COCA Call: Neglected Infections of Poverty in the United States.

Date/Time: November 2, 2010 (2:00 PM- 3:00 PM ET)

Speaker: Dr. Paul Cantey, Medical Officer Parasitic Diseases Branch (CDC)

Coordinator: We welcome and thank you for standing by. At this time all participants are on a listen-only mode until the question and answer session of today's conference. At that time you may press star 1 on your touch-tone phone to ask a question. I would also like to remind parties that this call is being recorded. If you have any objections you may disconnect at this time. I will now like to turn the call over to Loretta Jackson. Thank you. You may begin.

Loretta Jackson: Thank you (Diane). Good afternoon I'm Loretta Jackson Brown and I'm representing the Clinician Outreach and Communication Activity COCA with the Emergency Communication System at the Centers for Disease Control and Prevention. I am delighted to welcome you to today's COCA conference call, Neglected Infections of Poverty in the United States.

We are pleased to have with us today Dr. Paul Cantey, Medical Officer Parasitic Diseases Branch at Centers for Disease Control and Prevention here to discuss a group of parasitic bacterial and viral infections that disproportionately affect impoverished groups in the United States.

During today's call you will hear the presenter referring to slides in his PowerPoint presentation.

The PowerPoint slide set is available from our COCA Web site at emergency.cdc.gov/coca. Click on COCA Calls, the slide set can be found under the call in number and call pass code.

The objective for today's call are that participants will be able to understand why neglected infections of poverty are important, discuss epidemiology, clinical presentation, diagnosis, treatment, and gaps in our current understanding of Chagas Disease in the United States, discuss epidemiology clinical presentation, diagnosis, treatment and gaps in our current understanding of toxocariasis in the United States, discuss epidemiology, clinical presentation, diagnosis, treatment, and gaps in our current understanding of trichomoniasis in the United States.

Following the presentation you will have an opportunity to ask our presenter questions. Dialing star 1 will put you into the queue for questions.

In compliance with continuing education requirements all presenters must disclose any financial or other relationship with the manufacturers of commercial product, suppliers of commercial services or commercial supporters as well as any use of an unlabeled product or products under investigational use. This presentation will not include the discussion of the unlabeled use of a product or products under investigational use with the exception of drugs for the treatment of Chagas Disease which are not FDA approved and Albendazole for the treatment of toxicara infections which has not been FDA approved for this particular indication. CDC distributes the drugs for Chagas Disease through a compassionate use IND (Investigational New Drug) protocol. There is no commercial support for this presentation.

Today's presenter Dr. Paul Cantey is a Lieutenant Commander with the U.S. Public Health Service. As a Medical Officer in the Parasitic Diseases Branch at CDC his duties include surveillance, study design and implementation, program evaluation, outbreak response, and clinical consultation related to parasitic disease. Dr. Cantey is also an Assistant Professor Emory School of Medicine Division of General Medicine Atlanta, Georgia. He earned his Doctorate of Medicine from Emory School of Medicine; his Master's in Public Health from Rollins School of Public Health Emory University and completed his Epidemic Intelligence Service training at CDC in Parasitic Diseases. He has led the investigation of disease outbreaks both nationally and internationally and is the author of many scholarly papers.

If you're following along on the slides you should be on Slide 6. Again the PowerPoint slides that is available from our COCA Web site at emergency.cdc.gov/coca. At this time please welcome today's presenter Dr. Cantey.

Dr. Paul Cantey: Thank you Loretta for that introduction. As Loretta mentioned today we're going to talk about the neglected infections of poverty in the United States.

As you see on Slide 7 if you've been on these calls before you're probably used to seeing our CDC disclaimer that the findings and conclusion in this presentation are those of the author me, and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Moving on to Slide 8 on today's presentation we'll cover the definition of neglected infections of poverty, the distribution of poverty in the United States and poverty related diseases. And we're going to highlight three infections of

poverty. Specifically we'll cover Chagas disease, toxocariasis, and trichomaniasis.

Finally we will cover resources and links for additional information at the end of the presentation.

So on Slide Number 9 what are the neglected infections of poverty? These are infectious diseases concentrated in impoverished areas that disproportionately affect minorities, women, and other disadvantaged groups.

They can cause serious disease in individuals and may actually contribute to the development of poverty.

The overall burden of the disease in the United States is often uncertain and the studieson diagnosis and treatment are often limited.

Finally, clinicians often receive little training. So the average physician may not understand these diseases very well.

On Slide 10 you'll see a list of the six of the neglected infections of poverty that we we're going to - that many people will discuss.

Depending on your author and your point of view this list may change. But these are the six diseases which would be listed on the CDC Web site.

And they include Chagas disease, congenital cytomegalovirus infection, cysticercosis, toxocariasis, toxoplasmosis and trichomoniasis.

On Slide 11 we will discuss poverty in the United States. Poverty in the US is defined based on the schedule of pretax income and household size.

Certain groups in the United States are at higher risk of poverty. These include non-white under-represented minorities and in particular single-parent households led by a minority female.

In 2009 14.3% of the US population or 42.9 million people lived in poverty.

Six distressed reasons of poverty have been identified by prior research by Glasmeier in her Atlas of US Poverty.

These regions include Appalachia, the Mississippi Delta, other areas of rural poverty in the southern United States, Native American tribal lands, the US-Mexico borderlands, and highly segregated urban enclaves in the Northeast and in the Great Lakes region.

On Slide 12 although this map does not highlight the six regions of poverty that Glasmeier defined it does give us a general sense of the distribution of poverty in the United States.

States highlighted in the dark blue have a poverty - have more than 16% of the population living in poverty. And you can see cluster along the south and southeast United States.

States in the light blue have prevalence of poverty between 13% and 15.9%. And then the other two sections have poverty levels that are less than the national average.

If you look at Slide 13 we're going to discuss poverty and health in the United States. There are robust data that link poverty to health and decreased life expectancy in the United States.

This is typically related to an increased prevalence of chronic disease in these populations and an increase in infant and child mortality.

An analysis that was done by Murray et al looked at poverty at a county level basis in the United States.

They identified eight distinct mortality and disease patterns in the country. Comparing the top group which consisted of Asian-Americans to the bottom group which consisted of blacks living in high-risk urban areas they found a 21 year difference in life expectancy between Asian females and black males living in urban areas. When you looked at just male to male the difference was 16.1 years.

To put this difference in life expectancy in perspective this is the same difference you see between males living in Iceland and males living in the country of Bangladesh.

Moving on to Slide 14 we have a map of the United States that was created by Peter Hotez in his article on Neglected Infections of Poverty in the US.

He has defined what is called the Continental Poverty Divide. And you'll see six clusters of poverty and disease in the United States below the Continental Poverty Divide.

These include tribal lands in border regions on the Western part of the United States, the Mississippi and Boothill regions, and then the Cotton Belt and Appalachia in southeast United States.

Of note Chagas disease is concentrated in the border regions though it's certainly not exclusive to this region.

And toxocariasis is thought to be prevalent in both the Mississippi Delta region and the Cotton Belt. So again it's not exclusive to these regions.

Looking at Slide 15 we have clusters of poverty and disease above the Continental Poverty Divide. And these are in two major groups, the rural poor in tribal lands primarily in the Midwest United States and the disadvantage urban enclaves which are found along in the Northeast and along the Great Lakes.

Of note, both trichomoniasis and toxocariasis are thought to cluster in urban areas along this poverty map.

So now we'll move on to the first of the three diseases what we're going to discuss today. And that is Chagas disease.

On Slide Number 17 we're going to discuss the transmission of the disease.

Chagas disease is caused by the protozoan parasite *Trypanosoma cruzi*.

You can see an example of a trypomastigote of *Trypanosoma cruzi* in the blood smear seen in the upper left-hand corner Slide 17.

Their primary mode of transmission is through the nocturnal feeding habits of infected triatomine bugs which are associated with substandard housing and endemic countries in Latin America.

An example of a triatomine bug is found in the upper right-hand corner of this slide. What typically happens is that the triatomine feeds at night and defecates while feeding off a human host.

The human scratches the area where the bug has defecated causing abrasions through which the parasite is introduced into the human body.

Other modes of transmission include blood transfusion, organ and tissue transplantation, congenital transmission from mother to child, lab accidents, and through foodborne mechanisms.

On Slide 18 we see the distribution of Chagas disease. The disease is endemic in much of Latin America and these areas are highlighted in yellow on the map on the right.

But it's important to note that both the parasite and the triatomine bugs are found in the United States. And there is - and so domestic vector borne transmission is possible and has been documented in the United States.

Moving on to Slide 19 -- the burden of these Chagas disease in the United States -- the greatest burden of the disease in the country are prevalent imported cases.

There are an estimated 300,000 or more infected Latin American immigrants currently living in the United States.

California, Florida, and Texas are disproportionately affected by the disease. But there are other concentrations found in the United States including in Arizona, Georgia, Illinois, North Carolina, New York, and Virginia.

We've begun to get our first look at asymptomatic persons with chronic Chagas disease when blood donor screening began in early 2007.

Since screening began in 2007, 1267 infected donors have been identified and more than - and at least 40 of those have no recognized risk factor for acquisition of the disease outside of the United States.

I think you can get from this slide that we get a sense of how little data we actually have on the true burden of the disease and how much study is needed.

On Slide 20 we'll review the symptoms of Chagas disease. It's typically divided into two phases, the acute phase and the chronic phase.

The acute phase lasts four to eight weeks, is usually asymptomatic though 10% to 20% of people will present with a nonspecific febrile illness.

And even fewer will present with Romaña's sign which is periorbital edema around the site of infection. You can see a picture of this on the slide where the boy on the right side of his face he has swelling around the eye.

The chronic phase is life long. Most persons remain in the asymptomatic indeterminate phase though 20% to 30% over the course of ten to 20 years will go on to manifest symptomatic disease.

This can include cardiac disease which includes heart failure, sudden death, and stroke or gastrointestinal disease which can result in organomegaly syndromes such as megacolon or megaesophagus.

On Slide 21 you'll see a brief discussion of the diagnosis of Chagas disease. Testing for Chagas is available through the CDC.

In persons in whom acute infections is suspected blood, peripheral blood smears, hemoculture, or polymerized chain reaction or PCR are useful. Whereas in those suspected of having chronic infections serologic tests are useful.

Unfortunately the diagnosis of Chagas disease can be difficult as there are no gold standard tests for confirmation of infection.

The tests for acute infection are very sensitive. But as the acute phase is often not recognized so they're not as useful as we'd like them to be.

A positive test would certainly confirm infection but a negative test in someone who's chronically infective - infected would not rule out the infection.

Now the tests for chronic infection have issues with both sensitivity and specificity. And therefore we usually require at least two different positive tests to confirm the infection.

On Slide 22 we'll discuss treatment. There are two medications that are available through CDC, nifurtimox or benznidazole.

Neither one of these medications is FDA approved but both are available through CDC's investigational new drug protocol for compassionate use. And both have been used extensively in endemic areas outside of the United States.

The data on the efficacy of treating chronic infections evolving - is evolving though it currently suggests that treating - there's currently available data that suggests that treating people with chronic infection does reduce the risk of cardiac disease.

Unfortunately side effects are frequent particularly in adults and a lot of monitoring is required. Benznidazole is - treatment is also accompanying with a photo sensitive rash and there's the risk of a reversible peripheral neuropathy.

Nifurtimox is often associated with nausea, vomiting, anorexia, and weight loss. And you may also develop irritability, insomnia or tremor.

Use of both medications requires monitoring of the CBC and hepatic and renal profiles.

Despite the availability of treatment in the United States through the CDC treatment is often underutilized.

When we've looked at data from blood donors we found that less than 11% of blood donors identified by screening have sought treatment through the CDC. Why this is so is unclear.

A couple of other management issues to consider, anyone with chronic disease should get a yearly history and physical screening for cardiac and gastrointestinal disease and an EKG with rhythm strip because often the first presenting cardiac symptoms are subtle rhythm abnormalities on EKG.

If they have positive symptoms on history or physical or a positive EKG then work up for long term complications is indicated.

So on Slide 23 who should be treated for Chagas disease? We recommend always offering treatment to anyone with acute infection, any newborn identified with congenital infection, any child that's 18 years or younger with chronic infection or anyone immunocompromised with evidence of reactivation of their infection after immunocompromise.

We would generally offer treatment to women of reproductive age, any adult less than 50 years old with the indeterminate form or mild to moderate cardiomyopathy, and patients in whom immune suppression is anticipated such as someone anticipating organ transplantation.

Treatment is optional in adults greater than 50 years old without advanced cardiomyopathy. We would - generally would not offer treatment to patients with advanced cardiomyopathy with congestive heart failure because treatment may prevent progression of the disease but it does not reverse congestive heart failure.

Additionally we would not offer - generally would not offer patients with impairment of swallowing treatment. And we would almost never offer anyone who is pregnant treatment. Rather you would wait until after they finished breast-feeding their newborn before you would treat them and then patients with severe renal herpetic insufficiency because the drugs are cleared through these mechanisms.

On Slide 25, we'll discuss Chagas disease prevention. We need to do a better job of educating people and healthcare providers about who is actually at risk for infection.

We need to continue to screen donors to prevent transfusion and transplant associated disease. And we need to screen children of mothers from endemic areas or with known Chagas - or with known Chagas infection for congenital infection so that treatment can be initiated soon after birth.

Finally we need to counsel travelers to endemic areas to avoid putting themselves at risk by staying in poorly constructed buildings in endemic rural areas.

Now let's move on to toxocariasis. On Slide 27 we'll discuss the transmission of the disease. The infection is a human disease caused by infection with the larval stages of the dog, cat - the dog or cat roundworm.

Adult - an adult - an example of an adult roundworm is shown in the upper left-hand corner of this slide.

Toxocara eggs are shed in dog and cat feces. And then humans become infected by ingesting either embryonated eggs in the soil or food or encysted larva in raw tissues from cow, sheep, or chicken.

It's important to note that when an egg is initially shed it's not infectious. It can take one to two weeks at ambient temperatures for the larva to develop inside the egg and then the egg would become infectious.

After embryonated eggs are ingested the larva will migrate and encyst in human tissues. But they do not develop into adults and they are unable to reproduce in the human.

You can see an example of an embryonated egg in the upper right-hand corner of this slide.

Moving on to Slide 28, the epidemiology, what data are available suggests that the prevalence is higher - is significant.

NHANES data from 1989 to 1994 suggests that about 14% of the US population shows evidence of infection.

The highest prevalence is in the southern United States where the prevalence is greater than 17%. And typically infection affects non-Hispanic blacks more than other groups.

Risk factors are - include poverty, low education levels, and dog ownership.

There is limited data on environmental contamination. And it's been found that environmental contamination of the soil is common. Areas of particular concern are sandboxes and areas in the yard where animals tend to defecate.

Additionally there's been at least one - there's been several studies of parks in the US. And it found that up to 20% of soil samples in the US parks were positive for *Toxocara* - *Toxocara* eggs though it was unclear how many of these eggs were embryonated and thus infectious. And the data overall are somewhat limited.

Moving on to Slide 29 many or most people are asymptomatic when they're infected. The symptoms of toxocariasis are caused as a -by a reaction to the dead or dying larvae. An example of a larvae is in the upper right-hand corner of the slide.

There are three clinical forms of the disease. One is called mild toxocariasisthough in the literature it may also be referred to as covert or common toxocariasis.

In children the presentation can include fever, headache, behavioral and sleep disturbances, cough, anorexia, abdominal pain, hepatomegaly, nausea and

vomiting. And there may be peripheral eosinophilia, though in children this may or may not be present.

In adults it can be associated with chronic dyspnea, weakness, rash, pruritus, abdominal pain. And eosinophilia is much more likely to be present.

And again this - these symptoms are caused as the larvae migrate to the various tissues. So your symptoms will depend on what tissues the larvae are migrating through.

Mild toxocariasis is often - although the symptom - there are numerous symptoms, they're often not severe enough to get the patient to clinical attention and therefore the diagnosis often goes - is missed.

Two other more severe forms are visceral toxocariasis which has also been known as visceral larva migrans and ocular toxocariasis which is also known as ocular larva migrans.

Moving on to Slide 30 we'll talk about visceral toxocariasis in more detail. It typically occurs in children between the ages of 2 and 7 years old though it can - anyone can be infected. In Southeast Asia they find more - there is evidence - there are more episodes of visceral toxocariasis in adults due to cultural habits of eating undercooked foods.

Symptoms can include fever, lower respiratory symptoms, hepatomegaly, abdominal pain, and anorexia.

And then other symptoms will vary depending on which organism is involved. You can get a hepatitis or hepatic granuloma formation, chronic prurigo, pruritus, urticaria, eczema, or vasculitis with - when migration through the skin.

Rarely you can see eosinophilic meningitis or encephalitis, a myelitis, optic neuritis, radiculitis, or cranial nerve palsy.

And then even more or less common are myocarditis due to migration to the heart tissue, nephrotic syndrome due to migration to kidney and arthritis.

Lab findings are as follows. There's almost always a marked peripheral eosinophilia. There's often an anemia and a hypergammaglobulinemiaAnd you may note increased titers to A and B blood group antigens.

Ocular toxocariasis is covered on Slide 31. Ocular toxocariasis typically occurs in 5 to 10-year-olds but up to 20% of cases occur in people over the age of 16.

Usually only one eye is affected. And symptoms can include strabismus, unilateral decreased vision, and leukocoria.

Eye exam may show peripheral posterior pole retinal granuloma and endopthamalitis. And you may see a vitreous band on ultrasound.

If you look at the image of the boy on the right-hand of the slide you'll see opacification of the right eye due to ocular toxocariasis.

The upper left-hand corner is an image of the retina of a patient with ocular toxocariasis. You can see an inflammatory mass with a vitreous band extending to the optic disk.

On the upper right-hand side you can see an ultrasound of a patient with a vitreous band.

Diagnosis is covered on Slide 32. The test we use at CDC is an enzyme-linked Immunosorbent assay or ELISA. It's 78% sensitive and 92% specific for visceral toxocariasis.

However in patients with ocular toxocariasis the sensitivity is reduced and may be less than 50%. There's also some cross-reactivity with other helminths, in particular *Ascaris*.

Biopsy would be another method that can be used to diagnose toxocariasis though it’s not commonly used these days.

In tissue that has been biopsied the pathologist could visualize larvae surrounded by eosinophilic infiltrate.

It's important to note however you cannot diagnose toxocariasis with stool O&P because eggs are not excreted by humans. Remember the parasite cannot complete its lifecycle in the human host.

On Slide 33 will we have the treatment for toxocariasis; for mild toxocariasis treatment is often not needed.

However for visceral toxocariasis treatment is usually required and treatment would include five days of albendazole.

You could consider adding systemic corticosteroids for allergic symptoms such as the skin rash, pruritus or asthma-like symptoms.

For ocular toxocariasis you need a longer course of treatment lasting from two to four weeks with albendazole.

But what's very important is aggressive anti-inflammatory treatment with corticosteroids because much of the decreased vision is due to the inflammatory response to dead or dying larvae in the eye. Often surgery is also needed in order to remove the larvae from the eye.

One of the issues with treatment is there are very few controlled trials on treatment. So we don't again, don't have a placebo controlled double blinded trial to determine the best treatment regimen and the impact of the steroids on outcomes.

Confirming cure is also difficult due to the limitations of serologic testing.

And finally albendazole is not FDA approved for this indication although it is FDA approved for many other indications in the United States.

On Slide 34 there are some, we can target both humans and animals for prevention. Dog and cat targeted interventions include regular deworming during their - the - your pet’s annual veterinary visits.

Additionally people should be encouraged to always clean up after your pet during walks and to clean pet play areas weekly.

Because remember, it takes more than a week for eggs to embryonate and become infectious. So if you clean weekly you should be able to clean the eggs - out of the area before they become infectious.

Human targeted interventions include not allowing children to play in areas where the animals defecate, to cover sandboxes when not in use to prevent dogs and cats from defecating in the sandbox, to prevent geophagia when possible, and to use good hygiene practices such as washing your hands with soap and water after playing with pets and after other outdoor activities.

Moving on to trichomoniasis -- on Slide 36 we will discuss the epidemiology of the disease. *Trichomonas vaginalis* is a parasite spread through sexual contact.

There are an estimated five million to seven million cases yearly in the United States though this is felt to be possibly an underestimate.

The prevalence of the infection may be up to 20 million - 20 million people in the country. One prevalent study in young adults found 2.8% prevalence of the disease in young adult women and a 1.7% prevalence in young adult men.

In STD clinics the prevalence is much higher. They found between 28% and 34% of women in such clinics were infected with trichomonas vaginalis and 13% to 17% of men were infected.

And it was also an important disparity that was noted. There was a ten-fold higher risk of infection among African-American women compared to non-Hispanic white women with a difference in prevalence of 13.3% versus 1.3%.

On Slide 37 we can see a discussion of the symptoms. Often the infection can be asymptomatic. In one study 46% of men with trichomoniasis in the United States were found to be asymptomatic.

In a study of women 16% of asymptomatic women in Zimbabwe who were screened for vaginal infections were found to have trichomoniasis.

And this number may be an underestimate as other trials have found up to 80% of women did not report symptoms at the time that they entered in the trial.

When symptoms are had in women there's vaginal discharge, pruritus or dysuria. In men there's often urethral discharge or dysuria.

Physical exam may reveal mucopurulent discharge, strawberry cervix, cervical erythema, or cervical friability. An example of strawberry cervix is seen in the upper right-hand corner of this slide.

On Slide 38 there is a discussion of morbidity of the disease. Trichomoniasis is associated with other sexually transmitted infections and people may be infected simultaneously with trichomonias, chlamydia and gonorrhea.

And there are several consequences of *T vaginalis* infection. And our understanding of these consequences is still evolving.

It has been associated with premature rupture of membranes, preterm birth, low birth rate, pelvic inflammatory disease and an increased susceptibility to HIV transmission.

On Slide 39 we'll discuss diagnosis. In women one of the most common tests is the wet prep. If you look at the upper right-hand corner of the slide you can see flagellated trichomonads. If this were a live wet prep they should be motile.

Unfortunately the wet prep is only 60% to 70% sensitive; so many infections will be missed. Because of this many point of care tests have been developed that have higher sensitivity.

These include OSM trichomoniasis Rapid Test by Genzyme diagnostics and Affirm VP3 by Becht & Dickinson.

These tests are performed on vaginal secretions and have greater than 83% sensitivity and are more than 97% specific.

Although the Papanicolaou smear can be used for the diagnosis of trichomonias, it's not generally recommended for *Trichomonas* screening because of the delay in the time of the performance of the exam and the receipt of results.

Additionally PCR is becoming more available and there is also the possibility of doing culture on special media though there is a greater delay in diagnosis using special media.

In men wet preps can also be done of urethral discharge of prostratic secretions or of urethral scraping.

However it's uncertain as to the sensitivity of a wet prep in a male. PCR is also available and culture and special media would also be available.

On Slide 40 we see a discussion of treatment. Typically a course of an antimicrobial such as metronidazole or tinidazole would be indicated for trichomoniasis.

And of course you should always treat the sex partners of patients even if they're asymptomatic to preventive a cycle of infection and re-infection.

One concern is metronidazole resistance. And this resistance is estimated to be about 5% in the United States. Unfortunately the data on the management of resistance is limited.

The general recommendations is that if treatment with 2 gram of metronidazole fails and you excluded re-infection then you would treat the person again with 500 milligrams BID of metronidazole for seven days or with 2 grams of tinidazole once.

If either one of these therapies were to fail then you would use metronidazole or tinidazole 2 grams daily for five days.

If the patient is still having symptoms and re-infection has been excluded then you could consult the CDC for further testing and management. And the telephone number and the Web site are listed at the bottom of this slide.

On Slide 41 is a discussion of treatment in pregnancy. As *Trichomonas* infection has been associated with poor outcomes in pregnancy there has certainly been an interest in trying to prevent these outcomes.

Right now the general recommendation is to treat symptomatic women and to counsel asymptomatic women about the risk and benefits of treatments and defer until after 37 weeks.

There are some trials of asymptomatic women but the data has been inconsistent.

It's important to note that metronidazole is pregnancy category B and therefore would be the treatment of choice and tinidazole is pregnancy category C.

So let's move on to a summary of some of the key issues and then we'll go through some available resources.

On Slide 43 a summary of the key issues for Chagas disease. The true burden of Chagas Disease is uncertain and is based on extrapoliations of known data. Certainly we could use more.

The - there is a asymptomatic phase of infection that results in misdiagnosis. And this is further complicated by the fact that there is no gold standard - there are no gold standard diagnostic tests for the diagnosis of disease.

The data on treatment of chronic infection in adults is limited and evolving but there is currently a multicenter multinational trial that is ongoing. And we should have results in a few years.

And finally there are many patients who are being diagnosed with infection but they're not getting treatment. And as of right now it's unclear why.

On Slide 44 for toxocariasis again, the true burden of infection is uncertain and our data is more than 15 years old.

There is an incomplete understanding of the morbidity of the disease particularly of asymptomatic infections.

And I put the term asymptomatic in quotations marks because though the patient may not present with symptoms they still may have subclinical disease that could be important. And we really just do not understand this.

Additionally serologic tests may be negative in patients with mild disease or with ocular toxocariasis.

And finally we do have limited data on the efficacy of treatment of severe disease. On trichomoniasis you'll see a common theme but the true burden of infection is still uncertain.

Additionally infections may be missed in patients who are asymptomatic. And the more we study, the more we realize the prevalence of asymptomatic infection is higher than first thought.

And finally the consequences of asymptomatic infection in pregnancy remain unclear.

On Slide 46 to summarize some key information about neglected infections of poverty in the country, just want to review the definition one more time.

The neglected infections of poverty disproportionately affect minorities, women, and disadvantaged persons in both urban and rural settings.

They're often unrecognized, undiagnosed, and untreated and the infection is often asymptomatic or subclinical making diagnosis difficult.

And then finally the data to guide diagnosis and/or treatment may be limited. Nonetheless it's important to consider these diseases when evaluating populations at risk.

The last bullet gives the link to more general information on the Neglected Infections of Poverty available at the CDC Web site.

On Slide 47 it shows some of the resources available for Chagas Disease, the resources for the guidance of evaluation and treatment under the first bullet including a link to a JAMA article that reviews evaluation and treatment.

The second bullet, there are patients and physician fact sheets in both English and Spanish available at the link.

For general information is also available at www.cdc.gov\chagas.

And finally there is CME available called Chagas Disease, What US Clinicians Need to Know. And that's available at the link at the bottom of the slide.

Toxocariasis you can visit - you can find general information at the first link and then more specific information for health professionals including treatment recommendations at the second link on that slide.

It's important to note that we have a new Web site that apparently is actually going live today.

So we've tried to provide some of the older links that you would click on and would automatically redirect you to the new Web site.

However if you try those links today or shortly after this call you may get an error message because they are in the process at this very moment of putting up all the new Web site. And so that will disable even some of the old links for today. And this may be the case for the next couple of days.

On Slide 49 there's some links to resources for trichomoniasis. And these links are at the STD Web site and therefore unaffected by the changes to our Web site.

As shown on the first bullet you can get general information at the first link. At the second link there is a downloadable brochure that's available to give to patients. And treatment guidelines are available at the third link.

Additionally there should be an MMWR coming out in the not-too-distant future with some updated recommendations on managing potentially resistant trichomoniasis.

And finally suggested readings, the first slide shows you the citation for Peter Hotez's Neglected Infections of Poverty and the citation for the evaluation and treatment of Chagas Disease that you - that is available through the link on the CDC Web site.

Finally you have two citations for clinical toxocariasis.

And on Slide 51 you have two citations for the management and treatment of trichomoniasis.

And finally I'd like to acknowledge and thank those that helped with the - with putting together this presentation including Susan Montgomery, Kelly Stimpert, Jeff Jones, Evan Secor, and Kim Workowski. And I am now ready for any questions.

Loretta Jackson: Thank you Dr. Cantey for providing our COCA audience with such a wealth of information. We will now open up the lines for the question and answer session.

Coordinator: Thank you. We will now begin the question and answer session. If you would like to ask a question please press star 1.

Please un-mute your phone and record your name clearly when prompted. Your name is required to introduce your question. To withdraw your request press star 2.

One moment please while we wait for the first question.

Ms. Pannaraj, your line is now open.

Pia Pannaraj: Thank you. This is Pia Pannaraj at Pediatric Infectious Disease at AUSC. A question about a workup of an infant who's born to an asymptomatic mother who had a positive serology determined at a - when she was donating blood. How do we workup that infant?

Dr. Paul Cantey: How old is...

Pia Pannaraj: A newborn.

Dr. Paul Cantey: A newborn. I mean in general we would recommend trying, if the mothers identified prior to birth, trying to obtain cord blood.

And then someone, you know, that you find out later on that the mother was - had potentially infected we would - it depends on the age.

If you get the child in the first month of birth out you would send blood for PCR or hemoculture to CDC because there can be - you can have parasitemia at that age.

You could also send serology just to confirm that the child has acquired antibodies from the mother but that's not really necessary.

Pia Pannaraj: Okay.

Dr. Paul Cantey: Then you would repeat the test at about nine months. If the PCR is negative you would repeat the - and the hemoculture is negative, you would repeat the testing and after nine months when there would no longer be maternal antibodies present.

And if you found antibodies at that point in time you would consider the child with - as having congenital infection.

Pia Pannaraj: Okay and at that time you would think about treatment but not beforehand if the PCR was negative and the hemoculture was negative?

Dr. Paul Cantey: Correct.

Pia Pannaraj: Is that correct? Okay great. Thank you. And this the PCR is and the hemoculture is only done at the CDC at this time?

Dr. Paul Cantey: There - some of the blood banks have some of these capabilities but for most people, you know, we can offer all that testing free of charge. And to obtain the testing you would - you could call either our hotline which is - our consult

line which is 770-488-7775 or you could email a request at parasites parasites@cdc.gov and we can send you the appropriate paperwork for the testing.

Pia Pannaraj: Okay great. Thank you very much.

Coordinator: And again if you do have any more questions or comments please press star 1 and record your name. Again please press star 1.

I show no questions.

Loretta Jackson: Dr. Cantey do you want to offer any more commentary?

Dr. Paul Cantey: I mean I'll repeat the two numbers. If people do have consults about any of the parasite diseases presented today or other parasitic diseases you - the clinicians can obtain and public health departments can obtain consults by calling 770-488-7775 or emailing parasites@scdc.gov.

And I would like to plug once again we do have CME online available on Chagas Disease at the link shown on the slide under Resources for Chagas Disease.

Loretta Jackson: And I will add that that link is also posted to the COCA Web site. Operator do we have any more questions?

Coordinator: I show no further questions.

Loretta Jackson: Thank you. On behalf of COCA I would like to thank everyone for joining us today with a special thank you to our presenter Dr. Cantey.

If you have additional questions for today's presenter please email us at coca@cdc.gov. Put Dr. Cantey in the subject line of your email and we will ensure that your email is forwarded to him for a response.

Again that email address is C-O-C-A@cdc.gov.

The recording of this call and the transcript will be posted at the COCA Web site at emergency.cdc.gov/C-O-C-A within the next few days.

Continuing education credits are available for this call. Those who participated in today's COCA conference call and would like to receive continuing education credits should complete the online evaluation by December 9, 2010 using course code EC1648. That is E as in Echo, C as in Charlie and the numbers 1648.

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Thank you again for being part of today's COCA conference call. Have a great day.

Coordinator: Excuse me we do have one more question that just came through.

Loretta Jackson: Dr. Cantey are you are you still there?

Dr. Paul Cantey: Sure.

Loretta Jackson: Okay go ahead operator.

Coordinator: Thank you so much. It comes from Danielle. Your line is now open.

Danielle Stanek: Yes this is Daniel Stanek at Florida Department of Health. I was wondering if you have any recommendations for environmental decontamination for roundworms or zoonotic hookworms or things like that?

We're actually dealing with such an event right now with hookworms in Florida. And we were also asked if there's any sort of standard environmental monitoring that could be done if you felt like an area might be heavily contaminated?

Dr. Paul Cantey: That is an excellent question and unfortunately I don't know the answer to that question but I can find out for you. What would be the best way to handle getting that information back?

Danielle Stanek: Dr. Montgomery, I plague her frequently with calls so you might work through her. This is Daniel Stanek at Florida Department of Health.

Dr. Paul Cantey: Daniel Stanek, okay. Well I will have to get back to you on that. That's a good question. I'm unfamiliar with any well studied environmental protocols but there may be some that I'm unaware of.

Danielle Stanek: Thank you.

Coordinator: That was the last question.

That concludes today's conference. Thank you for participating. You may disconnect at this time.

END