

# **Laboratory diagnosis of parasitic diseases**

**(pathogenic intestinal and urogenital flagellates)**

**Sarah Alharbi**

**Clinical Laboratory department**

**Collage of Applied Medical Sciences**

**King Saud University**

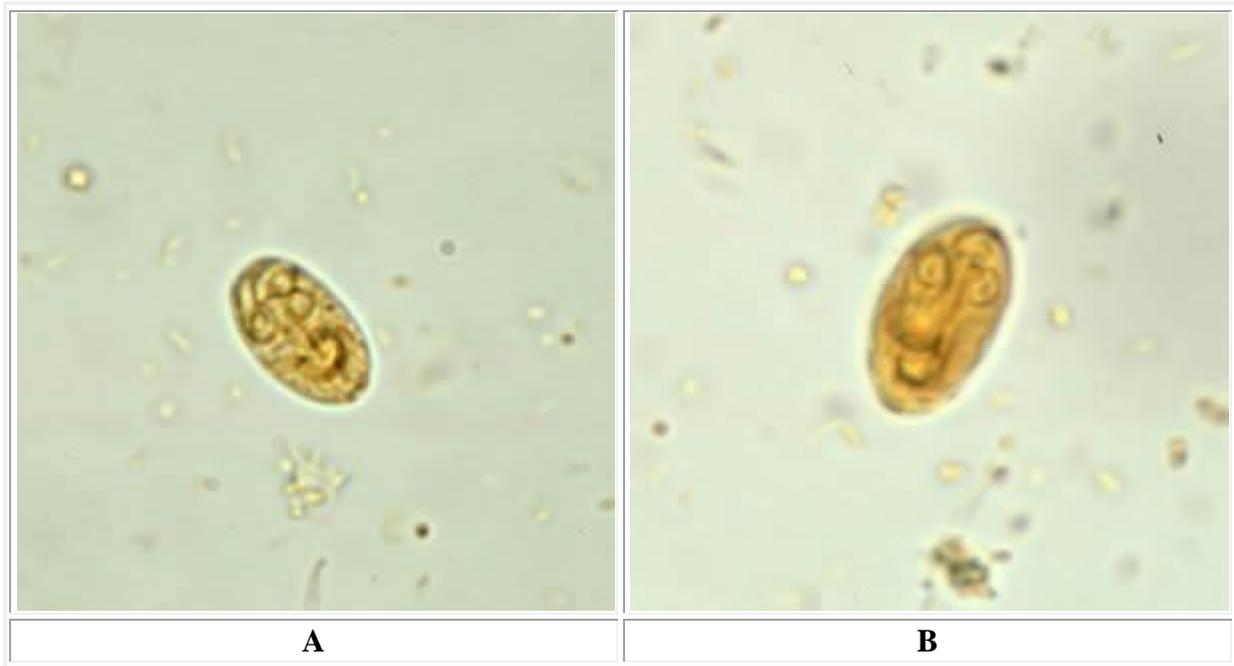
**This document contains materials modified or adapted from the information  
provided by CDC through its site: <http://www.dpd.cdc.org>**

1) *Giardia lamblia*

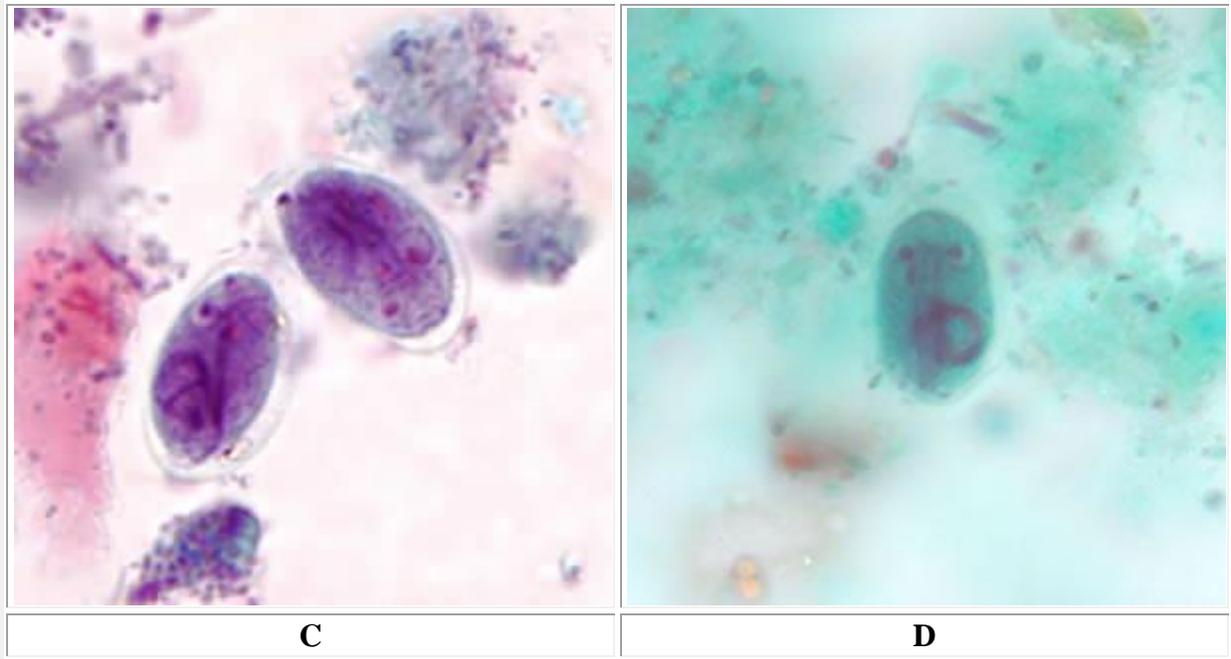
- Both cysts and trophozoites can be found in the feces (diagnostic stages)
- The cyst is the stage found most commonly in nondiarrheal feces
- Giardiasis is diagnosed by the identification of cysts or trophozoites in the feces, using direct mounts as well as concentration procedures.
- Repeated samplings may be necessary.
- In addition, samples of duodenal fluid (e.g., Enterotest) or duodenal biopsy may demonstrate trophozoites.
- Alternate methods for detection include antigen detection tests by enzyme immunoassays, and detection of parasites by immunofluorescence.

**Cysts**

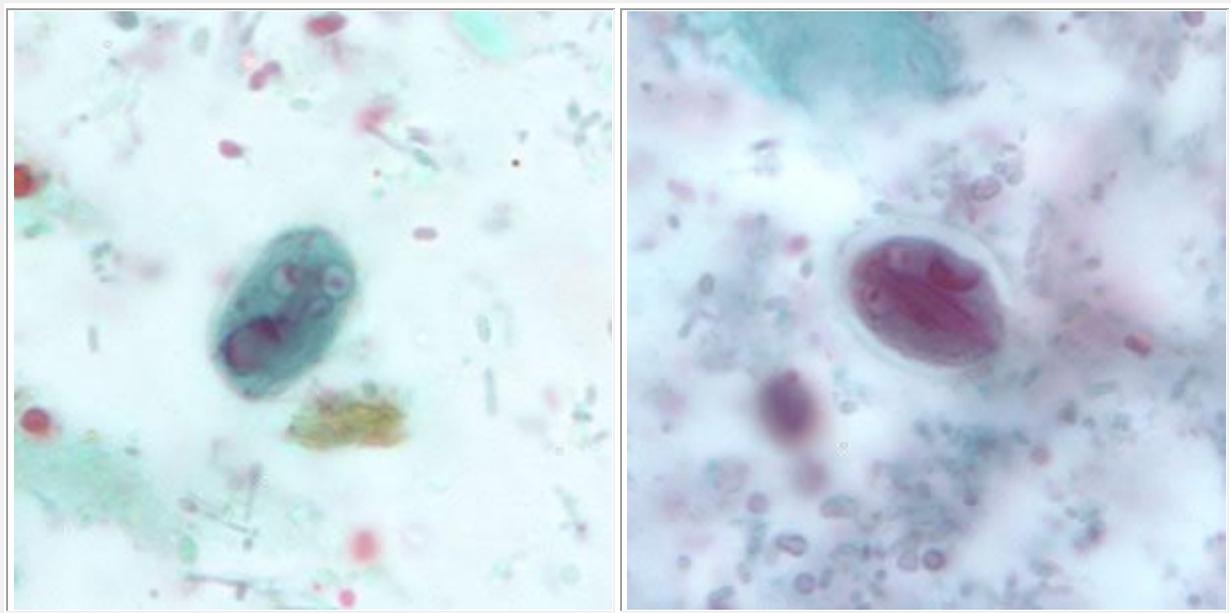
*Giardia intestinalis* cysts are oval to ellipsoid and measure 8-19  $\mu\text{m}$  (average 10-14  $\mu\text{m}$ ). Mature cysts have 4 nuclei, while immature cysts have two. Nuclei and fibrils are visible in both iodine-stained wet mounts and trichrome-stained smears.



**A, B:** *G. intestinalis* cysts in a wet mount stained with iodine.



**C, D, E, F:** *G. intestinalis* cysts stained with trichrome. Sometimes the cytoplasm of the cyst may retract from the cell wall; this is visible in Image **F**.

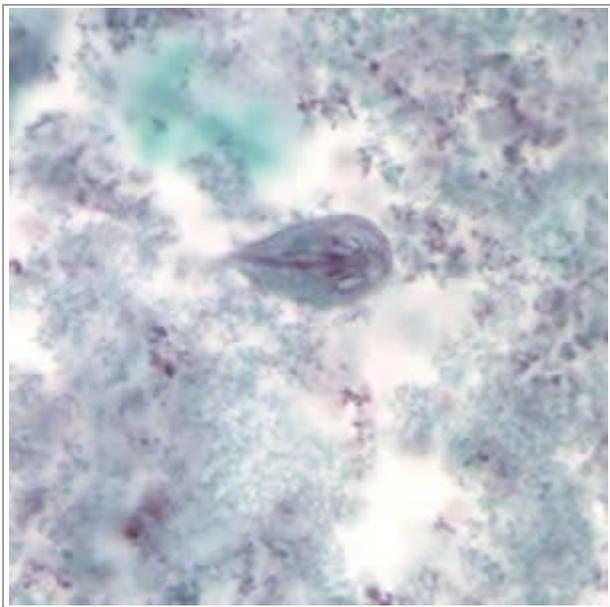


### **Trophozoites**

*Giardia intestinalis* trophozoites are pear-shaped and measure 10-20 micrometers in length. In permanent, stained specimens, 2 large nuclei are usually visible. The sucking disks (used for attaching to the host's mucosal epithelium), median bodies, and flagella (8) may also be seen.



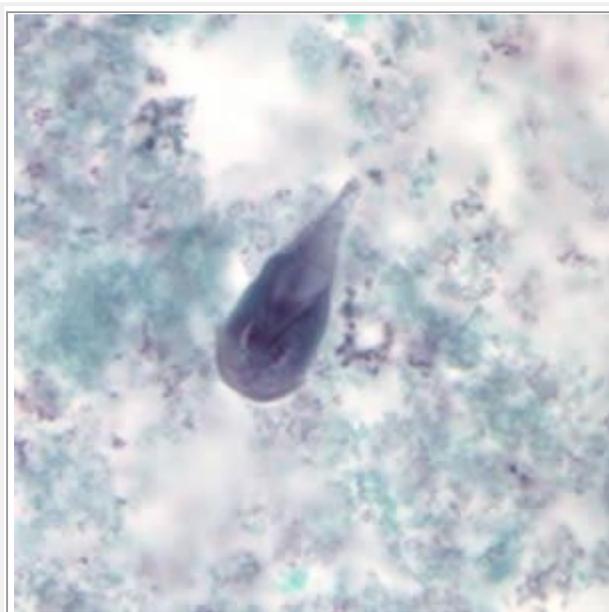
**G**



**H**

**G:** *G. intestinalis* trophozoite in a wet mount stained with iodine.

**H:** *G. intestinalis* trophozoite stained with trichrome.



**I**

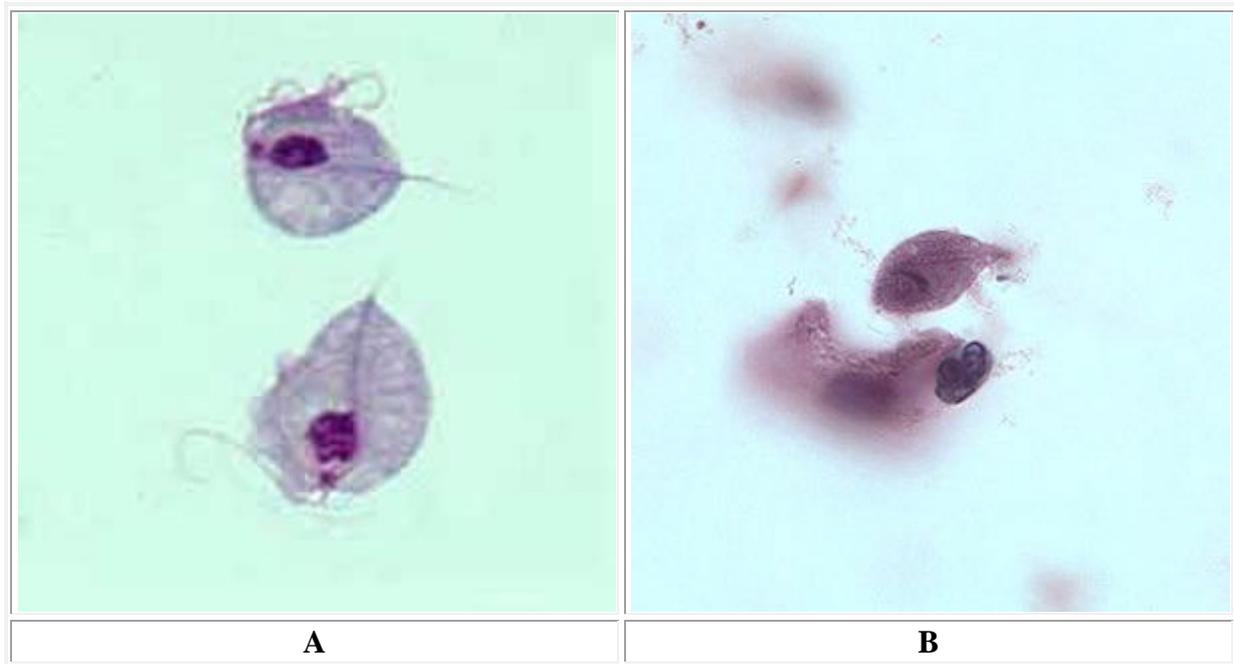
**I:** *G. intestinalis* trophozoite stained with trichrome.

## 2) *Trichomonas vaginalis*

- The parasite does not appear to have a cyst form, and does not survive well in the external environment
- Microscopic examination of wet mounts may establish the diagnosis by detecting actively motile organisms. This is the most practical and rapid method of diagnosis (allowing immediate treatment), but it is relatively insensitive.
- Direct immunofluorescent antibody staining is more sensitive than wet mounts, but technically more complex.
- Culture of the parasite is the most sensitive method, but results are not available for 3 to 7 days.
- In women, examination should be performed on vaginal and urethral secretions.
- In men, anterior urethral or prostatic secretions should be examined.

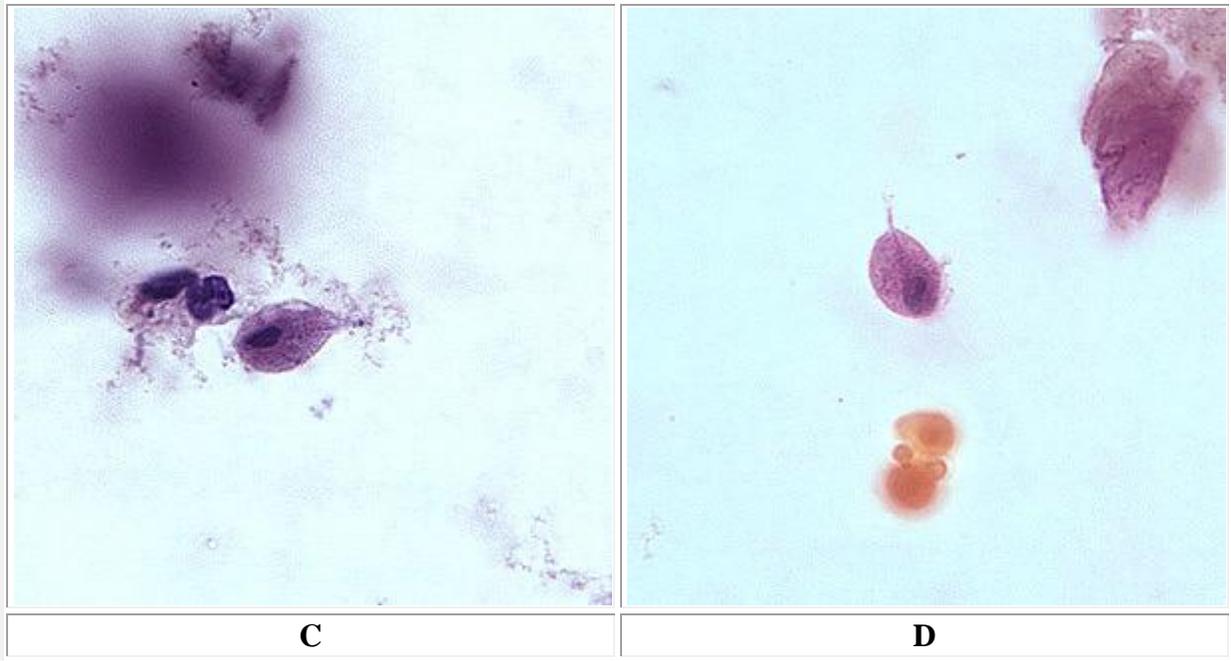
### Microscopy:

Trophozoites of *Trichomonas vaginalis* are pyriform and 7-30  $\mu\text{m}$  long. They have five flagella: four anteriorly directed flagella and one posteriorly along the outer membrane of the undulating membrane. The large nucleus is usually located at the wider, anterior end and contains many chromatin granules and a small karyosome. The cytoplasm also contains many granules, but these are often not seen in Giemsa-stained specimens.



**A:** Two trophozoites of *T. vaginalis* obtained from in vitro culture, stained with Giemsa.

**B:** Trophozoite of *T. vaginalis* in a vaginal smear, stained with Giemsa.



**C, D:** Trophozoites of *T. vaginalis* in a vaginal smear, stained with Giemsa.

