukine) are two cytokine therapies that have been approved in the treatment of chronic granulomatous disease and post-transplantation hematopoietic reconstitution, respectively. A number of in vitro studies suggest that either or both of these therapies may help to clear MAC infection. Given the poor outcomes of therapy and the persistent, debilitating nature of the disease, new therapies are desperately needed, and many are being tried without benefit of scientific foundation. Currently, there are no prospective trials that show any effect of these drugs in the lung delivered subcutaneously. This protocol proposes to perform a pilot study to evaluate the effects, if any, of these macrophage stimulating cytokines in the context of ongoing pulmonary MAC infection.

Comment: Professor of Medicine Desire’ Dubounet, D. Sc. L.P.C.C.
This next article of the medical profession admitting the difficulty they have with Mycobacterium tells us how little they understand lifestyle, exercise, and naturopathy.

Why Can't We Cure Nontuberculous Mycobacterial Lung Disease (yet)?

Date: Friday, May 20, 2011

Speaker: Jakko van Ingen, Resident in Clinical Microbiology, Radboud University Nijmegen Medical Centre
The incidence of disease caused by nontuberculous mycobacteria (NTM) is increasing in most industrialized countries. Factors driving the epidemiology, as well as the most frequent disease manifestations, differ strongly by region. The Mycobacterium avium complex (MAC) bacteria are the predominant causative agents of NTM lung disease in terms of frequency, although other species, e.g. M. kansasii, M. szulgai and, in Europe, M. malmoense seem more pathogenic, as a higher percentage of isolates is related to true clinical disease.

The increase in incidence of NTM disease implies that more and more patients require treatment. Yet, nontuberculous mycobacteria are characterized by high levels of natural drug resistance, including resistance to compounds that make up the core of currently advocated regimens, i.e. macrolides and rifamycins. These levels of natural resistance differ by species and likely impact on the outcome of treatment. Recent pharmacokinetic studies have revealed relatively low serum concentrations of antimycobacterial drugs in patients with MAC disease, which further questions the efficacy of currently recommended regimens. New treatment regimens are needed and should preferably include agents to which no natural resistance exists.

This seminar will discuss possible new treatment regimens, based on recent in vitro and pharmacokinetic data and will explore hypotheses on the background of the differences in natural resistance to antimycobacterial drugs in different NTM species.

The mycobacterium is resistant to nearly all antibiotics and we have tried to eradicate it with no success, the only antibiotic it is sensitive to is Tigecycline and I was only able to tolerate that for about 6-8 weeks before I went into renal failure and lost most of my hearing. The regime consisted of Doxycycline, Clarithromycin, Tigicycline and Amikacin and it didn't touch the atypical, after that I was on long term IV and oral antibiotics for almost 2 years with no success.
1. Medscape Reference - Mycobacterium Avium-Intracellulare Author: Janak Koirala, MD, MPH, FACP, FIDSA; Chief Editor: Burke A Cunha, MD, Updated: Jan 12, 2011


Why over use of Antibiotics has accelerated Fungal Disease
Unnecessary Antibiotic Prescriptions

<table>
<thead>
<tr>
<th>Infection type</th>
<th>Percentage unnecessary Prescriptions</th>
<th>Totals prescribed per year (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ear Infection</td>
<td>30%</td>
<td>23m</td>
</tr>
<tr>
<td>Common Cold</td>
<td>100%</td>
<td>18m</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>80%</td>
<td>16m</td>
</tr>
<tr>
<td>Sore Throat</td>
<td>50%</td>
<td>13m</td>
</tr>
<tr>
<td>Sinusitus</td>
<td>50%</td>
<td>13m</td>
</tr>
</tbody>
</table>

Totals prescribed per year (in millions)

Counseling Points

Pharmacists can give patients the following suggestions to help prevent antibiotic-resistant infections:

- Talk with health care providers about antibiotic resistance and ask whether an antibiotic is likely to be beneficial for your condition.
- Ask what else can be done to help you feel better sooner.
- Do not take an antibiotic for a viral infection (e.g., cold, flu).
- Do not save antibiotics for the next time you get sick.
- Take an antibiotic exactly as prescribed.
- Do not take an antibiotic prescribed for someone else.

Source: Reference 21.
The Benefits Of Probiotics

100 years of scientific studies have shown that probiotics have numerous benefits. In fact, recent studies have shown there are more than 100 distinct benefits of probiotics.

Many are surprised to learn that probiotics affect more than just digestion. But volumes of research have shown that every single body system is affected by the health of our probiotic colonies.

Be sure to take more probiotics so you stay healthy!

Infant Benefits
- Improve gut bacteria
- Reduce stomach discomfort
- Improve immune system function
- Reduce respiratory infections
- Reduce diarrhea

Lung Health
- Improve lung function
- Reduce respiratory infections
- Reduce airway inflammation
- Reduce asthma symptoms

Heart Health
- Improve heart function
- Reduce blood pressure
- Reduce cholesterol levels
- Reduce heart disease risk

Immunity And General Health
- Improve immune function
- Reduce cold and flu symptoms
- Reduce allergy symptoms
- Reduce depression and anxiety

Liver Health
- Reduce liver function
- Reduce liver damage
- Reduce liver inflammation

Stomach Health
- Reduce stomach pain
- Reduce stomach ulcers
- Reduce stomach acidity

Reduce Digestive Discomfort
- Reduce bloating
- Reduce gas
- Reduce diarrhea
- Reduce constipation

Increase Nutrient Absorption
- Improve nutrient absorption
- Reduce sugar cravings
- Reduce inflammation

Vaginal Health
- Improve vaginal health
- Reduce yeast infections
- Reduce bacterial vaginosis

Skin Conditions
- Treat eczema
- Treat acne
- Prevent eczema
- Reduce inflammation

Probiotics.org
Treating Fungal Infections of the Skin and Lungs

You can find fungus everywhere in both indoor and outdoor environments, and half of these fungi can threaten our health. If you find yourself dealing with a fungal infection, many complementary and alternative health options exist for fungal infection treatment. These home remedies can kill off the yeast or bacteria causing the fungal infections while reducing symptoms of the infection in the skin, lungs, sinuses, eyes, and other organs.

Exposure to fungus, mold, and other allergens can cause out of control immune system reactions in your body, the symptoms of which can include pain, headache, fevers, mucus production in the sinuses and/or lungs, and may in some cases may lead to death. More common symptoms include a fungal rash on the skin or some mild respiratory distress. More serious fungal infections include fungal pneumonia, fungal sinusitis, aspergillosis, fungal meningitis, and systemic candida albicans infections.

Fungal Treatment Options in Alternative Medicine

Apple cider vinegar is a common skin fungus treatment and may be used for internal treatment as well. Also consider probiotics in the form of pills or regular yogurt consumption, which can help support your immune system. Pair that with eating a couple raw cloves of garlic each day. The sulfur and other compounds in garlic (including ajoene) have powerful antifungal properties, though these are more effective as a fungal infection treatment via topical application than for systemic use through ingestion.

Research conducted in 1996 indicated the following substances or essential oils had antifungal properties:

- Oregano – the most powerful anti-fungal of the essential oils, and possess significant activity against Candida albicans. The minimum inhibitory concentration against C. albicans has been found to be <0.1μg per ml. In contrast, caprylic acid (a mixture of calcium and magnesium salts, a natural anti-fungal fatty acid), is 0.5μg.
- Pau D’ Arco natural Nyastatin
- Citronella oil – obtained from the leaves and stems of different species of Cymbopogon (lemon grass)
- Coconut oil – medium-chain triglycerides in the oil have antifungal activities
Fungal Lung Infections

PatientPlus articles are written by UK doctors and are based on research evidence, UK and European Guidelines. They are designed for health professionals to use, so you may find the language more technical than the condition leaflets.

See also the separate article on Systemic Mycoses.

Fungi may cause lung disease through direct infection of pulmonary tissue, through infection of pulmonary air spaces/lung cavities, or through their ability to trigger an immunological reaction when fungal material is inhaled. The latter mechanism is involved in cases of allergic bronchopulmonary aspergillosis, aspergillus-
induced asthma and extrinsic allergic alveolitis due to fungi (eg, maltworker's lung, farmer's lung). This article will concentrate on those diseases caused by direct fungal infection of the lung (fungal pneumonias).

With the exception of aspergillosis, these infections are usually not present to any significant degree in immunocompetent residents of the UK. They are more likely to affect those who have travelled abroad to areas where they are endemic, or arise as opportunistic infections in patients who are immunocompromised as a result of oncological treatment, due to immunomodulation following solid organ transplantation, or HIV infection. Pulmonary infection occurs after inhalation of spores/conidia, or by the reactivation of latent infection. Haematogenous dissemination of fungal infection leading to a systemic mycosis tends to occur chiefly in immunocompromised patients.\textsuperscript{1}

<table>
<thead>
<tr>
<th><strong>Endemic fungal pneumonia pathogens:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Histoplasma capsulatum</em> causing histoplasmosis.</td>
</tr>
<tr>
<td><em>Coccidioides immitis</em> causing coccidioidomycosis.</td>
</tr>
<tr>
<td><em>Blastomyces dermatitidis</em> causing blastomycosis.</td>
</tr>
<tr>
<td><em>Paracoccidioides brasiliensis</em> causing paracoccidioidomycosis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Opportunistic fungal pneumonia pathogens:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Candida</em> spp. causing candidiasis.</td>
</tr>
<tr>
<td><em>Aspergillus</em> spp. causing aspergillosis.</td>
</tr>
<tr>
<td><em>Mucor</em> spp. causing mucormycosis.</td>
</tr>
<tr>
<td><em>Cryptococcus neoformans</em> causing cryptococcosis.</td>
</tr>
</tbody>
</table>

**Epidemiology and distribution**

In the UK the endemic fungi are exceedingly rare and occur only in returning travellers. The endemic fungi are distributed in the Americas in the valleys of the Mississippi and Ohio rivers (histoplasmosis and blastomycosis), the Southwestern United States and Northern Mexico (coccidioidomycosis) and Central and South America (paracoccidioidomycosis). In Africa histoplasmosis is found in the equatorial regions.

The opportunistic pathogens are ubiquitously distributed and may cause disease in those with immunosuppression. There are few figures for their incidence in the population at large in the UK. A recent review estimates that 15-18.3% of HIV-infected patients admitted to hospital will suffer a nosocomial pulmonary infection. Of these, a small but significant proportion (around 5-10%) will be due to opportunistic fungal pneumonias.\textsuperscript{2}

**Risk factors**

- Travel to an area where fungal pneumonia pathogens are endemic (see above).
- Regular exposure to bird, bat or rodent droppings in endemic areas.
- Any cause of immunocompromise, for opportunistic infections.
- Endemic fungal infections seem to be more common in men than in women, as oestrogen is thought to exert an inhibitory effect on the growth cycle of fungi.\textsuperscript{1}

**Presentation**
Symptoms
- Fever - persistent fever in the immunocompromised should always raise the suspicion of opportunistic pulmonary or systemic fungal infection.
- Cough which is usually dry.
- Chest discomfort (dull and poorly localised or focal and pleuritic).
- Progressive dyspnoea, particularly on exertion.
- Haemoptysis is a relatively common symptom of invasive aspergillosis/mucormycosis.
- Endemic mycoses may cause lymphadenopathy and obstruction of large airways through pressure effects.
- Endemic mycoses have a predilection for causing symptoms of 'rheumatological' syndromes - eg, arthritis/arthralgia, erythema multiforme, erythema nodosum, pericarditis.
- Endemic mycoses may also cause symptoms by haematogenous dissemination to skin, brain/meninges, bone and joints and full-blown septicaemia.
- Infections with Aspergillus and Candida spp. and other opportunistic fungi may cause symptoms of hypersensitivity reactions - eg, allergic asthma, allergic bronchopulmonary aspergillosis, extrinsic allergic alveolitis.
- Symptoms due to other sites of extrapulmonary involvement (particularly in the immunocompromised) - eg, meningoencephalitis/brain abscess, skin lesions, kidneys, liver, muscles, endophthalmitis, nasal passages and sinuses, systemic sepsis affecting blood and bone marrow.

Signs
- Fever.
- Tachycardia.
- Tachypnoea.
- Wheeze.
- Signs of focal pulmonary consolidation - eg, reduced expansion, dullness to percussion and bronchial breathing.
- Signs of bronchial obstruction if thoracic lymphadenopathy is significant.
- Signs of pleural effusion.
- Seek signs of extrapulmonary involvement - eg, skin lesions, signs of meningism, joint pain or swelling, retinal lesions on ophthalmoscopy.

Differential diagnosis
- Bacterial, atypical or viral pneumonia.
- Aspiration pneumonia.
- Pneumocystis jirovecii pneumonia.
- Eosinophilic pneumonia.
- Hypersensitivity reaction caused by fungal antigen - eg, allergic asthma, allergic bronchopulmonary aspergillosis, extrinsic allergic alveolitis.
- Chemical pneumonitis - eg, chemical worker's lung.
- Coal worker's pneumoconiosis.
- Löffler's disease (marked eosinophilia and benign, transient, migratory or recurrent pulmonary infiltrates with minimal constitutional upset).
- Adult respiratory distress syndrome.
- Causes of pulmonary fibrosis.
- Tuberculosis (TB).
- Pulmonary oedema.
- Helminthic infections.

Investigations
The diagnosis of invasive pulmonary aspergillosis, histoplasmosis and blastomycosis, has improved with the use of easily performed antigen detection systems in serum and bronchoalveolar lavage fluid.
- **FBC:**
  - Raised WCC in immunocompetent patients.
  - Eosinophilia may predominate.
  - Progressive neutropenia or leukopenia in an unwell immunocompromised host suggests systemic candidiasis/aspergillosis.

- **CXR:**
  - May show patchy infiltration, nodules, consolidation, cavitation or pleural effusion.
  - Pronounced mediastinal lymphadenopathy - some endemic fungal pneumonias.
  - Miliary pattern pulmonary infiltration in extensive disease.
  - Blood cultures (may require specific fungal culture bottles).
  - Urine/sputum/invasive catheter cultures (potassium hydroxide staining can be used for sputum but may detect colonising rather than invasive species).

- **CT/MRI scanning of thorax:**
  - Early chest CT scan in immunocompromised patients suspected of having invasive fungal pneumonia can help identify and treat disease early, leading to an improved outcome.\(^4\)
  - Halo sign: ground-glass opacity surrounding a pulmonary nodule or mass. Most commonly associated with invasive pulmonary aspergillosis.\(^5\)
  - Reversed halo sign: focal rounded area of ground-glass opacity surrounded by a crescent or complete ring of consolidation. Most often associated with pulmonary mucormycosis.\(^5\)
  - Bronchoscopy - to obtain bronchoalveolar lavage/transbronchial biopsy specimens for fungal staining and culture.
  - Transthoracic fine-needle biopsy - usually radiologically guided to biopsy nodules for staining/histology/culture.
  - Open lung biopsy - used occasionally.
  - Lumbar puncture in cases of suspected meningeal involvement.
  - Bone marrow aspiration/biopsy in immunocompromised patients with suspected disseminated disease.
  - Biopsy of any skin lesions.
  - Joint aspiration if joint effusion.
  - There are specific antigen-detection tests, PCR techniques and ELISA assays and serial serology available to detect specific pathogens - seek microbiological advice on the most appropriate test in the clinical context.

It is also important to think of why the patient might be immunosuppressed. There are other illnesses that may explain the reason for immunosuppression - eg, previously unknown TB, diabetes and HIV. Thus history, examination and investigations also need to be tailored to try to determine the cause of immunosuppression. TB should be particularly sought after as it is an important differential diagnosis.

**Management**\(^1\)

- In immunocompromised patients, factors that are contributing to the illness, such as chemotherapy, steroids, indwelling venous catheters, etc, need to be addressed where possible.
- Immunocompromised patients may benefit from the use of colony-stimulating factors to boost immune cell production.
- The new azoles (eg, voriconazole) are most often used. Amphotericin is now less often used, and when used is often given as lipid formulation to decrease toxicity.\(^3\)
- British National Formulary recommendations:\(^6\)
  - Amphotericin or caspofungin are used for the empirical treatment of serious fungal infections.
  - Aspergillosis: voriconazole is the treatment of choice; liposomal amphotericin is an alternative first-line treatment when voriconazole cannot be used. Caspofungin, itraconazole or posaconazole can be used in patients who are refractory to, or intolerant of voriconazole and liposomal amphotericin. Itraconazole is also used for the treatment of chronic pulmonary aspergillosis.
• Invasive or disseminated candidiasis: an echinocandin (eg, anidulafungin, caspofungin and micafungin) can be used. Fluconazole is an alternative for clinically stable patients. Amphotericin is an alternative when an echinocandin or fluconazole cannot be used. In refractory cases, flucytosine can be used with intravenous amphotericin.

• Cryptococcosis is usually treated with amphotericin and flucytosine, followed by fluconazole for eight weeks or until cultures are negative.

• Histoplasmosis: itraconazole can be used for immunocompetent patients. Amphotericin is preferred for patients with fulminant or severe infections. Following successful treatment, itraconazole can be used for prophylaxis against relapse until immunity recovers.

• Cardiothoracic surgery may be needed to resect infiltrated/necrotic pulmonary tissue as an adjunct to antifungal therapy, or to treat some complications such as massive haemoptysis and pulmonary abscesses.

Complications

• Dissemination of fungal infection to other sites such as the brain, meninges, skin, liver, kidneys, adrenal glands, heart, eyes, spleen.

• Progressive respiratory failure.

• Systemic fungaemia and septic shock.

• Blood vessel invasion causing massive haemoptysis, pulmonary infarction, myocardial infarction, cerebral infarction/embolism.

• Associated rheumatological complex/pericarditis with endemic fungal pneumonias.

• Lung cavitation.

• Development of mycetoma in a lung cavity.

• Local pulmonary damage causing bronchopleural or tracheo-oesophageal fistulas, mediastinal fibrosis, calcification in pulmonary tree, chronic pulmonary symptoms.

• Immunological reaction to fungal antigens.

• Fungal endocarditis.

Prognosis

• This is highly variable in cases of opportunistic infection, depending on the cause and degree of immunocompromise, comorbidities and speed of recognition of pulmonary fungal infection.

• Overall mortality is relatively high (probably >50% in immunocompromised patients).

• Mortality for untreated disseminated histoplasmosis is ~80%, reduced to ~25% with treatment.\footnote{1}

• Aspergillosis and mucormycosis have mortality rates of 50-85% in transplant recipients, especially after bone marrow transplantation.\footnote{1}

• Coccidioidomycosis has a mortality rate as high as 70% in patients with AIDS.\footnote{1}

Prevention

• HIV patients are routinely treated with prophylactic antifungal drugs to try to avoid infection with opportunistic fungal pathogens, particularly Cryptococcus neoformans.

• Transplant patients may also benefit from prophylactic antifungal agents.\footnote{2}

• Fluconazole has shown some benefits as prophylaxis against invasive fungal infections in transplant patients.\footnote{2}

• Patients likely to have prolonged neutropenia should avoid activities that increase exposure to environmental fungal spores, such as gardening or working with potted plants and fresh flowers, cleaning, building work and handling uncooked vegetables.
Further reading & references

2. Sheehan D., Hitchcock C, Sibley C. Current and Emerging Azole Antifungal Agents
3. Echinocandins for the treatment of systemic fungal infection | Canadian Antimicrobial Resistance Alliance (CARA)

- King JW et al; Cryptococciosis, Medscape, Oct 2012
Fungi In Lungs May Hold Asthma Treatment Clues

Wednesday 20 February 2013 - 12am PST

There was a time when we assumed the insides of our lungs were devoid of life, apart from our own cells helping us breathe. But now we learn that the lung is home to a wide range of organisms, including fungi. A new study finds that people with asthma have a different blend of fungi in their lungs compared to healthy people who do not have asthma, leading the researchers to suggest this could be a useful avenue for developing new treatments.

The team, from the School of Medicine at Cardiff University in the UK, reports the study, the first large one of its kind, in the 5 February online issue of *BMC Infectious Diseases*.

Study leader, Hugo van Woerden from Cardiff University's Institute of Primary Care and Public Health, says in a statement:

"Our analysis found that there are large numbers of fungi present in healthy human lungs. The study..."
also demonstrates that **asthma** patients have a large number of fungi in their lungs and that the species of fungi are quite different to those present in the lungs of healthy individuals."

He and his colleagues suggest the hundreds of tiny fungal particles they found in the lungs of asthma patients could hold new clues for treating the respiratory illness.

For their study, they examined the mucus or sputum of people with and without asthma, drawn from the same community.

They found a total of 136 different species of fungi across both groups, with 90 more common in the people with asthma and 46 more common in the healthy people without asthma.

"Of particular interest was the presence of *Malassezia pachydermatis*, which is known to be associated with atopic dermatitis", notes the team.

The main value of the study is that it establishes that the lungs are home to fungi, and that people with asthma may have a particular blend of fungal colonies, which could open up a new field of research, bringing together molecular techniques for identifying fungi and developing treatments, says van Woerden.

"**In the future it is conceivable that individual patients may have their sputum tested for fungi and their treatment adjusted accordingly,**" he adds.

In November 2012, another group of researchers in Scotland reported that **drying laundry indoors could pose health risks for people prone to asthma** because the increased humidity encourages molds and dust mites.
Anti-Candida Protocol

Remedies that Directly Attack Candida (Mandatory)

I must stress here -- to avoid any confusion -- that not all of the attack remedies below need to be used. These are just options for you. Furthermore, if recommendations are needed for clarity's sake -- I have also personally found that using Ted's Alkalizing Remedies, Lugol's Iodine and Borax in combination to be very useful at curing candida problems. But if these nutrients are hard to get -- just use another combination from below of your own choice.

* Take Ted's Lime/Lemon baking soda water alkalizing remedy at least 2 times a day as recommended. I used mainly the ACV, lemon or lime as well as just the sodium bicarb with water alkalizing remedies which also act to kill candida. These alkalizing remedies create the worst possible environment for the candida while simultaneously creating a healthy body terrain. Also take the Baking Soda with water remedy on it's own throughout the day and one hour before bed - this will help you get a good nights sleep. If you have problems with this remedy, then use Ted's Carbicarb remedy -- this is more balanced and incorporates potassium to balance any sodium issues. Potassium citrate can be taken to more directly aid intracellular alkalization. See this link for the alkalizing remedies:
  http://www.earthclinic.com/Remedies/alkalizing_formulas.html
  http://www.earthclinic.com/CURES/candida4.html#TEDS

* Supplementing with at least 50 mgs to 100 mgs of 5% Lugols Iodine per day - 8 to 16 drops a day(or as much as you can stand without problems) in split doses taken four times a day(not at mealtimes) in a glass of water. Iodine will also help to balance your hormones because it supports the thyroid and is also able to remove dangerous halogens like fluorine and bromine from your body. Lugol's Iodine also chelates heavy metals like aluminium, cadmium, lead and mercury from your body and this is very beneficial. LI also kills 90% -- 95% of all known pathogens – including candida. You can also use Kelp as the iodine source – but this does not really give sufficiently high amounts of iodine/iodide needed to kill the candida in my opinion.
* Drink 1/4 teaspoon of Tetrasodium Borate or Borax (1/8 tspn for women) in a litre of water throughout the day. Take this protocol for 5 days on then rest for 2 days. So, 5 days on, 2 days off with the Borax. Borax is the ultimate anti-fungal, also good for bones and helps to balance the hormones as well as chelates and removes fluoride from the body. Borax affects your male hormones or androgens in a viagra-like manner, which is why you must rest for 2 days -- to avoid gland over-stimulation.

* Sodium Molybdate or Molybdenum. Take at least 900 mcg Molybdenum a day. Sodium Molybdate kills candida and also removes the debilitating candida alcohol and aldehyde poisons from the body via the aldehyde dehydrogenase enzyme pathway (needs molybdenum) in the body -- this will help to remove symptoms like nausea, flu-like symptoms, aches and pains, brain fog and lethargy problems. Ted recommends supplementing between 10 mg and 25 mgs sodium molybdate a day taken for only two weeks to quickly kill off the candida -- but I've found Sodium Molybdate or Molybdenum difficult to purchase in amounts greater than 900 mcgs (the highest allowed RDA dosage).

http://candidapage.com/aldehyde.shtml

* Hydrogen peroxide (food grade) I just use a capful of 3% HP in one litre of water a day when I need it. HP kills bacteria, viruses and fungi and it also helps greatly to clear and unblock the lymph glands. Sometimes I splash 3% HP all over my body, this kills everything bad topically as well as being absorbed quite well transdermally into my body by this method. Very potent against all forms of bacteria, viruses and fungus. Do not use Lugol's Iodine together with Hydrogen Peroxide in the daily protocol -- because they tend to neutralize and cancel each other out -- so just use one or the other in your protocol. See this link:


Caveat: Although Hydrogen Peroxide is highly useful -- it does have its downside. Some people get nausea, migraine headaches etc when they supplement HP. HP also inactivates or neutralizes and depletes antioxidants in the body because of its pro-oxidant effects. I always prefer to use lugol's iodine against candida because it
isn't as complicated to use as HP. But if lugol's iodine cannot be found or used -- use HP as recommended and increase anti-oxidant intake at the same time.

* **Methylene Blue(MB).** You can buy this at any aquatics or fish supply store. It is used to get rid of fungal and bacterial infections on fish. Also used throughout the last century as a successful anti-malarial. Taking MB on its own will turn your urine green and the whites of your eyes blue, but if you take at least 1000 mgs Vitamin C with the MB, these side-effects will not occur. Dosage: 4 - 6 drops of a 0.1% solution of MB in a full glass of water once or twice a day. Do not take MB after 3 or 4 o'clock in the afternoon - it gives you alot of energy so you will not be able to sleep, MB is a deep acting anti-fungal that is able to penetrate the blood/brain and blood/bone barriers of the body. MB is also a marvellous mitochondrial super anti-oxidant for your brain -- gives you lots of energy. 

* **Pau D'Arco** (Tabebuia impetiganosa). This is a very effective herb against candida with a solid and useful reputation as an effective anti-fungal. This is best taken as a tea or capsule(1000 mgs twice a day).

**Body Detox(Mandatory)**

* Detox and get rid of heavy metals from your body. Due to diet and if you've taken medicinal drugs for any length of time your body will have an accumulation of heavy metals. To get rid of these problems just drink green tea 2 or 3 times a day and eat Cilantro 3 times a week in salads. You can also use Sodium Thiosulphate to get rid of heavy metals, arsenic, cyanide and chlorine. ST will get rid of heavy metals over time. Use 6-10 drops of 10% ST solution in a full glass of water daily. Heavy metals create an ideal acidic environment for candida as well as for nanobacteria.

* Chlorella - Also for detoxing heavy metals and for mineral support.

* Using Lugol's Iodine in the protocols is also the best way to detox fluoride and bromide from the body and will also help to remove heavy metals like aluminium, lead, mercury, cadmium and arsenic from the body.

**Additional Support with Vitamin and Mineral Supplements(Optional)**
* **Vitamin C** - Taken in the more alkaline form of Sodium Ascorbate -- at least 1000 mgs three times a day. Vit C is an anti-oxidant and also chelates heavy metals from the body as well.

* **Magnesium** - Taken as Mag Chloride, Mag Citrate or Mag Gluconate. Dosage: 250 mgs twice a day. Magnesium Oil(40% water 60% magnesium chloride) cab also be used transdermally. Magnesium is involved in over 300 major enzyme and coenzyme body processes and also gets rid of any staph or strep bacteria quite well. Magnesium Chloride is the best form of magnesium to take in my opinion.

* Take at least 2 tablespoons of **Virgin Coconut Oil** (VCO) per day with meals to help constipation and intestinal issues. VCO contains mainly medium chain saturated acids, very protective for the intestines, liver and blood. Contains lauric acid, caproic acid, capric acid, caprylic acid and myristic acid -- these act as anti-microbials helping to destroy the candida as well as protecting the intestines from any further external microbial invasion. I don't use vegetable oils anymore, I cook only with VCO now.

* **Zinc gluconate or zinc acetate** - Helps to support the immune system. 25mgs – 50mgs taken for one week, then take this dose once a week thereafter.

* **Natural Sea Salt** or **Fulvic/Humic Acid**. Both of these will act in the same way as absorption synergists as well as helping to create a healthy intestine and help to supply other important and much needed micro-minerals to your body.

* **Selenium** - 200 mcg twice a day at mealtimes. Selenium helps remove mercury and supports the liver and thyroid. There is no need to take this dose if you are also already taking the recommended liver support (which includes selenium).

* **Vitamin B3** - as niacin or niacinamide. Dosage: 500 mgs twice a day. Be aware of the "niacin flush" effect if you take the niacin form. Niacin is anti-candida and supports the liver, digestion and is relaxing for the body.

* Take **B50 Complex** three times a week - this is beneficial for digestion and will also help fight candida. It also acts synergistically when higher dose B3 is also supplemented.
Liver and Kidney Support(Optional)
* Take herb supplements like Chanca Piedra, Milk Thistle or Dandylion because the candida die-off will create a big strain on both your immune system and the liver/kidneys which will have to clear the dead candida debris and toxins from your blood. Think of this as taking out the candida trash. This die-off will give you flu-like or liverish symptoms and perhaps some diarrhea. You will probably feel much worse before you feel better. Accept this and work your way through it as this should disappear once your body gains control again. If you have actual liver damage then taking Milk Thistle(1000 mgs twice a day at lunch and dinner) in combination with Alpha Lipoic Acid(300 mgs twice a day at lunch and dinner) and Selenium(200 micrograms twice a day at lunch and dinner) will help to support the liver and kidneys.

Can a foot cream really do battle with HIV?
A study has found that the antifungal drug Ciclopirox kills HIV in cell cultures -- and the virus doesn't bounce back when the drug is stopped. But the research has yet to be performed on people.

by Elizabeth Armstrong Moore
September 24, 2013 4:26 PM PD
Ciclopirox is currently approved by the FDA as a topical antifungal cream. (Credit: Fougera)

A drug commonly prescribed to treat nail fungus appears to come with a not-so-tiny side effect: killing HIV in cell cultures.

In a study performed at Rutgers New Jersey Medical School, not only does the drug Ciclopirox rid infectious HIV from cell cultures, but the virus also doesn't bounce back when the drug is withheld. The same group of researchers had previously shown that Ciclopirox -- approved by the FDA and Europe's EMA as safe for human use to treat foot fungus -- inhibits the expression of HIV genes in culture. Now they have found that it also blocks the essential function of the mitochondria, which results in the reactivation of the cell's suicide pathway, all while sparing the healthy cells.

The researchers said that one aspect of HIV that makes it particularly persistent, even in the face of strong antiviral treatments, is its ability to disable a cell's altruistic suicide pathway -- which is typically activated when a cell is damaged or infected. In other words, infected cells that would normally commit suicide to spare healthy cells no longer pull any altruistic kamikaze missions. Ciclopirox tricks these cells back into their old ways with a double negative, disabling the disabling of the suicide pathway.

"The key thing these drugs do is, unlike anti-retrovirals in the current clinical arsenal, and there are lots of them and they have controlled this disease pretty successfully, these drugs kill the HIV-infected cell," says Michael Matthews, lead researcher and chair of the school's department of biochemistry and molecular biology. "That's what's so new and so promising about it."

It's obviously still going to take clinical trials on humans to study the safety and efficacy of Ciclopirox as a potential topical HIV treatment, but the fact that it's already deemed safe for one type of human use could make the regulatory process faster than usual.

Unfortunately, says Dr. Robert Gallo, a professor of medicine at the University of Maryland best known for co-discovering HIV in 1984, even if the topical antifungal treatment successfully kills HIV-infected cells in clinical trials, it would need to be a systemic treatment, not a topical one, to actually treat (instead of simply prevent) HIV.

"On the positive side, I know Mike Matthews, and he's a superb scientist, probably the lead guy on this," says Gallo, who did not participate in this research. "And that is exciting that it kills cells. That would be very exciting if you could give it systemically and it kills only HIV-infected cells. But topical treatment would be for prevention, not as a therapy. The only way you could use it as a therapy is systemically, and it would be unlikely this could be used systemically."

But Rutgers researcher Hartmut Hanauske-Abel, who is working with Matthews, says that the topical treatment may some day be used systemically, and that Ciclopirox "must no longer be considered a topical-only drug."

The researchers also note that another FDA-approved drug now thought to help subdue HIV, called Deferiprone, skipped studies in animals and went straight from tests in culture to a phase I human trial in South Africa, possibly paving the way for other FDA-approved drugs to move faster through the study phases. (Unlike Ciclopirox, which is approved for topical treatment, Deferiprone is FDA- and EMA-approved for systemic use.)

The new findings on Ciclopirox appear in the current issue of the journal PLOS ONE.

Update, September 26 at 1:47 p.m. PT: The headline and lead paragraphs have been changed to clarify what the study found. Also this story has been updated with comments from Michael Matthews, Hartmut Hanauske-Abel, and Robert Gallo.
"At IMUNE you Teach Yourself Medicine, but I Train your Mind your Spirit and your Soul to Heal"

Desiree Dubouneet