Technical Manual Cystic Echinococcosis (CE)

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Step 1: Study data extraction

Within the “subgroups” (e.g. “imaging”, “surgery” etc) the experts agree on the publications from which the relevant data are extracted (e.g. efficacy of the various surgical / percutaneous treatment modalities, rate of complications and adverse events, relapse rates, follow-up time). The extracted data are documented on data extraction sheets and annexed to the “CE Technical Manual” for transparency of the process. The extracted data are the evidence base on which the “CE Technical Manual” is built.

Controversial issues generated from the analysis of the literature and expert experience are discussed in the respective expert groups.

Step 2: Expert discussion and outputs

The templates are circulated and completed by email. The consensus on the various controversial issues go into the “CE Technical Manual”. For transparency of the process the completed templates are annexed to the “CE Technical Manual”. Very important is the formulation of “research needs” clearly highlighting where research and funding is needed to improve patient management.
Structure of the „CE Technical Manual”: Table of content

A. Definitions and strategy
B. Health services settings (level of infrastructure, resources, skills)
C. Diagnosis, treatment and follow-up of uncomplicated cystic echinococcosis stratified by organs
   I. Screening (populations at risk) vs accidental finding (asymptomatic patients / patients with non-specific mild symptoms)
   II. Overall strategy (summary)
   III. Procedures & techniques
      a. Liver
         i. Clinical features
         ii. Diagnosis (Imaging, Laboratory-based diagnosis)
         iii. Treatment (medical, percutaneous, surgery, endoscopic, watch & wait)
         iv. Follow-up
      b. Lung
         i. Clinical features
         ii. Diagnosis (Imaging, Laboratory-based diagnosis)
         iii. Treatment (medical, percutaneous, surgery, watch & wait)
         iv. Follow-up
      c. Other organs
C. Diagnosis, treatment and follow-up of complicated echinococcal cysts
D. Evidence-base of diagnostic and treatment procedures presented in the “CE Technical Manual”
E. Checklists
F. Training
G. Useful links
References
Annex
The „CE Technical Manual“ focuses on the **practical** aspects of the diagnostic and clinical procedures for patients with cystic echinococcosis.

It provides “hands on” advice on clinical management. The descriptions of procedures and techniques in the main sections of the “Manual”

A. Diagnosis, treatment and follow-up of *uncomplicated* cystic echinococcosis stratified by organs
B. Diagnosis, treatment and follow-up of *complicated* echinococcal cysts
supplemented by
C. Checklists

are augmented by figures detailing specific techniques and by videos so that users can see how these techniques are performed.

The evidence on which the various techniques and procedures in the “Manual” are based is accessible in an annex.
A. Definitions and strategies

Introductory remarks, definitions

CE-Management (diagnosis – treatment – follow-up) is stratified by settings (level of infrastructure, resources, skills) with

• **most patients** treated in low resource settings with limited access to health services
• **few patients** treated in high resource settings with little experience with CE management

Uncomplicated CE is defined as

• CE cysts which have neither in the past (medical history) caused complications nor present acutely with complications (medical emergency).

Complicated CE is defined as

• CE cysts presenting with acute (life-threatening) problems (anaphylaxis, respiratory failure / asphyxia, biliary obstruction, major compromise of vital blood vessels, CNS deficits, secondary bacterial complications and sepsis)
Strategies

Diagnosis, treatment and follow-up is stratified into

STRU standard procedures for *uncomplicated* cysts ⇒ Section C

STRU further stratified by organ in descending order of clinical prevalence: liver – lung – other organs.

STRU emergency presentations and management (*complicated* cyst) ⇒ Section D
B. Health services settings (level of infrastructure, resources, skills)

**Low-resource setting defined as:**
- Broad community access to **health posts** with minimal technical equipment. Ultrasound mostly not available.
- Access to **district hospitals** predominately through health post referrals. Ultrasound mostly available.
  - “Safe surgery” and anaesthesia limited.
- Limited access to **tertiary hospitals**.

**High resource setting defined as:**
- Unlimited access to all levels of the health care system.
- High quality imaging (US, MRI, CT) available
- “Safe surgery” and anaesthesia available
Cross reference is made to important activities relevant to the management of CE:

http://www.who.int/patientsafety/safesurgery/en/
http://www.who.int/surgery/globalinitiative/en/
http://www.who.int/surgery/globalinitiative/gieesc_country_reports/en/

The WHO Global Initiative for Emergency and Essential Surgical Care (GIEESC) is a global forum that convenes multidisciplinary stakeholders representing health professionals, public health experts, health authorities and local and international organizations.

Established in December 2005, the GIEESC has grown to include over 2200 members from 140 countries, which collaborates to share knowledge, advise policy formation and develop educational resources to reduce the burden of death and disability from conditions that could be treated through surgery.
Table: Critical features of health care services for the management of patients with cystic echinococcosis

<table>
<thead>
<tr>
<th></th>
<th>Low resource setting</th>
<th>High resource setting</th>
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<td>primary</td>
<td>secondary</td>
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<td>Infrastructure</td>
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<tr>
<td>High quality hygiene</td>
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<tr>
<td>procedures in place</td>
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<tr>
<td>Resources</td>
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<td>MRI</td>
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<td>Percutaneous methods</td>
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<td>Anaesthesia</td>
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</table>
C. Diagnosis, treatment and follow-up of *uncomplicated* cystic echinococcosis stratified by organs

I. Screening (populations at risk) vs accidental finding (asymptomatic patients or patients with non-specific mild symptoms)

... a reflection on the principles of screening contrasted to the diagnosis and treatment of patients as they present at the various health care settings in endemic and non-endemic countries, e.g. risk of treating advanced disease in countries without “safe surgery”.
II. Overall strategy (summary)

In this section diagnostic-therapeutic strategies will be summarised for quick orientation. Could be summary figures such as:

*Uncomplicated* hepatic cystic echinococciosis as an accidental finding or finding at screening (asymptomatic or non specific mild symptoms)

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**Diagnosis and cyst-staging:**

Ultrasound - WHO cyst classification

**Treatment decision:**

1. CE4, CE5 \(\rightarrow\) **Watch & wait**
2. Small CE1, CE2, CE3a, CE3b cysts \(\rightarrow\) **Albendazole** (start with 3 months, repeat if not effective)
3. Big cysts and cysts with fistulas (CE1, CE2, CE3a, CE3b) \(\rightarrow\) **Surgery plus albendazole** (start before surgery until 1 month after surgery)
4. **Percutaneous treatment** \(\rightarrow\) **PA, PAIR, MoCat** combined with albendazole

Complement with CXR
... or even more comprehensive summaries such as:

<table>
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<tr>
<th>Active cysts</th>
<th>Early Rx</th>
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<th>Very late Rx</th>
<th>No Rx</th>
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<tr>
<td></td>
<td>≤5-6 cm</td>
<td>&gt;5-6 cm &lt;10 cm</td>
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<td><img src="image12.png" alt="Image" /></td>
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- **Benzimidazoles** (possibly higher efficacy)
- **Benzimidazoles** (possibly lower efficacy)
- **PAIR**
- **Surgery** / (continuous catheter drainage [CE1, CE3a], large-bore catheter [CE3a, CE3b, CE2])
- **Watch & wait**

Stojkovic, Gottstein, Junghanss in: *Manson’s Tropical Diseases 2014*
III. Procedures & techniques (details)

a. Liver

1. Clinical features
   i. ...

2. Diagnosis
   i. Imaging (US, MRI, CT) including US-based classification → [link to VIDEO] and differential diagnosis
   ii. Laboratory-based diagnostics
      i. ...

3. Treatment
   i. Medical treatment
      i. ...
   ii. Surgery → [link to VIDEO]
      i. ...
   iii. Percutaneous treatment → [link to VIDEO]
      i. ...
   iv. Endoscopic treatment → [link to VIDEO]
      i.
   v. Watch & wait

4. Follow-up
   i. ...
b. Lung

1. Clinical features
   • ...

2. Diagnosis
   i. Imaging (US, MRI, CT) including US-based classification ➔ link to VIDEO and differential diagnosis
      • ...
   ii. Laboratory-based diagnostics
      • ...

3. Treatment
   i. a. Medical treatment
      • ....
      a. Surgery ➔ link to VIDEO
         • ...
      b. Percutaneous approach ➔ link to VIDEO
         • ...
      c. Watch & wait

4. Follow-up
   • ...


c. Other organs

- Spleen
  - ...
- Renal
  - ...
- Peritoneal
  - ...
- Muscular
  - ...
- Bone / spine
  - ...
- CNS
  - ...
- Other (rare) locations
  - ...
D. Diagnosis, treatment and follow-up of complicated echinococcal cysts

a. Overall Strategy

*Could be structured as follows:*

Any location of CE

- **Suddenly itchy skin rash; wheezing; collapse (low blood pressure) → Rupture of cyst**
  - Ultrasound, abdomen: free fluid, cyst incomplete, collapsed endocyst, water-air level
  - CXR / CT, thorax: free fluid, cyst incomplete, collapsed endocyst, water-air level

Abdominal / liver CE

- **Colicky pain, jaundice → cysto-biliary fistula → hydatid material → biliary obstruction**
  - Ultrasound: biliary obstruction / dilatation of biliary vessels
- **Colicky pain plus fever → cysto-biliary fistula plus cholangitis**
  - see above
- **Fever → cyst bacterially infected**
  - Ultrasound: abscess

Pulmonary CE

- **Coughing clear fluid → cysto-bronchial fistula**
  - CXR / CT: free fluid, cyst incomplete, collapsed endocyst, water-air level
- **Coughing (+/- blood) +/- fever → cysto-bronchial fistula**
  - CXR / CT: incomplete cyst +/- surrounding infiltration (careful → DD TB!!)
- **Fever → cyst bacterially infected**
  - CXR / CT: abscess

b. Interventions

i. Surgery
   ....

ii. Percutaneous
   ....
E. Evidence-base of diagnostic and treatment procedures presented in the “CE Technical Manual” → we have decided to go for the strategy marked in “red” below

• Systematic review

will (1) take very long to perform this in the strict sense and (2) a lot of the material to be reviewed is of low quality ...

... instead: Study data are systematically extracted (see “data extraction sheet” below) from publications selected and agreed upon by experts → annexed to the “Manual” to make the published evidence transparent

• Expert opinion

The main „problem areas“ are identified and tabulated → each expert provides his/her “opinion” → consensus statements are generated, “unresolved areas” for future research are highlighted (see documentation sheet below) → annexed to the “Manual” to make the process transparent and to mark “work in progress”

• Biological plausibility

to make more use of “biological plausibility”. There are issues which do not need to undergo trials, because they are biologically plausible.
“Data extraction sheet” to document relevant data from published studies selected by experts

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<tr>
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<tr>
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<td>Type of outcome(s)</td>
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Marija Stojkovic, Francesca Tamarozzi, Marcel Zwahlen
“Expert discussion and output sheet” for problem areas

<table>
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<tr>
<th>Controversial ISSUE</th>
<th>EXPERT opinion</th>
<th>CONSENSUS</th>
<th>Research NEED</th>
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<td>Issue x</td>
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F. Checklists

The “checklists” list what is required, e.g. to perform a “PAIR” procedure or an “endocystectomy”, or in the case of imaging minimal requirements for e.g. ultrasound machines etc.

I. Imaging

   i. Ultrasound
      ...
   i. CT
      ...
   i. MRI
      ...

II. Laboratory diagnosis

   i. Non-specific
      1. Blood count including differential
         ...
      1. LFTs
         ...
      1. Serology Hep B, C
         ...

cont. **Laboratory diagnosis**

**ii. specific**

1. Serology
   a. ...
   b. ...
2. Microscopy
   ...

1. PCR
   ...

1. Histology
   ...

1. Albendazol-Sulfoxid serum level
   ...
III. Surgery
   i. ...

IV. Anaesthesia
   i. ...

V. Percutaneous methods
   i. ...

VI. Endoscopic methods
   i. ...
G. Training
Suggestions for training, e.g. ultrasound, PAIR, surgical procedures, etc.

H. Useful links
Links to existing training courses; useful materials on the internet, etc.

References
All citations in the “Manual” are listed here, including links to free access journals

Annex
For transparency the “data extraction sheets” of published studies (see above) and the “expert discussion and output sheets” for problem areas (see above) are annexed to the “Manual”.