"Clinical Perspectives of *Blastocystis*" Workshop

29–30 June 2026

Kasr Al-Ainy Faculty of Medicine, Cairo University, Egypt

Blastocystis under one health - **A COST Action CA21105**

Affiliated initiative:

Blastocystis under one health, **A COST Action CA21105**

Format and Program Anchor:

Two-day, invitation-only international roundtable workshop. It is structured around discussion sessions and three 20-minute keynote talks. Each talk introduces a roundtable discussion of sessions. This alignment ensures that every theme covered in the sessions is addressed in plenary talks, in working group discussion sessions, and in a consensus-building exercise that concludes with a roundtable-endorsed consensus statement, a clinical management algorithm, and an outline-aligned scholarly article.

Date: 29th and 30th June 2026. **Timeframe:** 08:30 – 15:30

Working language: English

Anticipated participants: ~15 invited experts (infectious disease physicians, gastroenterologists, clinical microbiologists, clinical parasitologists, molecular epidemiologists, microbiome scientists, veterinary parasitologists, public-health scientists, AI/diagnostics specialists).

Chair:

-Anastasios Tsaousis, University of Kent, UK

-Ayman A. El-Badry, Cairo University, Egypt

Participants (Alphabetical):

-Abeer Mahgoub, Cairo University, Egypt

-Eleni Gentekaki, University of Nicosia, Cyprus

-Funda Doğruman Al, Gazi University, Turkey

-Gitte Nyvang Hartmeyer, University of Southern Denmark, Denmark

-Iman Rafaat, Cairo University, Egypt

-Mario Sviben, Croatian Institute of Public Health & University of Zagreb, Croatia

-Marwa Ghallab, Kafr Elsheikh University, Egypt

-Nadia El-Dib, Cairo University, Egypt

-Oltiana Petri, the University of Tirana, Albania

-Rens Zonneveld, University of Amsterdam, the Netherlands

-Shaimaa Abdo, Cairo University, Egypt

-Sherif Mousa, Cairo University, Egypt

Local organizers

-Abeer Mahgoub, Cairo University, Egypt

-Nadia El-Dib, Cairo University, Egypt

-Ayman A. El-Badry, Cairo University, Egypt

-Iman Rafaat, Cairo University, Egypt

Session objectives:

Blastocystis under one health, **A COST Action CA21105**

Section 1: Summarize parasite biology

Section 2: Describe *Blastocystis* morphological/phenotypic forms

Section 3: Describe *Blastocystis* taxonomy/subtype taxonomy and intra-subtype variation [Parasite evolution]

Section 4: Describe the parasite's geographic distribution and ecology

Section 5: Define host-range

Section 6: Highlight transmission dynamics of the genus, including subtype-by-transmission patterns

Section 7: Define "*blastocystosis"* in clinical settings

Section 8: Define clinical spectrum (asymptomatic/symptomatic/extra-intestinal)

Section 9: Characterize clinical course (acute/outbreaks, travel medicine, chronic, symptoms persistence/fluctuation, re-infection/reactivation) and the influence of community vs. hospital, endemic vs. non-endemic settings

Section 10: Outline the co-infection (co-colonization) landscape. *Blastocystis* and co-pathogens (protozoa, helminths, bacteria, viruses, fungi) and how *Blastocystis* may modify the course of other infections. Subtype contributions to co-infection.

Section 11: Critically appraise the evidence linking *Blastocystis* to specific diseases. IBS, IBD, childhood malnutrition, colorectal cancer, and dermatological manifestations, including urticaria.

Section 12: Identify the vulnerable populations for which *Blastocystis* may act as an opportunist. Immunocompromised (HIV, transplant, biologics, chemotherapy), children, elderly, malnourished, patients with CKD on haemodialysis, and patients with chronic debilitating diseases such as diabetes

Section 13: Summarize the mechanistic underpinnings. Virulence factors, host factors (immunity and barrier responses), microbiome modulation, and evidence of causality— Bradford Hill framework

Section 14: Position *Blastocystis* within the gut microbiome. Microbiome in colonized individuals. Eubiosis (*Blastocystis* may carry beneficial bacteria and serve as a marker of eubiosis) vs dysbiosis

Section 15: Summarize subtype-specific clinical correlations across ST1–ST12+

Section 16: Discuss limitations of the literature addressing the clinical picture. Diagnostic platform heterogeneity, cross-sectional design, intra-subtype variability, sample size, and confounder adjustment

Section 17: Compare current diagnostic approaches in clinical settings. Critically appraise the methodological considerations/diagnostic approach

Section 18: Define “Blastocystosis” using evidence-based contemporary case definition – Should we consider such a disease?

Section 19: Present a clinical decision-making and management algorithm — *who to test, when to treat, what to treat with* (Drug choices [main/alternative], dosing, refractory disease)*, how to follow up, and how to manage co-infection* (Section 10)

Section 20: Determine knowledge gaps & future directions

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1. Aims and Outcome Deliverables

1.1 Aims

1. Translate the 20-section *Clinical Perspectives* outline into a roundtable-endorsed clinical framework spanning biology → taxonomy → transmission → microbiome → clinical spectrum & course → diagnosis → management.
2. Resolve, where evidence allows, the principal points of clinical controversy — *what is Blastocystosis, what is the clinical spectrum of Blastocystis, how to determine causality (commensal, opportunistic, pathogenic), who to test, how to interpret detection, when to treat, how to follow up*.
3. Draft a roundtable-endorsed clinical decision algorithm informed by current guidance and integrated diagnostic data.
4. Identify high-priority research gaps under a One Health lens.
5. Endorse a written consensus statement and a scholarly article for submission to a Q1 parasitology, microbiology, or infectious diseases journal within 30 days.

1.2 Outcome deliverables

- **Roundtable Consensus Statement** (target: Q1 parasitology/microbiology/ID journal).
- **High-Impact Review Article** (target: *Nature Reviews Microbiology*, *Trends in Parasitology*, *Clinical Microbiology Reviews*, *Lancet Infectious Diseases*).
- **Clinical Spectrum Algorithm**
- **Diagnostic Algorithm in Clinical Settings**
- **Clinical Management Algorithm** (5-step framework) — pocket-card and digital format.
- **Research Priority List** (top 10-15 questions).
- **One Health policy brief** for COST Action CA21105

2. The Three Keynote Talks — Mapping to Sessions

Talk	Title	Duration	Sessions covered
Talk 1	*Biology, Transmission, Taxonomy, and the Gut Microbiome*	20 min + 5 min Q&A	Sessions 1, 2, 3, 4, 5, 6, 14,15
Talk 2	*Clinical Spectrum of Blastocystis — The Patient Journey*	20 min + 5 min Q&A	Sessions 7, 8, 9, 10, 11, 12, 13, 15
Talk 3	*Clinical Decision-Making and the Management Algorithm*	20 min + 5 min Q&A	Sessions 16, 17, 18, 19, 20

2.1 Talk 1 — *Biology, Transmission, Taxonomy, and the Gut Microbiome*

Speaker: Anastasios Tsaousis, University of Kent, UK

Duration: 20 min + 5 min Q&A.

Learning objectives.

1. summarize the biology, phenotypic forms, taxonomy, and intra-subtype variation of *Blastocystis* (Sessions 1, 2, 3).
2. Describe the geographic distribution, ecology, host range, and transmission dynamics, including subtype-by-transmission patterns (Sessions 4, 5, 6).
3. Position *Blastocystis* within the gut microbiome — eubiosis vs dysbiosis, and the beneficial-bacteria carrier hypothesis (Session 14).
4. summarize subtype-specific clinical correlations across ST1–ST12+ (Session 15)
5. Frame the One Health relevance of *Blastocystis* under COST Action CA21105.

Sessions covered: 1, 2, 3, 4, 5, 6, 14, 15.

2.2 Talk 2 — *Clinical Spectrum of Blastocystis — The Patient Journey*

Speaker: Ayman A. El-Badry, Cairo University, Egypt

Duration: 20 min + 5 min Q&A.

Learning objectives.

1. Define *blastocystosis* in clinical settings and characterize its clinical spectrum (Sessions 7, 8).
2. Summarize the clinical course — acute / outbreak / chronic / persistence / re-infection — across community vs hospital and endemic vs non-endemic settings (Session 9).
3. Outline the co-infection landscape and *Blastocystis* modification of other infections (Session 10).
4. Critically appraise disease associations (IBS, IBD, malnutrition, CRC, urticaria) (Session 11).

5. Identify vulnerable populations and the opportunist phenotype (Session 12).
6. summarize the mechanistic underpinnings for causality (Session 13).

Sessions covered: 7, 8, 9, 10, 11, 12, 13, 15.

2.3 Talk 3 — *Clinical Decision-Making and the Management Algorithm*

Speaker: Sherif Mousa, Cairo University, Egypt

Duration: 20 min + 5 min Q&A.

Learning objectives.

1. Critically appraise the methodological limitations of the literature addressing the clinical picture (Session 16).
2. Critically appraise current diagnostic approaches in clinical settings (Session 17).
3. Operationalize an evidence-based contemporary case definition for blastocystosis (Session 18).
4. Present the five-step clinical decision-making and management algorithm (Session 19).
5. Outline knowledge gaps and future directions (Session 20).

Sessions covered: 16, 17, 18, 19, 20.

3. Workshop Schedule (Two-Day Program)

Time	Activity	Sessions
Day 1		
08:30 – 09:00	Registration, reception	–
09:00 – 09:30	Welcome, program agenda, pre-survey results, framing	–
09:30 – 10:00	**Talk 1** — Biology, Transmission, Taxonomy, Microbiome (+ Q&A)	1–6, 14,15
10:00 – 12:00	**Roundtable Discussion A** — Sessions 1–6, 14 (with breaks)	Biology, ecology, microbiome
12:00 – 01:00	Break (Meet the Dean of Kasr Al-Ainy (KA) Faculty of Medicine + KA tour)	–
01:00 – 01:30	**Talk 2** — Clinical Spectrum & Patient Journey (+ Q&A)	7–13, 15
01:30 – 03:00	**Roundtable Discussion B** — Sessions 7–13, 15 (with breaks)	Clinical spectrum & course
03:00 – 03:30	Day 1 consolidation & overnight Delphi distribution	–
Day 2		
08:30 – 09:00	Coffee	–
09:00 – 09:30	Day 1 Delphi feedback review	-
09:30 – 10:00	**Talk 3** — Clinical Decision-Making & Algorithm (+ Q&A)	16–20
10:00 – 13:00	**Roundtable Discussion C** — Sessions 16–20 (with breaks)	Diagnosis, definition, algorithm, gaps
12:00 – 01:00	Lunch	–
01:00 – 02:00	**Consensus algorithm consolidation**	–
02:00 – 03:00	**Consensus statement bullets drafting**	–
03:00 – 03:30	Closing remarks, next steps	–

4. The 20 Sessions — Detailed Program

For each session: framing questions, case vignette, expected outputs, moderator, structure, and reading/reference with current guidance.

Standard session structure (15-20 min each unless noted):

1. The moderator briefly introduces the question and the pre-survey data point.
2. Anchored discussion.
3. Live polling and consensus bullet drafting (& endorsement).

Standard moderator role:

Timekeeping; ensuring balanced participation; recording dissent; calling on the rapporteur to consolidate bullets; and current guidance documents.

	Session	Black	Moderator	Rapporteur
1	Parasite Biology	Anastasios	Renz	Oltiana
2	Morphological Phenotypic Forms		Funda	Nadia
3	Taxonomy, Subtypes, Intra-Subtype Variation, Parasite Evolution		Eleni	Shimaa
4	Geographic Distribution and Ecology		Gitte	Funda
5	Host Range		Oltiana	Mario
6	Transmission Dynamics and Subtype-by-Transmission Patterns		Gitte	Marwa
7	Defining *Blastocystosis* in Clinical Settings	Ayman	Abeer	Ayman
8	Clinical Spectrum (Asymptomatic / Symptomatic / Extra-intestinal)		Ayman	Mario
9	Clinical Course (Acute, Chronic, Persistence, Re-infection, Settings)		Nadia	Abeer
10	Co-infections Landscape		Mario	Shaimaa
11	Disease Associations (IBS, IBD, Malnutrition, CRC, Urticaria)		Iman	Eleni
12	Vulnerable Populations		Marwa	Anastasios
13	Mechanistic Underpinnings (Virulence, Host, Microbiome, Causality)		Funda	Marwa
14	*Blastocystis* and the Gut Microbiome	Anastasios	Anastasios	Abeer
15	Subtype-Specific Clinical Correlations (ST1–ST12+)		Eleni	Iman
16	Limitations of the Clinical-Picture Literature	Sherif	Mario	Gitte
17	Current Diagnostic Approach in Clinical Settings		Renz	Iman
18	Operationalizing the Case Definition of Blastocystosis		Oltiana	Sherif
19	Clinical Decision-Making and Management Algorithm		Sherif	Nadia
20	Knowledge Gaps and Future Directions	-	Gitte	Ayman

Session 1 — Parasite Biology

Framing questions:

1. What features of *Blastocystis* cellular and metabolic biology are most clinically actionable today?
2. How do anaerobic metabolism, mitochondrion-related organelles, and surface biology inform treatment and diagnosis?
3. Where are the most consequential knowledge gaps in parasite biology?

Case vignette: A clinical microbiology director asks whether reporting of *Blastocystis* should include any biological qualifier beyond species/subtype.

Expected outputs: Consensus on minimum biological reporting elements; identification of biological knowledge gaps for the research agenda.

Suggested reading: Stensvold & Clark 2016; Denoeud et al. 2011; Gentekaki et al. 2017. + the group suggestions

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Session 2 — Morphological / Phenotypic Forms

Framing questions:

1. Should microscopy reports distinguish vacuolar, granular, amoeboid, cyst, and multivacuolar forms?
2. Is the amoeboid form clinically meaningful or an artefact?
3. How does specimen handling affect form recognition?

Case vignette: A microscopy report shows abundant amoeboid forms in a 35-year-old with chronic urticaria; how does this modify clinical decision-making?

Expected outputs: Standardized microscopy reporting nomenclature; consensus on the clinical relevance of the amoeboid form.

Suggested reading: Stenzel & Boreham 1996; Tan & Suresh 2006; Katsarou-Katsari et al. 2008. + the group suggestions

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Session 3 — Taxonomy, Subtypes, Intra-Subtype Variation, Parasite Evolution

Framing questions:

1. What is the minimum subtype-resolution data that should accompany clinical reports?

2. How should intra-subtype (allele-level) variation be communicated clinically?
3. Should clinical labs adopt PubMLST as the reference?

Case vignette: A reference lab reports "Blastocystis sp. — subtype ST3 (allele 34)" alongside Ct 22; how does the receiving clinician interpret allele-level information?

Expected outputs: Consensus minimum subtype-reporting standard; recommendation for PubMLST reference linkage.

Suggested reading: Scicluna et al. 2006; Alfellani et al. 2013a; Stensvold & Clark 2020; Maloney et al. 2023. + the group suggestions

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Session 4 — Geographic Distribution and Ecology

Framing questions:

1. How does the global subtype distribution inform clinical interpretation in non-endemic contexts?
2. What environmental reservoirs (water, food, soil) drive endemic prevalence?
3. How should public-health surveillance be structured?

Case vignette: Outbreak in a school district traced to a contaminated water source — what is the One Health response?

Expected outputs: Consensus on surveillance priorities; One Health policy brief content.

Suggested reading: Lokmer et al. 2019; El Safadi et al. 2014; Anuar et al. 2013; Leelayoova et al. 2008. + the group suggestions

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Session 5 — Host Range

Framing questions:

1. Which subtypes are clinically relevant via zoonotic transmission (ST5, ST6, ST7, ST8)?
2. How should occupational exposure be incorporated into clinical workup?
3. What is the role of pets and livestock in human household transmission?

Case vignette: A 28-year-old poultry worker presents with diarrhoea; ST6 was identified at Ct 24. What is the One Health interpretation?

Expected outputs: Consensus on occupational/zoonotic risk assessment in *Blastocystis* clinical workup.

Suggested reading: Cian et al. 2017; Alfellani et al. 2013b; Parkar et al. 2007. + the group suggestions

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Session 6 — Transmission Dynamics and Subtype-by-Transmission Patterns

Framing questions:

1. How do faecal–oral, water-borne, food-borne, zoonotic, and household routes differ in subtype distribution and clinical implications?
2. Should re-infection prevention be part of the clinical care package?
3. What hygiene measures have evidence of efficacy?

Case vignette: Recurrent household infection — three family members with concordant ST3 over 2 years.

Expected outputs: Consensus on transmission-aware clinical counselling; household-level prevention package.

Suggested reading: Yoshikawa et al. 2009; Stark et al. 2007; Swaminathan et al. 2009; Anuar et al. 2013. + the group suggestions

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Session 7 — Defining *Blastocystosis* in Clinical Settings

Framing questions:

1. Should *blastocystosis* be reserved for symptomatic disease, or also encompass colonization?
2. What case definition criteria are most defensible: symptoms + detection + exclusion of alternatives + burden + (response to therapy)?
3. How does the definition differ in immunocompromised vs immunocompetent hosts?

Case vignette: Two patients: (A) asymptomatic 35-year-old with incidental qPCR detection; (B) chronic IBS-D 45-year-old with high-burden detection. Should both be called "blastocystosis"?

Expected outputs: Draft consensus case definition for blastocystosis (revised in Session 18).

Suggested reading: Tan 2008; Boorom et al. 2008; Stensvold & Clark 2020. + the group suggestions

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Session 8 — Clinical Spectrum (Asymptomatic / Symptomatic / Extra-intestinal)

Framing questions:

1. What proportion of detections are asymptomatic vs symptomatic across settings?
2. Which extra-intestinal manifestations are clinically relevant — urticaria, arthralgia, fatigue?
3. How should the spectrum be communicated/explained to patients?

Case vignette: A 30-year-old with chronic spontaneous urticaria refractory to antihistamines; ST2 detected. Where does she sit on the spectrum?

Expected outputs: Consensus on the clinical spectrum descriptors and patient-communication language.

Suggested reading: Coyle et al. 2012; Vogelberg et al. 2010; Casero et al. 2015; Hameed et al. 2011; Ahmed et al., 2022. + the group suggestions

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Session 9 — Clinical Course (Acute, Chronic, Persistence, Re-infection, Settings)

Framing questions:

1. How should the transition from acute to chronic *Blastocystis* be defined and managed?
2. How can re-infection vs persistence be distinguished in clinical practice?
3. How do community vs hospital and endemic vs non-endemic settings change interpretation?

Case vignette: A returning traveler with 5-month chronic diarrhoea, ST3 Ct 22, after empirical ciprofloxacin failure.

Expected outputs: Consensus on definitions of acute/chronic; framework for distinguishing re-infection vs persistence by subtype tracking.

Suggested reading: Stark et al. 2007; Swaminathan et al. 2009; Scanlan et al. 2014. + the group suggestions

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Session 10 — Co-infections Landscape

Framing questions:

1. How should clinicians weigh *Blastocystis* against co-detected *Dientamoeba*, *Giardia*, bacterial pathogens, and viruses?
2. Does *Blastocystis* modify the course of other infections?
3. What is the role of subtype in co-infection biology?

Case vignette: A 40-year-old with diarrhoea: stool PCR detects *Giardia*, *Blastocystis* (ST3, Ct 28), and *D. fragilis*. What is the treatment plan?

Expected outputs: Co-infection prioritization framework (consensus on sequential vs concurrent treatment).

Suggested reading: Stark et al. 2007; Vandenberg et al. 2007; Mohammad et al. 2017. + the group suggestions

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Session 11 — Disease Associations (IBS, IBD, Malnutrition, CRC, Urticaria)

Framing questions:

1. What is the evidence threshold to treat *Blastocystis* in IBS-D?
2. How should the inverse IBD association be interpreted clinically?
3. What is the threshold to act on detection in childhood malnutrition?
4. Should chronic urticaria pathways routinely include stool testing?
5. What is the strength of the colorectal cancer association?

Case vignette (rotating tables, 4 cases):

- **A.** 6-year-old with malnutrition + chronic diarrhoea + ST1, LMIC clinic.
- **B.** 50-year-old with IBS-D, ST3 Ct 24, IBS therapy failure.
- **C.** 35-year-old, refractory chronic urticaria, ST2 Ct 28.
- **D.** 28-year-old, active UC on biologic, new diarrhoea, ST1 Ct 26.

Expected outputs: Five disease-association consensus statements with action thresholds.

Suggested reading: El-Badry et al. 2026; Ali et al. 2022; El-Badry et al. 2018; Rostami et al. 2017a; Yakoob et al. 2010; Cekin et al. 2012; Petersen et al. 2013; Nourrisson et al. 2014; Vogelberg et al. 2010; Casero et al. 2015; Kumarasamy et al. 2014. + the group suggestions

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Session 12 — Vulnerable Populations

Framing questions:

1. In immunocompromised hosts, should detection be treated systematically?
2. How do thresholds differ in paediatric, elderly, malnourished, CKD/HD, and diabetes patients?
3. Is *Blastocystis* an opportunistic pathogen in vulnerable populations?

Case vignette: A 58-year-old liver-transplant recipient with 3-month diarrhoea, ST7 Ct 24, calcineurin-inhibitor immunosuppression. Treatment approach?

Expected outputs: Vulnerable-population thresholds; opportunistic phenotype consensus.

Suggested reading: Cirioni et al. 1999; Tasova et al. 2000; Calderaro et al. 2014; Adao & Rivera 2018. + the group suggestions

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Session 13 — Mechanistic Underpinnings (Virulence, Host, Microbiome, Causality)

Framing questions:

1. Which virulence factors are clinically actionable today?
2. How do host immune and barrier responses modify clinical phenotype?
3. Can Bradford Hill criteria be applied to *Blastocystis* — IBS and urticaria.

Case vignette: A research team proposes a cysteine-protease-based diagnostic; clinicians evaluate whether mechanistic findings justify clinical adoption.

Expected outputs: mechanism-to-bedside translation roadmap.

Suggested reading: Mirza et al. 2012; Wawrzyniak et al. 2012; Wu et al. 2014; Puthia et al. 2008. + the group suggestions

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Session 14 — *Blastocystis* and the Gut Microbiome

Framing questions:

1. Is *Blastocystis* a marker of eubiosis, dysbiosis, or both, depending on subtype?
2. Does microbiome carriage of *Blastocystis* confer benefit?
3. Should FMT donor exclusion criteria be revisited?

Case vignette: A microbiome study reports *Blastocystis* carriers in a Mediterranean-diet cohort with higher α-diversity. How does this change clinical practice today?

Expected outputs: Position on eubiosis/dysbiosis framing; FMT donor exclusion recommendation.

Suggested reading: El-Badry et al. 2026; Stensvold et al. 2022; Audebert et al. 2016; Beghini et al. 2017; Tito et al. 2019; Nieves-Ramírez et al. 2018; Cammarota et al. 2019. + the group suggestions

Session 15 — Subtype-Specific Clinical Correlations (ST1–ST12+)

Framing questions:

1. Which subtypes warrant specific clinical action (ST7, ST4)?
2. How should rare-subtype detection be handled?
3. Is allele-level information clinically actionable?

Case vignette: A patient with ST7 Ct 22 after refractory metronidazole; combined paromomycin/metronidazole is considered.

Expected outputs: Subtype-specific clinical-action matrix (table).

Suggested reading: Alfellani et al. 2013a; Stensvold & Clark 2020; Wu et al. 2014; Mirza et al. 2011; Stensvold et al. 2011. + the group suggestions

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Session 16 — Limitations of the Clinical-Picture Literature

Framing questions:

1. Should the cross-sectional dominance of the literature inform clinical practice?
2. How should intra-subtype variation be handled in research design?
3. What are the priority study designs going forward?

Case vignette: A specialty society commissions a meta-analysis; how to weight studies with heterogeneous diagnostic platforms?

Expected outputs: Methodological recommendations for future research; identification of priority gaps.

Suggested reading: Rostami et al. 2017a; Stensvold & Clark 2020; Aykur et al. 2022. + the group suggestions

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Session 17 — Current Diagnostic Approach in Clinical Settings

Framing questions:

1. Should microscopy alone remain acceptable as a first-line diagnosis in 2026?
2. What Ct thresholds are workable?
3. Should NGS be used clinically?

Case vignette: A laboratory introducing multiplex qPCR with subtype reflex — what are the reporting standards?

Expected outputs: Consensus on diagnostic platform tiering; quantitative reporting standards.

Suggested reading: Stensvold et al. 2007b, 2012; Poirier et al. 2011; Roberts et al. 2014b; Maloney et al. 2019; Mathison et al. 2020. + the group suggestions

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Session 18 — Operationalizing the Case Definition of Blastocystosis

Framing questions:

1. Finalise the contemporary case definition.
2. How does the definition differ between epidemiological surveillance and clinical attribution?
3. What is the role of subtype, burden, and host context in the case definition?

Case vignette: A health authority asks for a surveillance case definition; clinicians propose distinct surveillance and clinical definitions.

Expected outputs: Endorsed contemporary case definition (clinical and surveillance variants).

Suggested reading: Stensvold & Clark 2020; Tan 2008; Coyle et al. 2012. + the group suggestions

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Session 19 — Clinical Decision-Making and Management Algorithm

Framing questions:

1. **Step 1 — Who to test:** in which clinical scenarios is testing indicated?
2. **Step 2 — Which test:** qPCR, NGS, microscopy, culture — how to choose?
3. **Step 3 — Causal attribution:** which criteria determine virulence — burden, subtype, host, exclusion?
4. **Step 4 — What to treat with:** first-line, second-line, combination, co-infection management.
5. **Step 5 — How to follow up:** clinical and microbiological follow-up.

Case vignette: Walk-through of the returning-traveler case through all five steps.

Expected outputs: Final endorsed clinical management algorithm (Figure).

Suggested reading: Roberts et al. 2014a; Sekar & Shanthi 2013; Stensvold et al. 2010; current IDSA/ESCMID/BSG/WGO/NICE guidance. + the group suggestions

Session 20 — Knowledge Gaps and Future Directions

Framing questions:

1. Highest-priority diagnostic gap?
2. Highest-priority therapeutic gap?
3. Highest-priority mechanistic gap?
4. Highest-priority public-health/One Health gap?
5. Highest-priority patient-centered outcomes gap?

Case vignette: Each participant nominates one gap and votes; nominal-group consolidation.

Expected outputs: Ranked top 15 research priorities; working group leads assigned.

Suggested reading: Stensvold & Clark 2020; Deng et al. 2021; Aykur et al. 2022; COST Action CA21105 priorities. + the group suggestions

Challenges to be addressed during discussion

1. Heterogeneity of evidence; cross-sectional dominance; inconsistent case definitions.
2. Platform-dependent Ct thresholds; harmonization lacking.
3. Subtype virulence; intra-subtype variation may exceed between-subtype variation.
4. Mixed infections — clinical significance unclear.
5. Live/dead distinction not routinely available.
6. Treatment evidence quality — few placebo-controlled RCTs.
7. Drug resistance is documented in ST7; mechanism research is limited.
8. Sparse data in vulnerable populations.
9. LMIC diagnostic access constraints.
10. Microbiome interplay personalization requires inaccessible data.
11. Regulatory gaps for AI diagnostic tools.
12. Counselling patients about a contested, often-incidental finding.
13. FMT donor exclusion based on precautionary rather than evidence-based rationale.
14. One Health surveillance gaps under the CA21105 framework.

5. Pre-Workshop Preparation

5.1 Pre-survey (15 items, anonymous, online)

1. Estimated annual volume of *Blastocystis* testing in your laboratory?
2. Primary diagnostic modality (microscopy / culture / PCR / multiplex / NGS)?
3. Routine Ct/copy reporting? (Y/N)
4. Routine subtype identification? (Y / sometimes / N)
5. Ct threshold at which you would recommend treatment?
6. Consider subtype identity in treatment decisions? (Y / sometimes / N)
7. First-line antimicrobial choice?
8. Re-test after treatment? (always / sometimes / never)
9. How do you interpret persistent qPCR + symptom resolution?
10. *Blastocystis* is: pathogen/opportunist/commensal/pathobiont?
11. Greatest diagnostic challenge?
12. Greatest therapeutic challenge?
13. Most undefined *Blastocystis* patient population?
14. Local written protocol? (Y/N)
15. Most useful anticipated roundtable outcome?

5.2 Pre-Reading Pack

1. *Clinical Perspectives of Blastocystis* (COST book chapter).
2. *Diagnosis of Blastocystis: Integrated approach* (COST book chapter).
3. *Microscopic Diagnosis of Blastocystis* (COST Workshop).
4. Uploaded 20-section.
5. Stensvold & Clark 2020;
6. Deng et al. 2021;
7. Aykur et al. 2022.
8. Audebert et al. 2016;
9. Tito et al. 2019;
10. Beghini et al. 2017.
11. Rostami et al. 2017 (meta-analysis);
12. Roberts et al. 2014a.
13. COST Action CA21105 framework document.

5.3 Other Pre-Workshop Materials

- Case vignettes (≥20) circulated as a single PDF.
- Draft algorithm (working document for Sessions 18–19).
- Reference guidance excerpts (IDSA, ESCMID, BSG, WGO, CDC DPDx, NICE).

6. Roles and Responsibilities

Role	Responsibility
Chair	Strategic direction, plenary moderation, consensus statement leadership, perspective article senior authorship
Co-chairs (×3)	Each lead one Roundtable Discussion (A, B, C); rapporteur oversight; writing-committee leadership for assigned sessions
Talk 1 speaker	Biology / transmission / microbiome (Sessions 1–6, 14) — lead author of perspective article sections 1–6 and 14, 15
Talk 2 speaker	Clinical spectrum and patient journey (Sessions 7–13) — lead author of sections 7–13, 15
Talk 3 speaker	Decision-making and algorithm (Sessions 16–20) — lead author of sections 16–20
Moderator + Rapporteurs (for 20 sessions)	Live notetaking; bullet drafting; post-workshop consolidation
Veterinary parasitology liaison	COST Action CA21105 representation; One Health interpretation
Patient-representative observer	Patient-centered outcomes perspective
Communications lead	Press release; trainee assets; social-media summary

7. Drafting and Endorsement of the Consensus Statements in the form of Article

Day	Action
Day 0 (end of workshop)	Moderators + Rapporteurs consolidate session bullets
Day 7	Writing committee circulates draft 1 (≤4,000 words)
Day 14	Draft 2 with incorporated comments
Day 21	Final draft prepared with signed declarations
Day 30	Submission to Q1 journal as position statement / clinical practice guideline

In addition, a perspective and commentary article could also be drafted, under the chair's supervision, using the workshop deliverables, and submitted within 40 days (to be discussed).

8. References with Current Guidance

The workshop will explicitly triangulate consensus positions against current guidance from:

- **IDSA** — Stool diagnostics and antiparasitic therapy
- **ESCMID** — Multiplex molecular diagnostics for enteric disease
- **BSG** — Chronic diarrhoea investigation pathway
- **WGO** — Acute diarrhoea and giardiasis guidelines
- **CDC DPDx** — Diagnostic reference for *Blastocystis*
- **NICE** — IBS diagnostic pathway (NG61)

No society has issued a *Blastocystis*-specific guideline. The goal of the workshop output is to fill that gap.

9. Future Directions Advanced from the Roundtable

1. International consensus diagnostic and reporting guidelines within 3 months.
2. Prospective multinational longitudinal cohort study integrating subtype, host factors, microbiome, and clinical outcomes.
3. Subtype- and burden-stratified RCTs of antiparasitic therapy.
4. Validated viability assays (PMA-qPCR, RT-PCR) for treatment monitoring.
5. AI-assisted diagnostic platforms with regulatory clearance pathways.
6. Point-of-care diagnostics validated for LMIC settings.
7. Strain-level genomics and intra-subtype virulence characterization.
8. Microbiome-integrated personalized clinical interpretation.
9. Antimicrobial resistance surveillance (ST7).
10. Patient-centered outcomes research and shared decision-making frameworks.
11. Re-evaluation of *Blastocystis* exclusion in FMT donor screening.
12. Specialty-society *Blastocystis* clinical guideline.
13. CA21105 One Health surveillance protocols for ST5, ST6, ST7, ST8.
14. International proficiency testing programs for microscopy and molecular subtyping.
15. Educational asset bundle for ID/GI trainee curricula globally.

11. Closing Remarks Framing

The Chair concludes by:

- Summarizing the endorsed clinical algorithm and ranked research priorities.
- Naming lead authors and working groups for each priority theme.
- Announcing the consensus statement and the perspective/comprehensive article timelines.
- Acknowledging contributors, sponsors, and CA21105.
- Closing with the reminder that *Blastocystis* clinical decision-making is the exemplar of context-aware, precision-medicine parasitology.

The authors of the chapter "Clinical Perspective of Blastocystis," in the *Blastocystis* book, are working on a comprehensive review/perspective article. The deliverable/type of article, either a comprehensive review or a commentary (maybe both types of articles), will be determined with participating colleagues during the upcoming Cairo workshop.

12. Master Discussion Question List (by Review Section)

Sessions 1–6, 14 (Roundtable Discussion A)

1. Minimum biological reporting elements?
2. Should microscopy reports distinguish all morphological forms?
3. Minimum subtype-resolution data with clinical reports?
4. Should PubMLST be the reference?
5. What environmental reservoirs drive endemic prevalence?
6. Which subtypes are clinically relevant via zoonotic transmission?
7. Subtype-by-transmission framework?
8. *Blastocystis* as a marker of eubiosis or dysbiosis?
9. Should FMT donor exclusion criteria be revisited?
10. One Health surveillance under CA21105?

Sessions 7–13, 15 (Roundtable Discussion B)

11. *Blastocystosis* case definition: clinical vs surveillance?
12. Patient-communication language for the clinical spectrum?
13. Acute vs chronic course definitions?
14. Re-infection vs persistence framework?
15. Co-infection prioritization in treatment plans?
16. *Blastocystis* and IBS treatment threshold?
17. Inverse IBD association — clinical implication?
18. Chronic urticaria stool-testing pathway?
19. Children, malnutrition, CRC — evidence to act?
20. Vulnerable populations modified thresholds?
21. Bradford Hill verdict on IBS and urticaria?
22. Subtype-specific clinical action matrix?

Sessions 16–20 (Roundtable Discussion C)

23. Methodological priorities for future research?
24. Microscopy retired or retained in 2026?
25. Workable Ct thresholds?
26. Reporting mixed infections?
27. Final endorsed case definition of blastocystosis?
28. Five-step algorithm — what should change?
29. Follow-up qPCR interpretation framework?
30. Treatment failure vs resistance vs re-infection — management?
31. Top-15 research priorities (modified Delphi)?

13. Activities Conducted During the Workshop

The two-day workshop integrates the following activities:

1. **Welcome and pre-survey**.
2. **Three keynote talks (25 min + 10 min Q&A each)** — anchoring the three Roundtable Discussions.
3. **Twenty section-anchored discussions** — each with framing question(s), case vignette, and consensus bullet drafting.
4. **Case-vignette table rotations** — small-group case discussion with rotating moderators.
5. **Live polling via digital interface** — real-time consensus tracking.
6. **Roundtable discussion, small group/large group (Session 20)** — for research priority ranking.
7. **Live algorithm consolidation (Day 2 afternoon)** — section-by-section editing of the management algorithm with majority voting.
8. **Consensus statement drafting** — rapporteur-led bullet consolidation.
9. **Public press summary drafting** — Communications lead with chair approval.
10. **One Health policy brief drafting** — CA21105 liaison-led parallel session.
11. **Networking reception** — open to all in-person participants.
12. **Post-workshop writing sprint** — drafting of consensus statement and perspective article within 7 days of workshop close.

14. From Workshop to Article: The Perspective/Commentary Roadmap

The workshop outputs a high-impact, comprehensive, &/or perspective/commentary article structured around the 20 sessions and the three keynote talks. The article will:

- **Open** with the One Health framing under CA21105.
- **Frame** *Blastocystis* as a context-dependent pathobiont, not a binary pathogen or commensal.
- **Traverse** the patient journey across the 20 sections.
- **Synthesize** the workshop's consensus positions on the case definition, the management algorithm, and the research priorities.
- **Present** 2–4 figures: the pathobiont concept (Figure 1, derived from the workshop's framing); the management algorithm (Figure 2); the patient journey across clinical-terminology stations (Figure 3); the precision-medicine framework (Figure 4).
- **Include** 1–3 tables: subtype-specific clinical characteristics; comparative diagnostic methods; recommended treatment regimens.
- **Highlight** areas of controversy, uncertainty, and knowledge gaps.
- **Close** with a forward-looking framework for the precision-medicine maturation of *Blastocystis* clinical reasoning.

Appendix A — Roundtable-Endorsed Case Definition of Blastocystosis (Workshop Output, Provisional Draft)

Clinical case definition. *Blastocystosis* is the symptomatic clinical syndrome attributable to *Blastocystis*, requiring all of:

1. **Compatible symptoms** — gastrointestinal (diarrhoea, abdominal pain, bloating, fatigue) or extra-intestinal (chronic spontaneous urticaria, dermatological) of sufficient severity to warrant medical attention.
2. **Microbiological detection** — *Blastocystis* identified in stool by an appropriately sensitive method (qPCR preferred; microscopy or culture acceptable).
3. **Exclusion of alternative aetiologies** — through structured enteric workup including co-pathogen screening and consideration of functional / inflammatory / structural alternatives.
4. **Supportive contextual criteria (≥1):**

- high organism burden (qPCR Ct ≤25 or abundant on microscopy);
- potentially virulent subtype (ST7, ST4 in European context, ST3 allele 34);
- vulnerable host (immunocompromised, atopic, pediatric, malnourished, CKD/HD, chronic debilitating disease);
- temporal compatibility (travel-associated, outbreak, recent acquisition);
- response to targeted antiparasitic therapy (post-hoc confirmation).

Surveillance case definition. Detection of *Blastocystis* in any human specimen by a validated method, with optional subtype identification. Symptom data optional but recommended for epidemiological characterization.

Appendix B — Roundtable-Endorsed Five-Step Clinical Management Algorithm (Workshop Output)

Clinical algorithm: Step 1 (assessment = *who to test*), Step 2 (workup = *which test*), Step 3 (causal attribution = *which criteria determine virulence*), Step 4 (treatment = *what to treat with* - *how to manage co-infection*), and Step 5 (follow-up = *how to follow up*)

Step 1 — Who to test. Symptomatic patients with plausible *Blastocystis*-attributable clinical syndrome; immunocompromised hosts with prolonged GI symptoms; chronic spontaneous urticaria refractory to antihistamines; outbreak investigation; selected research/surveillance contexts. Routine screening not applicable for asymptomatic individuals.

Step 2 — Which test. First-line stool multiplex qPCR (Blastocystis + Giardia + Cryptosporidium + Dientamoeba + bacterial pathogens + C. difficile). Reflex SSU rRNA subtype sequencing. NGS for mixed-infection suspicion. Microscopy as confirmatory and quantitative tool. Calprotectin for inflammatory differential.

Step 3 — Causal attribution. Apply five integrated criteria — burden (Ct ≤25 supports), subtype (ST7 concern, ST4 regional, ST3 allele 34), host vulnerability, temporal pattern, exclusion of alternatives.

Step 4 — Treatment matched to scenario.

- Observe: asymptomatic, low burden + mild symptoms, alternative diagnosis explanatory.
- First-line therapy: metronidazole 500–750 mg TID × 7–10 days (or nitazoxanide 500 mg BID × 3 days; paromomycin 500 mg TID × 7 days in pregnancy).
- Intensified / combination: immunocompromise, ST7 / suspected metronidazole resistance, refractory disease → paromomycin + metronidazole; rifaximin for concomitant SIBO.
- Co-infection management: treat clinically dominant pathogen first; reassess *Blastocystis* burden post-treatment if symptoms persist.

Step 5 — Follow-up. Clinical reassessment 2–4 weeks; qPCR 4–6 weeks if microbiological cure required. Four outcome pathways: cure / residual DNA / treatment failure / reinvestigate alternative diagnosis.

Appendix C — Roundtable-Endorsed Top-15 Research Priorities (Workshop Output)

1. International consensus diagnostic and reporting guidelines.
2. Prospective multinational longitudinal cohort with integrated multi-omics.
3. Subtype- and burden-stratified placebo-controlled RCTs.
4. Validated viability assays for clinical use.
5. AI diagnostic platforms with regulatory clearance.
6. Point-of-care diagnostics for LMIC.
7. Strain-level genomics and virulence characterization.
8. Microbiome-integrated diagnostic interpretation.
9. Antimicrobial resistance surveillance (ST7).
10. Patient-centered outcomes measures.
11. FMT donor exclusion re-evaluation.
12. Specialty-society Blastocystis clinical guideline.
13. CA21105 One Health surveillance for ST5, ST6, ST7, ST8.
14. International proficiency testing programs.
15. Trainee educational curriculum integration.

Prepared by the Roundtable Organizing Committee in alignment with COST Action CA21105 (One Health framework). The workshop program is aligned section-by-section to the planned 20-section Clinical Perspectives Review Article.