Diagnosis

Diagnosis of amoebiasis depend on:

1- Physical signs and symptoms.

2- Sigmoidoscopy or colonoscopy; is not recommended as a routine diagnostic approach.

Diagnosis by sigmoidoscopic image should always be supplemented by microscopic examination of aspirated and biopsied specimens.

3- X-ray, U.S., C.T. scan and MRI are helpful methods if there is obstruction amoeboma, peritonitis, and extraintestinal infections and also to assess chemotherapy.

4- Laboratory diagnosis: either by:

a- Direct demonstration of the parasite in stool specimen, liver abscess aspirate, colonic biopsy and sputum by microscopic examination, cultivation, animal inoculation and antigen detection test.

b- Indirect demonstration of the parasite by:

1- Serological tests.

2- Blood picture.

3- Liver function test.

Methods of direct demonstration of the parasite:

1- Stool examination:

Usually more than one specimen is recommended at 3 – 4 days intervals and almost trophozoites are seen in liquid warm fresh stool, while cysts are seen in formed and semi-formed stool.

General stool examination include macroscopic and microscopic examination.
a- Macroscopically the stool specimen in amoebic dysentery contains exudates, mucus and blood.

b- Microscopic examination include:

1- Direct wet smear preparation of saline and iodine solutions to look for the trophozoites, cysts and charcot-leyden crystals. We need to differentiate between E.histolytica and other amoebae and macrophages.

2- Indirect concentration method by flotation or sedimentation of the cysts in case of light infection.

3- Permenante stained smear.

Microscopic examination is unable to distinguish pathogenic E.histolytica from morphologically identical and non pathogenic E.dispar. Erythrophagocytic amoeba are more likely to be E. histolytica.

Microscopy is still the most widespread method of diagnosis around the world. However is not as sensitive or accurate in diagnosis as the other tests available.

2- Cultivation of the parasite on specific media.

3- Animal inoculation: experimental infections of animals to demonstrate the parasite.

4- Antigen detection test: it gives indication that the parasite is still present. It is more sensitive method than microscopy and it is specific for E.histolytica infection. This test is recently developed and include a kit that detects the presence of amoebae proteins or DNA of amoeba in feces. These tests are not in widespread use due to their expense.
Methods of indirect demonstration of the parasite:

1- Serological tests: to detect specific antibodies against *E. histolytica*. Antibodies will be detectable within 5 – 7 days of acute infection and may persist for years.

   Serological tests are positive in 90 – 95% of patients with extra-intestinal infection. Several serological tests are used e.g. Indirect haemagglutination, ELISA and Indirect fluorescent antibody test. The levels of antibodies are much higher in individual with liver abscess.

2- Blood picture: leukocytosis with eosinophilia is observed in 80% of cases and mild anemia also observed.

3- Liver function test: In amoebic liver abscess, alkaline phosphatase shows slight elevation.

Occult blood test usually positive in acute bloody diarrhia cases.

In patients with amoebic dysentery, it is necessary to differentiate between infectious causes including amoebiasis, shigellosis, campylobacter and non – infectious causes including inflammatory bowel disease and ischemic colitis.

Parasitic causes of dysentery include *E.histolytica*, *Balantidium coli* and *Schistosoma mansoni*. 
Differential diagnosis of amoebic and bacillary dysentery:

<table>
<thead>
<tr>
<th>Amoebiasis</th>
<th>Shigellosis</th>
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<tbody>
<tr>
<td>- Chronic disease may persist from 1 – 14 weeks or even years.</td>
<td>- Acute disease with short incubation period</td>
</tr>
<tr>
<td>- Flask – shaped ulcer involving all coats of intestine.</td>
<td>- Superficial infection with necrosis of mucous membrane</td>
</tr>
<tr>
<td>- Stool consisting of blood, mucus and fecal materials but with few leukocytes.</td>
<td>- Stool filled with cellular exudates, numerous pus cells.</td>
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<tr>
<td>- RBCs may be agglutinated.</td>
<td>- RBCs not agglutinate</td>
</tr>
<tr>
<td>- Charcot – leyden crystals usually present.</td>
<td>- Not present.</td>
</tr>
<tr>
<td>- <em>E. histolytica</em> troph. may have ingested RBCs.</td>
<td>- No <em>E. histolytica</em> troph.</td>
</tr>
<tr>
<td>- Localized abdominal pain over cecum.</td>
<td>- Generalized abdominal pain.</td>
</tr>
<tr>
<td>- No fever</td>
<td>- Fever usually present.</td>
</tr>
<tr>
<td>- Response to antiamoebic drug.</td>
<td>- Response to antibiotic.</td>
</tr>
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</table>

**Entamoeba coli**

It is non pathogenic amoebae, world widely distributed, usually the most common amoebic parasite of man. Although it is a harmless, commensal found in the lumen of cecum and lower levels of large intestine, its presence in the stool of man indicates that the patient has ingested fecal contaminated food.
**Morphology**

Trophozoite: 15 - 50µ in diameter that is larger than that of *E. histolytica* troph., ectoplasm non – granular and not well differentiated from the coarsely – granular endoplasm. Pseudopodia are short, broad and extend in different directions.

Motility: non progressive, non directional and sluggish movement.

Within the endoplasm there are many food vacuoles containing bacteria and food debris, but no RBCs. The trophozoite contain single nucleus which is larger than *E. histolytica* nucleus, relatively with thick nuclear membrane which is lined by irregularly distributed chromatin granules. Karyosome is eccentric and surrounded by a halo-like capsule connected to the nuclear membrane by thin fibrils and there is small chromatin granules scattered on these fibrils. This type of nucleus is called coli-type nucleus.
Coli type nucleus

Cyst: spherical, larger than *E. histolytica*, when it is immature, it is usually contain one nucleus than as it become mature it posses 8 or 16 or even 32 nuclei. Within the cytoplasm of immature cyst there is relatively large, sharply defined glycogen mass, this mass disappear after the maturation of the cyst.

There are numerous chromatoidal bodies, thread like or splinter – shaped with pointed ends, usually found in bundles.

Diagnosis: by identify trophozoites or cysts by wet saline or iodine preparation, or by demonstrate only in concentration method.