DRAFT

Manual for case management of cutaneous leishmaniasis in the WHO Eastern Mediterranean Region

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Draft Manual for case management of cutaneous leishmaniasis in the WHO Eastern Mediterranean Region

<H1>Contents

<H1>Foreword

<text>Cutaneous leishmaniasis is a complex entity representing a major public health problem in the WHO Eastern Mediterranean Region. Several epidemiological, parasitological and clinical aspects pose a challenge for the management and control of the disease.

The *Manual for case management of cutaneous leishmaniasis in the WHO Eastern Mediterranean Region* addresses a crucial and sensitive aspect of the control of the disease: the treatment of patients.

At the global and regional level, resolutions were endorsed on the control of leishmaniasis in 2007 by the World Health Assembly (Resolution WHA60.13) and the WHO Regional Committee for the Eastern Mediterranean at its 54th session (Resolution EM/RC54/R.3) on neglected tropical diseases. These resolutions called for necessary guidelines on prevention and management to support Member States in establishing systems for surveillance, data collection and analysis, as well as strengthening active detection and treatment of cases.

With this new manual, countries will have, for the first time, standardized diagnosis and treatment protocols, case definitions and indicators to easily track progress on cutaneous leishmaniasis case management across the Region.

We hope this manual will provide the necessary support to professionals in charge of cutaneous leishmaniasis to alleviate the suffering of affected populations from this appalling disfiguring and stigmatizing neglected tropical disease.

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WHO Regional Director for the Eastern Mediterranean

<H1>Acknowledgements

<text>The WHO Regional Office for the Eastern Mediterranean gratefully acknowledges the contributions made to this manual by the following people.

Pierre Buffet and Gloria Morizot, Pasteur Institute, France, Lama Jalouk, consultant, Syrian Arab Republic and Mourad Mokni, consultant, Tunisia, wrote the report. Badderedin Annajar, Ministry of Health, Libyan Arab Jamahiriya, and Reza Shirzadi, Ministry of Health, Islamic Republic of Iran, reviewed the document and provided comments and insight.

Jose A. Ruiz-Postigo and Riadh Ben-Ismail from the Regional Office provided technical input and comments.

Daniel Argaw and Jorge Alvar from WHO headquarters provided comments and insight.

This manual has been developed within the framework of the partnership signed between WHO and Sanofi-Aventis to fight some of the most neglected tropical diseases, including cutaneous leishmaniasis.[1]

<FN>[1]http://www.who.int/neglected_diseases/WHO_sanofi_partnership_2011/en/

<H1>Introduction: why read this document?

<H2>Cutaneous leishmaniasis is an important health problem

<text>Cutaneous leishmaniasis is a potentially severe and disfiguring disease. Patients with cutaneous leishmaniasis have one or several long-lasting lesions on the skin, usually without fever or general symptoms.

The impact that cutaneous leishmaniasis has on propagating poverty is important, since treatment is expensive and is therefore either unaffordable or involves a great loss of wages. The cost of treatment and implementation of prevention strategies needs sizeable financial and human resource investment.

Cutaneous leishmaniasis is a major public health problem in the WHO Eastern Mediterranean Region. New cases are emerging in areas previously free of the disease. Over 100 000 new cases of cutaneous leishmaniasis are reported annually to WHO by countries in the Region, but the actual incidence is estimated to be three to five times higher since many patients never seek medical attention and not all patients with a diagnosis of cutaneous leishmaniasis are reported to health authorities.

This manual is based on the available knowledge and expertise at the time of writing. It has been prepared by three WHO consultants, recognized internationally for their expertise in the field of cutaneous leishmaniasis. Drafts of the document have been shared with one expert at the Pasteur Institute in Paris, technical staff in the WHO Regional Office for the Eastern Mediterranean and WHO headquarters, and with other experts in the Region for their valuable input. The document represents a key step forward in translating *Control of the leishmaniases* (WHO Technical Report Series, No. 949) into a more practical tool for health personnel directly involved in the case management of cutaneous leishmaniasis.

<H2>This document provides directions to facilitate medical care to patients

<text>The scientific and medical communities have learnt a lot about cutaneous leishmaniasis during the 20th and early 21st centuries. However, the management and control of the disease remains a difficult task.

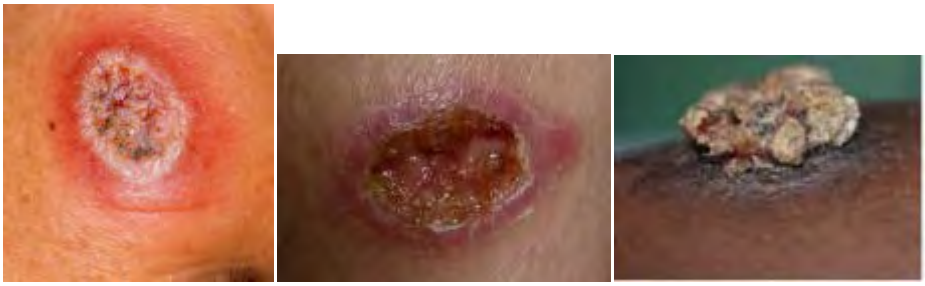
This manual provides essential information on the parasite, on the way it is transmitted and spreads, on how to make the diagnosis and how to treat patients. Annex 1 provides case definitions, Annexes 2–5 provide standard operating procedures for different treatments, Annex 6 provides a patient's file form to register all the necessary epidemiological, diagnostic and treatment information and Annex 7 provides monthly report forms on diagnostic and treatment activities.

Most lesions of cutaneous leishmaniasis display the following features (Figure 1):

<B1>

- there is some degree of infiltration of the skin (the skin on or around the lesion appears thicker than normal, either by eye or by touch);

- the evolution is slow, i.e. it takes over 1 week for the lesion to reach its final size;
- the shape of the lesion is broadly reminiscent of a disk or an oval;
- skin colour on the lesion and borders is abnormal (most often red or dark);
- the lesion's limits are usually well demarcated (i.e. except those with many peripheral papules).



(a) (b) (c)

<FC>Figure 1. Skin lesions in patients with cutaneous leishmaniasis: (a) ulcerated crusted nodule; (b) ulcerated lesion; (c) verrucous lesion.

<H1>Epidemiology

<H2>Cutaneous leishmaniasis in the world

<text>Cutaneous leishmaniasis is currently endemic in 87 countries worldwide. The disease is present in 20 countries in the New World (South and Central America) and in 67 countries in the Old World (Europe, Africa, Middle East, central Asia and the Indian subcontinent).

An estimated 500 000–1 000 000 new cases occur annually but only a small fraction of cases, 19%–37%, are actually reported to health authorities.

Cutaneous leishmaniasis principally affects poor populations. Outbreaks occur in urban and rural areas, refugee camps or internally displaced populations.

<H2>Cutaneous leishmaniasis in the Region

<text>The disease burden in the Region is 57% of the cutaneous leishmaniasis burden worldwide. Cutaneous leishmaniasis due to *Leishmania tropica* and *L. major* is endemic in 16 of the 23 countries in the Region: Afghanistan, Djibouti, Egypt, Iraq, Islamic Republic of Iran, Jordan, Kuwait, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Saudi Arabia, Sudan, Syrian Arab Republic, Tunisia, West Bank and Gaza Strip, and Yemen. In Djibouti, the parasite species causing cutaneous leishmaniasis are unknown and in Lebanon only cutaneous leishmaniasis cases due to *L. infantum* are reported.

In each country, some areas may be free of cutaneous leishmaniasis while the disease may be very frequent in other areas. New foci appear in addition to well-known zones of transmission.

<H1>Parasitology

<H2>The parasite

<text>The causing agent of cutaneous leishmaniasis is a single-celled parasite called *Leishmania*. *Leishmania* parasites exist as two forms: a small, rounded, still form (amastigotes) living in the cells of a vertebrate host, and an elongated form (promastigotes) that moves thanks to a flagellum and lives in the insect that transmits the disease. Amastigotes multiply in the cells of the host, essentially in macrophages. Promastigotes multiply freely in the gut of the sandfly and in culture medium.

More than 20 different species of *Leishmania* can cause disease in humans. In the Region, *L. tropica* causes anthroponotic cutaneous leishmaniasis whereas *L. major*, and less frequently *L. infantum*, cause zoonotic cutaneous leishmaniasis.

<H2>The vector: insects able to transmit the parasite

<text>*Leishmania* parasites are transmitted from a vertebrate host to another vertebrate host by a tiny 2–3 mm-long insect vector, the phlebotomine sandfly. Only the female sandfly bites vertebrates and can therefore transmit the parasite.

<H2>The reservoirs: diversity of vertebrates found infected with *Leishmania* and distinct persistence patterns

<text>The leishmaniases fall into two categories according to the role of human beings in the persistence of the parasite. In the first category, parasites are transmitted from human to human (anthroponotic cutaneous leishmaniasis). When there is no sandfly to assure transmission, parasites can persist for long periods in humans, who are therefore the "reservoir" of *Leishmania*. In other situations, reservoir hosts are wild, mainly rodent species (zoonotic cutaneous leishmaniasis).

<H2>Transmission of leishmaniasis

<text>Leishmaniasis is transmitted by the bite of female sandflies. When the sandfly bites infected skin it makes a pool. With their mouthparts, which have cutting and saw-like edges, they scratch the tissue of the dermis, which contains several macrophages full of amastigotes, and mix them with blood. By sucking the blood from these pools, they suck not only blood but also damaged tissue of the dermis containing macrophages with amastigotes.

In the midgut of the sandfly, amastigotes change to promastigotes with flagella and multiply by binary fission. It takes about 5–7 days, depending to the temperature of the environment, for promastigotes to almost fill the midgut and change to their infective form (metacyclic), which migrate to the anterior part of the gut and proboscis. At this stage, the sandfly is infective and when it bites for feeding it first injects some saliva (to prevent the blood from clotting) along with promastigotes in its mouthparts into the dermis of the new host.

Promastigotes injected by this bite change to amastigotes, which are ingested by the macrophages of the dermis, the cells in which they live and multiply.

In cutaneous leishmaniasis, it takes several weeks or months until the lesion at the site of injection becomes apparent.

<H3>Factors affecting transmission

<H4>Population movements

<text>Epidemics of cutaneous leishmaniasis are often associated with migration and the introduction of non-immune people into areas with existing transmission. Prediction of such outbreaks depends on t he availability of ecological information and on e valuation of development areas before implementation of projects or population movements.

<H4>Socioeconomic factors

<text>Poverty increases the risk for leishmaniasis in many ways. Poor housing and sanitary conditions (e.g. lack of waste management, open sewerage) may increase sandfly numbers, as well as their access to humans. Crowding of a large number of people into a small space may attract sandflies.

Economically driven migration may result in non-immune individuals entering areas with transmission.

<H4>Environmental risk factors

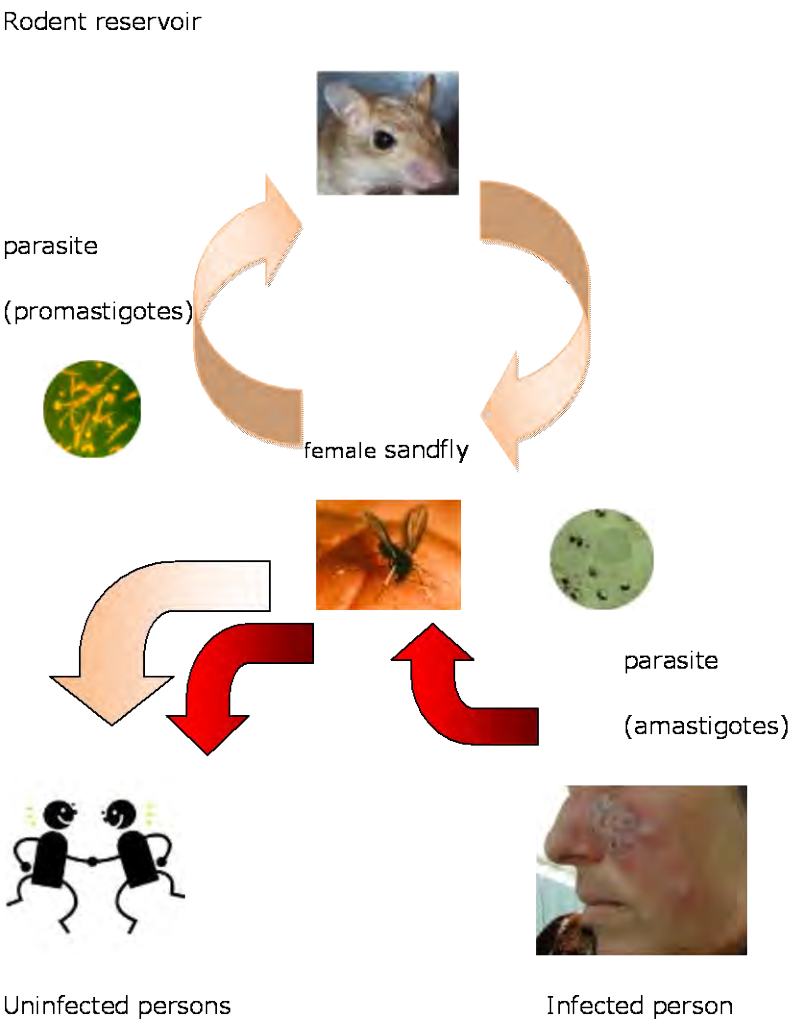
<text>High numbers of patients with cutaneous leishmaniasis have been reported when suburbs extend into formerly uninhabited lands with a high density of rodents. In some foci of anthroponotic leishmaniasis, rural-to-urban migration accompanied by poor-quality suburban housing can increase the frequency of the disease.

In some epidemiological situations, deforestation and destruction of natural habitats can reduce transmission of cutaneous leishmaniasis. However, in some cases, deforestation appears to have increased rather than decreased human infection.

Cutaneous leishmaniasis is a climate-sensitive disease, occupying a characteristic “climate space” that is strongly affected by changes in rainfall, atmospheric temperature and humidity.

<H3>Summary of transmission cycle

<text>Parasites causing cutaneous leishmaniasis are transmitted by sandflies (small insects) from animal to animal, from human being to human being or from animal to human being (Figure 2).



<FC>Figure 2. Cutaneous leishmaniasis transmission cycle for zoonotic cutaneous leishmaniasis (*L. major*), where rodents are the reservoir host, and for anthroponotic cutaneous leishmaniasis (*L. tropica*), where human beings are the reservoir. The sandfly transmits the parasite from the rodent to the human being and from person to person.

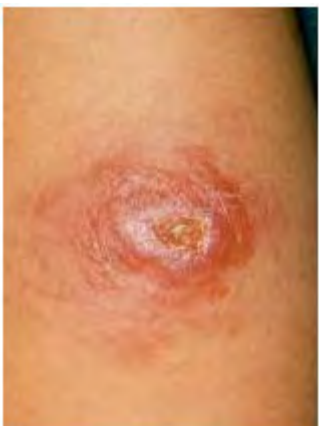
<H1>Clinical examination to identify skin lesions suggestive of cutaneous leishmaniasis

<H2>Typical lesions: initial history and constant signs

<text>A clinical history suggestive of cutaneous leishmaniasis is characterized by the appearance of one or more lesions, typically on uncovered parts of the body. The face, neck, arms and legs are the commonest sites.

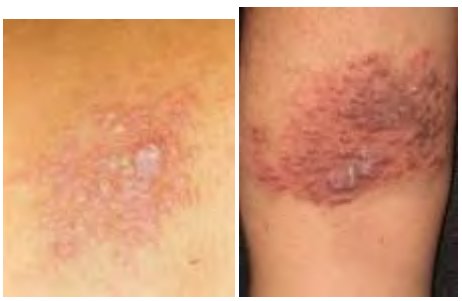
<H3>Localized cutaneous leishmaniasis: typical, common forms

<text>A typical lesion starts as a raised papule at the site of inoculation. It grows over several weeks to reach a final size of a nodule or a plaque. A crust develops centrally, covering an ulcer with a raised edge and variable surrounding induration (Figure 3).



<FC>Figure 3. Typical lesion of cutaneous leishmaniasis.

<text>If left without therapy, lesions usually heal gradually over months or years, usually leaving a depressed scar. A localized superficial dissemination of satellite papules at the edge of the lesion is common with some species (*L. major*) (Figure 4).



<FC>Figure 4. Nodule (a) and plaque (b) with satellite papules.

<H2>Variable features and unusual forms

<text>Skin lesions of other origin may display features similar to that of cutaneous leishmaniasis, and unusual forms of cutaneous leishmaniasis exist (see Figure 4). Also, several features of cutaneous leishmaniasis are highly variable, for example the number of lesions and their location, elementary aspect (i.e. ulcer, nodule or plaque) and size.

In some cases, often but not exclusively in patients with immunosuppression, cutaneous leishmaniasis is characterized by the presence of more than 10 lesions. These multilesional forms are often difficult to treat and require specialized advice.

<text>The infecting species of the parasite can influence the lesion aspect:

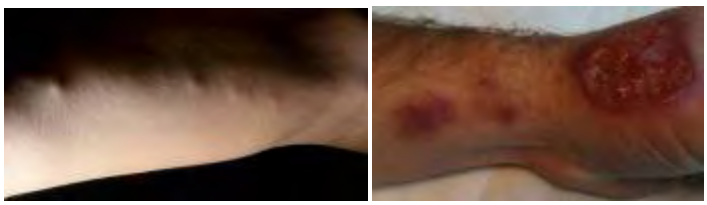
<B1>

- Cutaneous leishmaniasis caused by *L. tropica* (previously known as anthroponotic or urban anthroponotic cutaneous leishmaniasis) frequently appears as dry ulcers of the skin, which usually heal spontaneously within about 1 year or longer, often leading to disfiguring scars. The incubation period is usually 2–8 months.
- Cutaneous leishmaniasis caused by *L. major* (previously known as zoonotic or rural zoonotic cutaneous leishmaniasis) frequently appears as severely inflamed and ulcerated skin, which usually heals spontaneously within 2–8 months. There may be multiple lesions, especially in non-immune patients, which can lead to disfiguring scars. The incubation period is often less than 4 months.
- Cutaneous leishmaniasis caused by *L. infantum* typically causes a single nodular lesion of the face (i.e. there is no crust or ulcer and except for the induration and colour, the skin on the lesion looks almost normal). Although *L. infantum* also causes visceral leishmaniasis, cutaneous lesions most often develop without any visceral involvement.

<H2>Rare forms

<H3>Cutaneous leishmaniasis with nodular lymphangitis

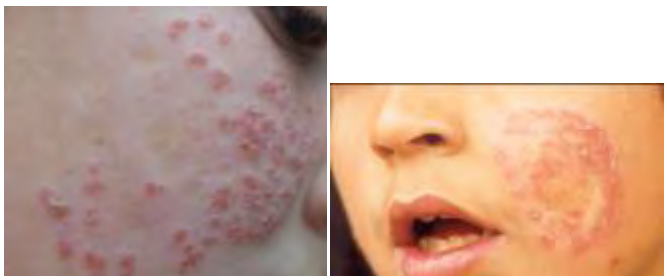
<text>Cutaneous leishmaniasis with nodular lymphangitis is a rare form of the disease. The subcutaneous nodules are usually inconspicuous, painless and proximal to the primary skin lesions. When multiple, they often show a linear configuration (Figure 5).



<FC>Figure 5. Cutaneous leishmaniasis with nodular lymphangitis.

<H3>Leishmaniasis recidivans

<text>Leishmaniasis recidivans, also known as lupoid or tuberculoid leishmaniasis, is almost exclusively associated with *L. tropica* infection. Characteristic papular lesions can appear months to years after clinical cure, in or around the scar of the healed lesion. Leishmaniasis recidivans may last for many years (Figure 6).



<FC>Figure 6. Leishmaniasis recidivans.

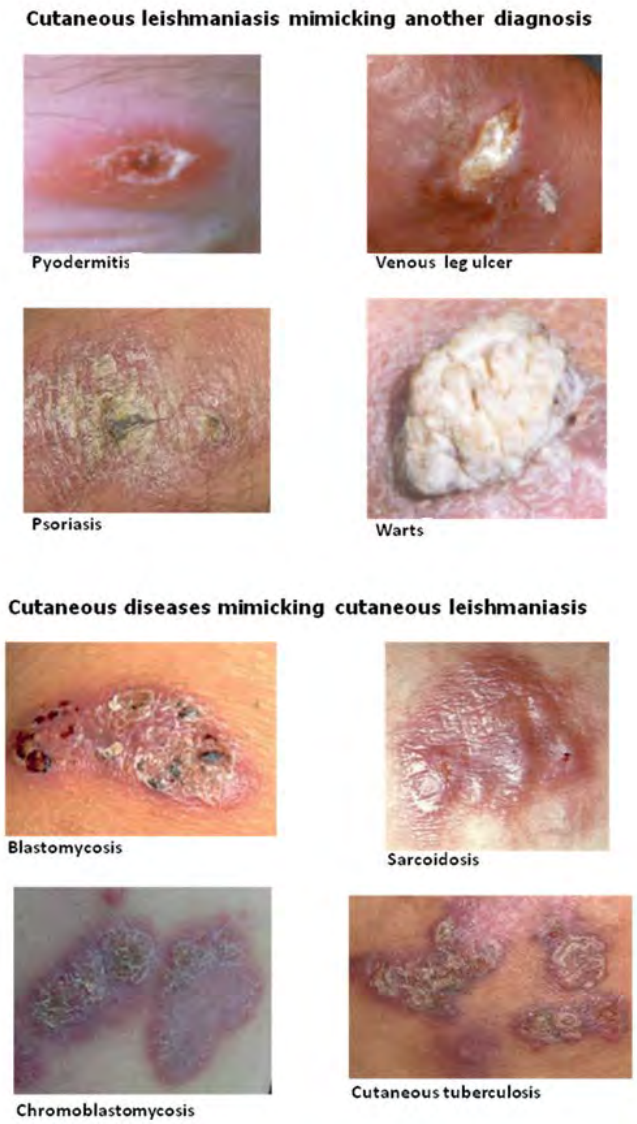
<H1>Parasitological diagnosis

<text>The clinical aspect of lesions can be highly suggestive but is not completely specific of the diagnosis of cutaneous leishmaniasis. Differential diagnosis must include infectious and non-infectious conditions (Figure 7). Therefore *it is mandatory to obtain a parasitological confirmation of the diagnosis before engaging into a systemic, potentially highly toxic antileishmanial treatment.* The same procedure is recommended before engaging into a local treatment.

<H2>Skin sampling

<text>The quality of the sampling procedure is essential. Local anaesthesia will reduce pain during the procedure, making sampling easier and of higher quality. Xylocaine with adrenaline can be used, except in the extremities (where adrenaline injection may cause necrosis). Adrenaline will help obtain a bloodless scraping. With fewer red blood cells on the slide, searching for parasites under the microscope will be faster and easier.

Alternatively, the lesion can be strongly pinched during scraping (see Annex 2, Figure A1). The procedure includes careful ablation of part of the crust and firm scraping on both the margin and bottom of the ulceration using a curved-blade scalpel (see Figure A2). Dermal scraping must provide enough material to cover half of a slide (see Figure A3). Depositing the smear in lengthwise streaks will ease microscopy. Preparing and reading three slides (rather than only one) will increase sensitivity.



<FC>Figure 7. Differential diagnosis of cutaneous leishmaniasis.

Culturing, polymerase chain reaction or both should be done whenever possible to increase sensitivity and allow for species identification. Fine-needle aspiration is minimally invasive and allows for closed-system sampling and transportation. A 2–4 mm punch blade can also be used to perform a biopsy that will generate a larger tissue sample, which is advantageous in lesions with few parasites (chronic lesions, previous search negative). This technique also allows for culturing for other microorganisms (e.g. mycobacteria, fungi, rare bacteria) and anatomopathological analyses for non-infectious differential diagnoses.

In practice, one to three smears and one to three needle aspirates are generally sufficient to confirm cutaneous leishmaniasis. If this first series of tests is negative or if clinical aspects and risk exposure are poorly suggestive of leishmaniasis, a biopsy should be performed.

<H2>Visualizing parasites or parasite components

<text>Slides will be fixed then stained with Giemsa stain. Amastigotes are oval, 1.5 µm wide and 3–5 µm long. Formal identification requires the visualization of a nucleus, a kinetoplast and a plasma membrane on two separate forms. In culture, promastigotes are elongated, unicellular 10–20 µm long, 2–3 µm wide and motile. The length of the flagellum is 10–20 µm (Annex 3.2).

<H2>Determination of *Leishmania* species

<text>Isoenzyme electrophoresis is currently the reference identification technique and correlations have been established between clinical forms and zymodemes for some species. Nucleic acid techniques, offering improved performance and ease of use, will probably predominate in the future.

<H2>Summary

<text>The procedure used to find parasites in lesions is important to reduce discomfort and enhance the probability of confirming the diagnosis.

Simple methods of staining used to identify parasites under the microscope requires expertise.

More complex methods at specialized centres allow precise identification of the parasites involved.

<H1>Treatment

<text>Many different therapeutic interventions, including local, systemic and physical treatments (e.g. cryotherapy, thermotherapy), have been used and tested in cutaneous leishmaniasis. The infecting species, geographical region and the immune status of the patient affect the efficacy of treatments. In cutaneous leishmaniasis due to *L. tropica* (anthroponotic cutaneous leishmaniasis), prompt treatment is important to improve the patient's health and also to reduce transmission of the parasite. Because of a predominant human-to-human transmission of *L. tropica*, there appears to be a higher risk for selection and spread of drug-resistant parasites of this species.

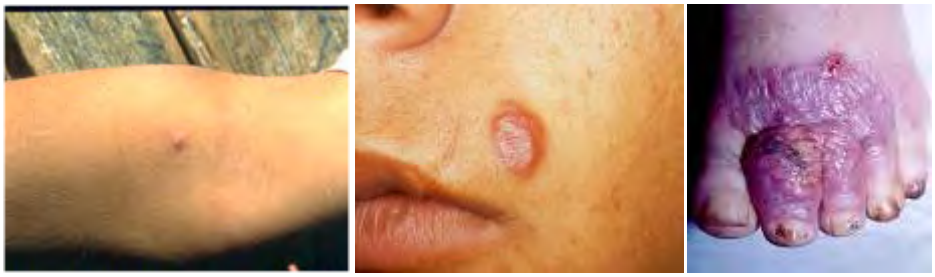
Cutaneous leishmaniasis is not a life-threatening condition and severe complications are infrequent. However, as superficial secondary infections may complicate ulcerated cutaneous leishmaniasis, it is important to clean lesions. Cutaneous leishmaniasis due to *L. major* is associated with a self-cure rate above 50%–75% at 4–6 months. The recommended drug or treatment approach in cutaneous leishmaniasis should not induce life-threatening complications; however, in severe cases, the risk–benefit ratio is different.

The treatment decision is based first on the risk–benefit ratio of the intervention for each patient (for the recommended step-wise approach to choosing the most appropriate treatment option, see Figure 9). Precise and illustrated treatment procedures appear in Annex 5.

To determine which treatment is most appropriate, it is important to collect the clinical information on the following five aspects:

<B1>

- size of lesion: papule (<1 cm), nodule (<4 cm) or plaque (≥4 cm) (Figure 8);
- number of lesions;
- location of lesions on the body;
- evolution of the lesions: duration, aggravation (active lesion), improvement (self-curing);
- immunological and general health status of the patient: immunocompromised or not, diabetes, heart, liver or kidney trouble.



(a) (b) (c)

<FC>Figure 8. (a) Papule, (b) nodule and (c) plaque.

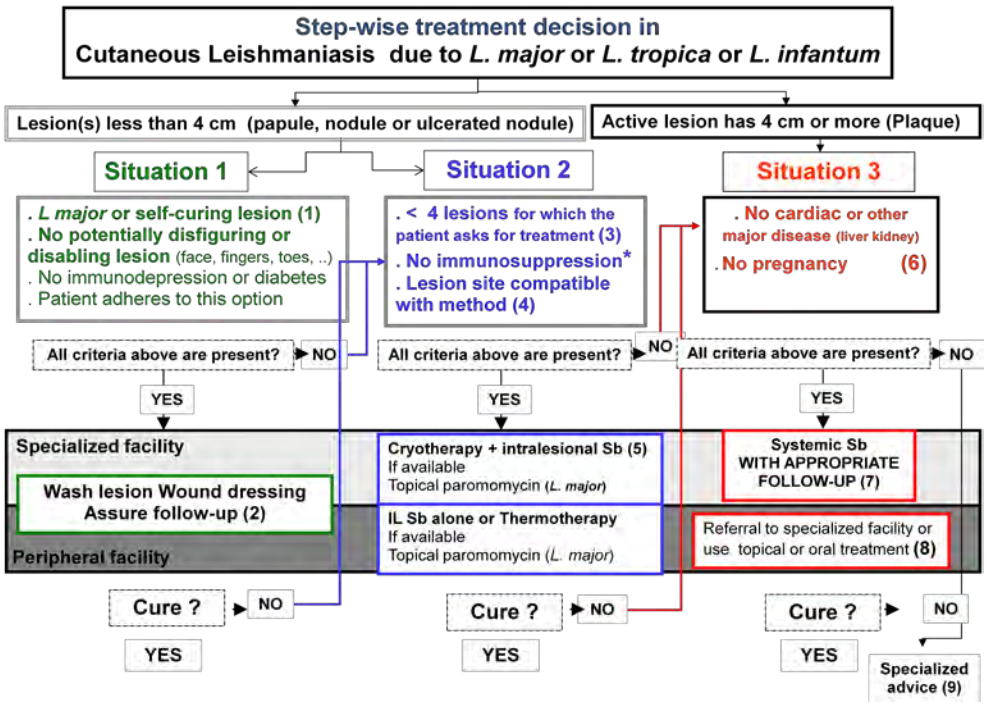
<text>In all patients, lesions should be washed with clean water and soap, then the lesion should be covered by a dressing (gauze and tape) and changed three or four times per week. This facilitates healing and prevents the creation of a sticky crust.

Bacterial superinfection is a r are complication in cutaneous leishmaniasis. However, if lesions show obvious signs of clinically significant bacterial superinfection, i.e. a red, swollen and tender zone extends beyond the cold infiltrated borders of the leishmaniasis lesion itself (a complication rarely associated with fever), it is then justified to initiate oral antibiotics effective against common streptococci and staphylococci such as cloxacillin, pristinamycin, or amoxicillin plus clavulanic acid.

If the bacterial superinfection appears in cases treated with intralesional antimonials, the injection must be postponed and systemic antibiotics should be prescribed. When superinfection is managed, intralesional antimonials can be resumed.

If the bacterial superinfection appears in cases treated with systemic antimonials, then treatment should be continued and systemic antibiotic must be added.

The treatment of cutaneous leishmaniasis is organized as a step-by-step process as shown in the algorithm (Figure 9).



<FC>Figure 9. Step-wise algorithm for the treatment of cutaneous leishmaniasis.

<FN>IL, intralesional; Sb, pentavalent antimony. *See Situation 1 in text.

[1] Self-curing lesions show flattening or reduction in the surface of the ulceration and/or induration.

[2] Washing lesion, wound dressing and follow-up will be performed in all situations.

[3] Lymphatic dissemination per se does not influence treatment decision. However, when it increases the number of lesions requiring therapy it may justify the use of systemic therapy.

[4] Most lesions of limbs, trunk, cheek, upper-cheek, chin and front can be injected, including those close to large joints. Injection in ears, fingers, toes are usually very painful. Injections in lesions of the eyelids, nose and lips can sometimes be performed by very experienced health care providers. In children, premedication facilitates the procedure.

[5] See Annex 3 and Annex 5 for information about the different formulations and the practical aspect of treatment administration.

[6] In patients aged over 50 years, the risk of severe adverse events related to systemic Sb therapy is probably higher than in younger patients, justifying specialized advice and very close follow-up.

[7] See Annex 5 for information about the different formulations and the practical aspect of treatment administration and follow-up.

[8] Fluconazole has been proposed to treat *L. major* cutaneous leishmaniasis but its efficacy is variable. Itraconazole has been tested in cutaneous leishmaniasis due to *L. tropica*. Where available, topical paromomycin can be used simultaneously on a large number of lesions. Oral miltefosine and liposomal amphotericin B have been used in tertiary care centres.

[9] In complex situations, decision must be discussed on a patient per patient basis.

<H2>Situation 1

<text>The patient:

<L1>

1. has lesions that are limited in size (papules, nodules or ulcerated nodules all <4 cm); *and*
2. has less than four lesions; *and*
3. has lesions that are not potentially disfiguring or disabling (i.e. not on face, fingers or toes); *and*
4. is infected with *L. major* (or the lesion is already self-curing); *and*
5. is not immunocompromised[2] and does not suffer unbalanced diabetes.

<text>In this situation, the recommendation is to wash lesions and put a dressing on the lesion without specific antileishmanial therapy. It is important to make sure that the patient adheres to this option; otherwise he or she will probably look for other kinds of interventions and will lose confidence.

It is also important to provide a clear explanation about the benefits and lack of risk of this approach:

<B1>

- cutaneous leishmaniasis induces no risk of general disease and there is no risk of transmission to family members;
- there is a reasonably high probability of cure in the next few months;
- this will avoid the discomfort created by the specific antileishmanial treatment.

<text>A schedule for follow-up is established and communicated to the patient at 14, 30 and 45 days, with a final visit at 180 days. It is important to clearly mention the possibility for the patient to come back to receive specific antileishmanial therapy if the evolution is not satisfactory.

[2] Immunocompromised patients include: HIV patients; patients receiving immunosuppressive drugs (corticosteroids; transplant-related immunosuppressive drugs such as cyclosporine, tacrolimus, sirolimus, mycophenolate mofetil and mitoxantrone; cancer chemotherapeutic agents such as alkylating agents, antimetabolites, etc.; tumour necrosis factor blockers such as etanercept, rituximab, adalimumab and infliximab; patients with chronic lymphocytic leukaemia; transplant patients; patients with hereditary immunodeficiency disorders.

<H2>Situation 2

<text>The patient:

had all features defined in Situation 1 but did not cure despite previous care as provided in Situation 1;

or:

<L1>

1. has lesions <4 cm; *and*
2. has less than four lesions for which he or she asks for treatment; *and*
3. has lesion(s) located in sites compatible with local treatment (see Figure 9); *and*
4. has one or more active lesion due to *L. tropica* or *L. infantum*; *and*
5. is not immunocompromised and does not suffer unbalanced diabetes.

<text>In this situation, one of the following therapeutic options can be used:

<B1>

- topical paromomycin ointment twice daily for 20 days (if *L. major*);
- cryotherapy (liquid nitrogen -195°C) plus intralesional pentavalent antimonials (Annex 3);
- thermotherapy (Annex 4);
- intralesional antimonials alone: 1–5 ml, twice weekly for 3–4 weeks until complete cure.

<text>The same follow-up schedule as in Situation 1 is proposed.

<H2>Situation 3

<text>The patient:

had all features defining Situation 1 or 2 but did not cure despite previous care as provided in Situations 1 and 2;

or:

<L1>

1. has a lesion ≥4 cm (plaque); *or*
2. has four or more lesions requiring immediate therapy; *or*
3. has lesion(s) located in sites *not* compatible with local treatment; *or*
4. is immunocompromised or suffers unbalanced diabetes.

<text>In this situation the treatment option is:

<B1>

- Systemic pentavalent antimonials with appropriate elimination of contraindications (see Figure 9) and appropriate follow-up (Annex 5).
- In complex situations (different from Situations 1–3 defined above), the decision must be discussed on a patient per patient basis. The following treatments can be discussed:

<B2>

  - Fluconazole, orally 200–600 mg/day for 4–6 weeks, has been proposed to treat *L. major* cutaneous leishmaniasis but the efficacy is variable.
  - Itraconazole has been tested in cutaneous leishmaniasis due to *L. tropica* in adults.
  - Topical paromomycin 1–2 applications per day for 20–28 days, where available, can be used simultaneously on a large number of lesions.
  - Oral miltefosine (2–2.5 mg/kg orally for 28 days) and liposomal amphotericin B (20 mg/kg cumulative dosage in 4–7 slow infusions) have been used at tertiary care centres. Miltefosine should not be used in women of childbearing age unless a validated contraceptive method is used during treatment and for at least 6 months post-treatment.

<text>It is also important to bear in mind that allergic reactions can appear when using any of the different medicines or materials during the treatment of cutaneous leishmaniasis.

<H2>Potential allergies and how to address them

<H3>Antimonials

<text>Treatment depends on the severity of the allergic status and the inflammatory response occurring.

<H4>Mild to moderate symptoms

<text>If the symptoms are mild to moderate (erythema, oedema, blisters that may be haemorrhagic, marked pruritus, etc.), anti-allergic drugs should be added systemically. Antimonials should be stopped temporary until the allergic symptoms disappear, after which they can be resumed with caution (the patient should be under direct medical supervision) and the anti-allergic medicines should be administered as long as the treatment lasts.

<H4>Severe symptoms

<text>If the symptoms are severe (hives, general eruption covering the body, shock, etc.) the treatment with antimonials should be stopped completely and alternative medications should be administered with caution after cure from the allergy.

<H3>Lidocaine (only in intramuscular administration)

<text>Although lidocaine is widely used and the incidence of allergy to this agent is very low, there may be a history of allergy to lidocaine or mepivacaine and this should be taken in consideration.

If there is no history of allergy to lidocaine, but local allergy signs appear at the injection site during the intramuscular treatment, it should be completely excluded from the treatment regime.

<H3>Antibiotics

<text>Allergic reactions can occur to antibiotic ointments used in routine wound care to keep wounds moist. The patient most often has a contact allergy to neomycin or bacitracin. Although bright red, poorly marginated erythema appears around the operative site with the antibiotic allergy, the diagnosis is usually obvious because the patient will report marked pruritus.

<H3>Antiseptics

<text>As iodine can cause contact dermatitis, it should be used with caution.

<H3>Bandages

<text>Allergic reactions to bandage materials such as Telfa® and Micropore® paper tape are extremely rare.

<H1>Monitoring and evaluation

<text>Monitoring and evaluation is a crucial step, not only in assessing the quality of service delivery to individual patients but also from a public health perspective. Data collection, data analysis and reporting are elements that contribute to measuring the performance of the health intervention at different levels of the health system.

The following forms and indicators are considered essential for case management of cutaneous leishmaniasis, follow-up and assessment:

<B1>

- a form for the clinical history (Annex 6);
- monthly report forms (Annex 7);
- indicators: there are 10 indicators considered essential in evaluating the case management of cutaneous leishmaniasis (Box 1).

<BT>Box 1. Indicators used in evaluating case management of cutaneous leishmaniasis.

<BH1>1. Size of lesion

<btext>Number of patients with lesion size ≥4 cm:

Total number of patients:

<BH1>2. Number of lesions

<btext>Number of patients with four or more lesions:

Total number of patients:

<BH1>3. Location of lesions

<btext>Number of patients with lesions on face or ears:

Total number of patients:

<BH1>4. Number of months between onset of symptoms and diagnosis (median instead of mean)

<btext>Number of patients dates between onset and diagnosis:

Total number of patients:

<BH1>5. Severity of disease

<btext>Number of patients undergoing systemic treatment:

Total number of patients diagnosed:

<BH1>6. Cure rate

<btext>Number of patients declared cured (Annex 1):

Total number of patients treated:

<BH1>7. Compliance rate (for each type of treatment)

<btext>Number of patients treated according to protocol (see Figure 9):

Number of patients eligible for treatment:

<BH1>8. Treatment failure rate (for each type of treatment)

<btext>Number of patients with treatment failure (Annex 1):

Number of patients treated:

<BH1>9. Relapse rate (for each type of cutaneous leishmaniasis)

<btext>Number of patients with relapse:

Number of patients treated:

<BH1>10. Parasitological confirmation

<btext>Number of patients with parasitological confirmation:

Total number of patients:

<H1>Annex 1. WHO case definitions

<H2>Cutaneous leishmaniasis

<H3>Clinical description

<text>Appearance of one or more lesions, typically on uncovered parts of the body. The face, neck, arms and legs are the commonest sites. At the site of inoculation, a papule appears and the papule may enlarge to become an indolent ulcerated nodule or plaque. The sore remains in this stage for a variable time before healing and typically leaves a depressed scar. Other atypical forms may occur. In some individuals, certain strains can disseminate and cause mucosal lesions. These sequelae involve nasopharyngeal tissues and can be disfiguring.

<H3>Laboratory criteria for diagnosis

<B1>

- Positive parasitology (stained smear or culture from the lesion).
- Mucocutaneous leishmaniasis only: positive serology (indirect immunofluorescent antibody test, enzyme-linked immunosorbent assay).
- Polymerase chain reaction (more sensitive than microscopic examination).

<H3>Case classification by WHO operational definition

<B1>

- *Probable case*: a probable case of cutaneous leishmaniasis is a person showing clinical signs (skin or mucosal lesions) without parasitological confirmation of the diagnosis (positive smear or culture) and/or, for mucocutaneous leishmaniasis only, serological diagnosis.
- *Confirmed case*: a confirmed case of cutaneous leishmaniasis is a person showing clinical signs (skin or mucosal lesions) with parasitological confirmation of the diagnosis (positive smear or culture).
- *Cured case*: complete re-epithelialization before Day 45.
- *Relapse case*: reappearance of a nodule, plaque or ulceration after cure. Parasitological confirmation only in complex cases.
- *Treatment failure*: increase of a nodule, plaque or ulceration within 14 da ys of treatment, or lack of complete re-epithelialization within 45 days of treatment starting.

<H1>Annex 2. Standard operating procedure for parasitological diagnosis

<H2>Skin sampling

<L1>

1. Clean the whole lesion and border using 70% alcohol at least 3 minutes before injecting the anaesthetic.
2. Inject 0.1–0.5 ml of lidocaine with adrenaline, using a short 23-gauge needle thereby creating a blanching area. It is not necessary to anaesthetize the whole lesion. For lesions on fingers or toes use lidocaine without adrenaline (necrosis risk).
3. Pinch strongly the lesion to further prevent bleeding (Figure A1).
4. Remove the crust, remove blood with a gauze, scratch firmly (using a sterile scalpel with a short-angle curved blade) the border and the centre of the lesion until tissue material is visible on the blade (Figure A2).
5. Gently move the blade on the surface of a slide to deposit a thin layer of the scraped material. Repeat the procedure on different parts of the anaesthetized zone until at least half of the surface of each of three slides is covered with material (Figure A3).
6. Dry the three slides at room temperature (>3 minutes).
7. Fix the slides and stain them with Giemsa according to validated procedures (see below).

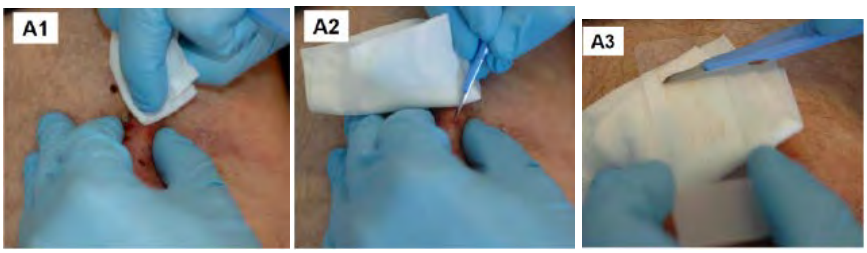


Figure A1, A2 and A3

<H2>Giemsa staining

<H3>Materials

<B1>

- Reagents:

<B2>

  - Giemsa stain
  - Giemsa buffer.

<B1>

- Supplies:

<B2>

  - glass slides, alcohol washed
  - glass marker.

<B1>

- Equipment:

<B2>

- microscope, binocular with mechanical stage; low (10x), high dry (40x) and oil immersion (100x) lens.

<H3>Procedure

<L1>

1. Fix air-dried slides in methanol by dipping the slides briefly (two dips) in a jar containing methanol.
2. Remove and let air dry.
3. Stain with diluted Giemsa stain (1:20 vol/vol) for 20 minutes. For a 1:20 dilution, add 2 ml of stock Giemsa to 40 ml of buffered water in a jar.
4. Wash by briefly dipping the slides in a jar of buffered water (one or two dips).
5. Let air dry.
6. Examine the slides under the microscope (100x oil immersion lens).
7. Read smears for at least 20 minutes (1000 fields) at 400x or 1000x magnification.
8. A smear can be reported positive when at least two amastigotes are observed (Figure A4). For valid identification, an amastigote form must show a nucleus, a kinetoplast and a plasma membrane.

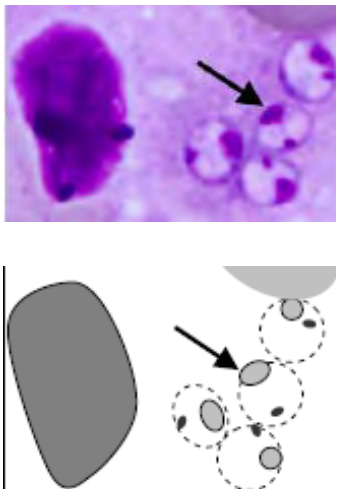


Figure A4

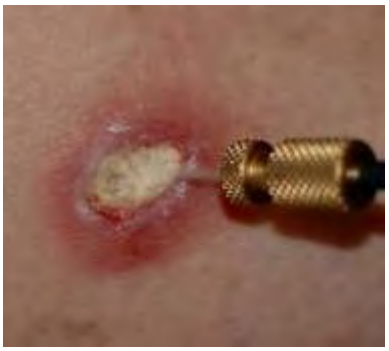
<H1>Annex 3. Standard operating procedure for cryotherapy and intralesional injection of antimony

<text>Swab the lesion with antiseptics several minutes before starting the procedure. Repeat the procedure once a week, until complete healing of lesions. Generally, three to five sessions are sufficient to cure most lesions.

<H2>Cryotherapy

<text>Apply the liquid nitrogen (-195°C) on the lesion (Figure A5) and up to 2 mm outside the lesion margin (Figure A6), ideally with a sprayer, alternatively with a cotton-tipped applicator, until a 10-second blanching is obtained.

When cryotherapy is applied before an intralesional injection of antimony, one 10-second blanching is enough. When cryotherapy is applied alone, the procedure is repeated two or three times at short intervals, resulting in a total time of 30 seconds.



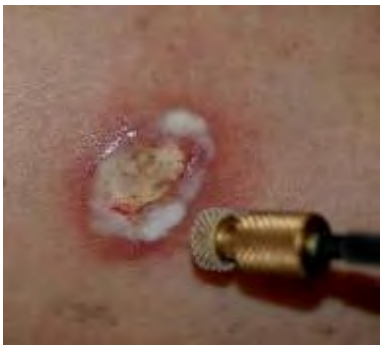


Figure A5 A 6

<H2>Intralesional injection

<L1>

1. Withdraw aseptically the product directly from the ampule of antimony as formulated for parenteral administration by the manufacturer (Figure A7).
2. Inject the antimony (immediately after liquid nitrogen application) into the lesion (Figure A8) and induce blanching of the borders (Figure A9, arrows), until the lesion is entirely swollen.
3. Aspect before procedure (Figure A10), aspect at the end of the procedure (Figure A11).

Figure A7

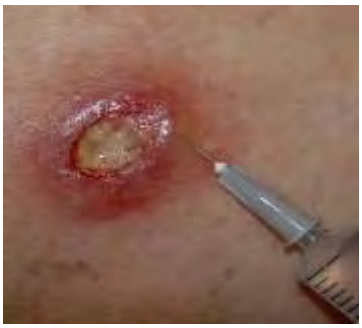


Figure A8

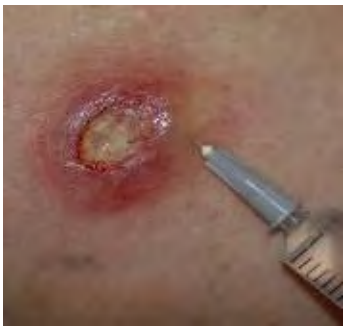


Figure A9

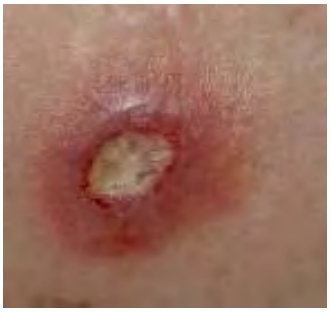


Figure A10

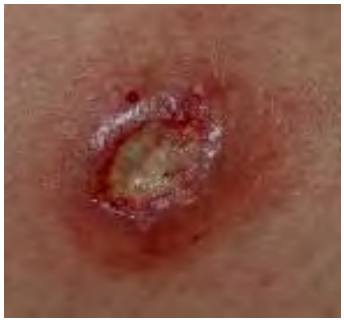


Figure A11

<H1>Annex 4: Standard operating procedure for thermotherapy

<text>Thermotherapy is an available technique for the treatment of cutaneous leishmaniasis patients by application of local heat at the site of lesion with a portable, battery-operated, localized current field radiofrequency generator (ThermoMed 1.8; Thermo-surgery Technologies).

<H2>Indication

<B1>

- Papule, nodule or ulcer <4 cm.
- Number of lesions <4 cm.
- Location of the lesion should not be close to the eyes, nose or lips.

<H2>Method

<text>A single thermotherapy treatment (one or more applications of localized heat of 50°C for 30 seconds, depending on lesion size). The area between the electrodes covers 49–73 mm^2. Therefore, several thermotherapy applications may be required to cover a lesion.

<H2>Procedure

<B1>

- Disinfect the lesion and 2 cm border of healthy skin around the lesion with antiseptic (e.g. 0.1% chlorine dioxide solution).
- Anaesthetize the lesion with 1% lidocaine HCl.
- Moisturize the lesion with sterile saline solution.
- Apply the heat locally for 30 seconds.
- Apply chlorine dioxide gel to the lesions and then cover them after treatment.

<H2>Patient follow-up

<text>To evaluate the outcome of thermotherapy, follow-up after completion of treatment should be scheduled at 14, 30, 45 and 180 days. It will be important to explain to patients that in case the lesion does not improve they should return to the health facility at any time.

<H1>Annex 5. Systemic treatment of cutaneous leishmaniasis with pentavalent antimonials

<H2>Dosage and precautions for the use of sodium stibogluconate

<text>Dosage: 20 mg Sb^{5+}/kg/day × 21 days.

<H3>Presentation

<text>Solution for injection, vials 30 ml.

Contains 33% (= 9.9 g/30 ml) sodium stibogluconate corresponding to 10% Sb^{5+},which is 100 mg Sb^{5+}/1 ml or 3000 mg Sb^{5+}/30 ml.

There is no upper limit for sodium stibogluconate. If the patient's weight is >75 kg, then calculate accordingly. Table A1 shows the volume of sodium stibogluconate injection that will give 20 mg Sb5+/kg/day.

<TT>Table A1. Volume of sodium stibogluconate injection per body weight to give 20 mg Sb^{5+}/kg/day

<TTX1>Weight (kg)	**Sodium stibogluconate dose (ml)**	**Weight (kg)**	**Sodium stibogluconate dose (ml)**	**Weight (kg)**	**Sodium stibogluconate dose (ml)**
<TTX>1	2	26	5.2	51	10.2
2	2	27	5.4	52	10.4
3	2	28	5.6	53	10.6
4	2	29	5.8	54	10.8
5	2	30	6	55	11
6	2	31	6.2	56	11.2
7	2	32	6.4	57	11.4
8	2	33	6.6	58	11.6
9	2	34	6.8	59	11.8
10	2	35	7	60	12
11	2.2	36	7.2	61	12.2
12	2.4	37	7.4	62	12.4
13	2.6	38	7.6	63	12.6
14	2.8	39	7.8	64	12.8
15	3	40	8	65	13
16	3.2	41	8.2	66	13.2
17	3.4	42	8.4	67	13.4
18	3.6	43	8.6	68	13.6
19	3.8	44	8.8	69	13.8
20	4	45	9	70	14
21	4.2	46	9.2	71	14.2
22	4.4	47	9.4	72	14.4
23	4.6	48	9.6	73	14.6
24	4.8	49	9.8	74	14.8
25	5	50	10	75	15

<H3>Contraindications

<text>Contraindications for systemic antimonials in cutaneous leishmaniasis are:

<B1>

- patient aged >50 years
- any significant heart, liver or kidney disease
- pregnancy.

<text>The risk of severe adverse events with this therapy is probably higher in older than in younger patients, justifying specialized advice and very close follow-up.

<H3>Toxicity and side-effects

<H4>Minor side-effects

<B1>

- *Symptoms*: nausea, anorexia, arthralgias, myalgias, injection site pain (minimized in some but not all patients by slow and deep injection and the use of lidocaine),[3] fatigue and abdominal pain.
- *Laboratory toxicity*: elevated amylase (biochemical pancreatitis), elevated liver enzymes (biochemical hepatitis), leukopenia/anaemia/thrombocytopenia. Occasionally, renal failure occurs.
- Electrocardiograph changes (ST segment and T wave).
- *Nausea and anorexia* are substantial problems where patients are already malnourished and dehydrated. The nausea and anorexia subside somewhat in the later weeks of treatment.

<H4>Serious toxicity

<text>Severe vomiting and abdominal pain (possibly due to pancreatitis) can be treated with antiemetic medications. When antiemetic treatment fails, Sb^{5+} treatment should be interrupted.

In case of pancreatitis confirmed by elevated serum amylase and/or lipase, Sb^{5+} treatment should also be interrupted when amylase is more than five times the upper limit and/or lipase is 12 times the normal upper limit.

<H2>Dosage, administration and precautions for meglumine antimoniate

<H3>Dosage

<text>Meglumine antimoniate and sodium stibogluconate are pentavalent antimony (Sb^{5+}) compounds used to treat leishmaniasis.

<FN>[3] The dose of lidocaine for systemic treatment with antimonials usually ranges from 0.5 ml in children to 1 ml in adult. It should be added to the syringe after it is full with antimonial so it is injected to the tissue before the drug, which minimizes the pain.

Meglumine antimoniate is commercialized by Sanofi-Aventis as a solution for injection in 5 ml ampoules (Glucantime®) containing 405 mg of pentavalent antimony (Sb^{5+}), i.e. 81 mg of Sb^{5+}/1 ml. The dose of meglumine antimoniate is based on the amount of pentavalent antimony.

Dosage: 20 mg Sb^{5+}/kg/day × 20 days.

Table A2 shows the volume of meglumine antimoniate solution injection that will give 20 mg Sb^{5+}/kg/day.

<TT>Table A2. Volume of meglumine antimoniate injection per body weight to give 20 mg Sb^{5+}/kg/day

<TTX1>Weight (kg)	**Meglumine antimoniate dose (ml)**	**Weight (kg)**	**Meglumine antimoniate dose (ml)**	**Weight (kg)**	**Meglumine antimoniate dose (ml)**
<TTX>4	1	30	7.4	56	13.8
5	1.2	31	7.6	57	14.0
6	1.5	32	8.0	58	14.4
7	1.8	33	8.2	59	14.6
8	2	34	8.4	60	14.8
9	2.2	35	8.6	61	15.0
10	2.6	36	9.0	62	15.4
11	2.8	37	9.2	63	15.6
12	3.0	38	9.4	64	15.8
13	3.2	39	9.6	65	16.0
14	3.4	40	9.8	66	16.2
15	3.8	41	10.2	67	16.6
16	4.0	42	10.4	68	16.8
17	4.2	43	10.6	69	17.0
18	4.4	44	10.8	70	17.2
19	4.8	45	11.2	71	17.6
20	5.0	46	11.4	72	17.8
21	5.2	47	11.6	73	18.0
22	5.4	48	11.8	74	18.2
23	5.8	49	12.2	75	18.6
24	6.0	50	12.4	76	18.8
25	6.2	51	12.6	77	19.0
26	6.4	52	12.8	78	19.4
27	6.6	53	13.0	79	19.6
28	7.0	54	13.4	80	19.8
29	7.2	55	13.6	>80	20.0

<H3>Route of administration

<text>The route of administration is intravenous or intramuscular.

Sb^{5+} pharmacokinetics are almost identical by intravenous and intramuscular routes. The choice of intravenous or intramuscular route depends on the setting:

<B1>

- Intramuscular is most logical in remote, poorly equipped settings. The drug may be given by deep intramuscular injection. If the volume of injection exceeds 10 ml, it should be divided into two doses: one in each buttock or thigh.
- Intravenous is much less painful. In adults, the drug should be given diluted in 50–200 ml of 5% glucose solution over 30–60 minutes.

<H3>Contraindications

<text>Contraindications for systemic antimonials in cutaneous leishmaniasis are if the patient:

<B1>

- is aged >50 years
- has any significant heart, liver or kidney disease
- is pregnant.

<text>The risk of severe adverse events with this therapy is probably higher in older than in younger patients, justifying specialized advice and very close follow-up.

<H3>Precautions

<text>The risk of serious, even fatal, toxicity of pentavalent antimonials is increased in patients who concomitantly present with:

<B1>

- cardiac disease, in particular arrhythmia
- renal failure or liver disease
- severe malnutrition/severely impaired general condition
- advanced HIV infection
- pregnancy.

<text>With any one of these conditions, the drug should not be used and an alternative therapy should be proposed.

<H2>Patient monitoring (for sodium stibogluconate and meglumine antimoniate)

<B1>

- A *complete blood cell count* should be done before treatment and weekly during treatment.
- *Hepatic function tests*: hepatic function determinations, including serum alanine aminotransferase (serum glutamic pyruvic transaminase), serum alkaline aminotransferase, and serum aspartate

aminotransferase (also called serum glutamic oxaloacetic transaminase), may be required before treatment and weekly during therapy. If the value of one of the serum aminotransferases reaches three to four times the upper normal limit, then antimonial therapy should be discontinued.

- *Serum amylase and lipase* should be monitored before and weekly during treatment. If the serum amylase value reaches over four times the upper normal limit, or if serum lipase value reaches over 15 times the upper normal limit, and if these rises in enzyme levels occur rapidly or are associated with abdominal pain, nausea and vomiting, then antimonial therapy should be temporarily interrupted.
- *Renal function tests*: renal function determinations, including blood urea nitrogen and serum creatinine, may be required before treatment and weekly during treatment.
- *Electrocardiogram monitoring* is recommended and should be done twice weekly. In the event that Stokes–Adams[4] attacks develop and sudden cardiac collapse occurs, treatment with antimonials should be stopped and atropine should be started. Atropine should be administered intravenously at a dose of 0.5–1.5 mg, followed by intramuscular administration of 0.5–1.0 mg every 3 hours. If treatment with atropine is unsuccessful, isoprenaline or atrial pacing should be considered.

<FN>[4] Stokes–Adams syndrome is defined as an abrupt, transient loss of consciousness due to a sudden but pronounced decrease in cardiac output, which is caused by a sudden change in heart rate or rhythm. This definition does not include vasovagal syncope or epilepsy, although patients with Stokes–Adams syncope may have seizures during periods of cerebral ischaemia.

<H1>Annex 6: Leishmaniasis medical record (patient's file)

1. PATIENT IDENTIFICATION		
Registration No.:	**Date of diagnosis**: (dd/mm/yyyy)	
Last name: **First name** :	**Age:** [years] [months]	**Gender:** [ ] Male [ ] Female
Present address: ( ) Village	( ) District	( ) Province
2. CLINICAL DIAGNOSIS		
Lesion(s) first noticed by patient: [ ] weeks [ ]months [ ] years	**Date**: (dd/mm/yyyy)	
Total number of lesions: [ ] **Location:** Head/neck [ ] Face/ears [ ] Trunk [ ] Upper limbs [ ] Lower limbs [ ] Fingers [ ] Toes [ ]		
Type of lesions: Papule [ ] Nodule [ ] Ulcer [ ] Plaque [ ] Other, specify: **Satellite lymphadenopathy**: [ ] Yes [ ] No **Secondary infection:** [ ] Yes [ ] No **Evolution of lesion**: [ ] Active [ ] Self-curing	**Size of largest lesion**: [ ] cm	
Past history of the disease: [ ] Yes [ ] No	**Presence of additional cases in the family**: [ ] Yes [ ] No	
Previous treatment received for current lesions: [ ] Yes [ ] No	**If "Yes"** which treatment received: [ ] Antimonials [ ] Thermotherapy [ ] Cryotherapy [ ] Other (specify):	

History of travel in last 6 months: [ ] Yes [ ] No	**If "Yes"** where: ( ) Village ( ) District ( ) Province

3. MEDICAL HISTORY	
Immunocompromised: [ ] Yes [ ] No	**If "Yes"** [ ] HIV [ ] Immunosuppressive therapy, specify: [ ] Other, specify:
Diabetes: [ ] Yes [ ] No	**Liver trouble:** [ ] Yes [ ] No **Heart trouble:**[ ] Yes [ ] No **Kidney trouble:**[ ] Yes [ ]No **Other relevant medical history:** (specify):
Pregnancy: [ ] Yes [ ] No [ ] Not applicable	

4. PARASITOLOGICAL DIAGNOSIS		
Lesion biopsy done: [ ] Yes [ ] No	**If "Yes":** [ ] Positive [ ] Negative	**Culture:** [ ] Yes [ ] No **If "Yes":** [ ] Positive [ ] Negative
Direct microscopy examination (smear) done: [ ] Yes [ ] No		**If "Yes":** [ ] Positive [ ] Negative

5. CASE MANAGEMENT
Date of onset of treatment: (dd/mm/yyyy)
Type of therapy provided: Wash/dressing [ ], Intralesional [ ], Cryotherapy [ ], Intramuscular/systemic [ ], Thermotherapy [ ], Other (specify):

Name of drug used: Sodium stibogluconate [ ], Glucantime [ ], Other (specify):	**Dosage given**:	**No. of doses received**:
Date of last follow-up after completing treatment: (dd/mm/yyyy)		
Treatment completed: [ ] Yes [ ] No	**Outcome:** [ ] Cure [ ] Failure [ ] Relapse [ ] Patient did not come for last follow up after completing treatment	
Adverse events: [ ] Yes [ ] No **If "Yes"** specify:		
6. INFORMATION ABOUT HEALTH FACILITY		
Name of health facility: **Name and title of person who filled the form**: **Signature**:		

<H1>Annex 7. Monthly report forms

<H2>Anthroponotic cutaneous leishmaniasis surveillance (diagnosis and treatment)

<TTX1>COUNTRY: **YEAR:**													
	<TTX1>Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
<TTX>No. of new cases of anthroponotic cutaneous leishmaniasis diagnosed													
No. of severe new cases of anthroponotic cutaneous leishmaniasis diagnosed													
No. of new cases of anthroponotic cutaneous leishmaniasis confirmed parasitologically													
No. of lupoid (recidivans) cases													
No. of new cases of anthroponotic cutaneous leishmaniasis treated													
No. of failure cases treated													
No. of previously defaulters treated													
Total cases treated													
No. of cases treated with systemic antimonials													

<TTX1>YEAR:													
	<TTX1>Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
<TTX>No. of new cases of anthroponotic cutaneous leishmaniasis treated													
Discharged (initial cure)													
Defaulters													
Failure													
No. of patients with serious adverse events of the treatment													

<TTX>No. of failure cases treated													
Discharged (initial cure)													
Defaulters													
Failure													
No. of patients with serious adverse events of the treatment													

<H2>Demographic characteristics, new cases of anthroponotic cutaneous leishmaniasis diagnosed

	<TTX1>Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Total**
<TTX1>Gender													
<TTX>Male													
Female													
<TTX1>Age group													
<TTX><5 years													
5–14 years													
≥15 years													
Total													

<H2>Anthroponotic cutaneous leishmaniasis surveillance (mapping)

<TTX1>COUNTRY: **YEAR:** **Geographical origin of patients (new anthroponotic cutaneous leishmaniasis cases):** **Place of infection (if known):**														
		<TTX1>Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
<TTX1>Province or equivalent	**County or equivalent**													

<H2>Zoonotic cutaneous leishmaniasis surveillance (diagnosis and treatment)

<TTX1>COUNTRY: **YEAR:**													
	<TTX1>Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
<TTX>No. of new cases of zoonotic cutaneous leishmaniasis diagnosed													
No. of severe new cases of zoonotic cutaneous leishmaniasis diagnosed													
No. of new cases of zoonotic cutaneous leishmaniasis confirmed parasitologically													
No. of new cases of zoonotic cutaneous leishmaniasis treated													
No. of failure cases treated													
No. of previously defaulters treated													
Total cases treated													
No. of cases treated with systemic antimonials													

<TTX1>YEAR:													
	<TTX1>Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
<TTX>No. of new cases of zoonotic cutaneous leishmaniasis treated													
Discharged (initial cure)													
Defaulters													
Failure													
No. of patients with serious adverse events of the treatment													

<TTX>No. of failure cases treated													
Discharged (initial cure)													
Defaulters													
Failure													
No. of patients with serious adverse events of the treatment													

<H3>Demographic characteristics, new cases zoonotic cutaneous leishmaniasis diagnosed

	<TTX1>Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
<TTX1>Gender													
<TTX>Male													
Female													
<TTX1>Age group													
<TTX><5 years													
5–14 years													
≥15 years													
Total													

<H2>Zoonotic cutaneous leishmaniasis surveillance (mapping)

<TTX1>COUNTRY: **YEAR:** **Geographical origin of patients (new zoonotic cutaneous leishmaniasis cases):** **Place of infection (if known):**														
		<TTX1>Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
<TTX1>Province or equivalent	**<TTX1>County or equivalent**													