

GASTRO-HEPATOLOGY & PANCREAS

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**REKAPITULASI KLB DIARE DI INDONESIA
TAHUN 2010 – 2018**

Tahun	Jumlah Propinsi	Jumlah Kejadian	Kasus	Kematian	CFR (%)
2010	11	33	4.204	73	1,74
2011	15	19	3.003	12	0,40
2012	17	34	1.625	25	1,54
2013	6	8	633	7	1,11
2014	5	6	2.549	29	1,14
2015	13	21	1.213	30	2,47
2016	3	3	198	6	3,03
2017	12	21	1.725	34	1,97
2018	8	10	756	36	4,76

Sumber: Ditjen P2P, Kemenkes RI, 2019

Ascaris lumbricoides

Trichuris trichiura

Hookworm

NEMATODA USUS

DISTRIBUSI GEOGRAFIS

- Hasil survei di beberapa tempat di Indonesia: prevalensi infeksi *Ascaris lumbricoides*, *hookworm*, *Trichuris trichiura* masih tinggi
- biasanya ditemukan di daerah yang panas, lembab dan sanitasi yang kurang
 - Contoh : daerah pertambangan dan perkebunan
 - Di Indonesia prevalensi tinggi, terutama di daerah pedesaan

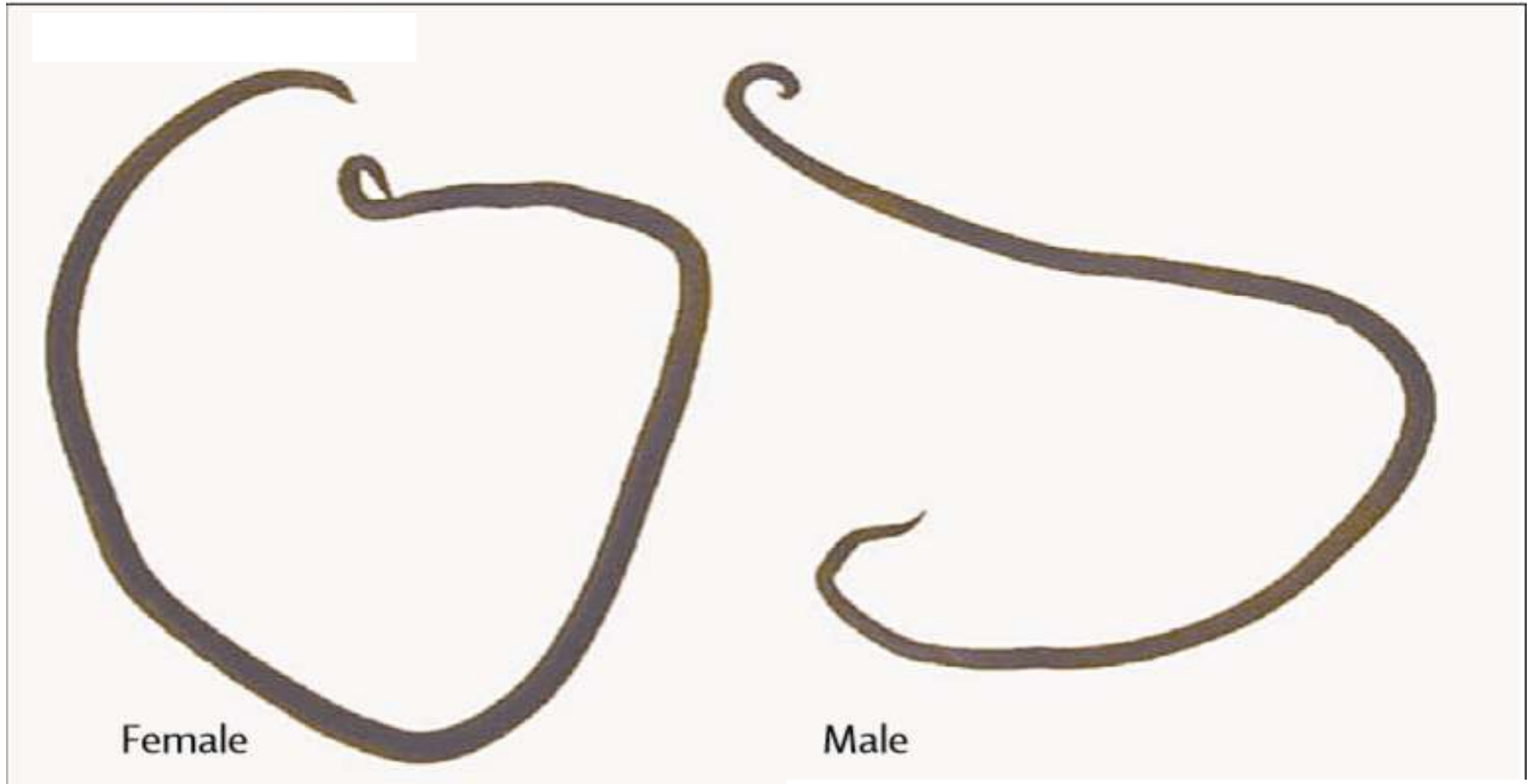
Kebiasaan yang berhubungan erat dengan tingginya angka infeksi dan reinfeksi STH, khususnya pada balita dan anak usia sekolah :

- Defekasi sembarangan di sekitar rumah
- Tidak mencuci tangan sebelum makan, bermain tanpa alas kaki
- Geophagia

Ascaris lumbricoides

MORPHOLOGY

Adult Worms



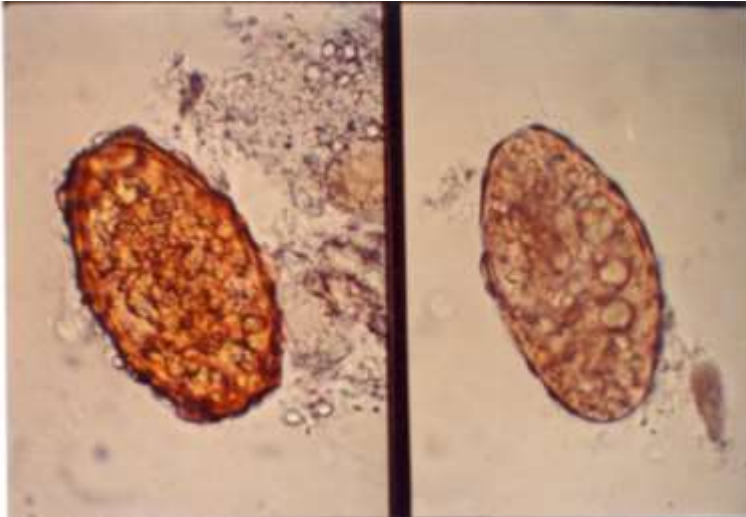
Jantan : 15-30 cm

Betina : 20-35 cm

Masa hidup : 1-2 tahun

Habitat : usus halus

Eggs



Telur yang tidak dibuahi : oval, ukuran: 90 μm

Telur yang dibuahi : oval, lapisan albuminoid, warna coklat kekuningan,
uk: 75 μm x 50 μm

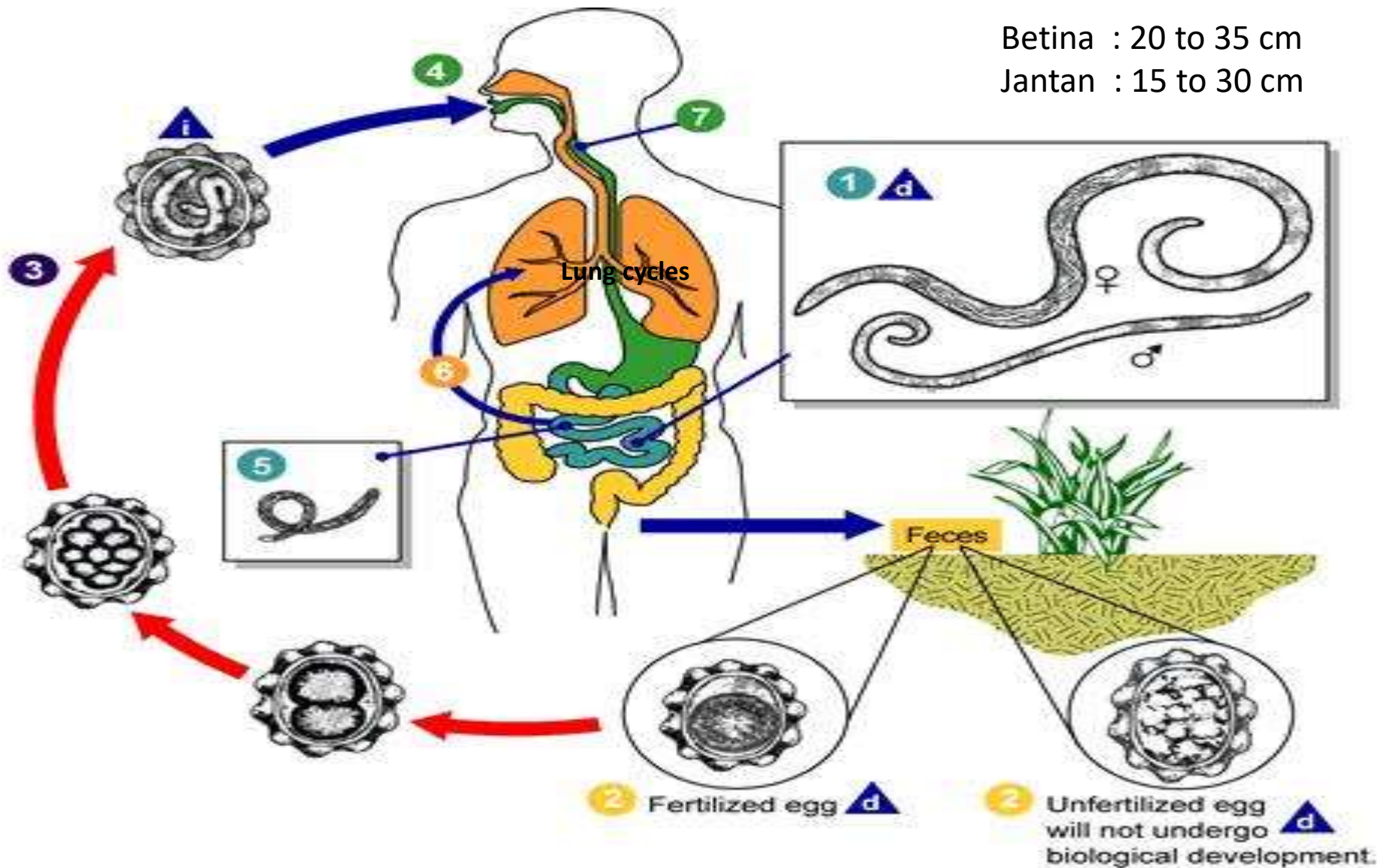
Telur berkembang dengan baik di tanah dengan kelembaban tinggi, 25-30 ° C

Telur menjadi bentuk infeksius dalam 2-3 minggu

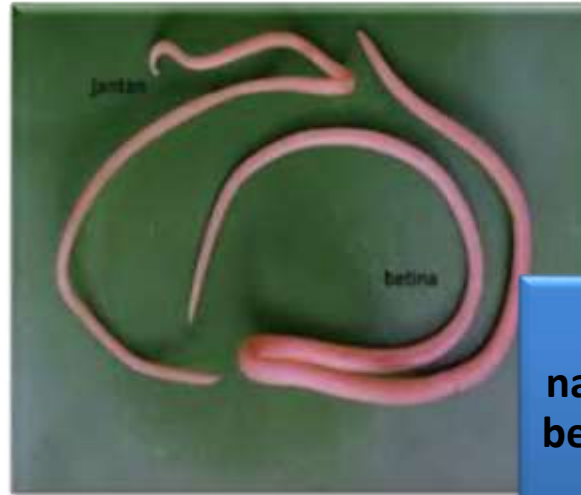
Life cycle

Betina : 20 to 35 cm

Jantan : 15 to 30 cm



Patologi dan Manifestasi Klinis



Efek mekanik :
nausea, nafsu makan berkurang, diare atau konstipasi, malabsorpsi



Efek migrasi larva :
demam, dyspnea, batuk, malaise, pneumonia

Hookworm

Necator americanus

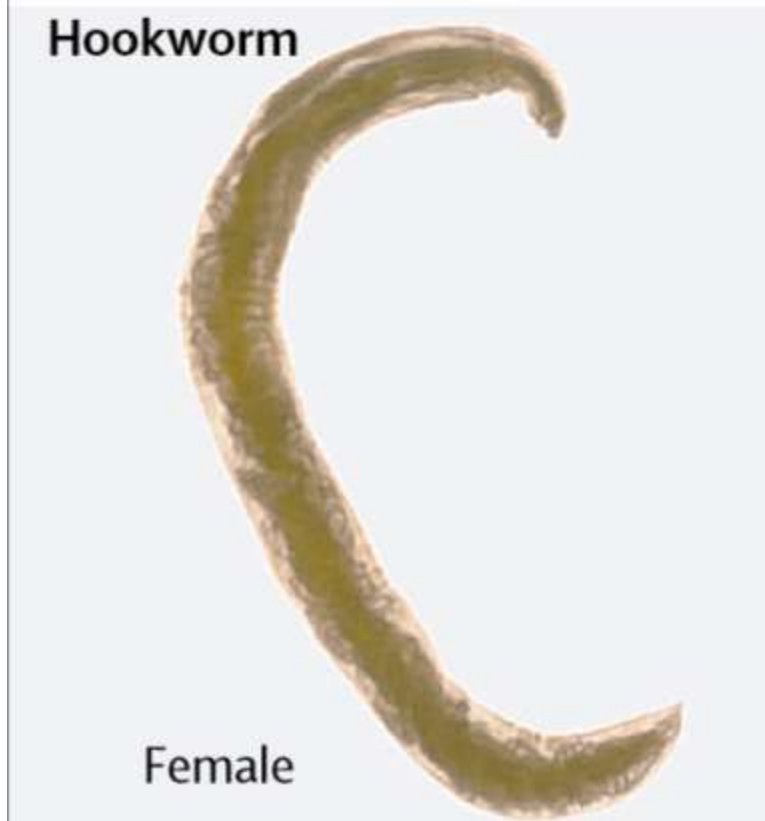
Ancylostoma duodenale

MORPHOLOGY

Necator americanus

- Cacing dewasa hidup di jejunum dan ileum bagian atas, menempel pada bagian mukosa dan bisa bertahan hidup selama 1 tahun
- *N. americanus* betina dapat memproduksi telur 5000-10.000 telur /hari , sementara *A. duodenale* 25.000 telur /hari
- *Ancylostoma duodenale* hampir tidak pernah ditemukan di Indonesia

Adult worms



N. americanus : tubuh berbentuk seperti huruf **S**
A. duodenale : tubuh berbentuk seperti huruf **C**
betina 1 cm; jantan 0,8 cm

ORAL CAVITY

N. americanus →
sepasang benda
kitin



ORAL CAVITY

2 pasang gigi

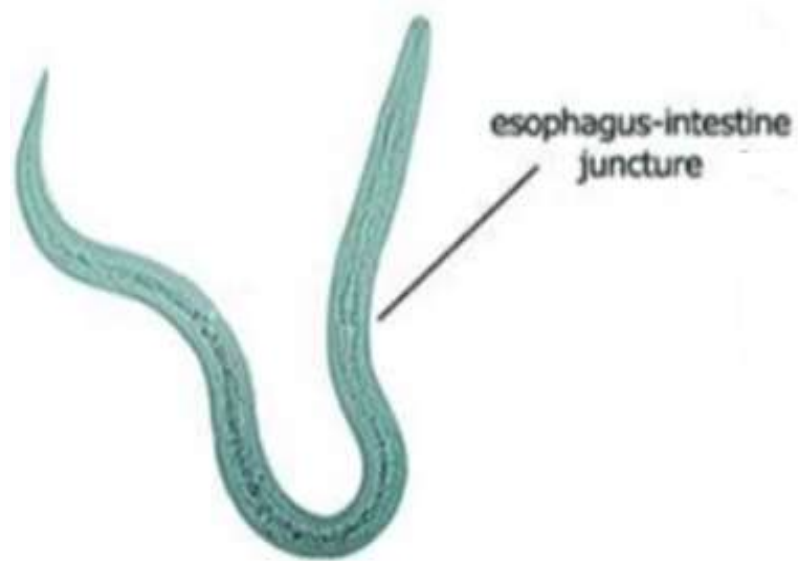


EGGS



bentuk: Oval; Uk: 60 x 40 μm
Dinding tipis, 1 lapis, berisi morula
Berkembang lebih baik pada tanah gambut (pasir,
humus) dengan suhu optimum 28-32°C

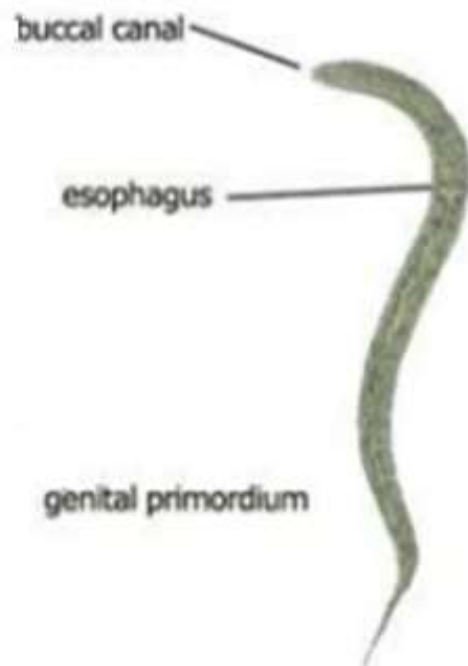
Filariform (L3) Stage



Hookworm

100 μ m

Rhabditiform



Hookworm

100 μ m

The diagram illustrates the life cycle of hookworms, showing the progression from eggs to infective larvae and then to adult worms in the human body.

- 1 Eggs in feces**: The cycle begins with eggs found in feces.
- 2 Rhabditiform larva hatches**: The eggs hatch into rhabditiform larvae, which take 1-1.5 days to hatch.
- 3 Filariform larva**: The rhabditiform larvae develop into filariform larvae over a period of 3 days.
- 4 Infective Stage**: The filariform larvae are the infective stage, capable of penetrating the skin and surviving in soil for 7-8 weeks.
- 5 Adults in small intestine**: Once a person is infected, the adult worms reside in the small intestine.

Microscopic images of the mouthparts of *Ancylostoma* and *Necator* are shown at the bottom left, highlighting the structure used for skin penetration.

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Additional details include:

- Hatch 1-1,5 hari:** A note indicating the hatching time for the rhabditiform larvae.
- Ancylostoma and Necator:** Microscopic images of the heads of these two hookworm species are shown at the bottom left.

The diagram illustrates the life cycle of hookworms, showing the progression from eggs to infective larvae and the stages of infection in a human host.

Life Cycle Stages:

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- 5 Adults in small intestine**: Upon infection, the larvae mature into adults residing in the small intestine of the host.

Host Interaction:

- The **Infective Stage** (4) is shown penetrating the skin of a human foot.
- The **Adults in small intestine** (5) are shown within the human digestive system.

Species Identification:

- Ancylostoma**: Shown as a microscopic view of the anterior end of the worm.
- Necator**: Shown as a microscopic view of the anterior end of the worm.

Developmental Timeline:

- Hatch 1-1,5 hari**: Time taken for the rhabditiform larva to hatch from the egg.
- 3 days**: Time taken for the rhabditiform larva to develop into the filariform larva.

The diagram illustrates the life cycle of hookworms, specifically *Ancylostoma* and *Necator*. The cycle begins with **1 Eggs in feces**, which hatch within 1-1.5 days (**Hatch 1-1,5 hari**). The resulting **2 Rhabditiform larva hatches** develops into a **Filariform larva** over a period of **3 days**. The **Filariform larva** is the **Infective Stage** and can penetrate human skin, living in soil for 7-8 weeks. Inside the human body, **5 Adults in small intestine** are shown. The cycle completes by returning to the feces, where **1 Eggs in feces** are laid by the adults.

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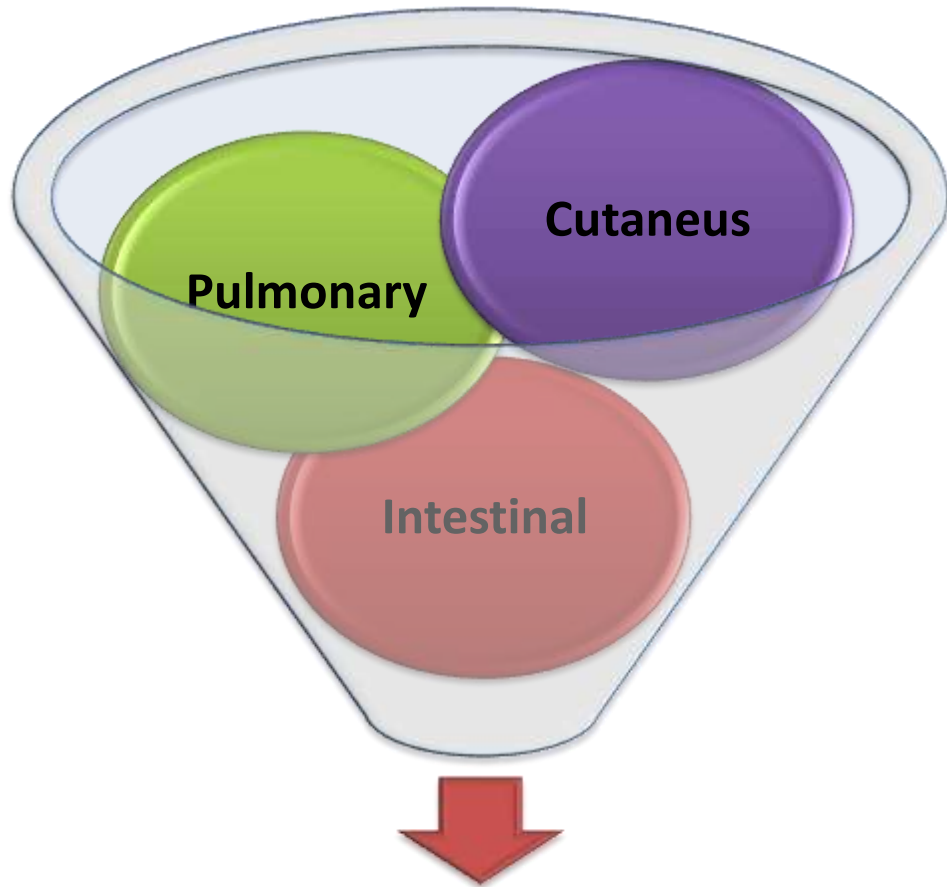
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3 fase Patologi



Manifestasi klinis

Patologi dan Manifestasi Klinis

Stadium Larva :

1. Cutaneus

- *Cutaneous larva migrans* : bentuk efek dari penetrasi larva ke kulit
- *Ground itch* → efek dermatitis yang disebabkan oleh penetrasi larva filariform dalam jumlah banyak
- Nyeri dan iritasi mengikuti penetrasi
- Infeksi larva filariform *A. duodenale* secara oral menyebabkan **Wakana disease** dengan gejala nausea, muntah, iritasi faring, batuk, sakit tenggorokan dan serak

2. Pulmonal

- Gejala paru disebabkan oleh migrasi larva di kapiler ke dalam alveoli → batuk kering, demam, asma + mengi

Patologi dan Manifestasi Klinis

Stadium cacing dewasa :

Gejala tergantung spesies dan jumlah cacing yang menginfeksi cacing dan juga kondisi nutrisi pasien.

- Iritasi usus halus
- Nausea, muntah , nyeri abdominal, diare
- Tinja dengan darah dan lendir

Patologi dan Manifestasi Klinis

Manifestasi Sistemik

1. Anemia kronis akibat kekurangan zat besi.
 - *Necator americanus* → jumlah darah yang hilang per hari 0.03 mL per cacing
 - Jumlah total darah yang hilang setiap hari 2 mL / 1000 telur/ gram tinja
 - *Ancylostoma duodenale* → jumlah darah yang hilang per hari 0.15 - 5 mL / 1000 telur/ gram tinja
2. Hb dapat turun sampai 5 g / dl atau lebih rendah
3. Pada anak-anak, infeksi hookworm dapat mempengaruhi perkembangan mental dan fisik



Trichuris trichiura

- Penyakit : *Trichuriasis*
- Penyebab infeksi tertinggi kedua pada manusia
- Intensitas infeksi tertinggi pada anak usia 5-15 tahun

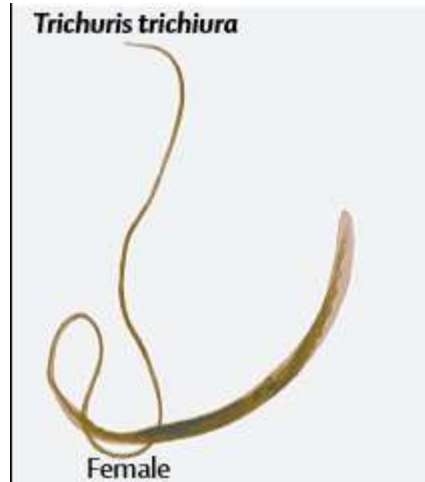
Morfologi

Betina : ± 5 cm

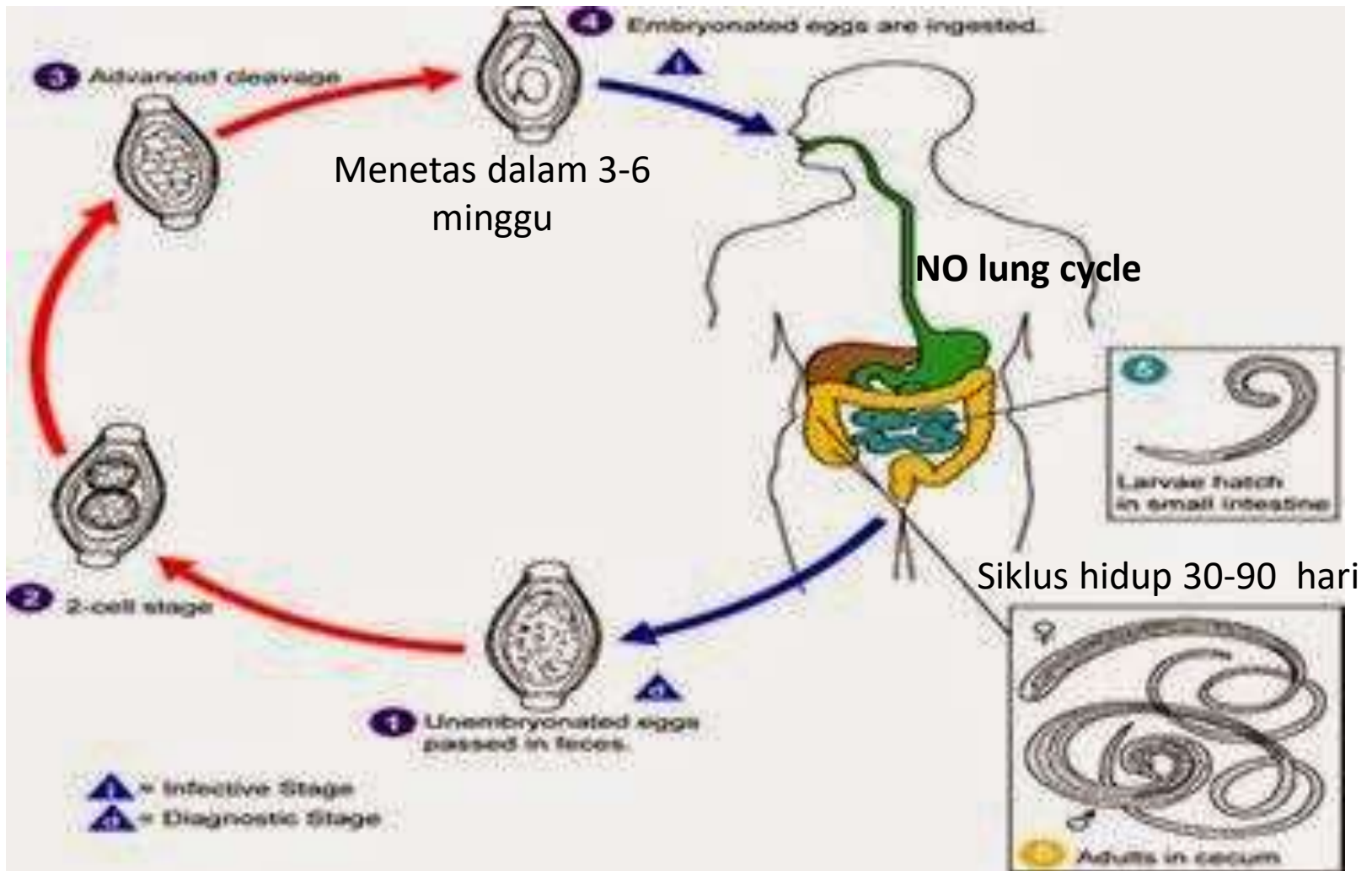
Jantan : ± 4 cm

Ukuran telur 50-54 μm x
32 μm

Cacing dewasa hidup di
kolon ascenden dan
caecum



Life cycles



Manifestasi Klinis

- Gejala ringan sampai asimtomatis
- Jumlah cacing banyak: diare dengan tinja berlendir, nyeri abdominal, dehidrasi, anemia, lemah, dan berat badan turun
- Infeksi parah biasanya pada anak-anak → cacing tersebar sepanjang kolon dan rektum
- Prolapsus rektal bisa terjadi pada orang yang banyak mengedan selama defekasi
- Anemia

INTESTINAL NEMATODES
Soil Transmitted Helminth

DIAGNOSIS, TERAPI & KONTROL

Specific clinical features/syndromes

General features

Larval migration

Adult gastrointestinal parasitism

Ascariasis

Verminous pneumonia

Lactose intolerance

Impaired growth

Vitamin A malabsorption

Impaired physical fitness

Intestinal obstruction

Impaired cognition

Hepatopancreatic ascariasis

Reductions in school attendance and performance

Trichuriasis

None

Colitis

Trichuris dysentery syndrome

Rectal prolapse

Hookworm

Ground itch

Intestinal blood loss

Cough

Iron-deficiency anaemia

Wakana disease

Protein malnutrition

DIAGNOSIS

- Pemeriksaan langsung tinja : menemukan telur
- Pada migrasi larva → menemukan larva di sputum atau bilasan lambung

TERAPI

Pengobatan bisa dilakukan secara individual atau masal

1. Terapi individual

- Piperazine,
 - Pyrantel pamoate 10 mg/kg BB,
 - Mebendazole 500 mg atau Albendazol 400 mg
-
- Trichuriasis:
 - Albendazole 400 mg dosis tunggal
 - Mebendazole 100 mg, 2x/hari, selama 3 hari

 - Oxanthel-pyrantel pamoate dapat digunakan untuk infeksi campur askariasis dan trichuriasis

TERAPI

Obat-obat di atas efektif untuk membunuh cacing dewasa tapi belum terbukti keefektifannya dalam membunuh stadium larva

2. Pengobatan Masal → membutuhkan beberapa kondisi :

- Obat bisa diterima oleh komunitas, memiliki aturan minum yang mudah, memiliki sedikit efek samping, efektif untuk beberapa spesies cacing, murah
- Dilaksanakan oleh pemerintah : Albendazole 400 mg, 2x/tahun pada anak usia sekolah dasar

Kontrol & Pencegahan

Faktor utama adalah penyebaran tanah yang terkontaminasi dengan tinja, umumnya karena penggunaan tinja sebagai pupuk

- Pengobatan masal di daerah endemis
- Membuat toilet yang baik, bersih dan sehat
- Sanitasi lingkungan dan edukasi kebersihan pribadi (terutama anak-anak)
- Cuci tangan sebelum makan
- Cuci sayuran yang dimakan mentah

Taenia solium

Taenia saginata

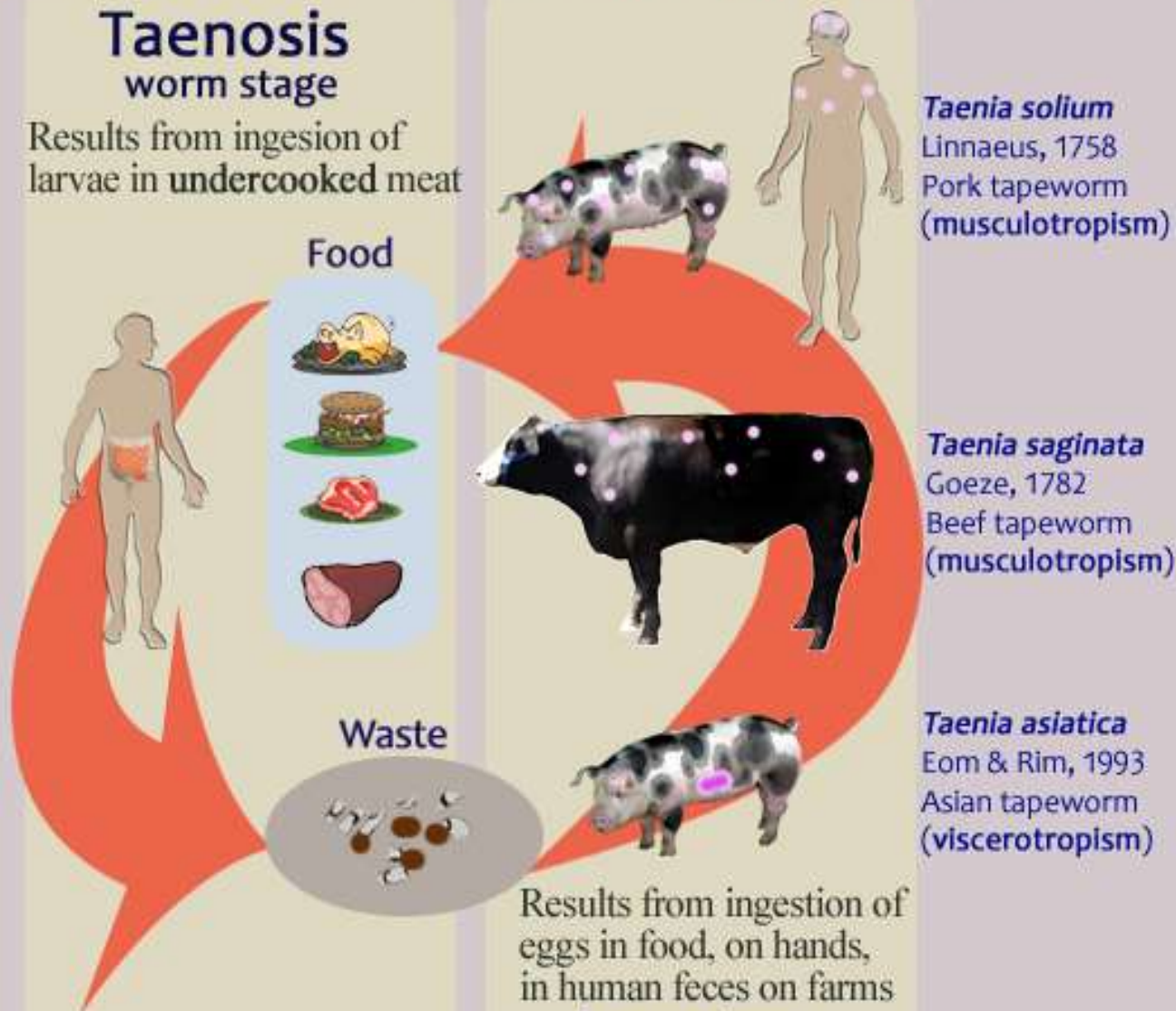
Taenia asiatica

TAENIASIS

Life cycles of three human *Taenia* tapeworms

Taenosis worm stage

Results from ingestion of
larvae in undercooked meat



Life cycles of *Taenia*

three human tapeworms



adult worms



Taenia saginata Goeze, 1782
Beef tapeworm

Taenia solium Linnaeus, 1758
Pork tapeworm

Taenia asiatica Eom and Rim, 1993
Asian tapeworm



Cysticercus hominis

C. cellulosae

C. viscerotropica



musculotropism

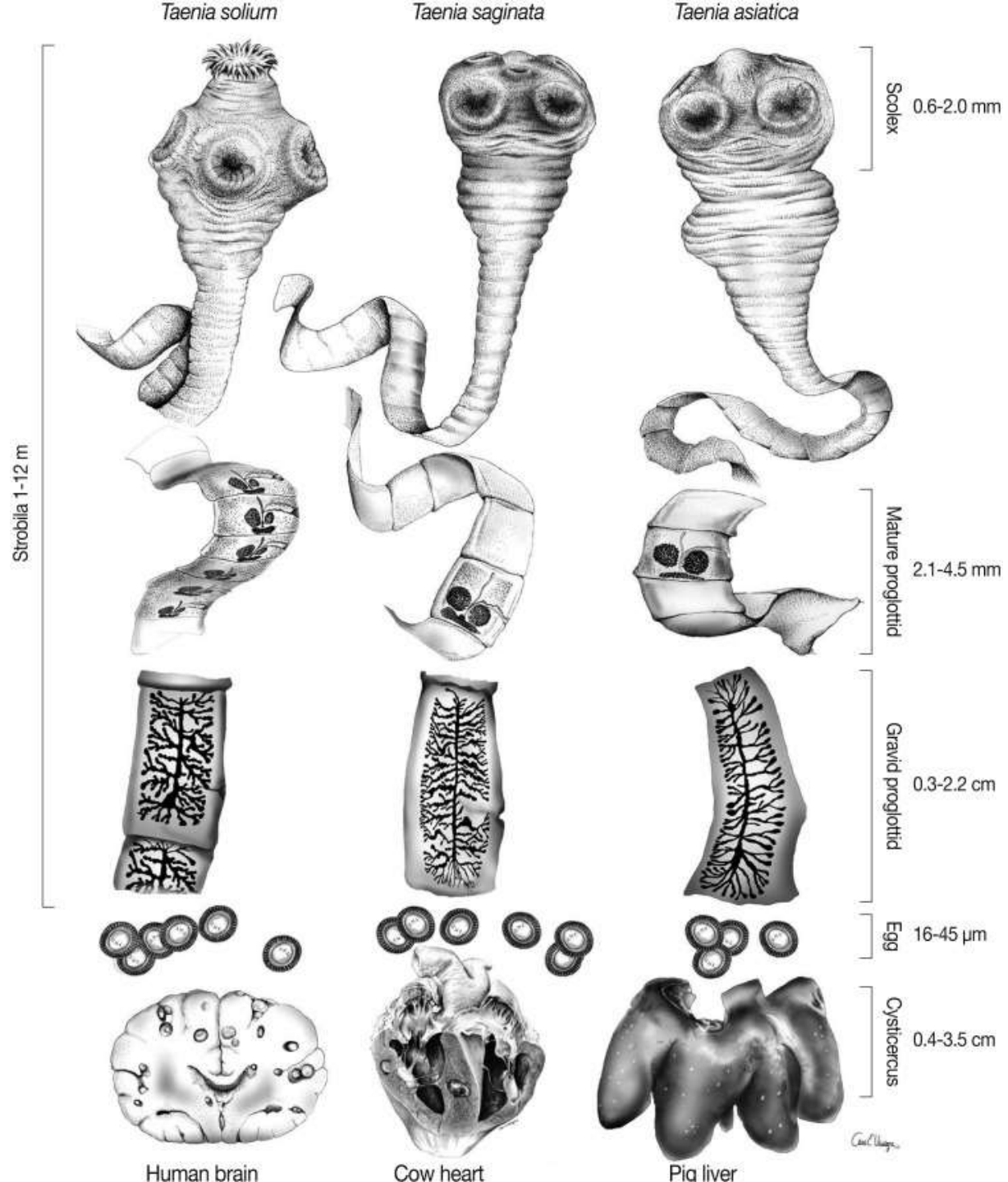
viscerotropism

egg

Human
cysticercosis

Morphological features	<i>T. saginata</i>	<i>T. asiatica</i>	<i>T. solium</i>
<u>Scolex</u>			
Rostellum	Absent	Present	Present
Hooklets	Absent	Absent	Present
Apical pit	Absent	Present	Absent
<u>Mature proglottid</u>			
Ovary	2 lobes	2 lobes	3 lobes
Testis (number)	800-1200	324-1216	375-575
Vaginal sphincter	Present	Present	Absent
<u>Gravid proglottid</u>			
Uterine branches (each side number)	14-32	11-31	7-16
Pattern of uterine branching	Dichotomous	Dichotomous	Dendritic
Expulsion from host	Actively, usually in singles	Actively, usually in singles	Passively during defaecation usually in groups
Posterior protuberance	Absent, if present-not prominent	Present and prominent	Absent
<u>Cysticercus</u>			
Size	6-10 mm×4-6 mm	2 mm×2 mm	5-8 mm×3-6 mm
Scolex	No rostellum or hooklets. Apical pit seen	Sunken rostellum with rudimentary hooklets	Rostellum with hooklets
Bladder wall outgrowths	Rugose	Warty with microtriches	Absent
Intermediate hosts (cysticercus/metacestodes seen)	Cattle	Pigs, occasionally cattle and goat	Pigs, humans

T. saginata: *Taenia saginata*, *T. asiatica*: *Taenia asiatica*, *T. solium*: *Taenia solium*. Adapted from references [1, 10, 12].



TELUR *Taenia* *sp.*

- Ukuran Telur 35-30 mikron
- Berisi embrio heksakan/onkosfer
- Bulat
- Dinding tebal, struktur linier
- Memiliki 6 buah kait-kait



GEJALA KLINIS

- Sakit ulu hati, dyspepsia
- Anorexia, vomitus
- Diare
- Pusing
- Ditemukan proglotid bergerak lewat dubur bersama / tanpa tinja
- Ileus → bila masuk appendix
- Berat Badan ↓↑
- Eosinofilia → pada darah tepi
- Gejala klinis lebih berarti disebabkan oleh larva → sistiserkosis

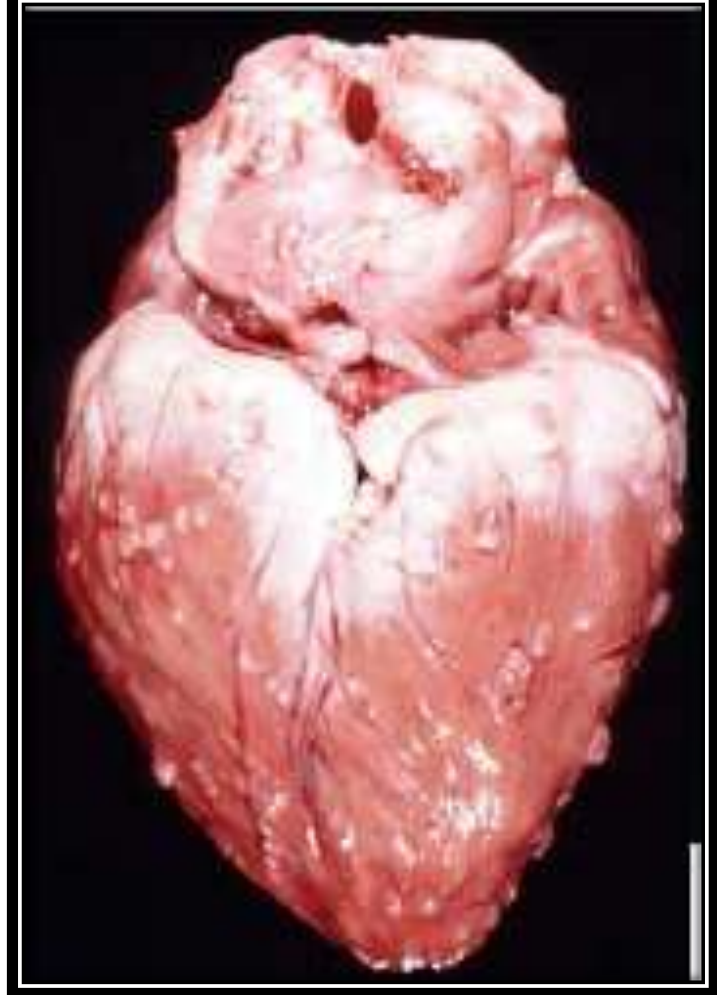
DIAGNOSIS & THERAPY

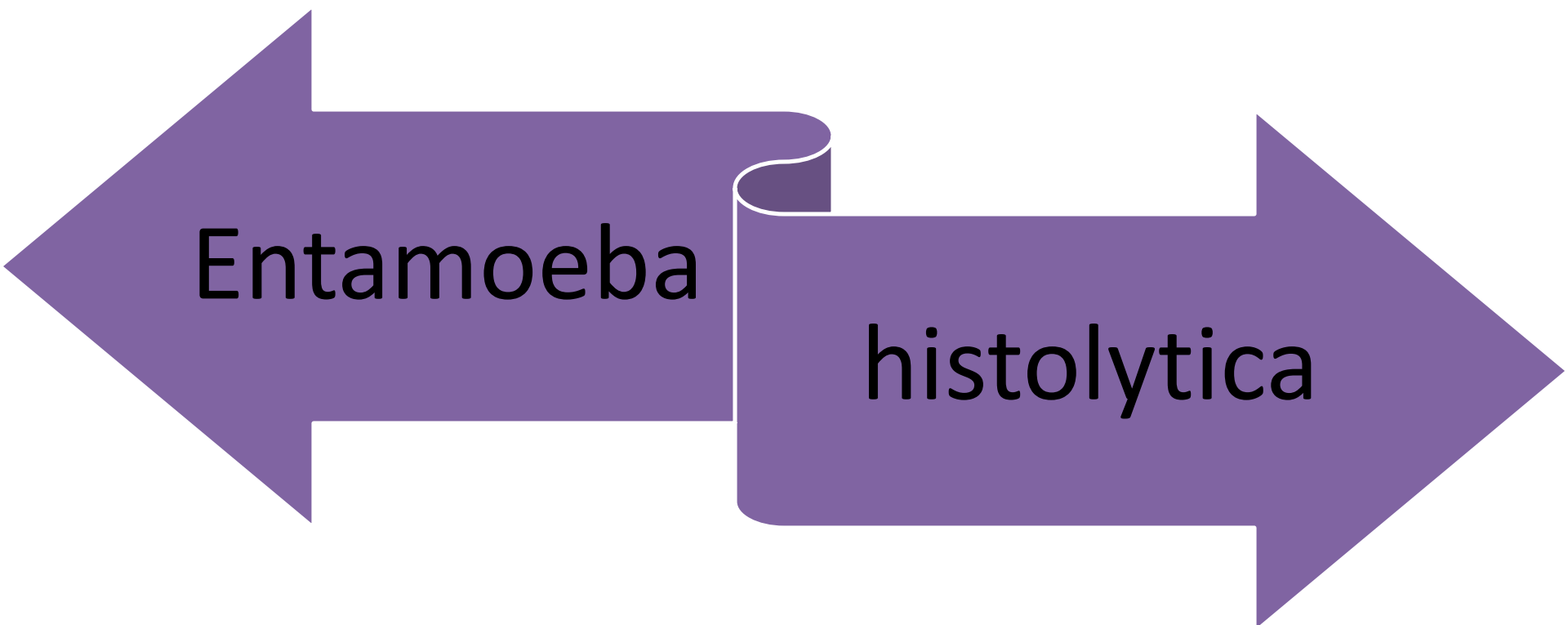
- Ditemukan proglotid yang bergerak aktif dalam tinja atau keluar spontan
- Telur dalam tinja atau anal swab
- Prazikuantel 5-10 mg/kg BB, single dose
- Albendazol
- Kuinakrin
- Amodiakuin
- Niklosamid

Gejala Sistiserkosis

- Jaringan : subkutis, mata, otak, otot, jantung, hati, paru dan rongga perut
- Kalsifikasi sistiserkus → gejala jarang
- Otot → Pseudohipertrofi otot + miositis, demam tinggi, eosinofilia
- Pada otak + medula spinalis → epilepsi, meningoensefalitis, nyeri kepala, kelainan jiwa
- Hidrosefalus → sumbatan aliran cairan LCS
- Kematian → sistiserkus tunggal dalam ventrikel IV otak

SISTISERKUS SELULOSA





Entamoeba

histolytica



Fedor
Alexandre
witch
Lösch
(1875)

Hospes dan Distribusi Geografik

Hospes :
manusia!!!

Amoebiasis

Kosmopolit

Stadium

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graph TD; Stadium[Stadium] --- Trofozoit[Trofozoit]; Stadium --- Kista[Kista];
```

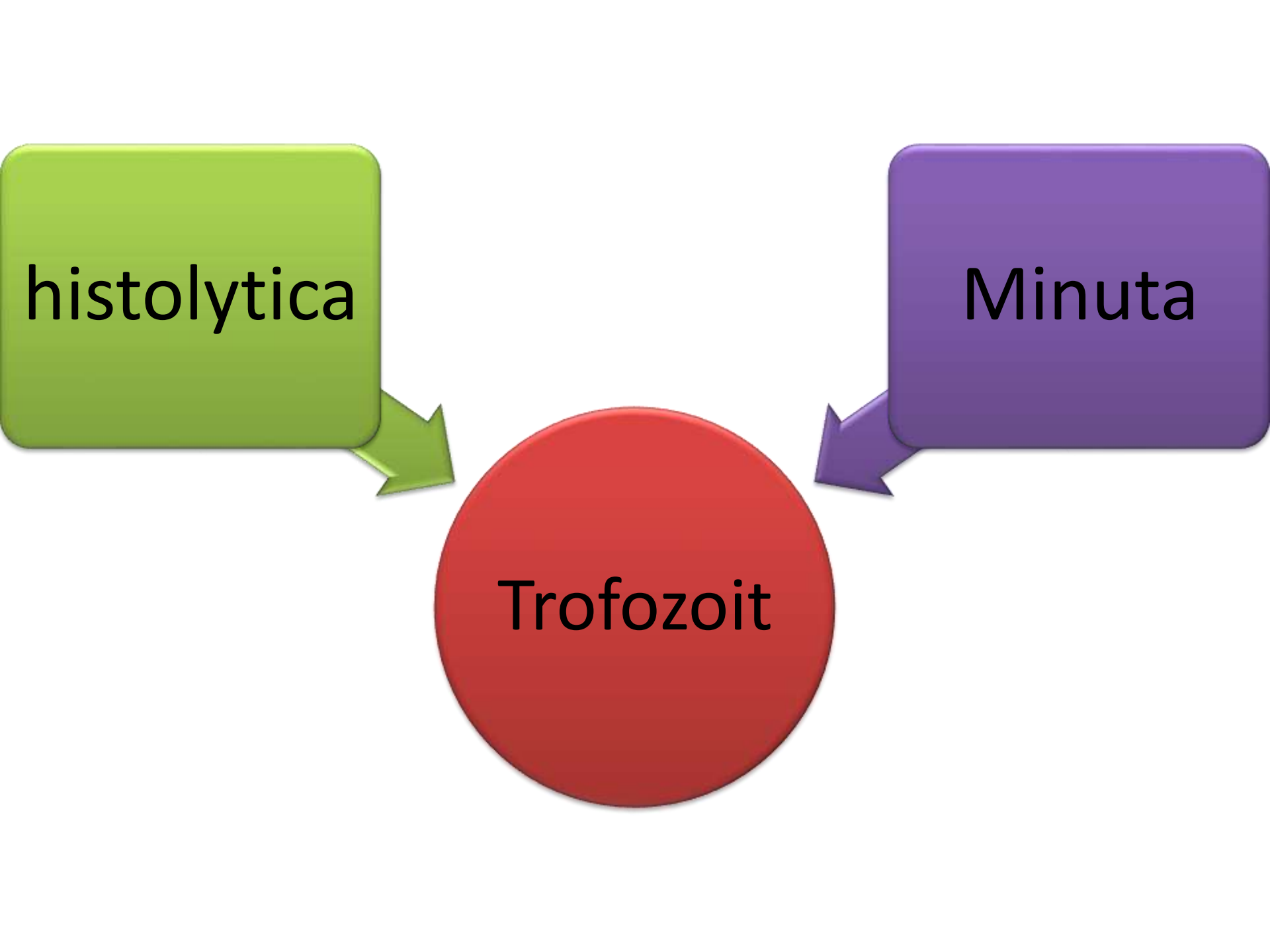
Trofozoit

Kista

histolytica

Minuta

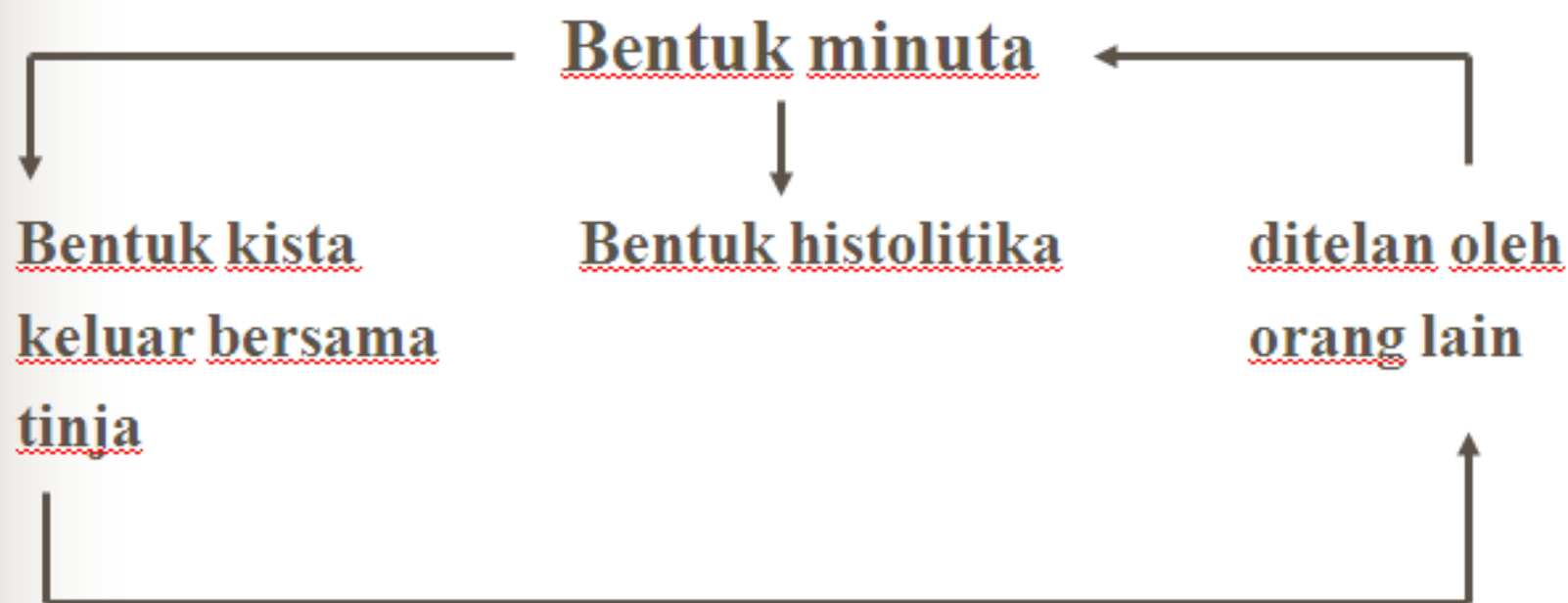
Trofozoit

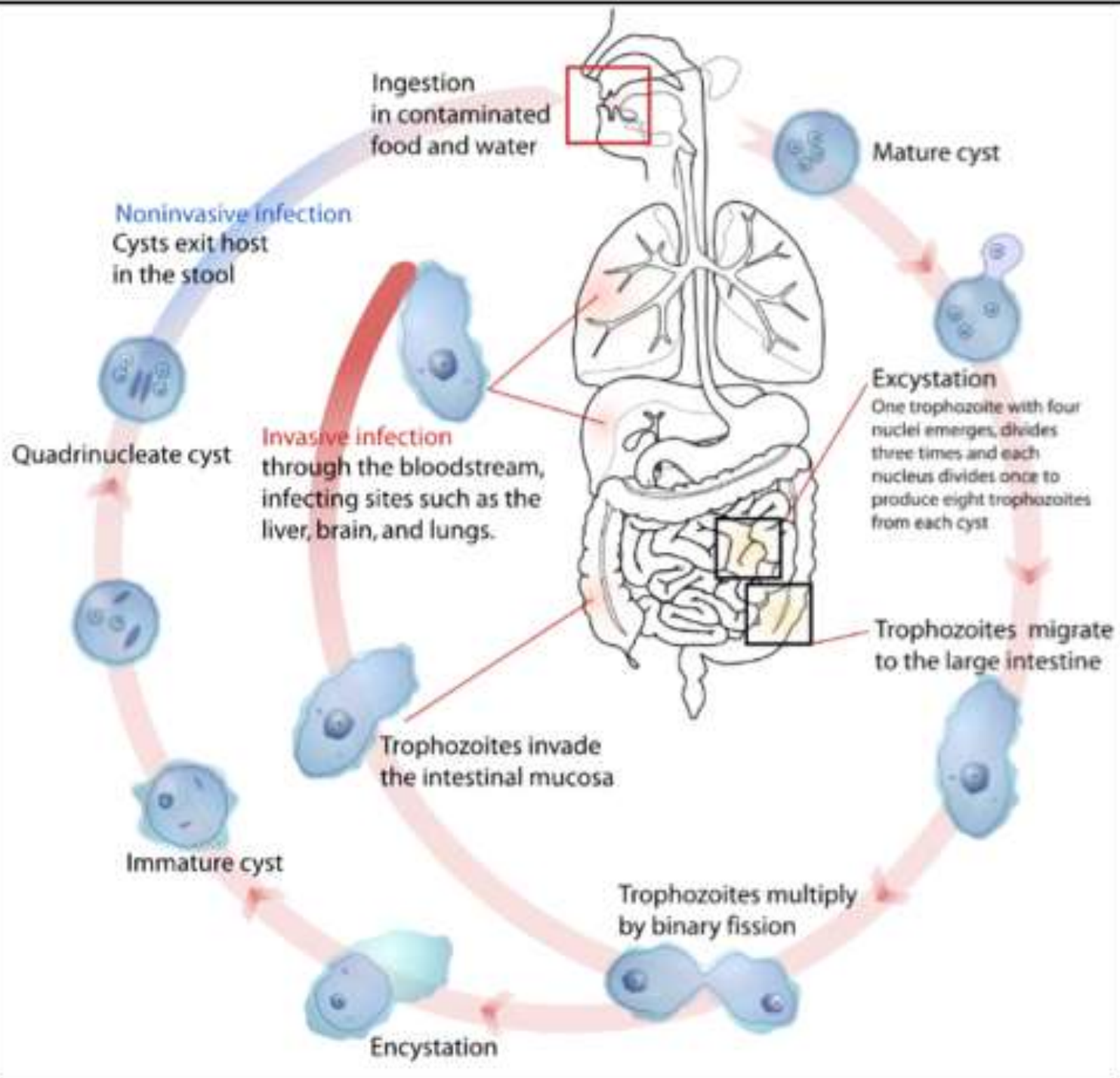


```
graph TD; A[histolytica] --> C((Trofozoit)); B[Minuta] --> C;
```

A diagram illustrating the relationship between two organisms and a central stage. On the left, a green rounded rectangle contains the text 'histolytica'. On the right, a purple rounded rectangle contains the text 'Minuta'. In the center, a red circle contains the text 'Trofozoit'. A green arrow points from the bottom of the 'histolytica' box to the red circle. A purple arrow points from the bottom of the 'Minuta' box to the red circle.

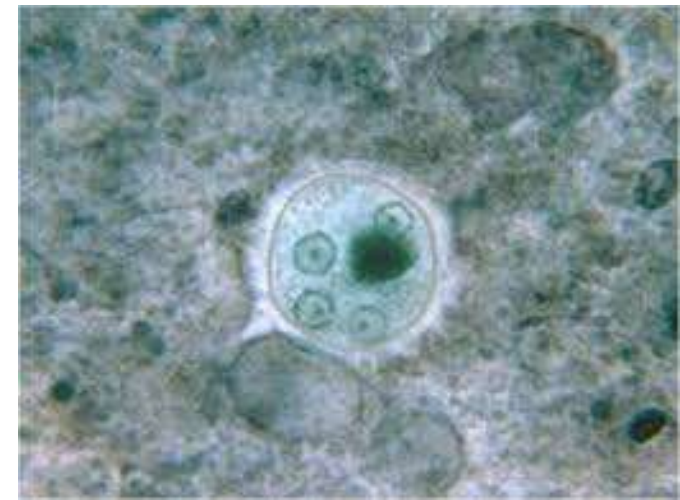
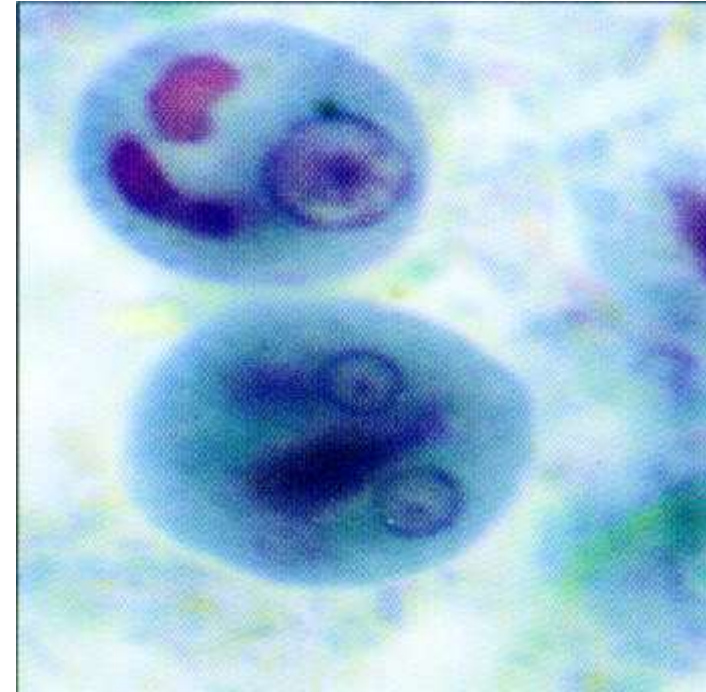
Daur hidup





ENTAMOEBA HISTOLYTICA

- BENTUK KISTA
 - UKURAN : 10 - 20 MIKRON
 - BENTUK BULAT ATAU OVAL
 - DINDING TIPIS (0,5 MIKRON),
TIDAK AMBIL WARNA
 - SITOPLASMA :
 - VAKUOL GLIKOGEN
 - BENDA KROMATOID
 - INTI ENTAMOEBA : JUMLAH 1-(2)-4



ENTAMOEBA HISTOLYTICA

- BENTUK MINUTA
 - UKURAN : 10 - 20 MIKRON
 - EKTOPLASMA :
 - PSEUDOPODIUM DIBENTUK PERLAHAN-LAHAN
 - PERGERAKAN TIDAK PROGRESIF
 - ENDOPLASMA
 - BERVAKUOL
 - BAKTERI DAN SISA MAKANAN
 - INTI ENTAMOEBA



ENTAMOEBA HISTOLYTICA

- BENTUK HISTOLITIKA
 - UKURAN : 15 - 30 MIKRON
 - EKTOPLASMA :
 - LEBAR, BENING
 - 1/3 BAGIAN PARASIT
 - PSEUDOPODIUM SEPERTI JARI DIBENTUK CEPAT
 - ENDOPLASMA
 - BERGRANULA HALUS
 - MENGANDUNG ERITROSIT
 - INTI ENTAMOEBA



Amoebiasis intestinal

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graph TD; A[Amoebiasis intestinal] --> B[Akut]; A --> C[Kronik]; D[Amoebiasis ekstra intestinal] --> E[Amoebiasis hati]; D --> F[Amoebiasis rektum, paru, perianal, vagina];
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Akut

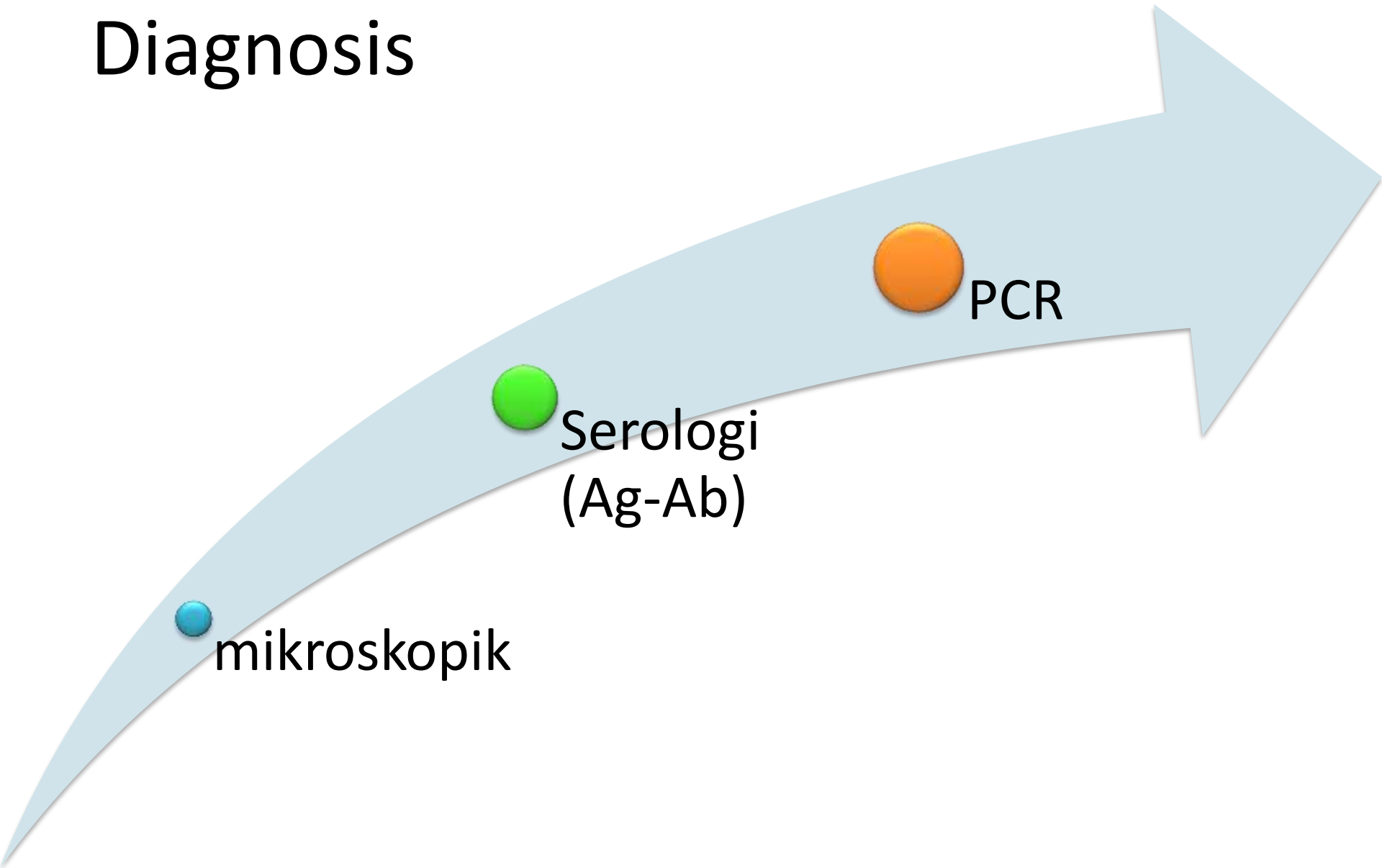
Kronik

Amoebiasis ekstra intestinal

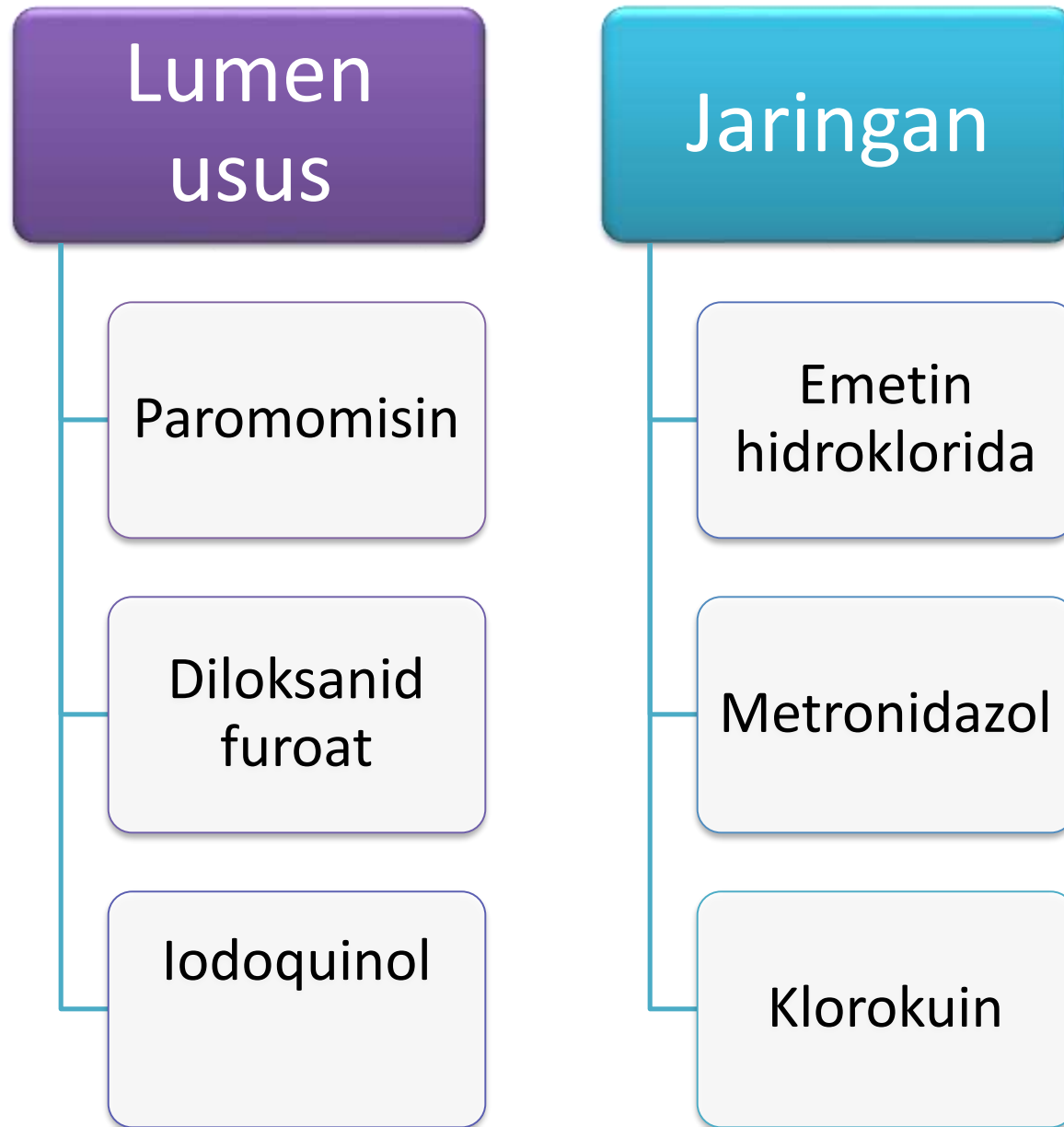
Amoebiasis hati

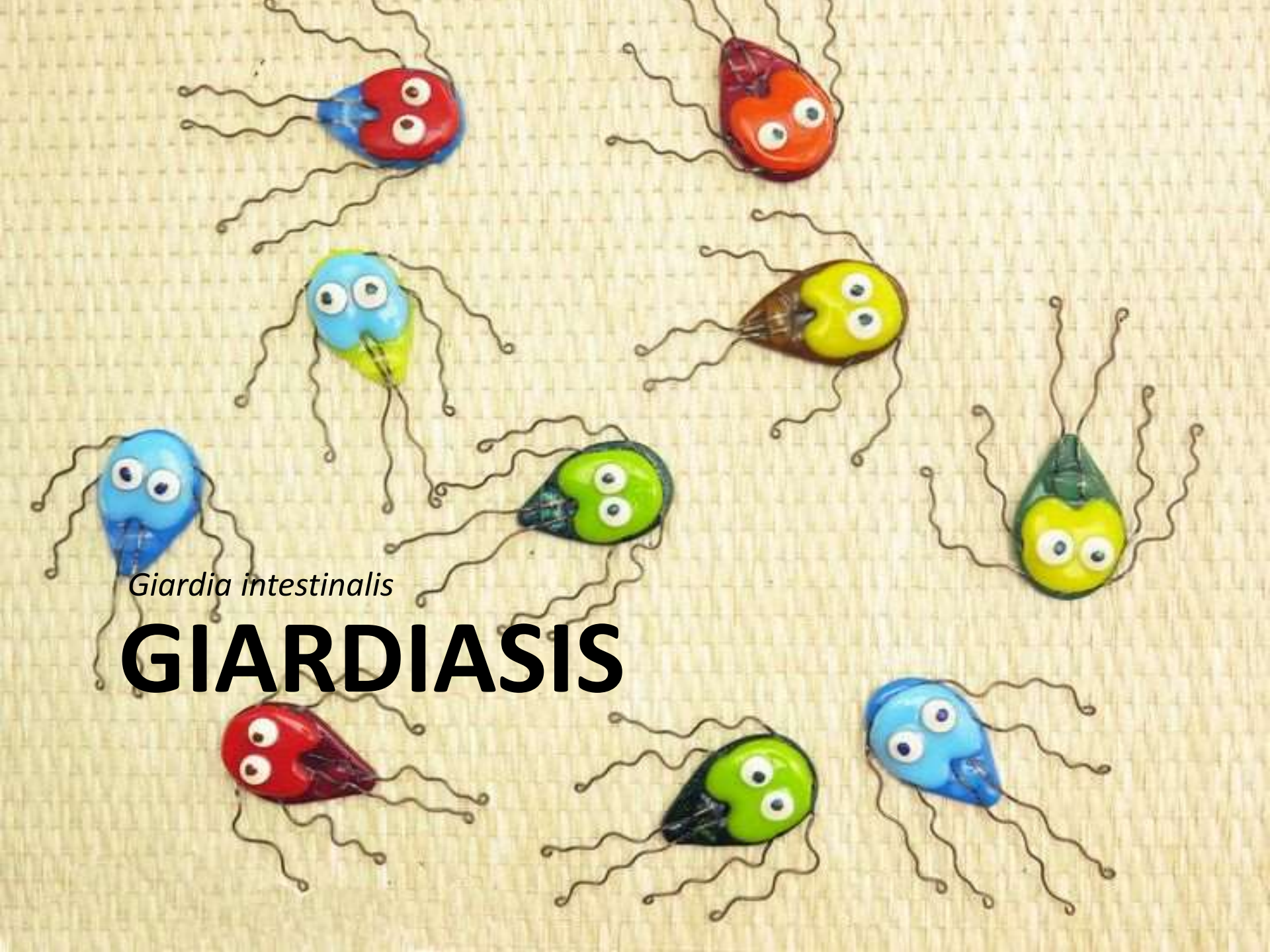
Amoebiasis
rektum, paru,
perianal, vagina

Diagnosis



Terapi



The image features ten cartoonish, teardrop-shaped parasites with large, expressive eyes and multiple wavy flagella. They are scattered across a light beige, textured background. The parasites are colored in various ways: some are solid red, some are solid blue, some are solid yellow, and others are split vertically (e.g., red on one side and blue on the other, or green on one side and yellow on the other).

Giardia intestinalis

GIARDIASIS



Antonie van Leeuwenhoek (1632-1723)

GIARDIASIS



WORLDWIDE



CHILDREN



ASIMPTOMATIK, ACUTE & CHRONIC



**HIGH MORBIDITY, CHRONIC DIARRHEA &
GROWTH RETARDATION**



FOOD-BORNE DISEASES

Etiologi

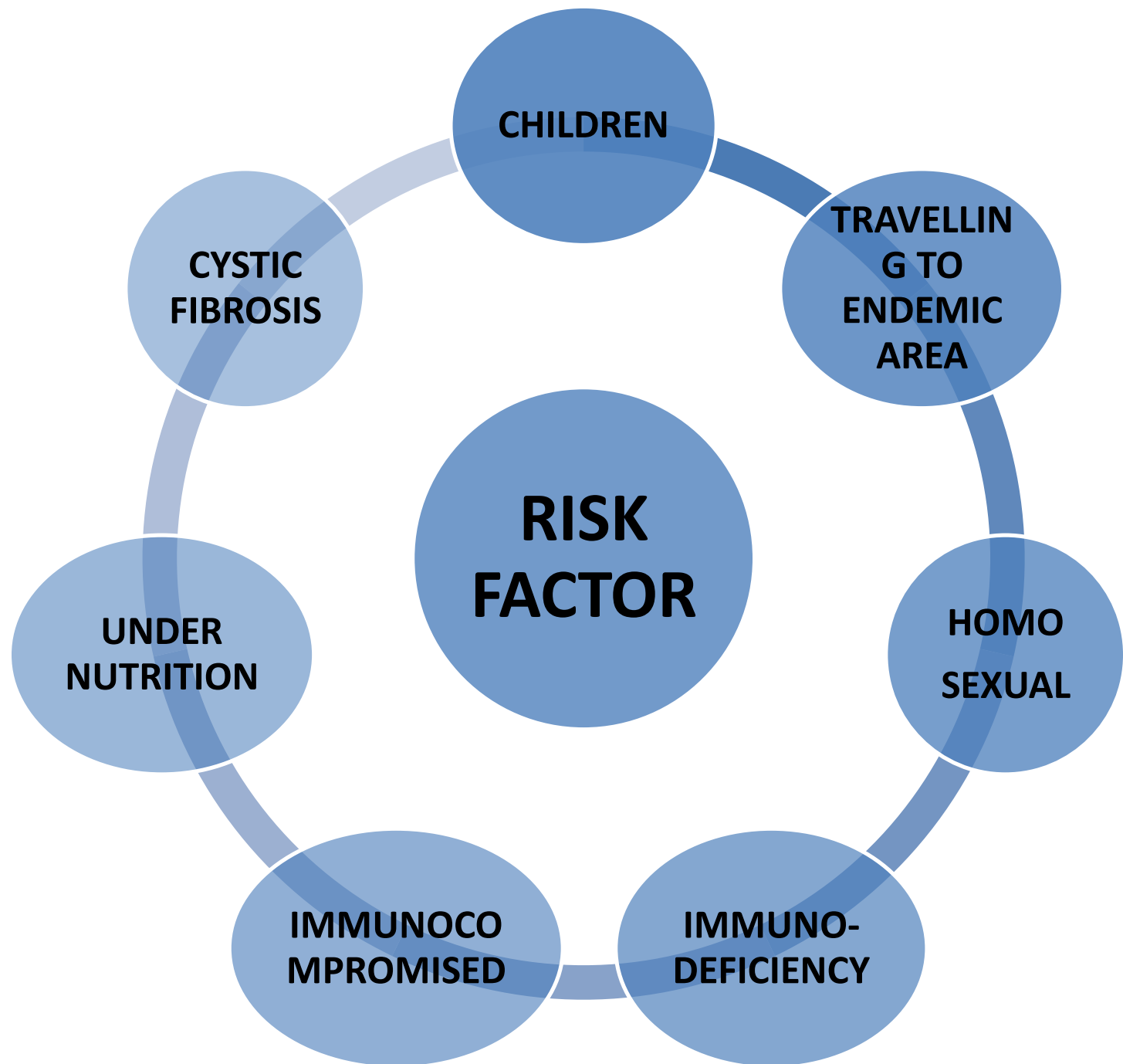
- *Giardia intestinalis* → Protozoa flagotida (sebelumnya dikenal dengan *Giardia lamblia*).
- Infeksi ditularkan melalui konsumsi kista
- Memiliki beberapa strain
 - Kemampuan menyebabkan penyakit, dan
 - beberapa strain yang berbeda dapat ditemukan di satu host selama infeksi.
- Infection rate 100% jika menelan lebih dari 25 kista.

EPIDEMIOLOGI

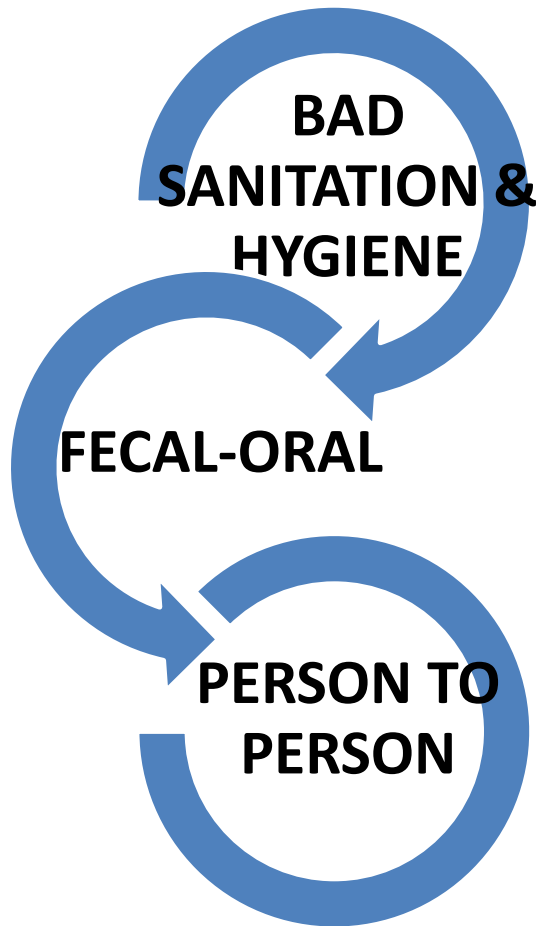
- Infeksi endemik paling sering terjadi pada anak-anak <5 tahun dan orang dewasa berusia 25-39 tahun
- Tingkat *carrier* setinggi 30-60% dilaporkan terjadi pada anak-anak, terutama di pusat penitipan anak
- Carrier asimtomatik pada anak sebanyak 20% dan pada anak < 36 bulan di tempat penitipan anak → Bertahan selama beberapa bulan
- Banyak anak dengan giardiasis simtomatik, mampu menularkan penyakit ini ke dalam rumah mereka → Tingginya tingkat endemik di komunitas mereka

Perbedaan Ras, Jenis Kelamin, dan Usia berkaitan dengan Insidens

- Giardiasis tidak memiliki predileksi ras khusus
- Laki-laki > wanita → RR 1.19
- < 6 bulan – bayi & kanak-kanak– remaja

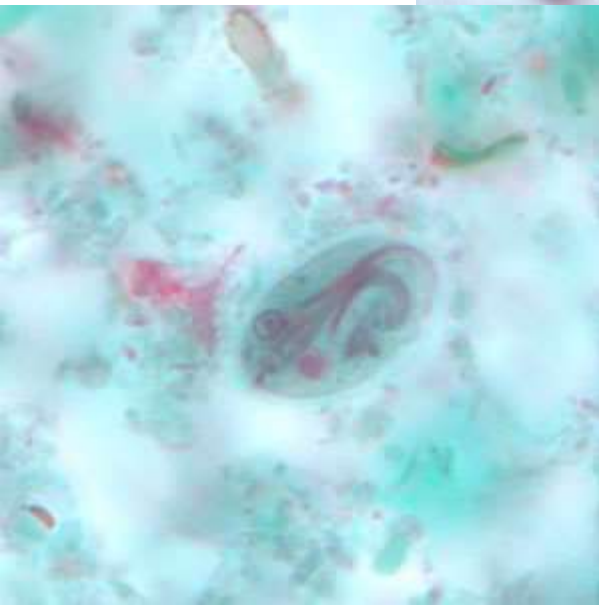
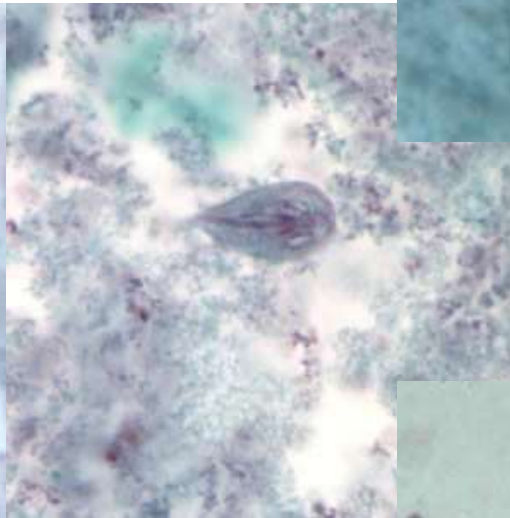
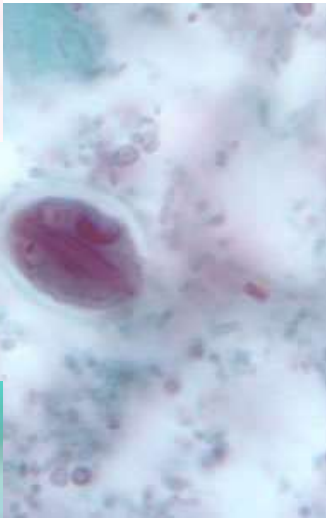
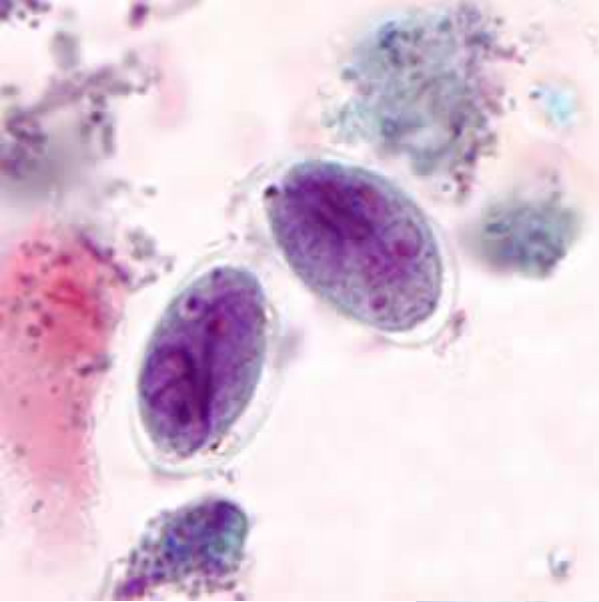


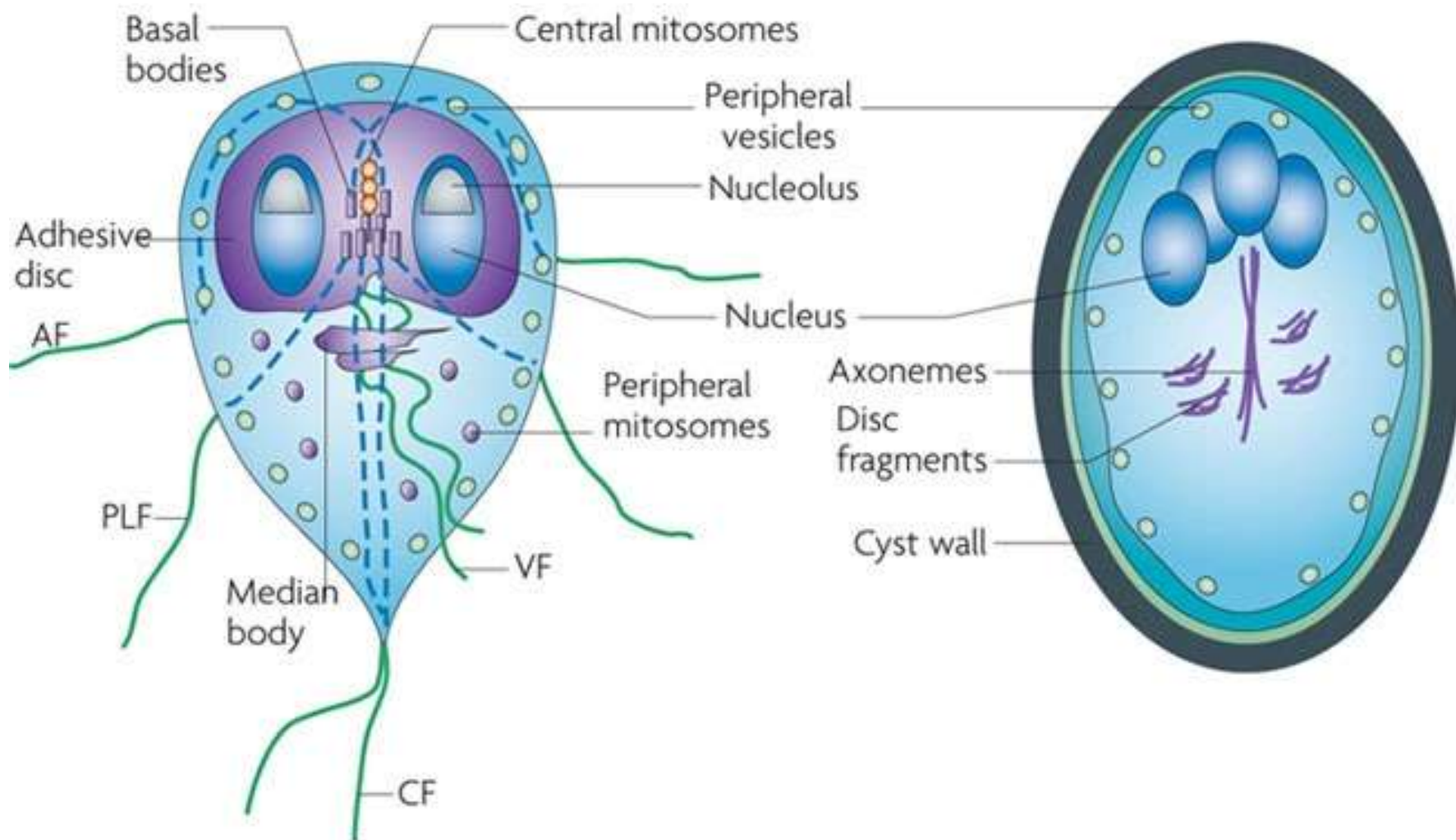
PENULARAN



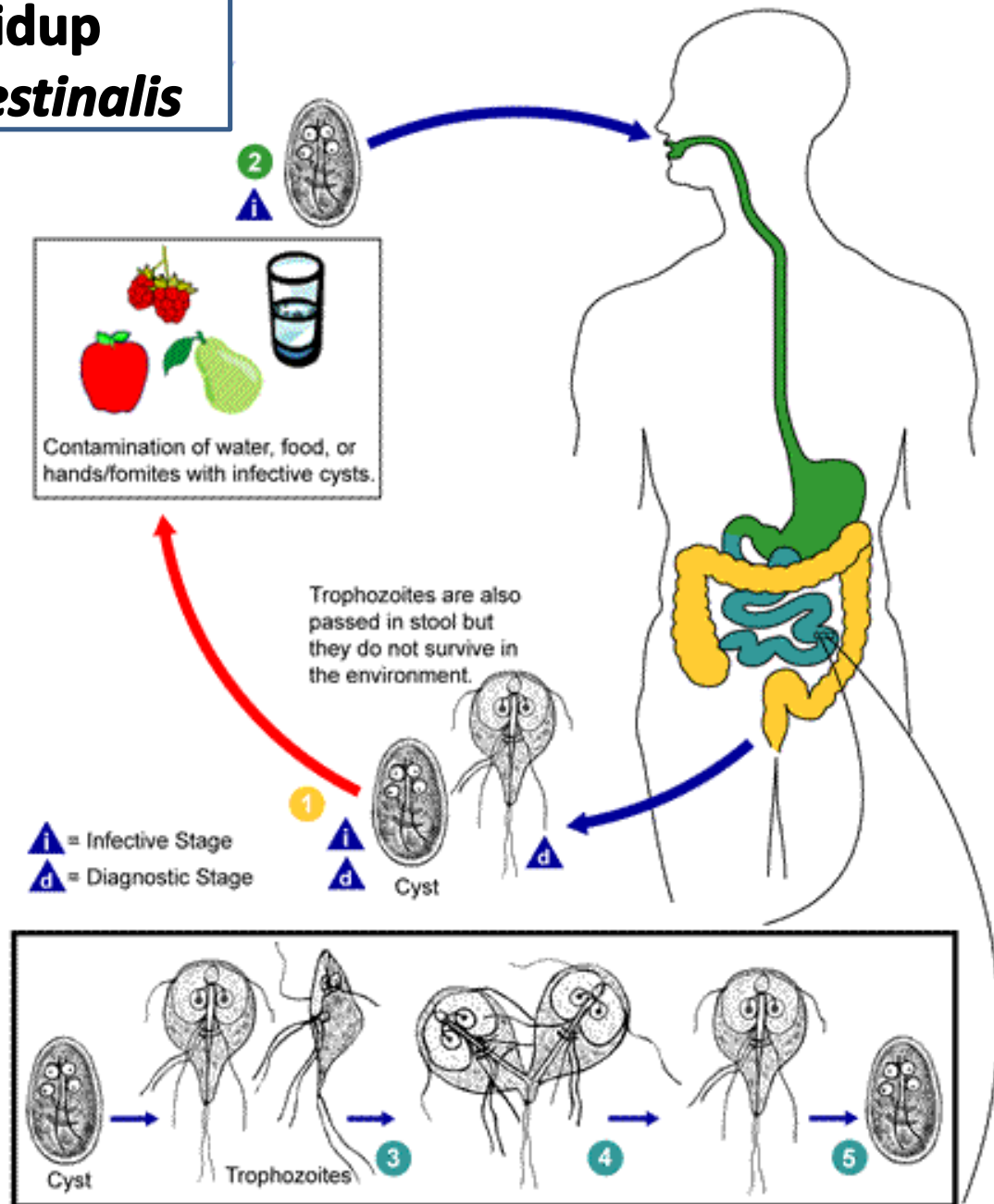
EX:
DAY CARE
KONSUMSI AIR SUNGAI/DANAU
TANPA FILTER

Mikroskopis





Siklus Hidup *Giardia intestinalis*



Patofisiologi

Giardia melekat di
sel epitel usus
halus

Perubahan
histopatologi
mukosa

Atrofi vilus,
enterosit rusak,
hiperplasia kriptus

Tekanan hisapan
dari perlekatan
trofozoit

Mikrovili rusak

Multiplikasi
trofozoit

Terbentuk sawar

Gejala Klinis

- Bervariasi dari asimtomatik (tanpa keluhan) ke diare berat dan malabsorpsi (gangguan penyerapan).
- Giardiasis akut berkembang setelah masa inkubasi 1 sampai 14 hari (rata-rata 7 hari) dan biasanya berlangsung 1 sampai 3 minggu.
 - Diare, sakit perut, kembung, mual, dan muntah.
- Giardiasis kronis gejala yang berulang dan malabsorpsi dan kelemahan.

Diagnosis

- Sediaan sampel tinja langsung dan atau prosedur konsentrasi → Identifikasi trofozoit atau kista *Giardia intestinalis*.
- Sampel cairan duodenum (misalnya, Enterotest) atau biopsi duodenum → Trofozoit.
- Metode alternatif :
 - Tes imunosorben antigen enzyme-linked
 - Tes immunoassay
 - Tes immunofluorescence

Penatalaksanaan

1. Metronidazol → Paling sering diresepkan
2. Tinidazol → *Drug of Choice* di luar Amerika Serikat.
3. Nitazoxanide → Anak.

Prognosis

- Prognosis giardiasis umumnya sangat baik.
 - Kebanyakan asimtomatik, dan sebagian besar carrier.
 - Beberapa agen antibiotik tersedia dengan tingkat efikasi yang baik → resistansi obat
- Tanpa diobati, giardiasis bisa berlangsung selama berminggu-minggu.
- **Komplikasi:**
 - Penurunan berat badan, defisiensi disakarida, malabsorpsi, dan retardasi pertumbuhan.
 - Beberapa pasien dapat mengalami gejala persisten

PENCEGAHAN

A. Agar terhindar dari Giardiasis

- Selalu mencuci tangan menggunakan sabun dan air mengalir setelah ke WC, menangani binatang, mengganti popok, tersentuh kotoran, berkebun, atau sebelum menyiapkan makanan/minuman.
- Jangan minum air mentah dari kali, sungai, telaga, bendungan, dan tangki air.
 - Merebus air minimal selama 1 menit dapat membunuh giardia.
 - Tablet pemurni air
 - Filter air
- Bila pergi ke negara yang pasokan air kurang baik, jangan minum air mentah dari kran.

PENCEGAHAN

B. Agar tidak menyebar

- Anak kecil yang sedang diare sebaiknya jangan ke sekolah, penitipan anak, atau kolam renang hingga diare mutlak sembuh.
- Carrier harus menjaga kebersihan pribadi dan lingkungan.

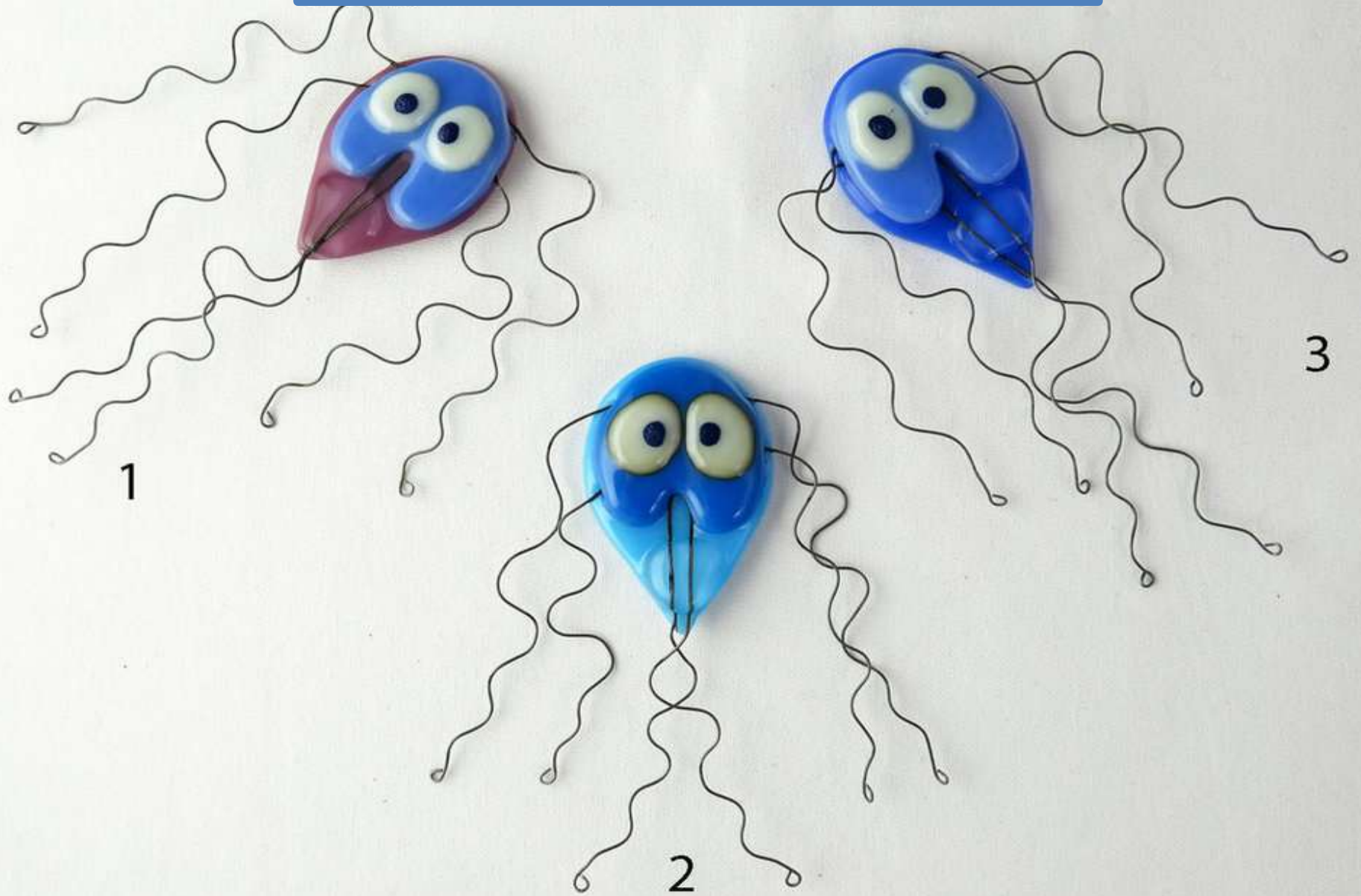
C. Jika kita terkena Giardiasis

- Jangan menyiapkan makanan dan minuman bagi orang lain
- Jangan menggunakan kolam renang
- Jangan pinjam-meminjam handuk, seprai, sendok-garpu

Edukasi

- Pasien dan individu berisiko harus diinstruksikan mengenai metode kebersihan yang sesuai dan tanda / gejala infeksi.
 - Mencuci tangan dengan hati-hati setelah mengganti popok.
 - Petugas penitipan anak harus menjaga kebersihan yang teliti dan mencuci tangan dengan hati-hati untuk mengurangi penyebaran antara anak-anak dan staf.
- Pendidikan kebersihan pribadi untuk meminimalkan transmisi orang-ke-orang.
- Pasien harus diberi tahu bahwa kontak oral-anal dan oral-genital meningkatkan risiko transmisi janin.
- Penyuluhan bagi wisatawan yang akan ke daerah-daerah endemik. Sebelum meminum air permukaan, mereka harus membersihkannya dengan cara merebus atau penggunaan senyawa halogen (misalnya klorin) atau perangkat penyaringan.

TERIMA KASIH



PERATURAN PRAKTIKUM MODUL GHP (DARING)

- MASING-MASING MAHASISWA MEMBUAT VIDEO PEMBUATAN SLIDE UNTUK PEMERIKSAAN LANGSUNG FESES (SESUAI VIDEO YANG AKAN DIPERAGAKAN SAAT PRAKTIKUM), NILAI VIDEO AKAN DIPERHITUNGKAN UNTUK NILAI PRAKTIKUM. PANJANG VIDEO MAKS 2 MENIT.
- VIDEO DIKUMPULKAN DI HARI UJIAN. AKAN DIBERIKAN WAKTU 15 MENIT UNTUK UPLOAD VIDEO.
- UJIAN ADA 2 TAHAP
 1. UPLOAD VIDEO (15 MENIT)
 2. MENGERJAKAN SOAL PRAKTIKUM (20 MENIT)
- SOAL UJIAN TIDAK AKAN TERBUKA JIKA VIDEO BELUM DIUPLOAD.