



Government of **Western Australia**
Department of **Health**



THE AUSTRALASIAN COLLEGE
OF DERMATOLOGISTS

Delusional Infestation – A Management Guide for General Practitioners

This booklet provides a summary of the epidemiology, clinical features, diagnosis and management of Delusional Infestation (DI).

Delusional Infestation (DI) is a psychotic syndrome characterized by a strong and fixed belief that a person's skin and/or body (and rarely their close personal environment) is infested by small, occasionally vivid (or less frequently inanimate) pathogens, against all the medical evidence. In some instances, clients cannot pin-point their delusions referring to them as "things" or "creatures" that cause itching sensations on or in their skin.

Delusional Infestation has most commonly been referred to as Delusional parasitosis or Morgellons syndrome amongst other names. However, it is particularly important **not** to refer to this condition as 'Morgellons', as this is likely to further encourage delusional patients.

The two core symptoms that characterise DI patients include:

- the rigid belief that they or their surroundings are infested by 'pathogens' (small, vivid, inanimate [rare], often 'new to science'); or
- abnormal sensations (itching, biting, crawling) in/on the skin, which can be explained by the above.

DI is divided into two main types, Primary DI and Secondary DI, based on the presence or absence of any underlying causes (toxic, psychiatric, brain pathology and general medical conditions).

The clinical course of DI is quite variable and depends on the type. It can be episodic; periodic; or chronic in nature. Primary DI has an insidious onset and a chronic course, usually lasting years.

Primary Delusional Infestation

In Primary DI, the delusions comprise the entire disease symptoms and there is no additional deterioration of basic mental functioning or personal thought processes beside the fixed, false belief that one is infested with parasites. This type is **not** the result of a general medical condition or other psychiatric disorder. These patients experience only cutaneous sensations, such as crawling, biting or stinging.

Primary DI is most prominent among middle aged to elderly women with few social contacts, no psychiatric history and normal cognitive and social function.

- *Primary Delusional Infestation* – most commonly seen in single individuals that believe they are infested with parasites/insects crawling or burrowing in or on their skin.

Other forms of Primary DI include:

- *Shared DI (folie à deux* French for “madness for two”) – Primary DI can be carried over to one or more members of the family, close friends or colleagues, thus all share the belief that an infection is present;
- *Delusional infestation by proxy* – patients believe someone or something other than themselves is infested (usually children, spouse or pets); or
- *Double delusional infestation* – Primary DI patients who believe that they and someone or something else is infested; however, the other party does not share the same belief.

Secondary Delusional Infestation

Secondary DI is the sequela to another medical condition or substance use/abuse (medicinal or recreational). Secondary DI can be induced by:

- Psychiatric illness such as schizophrenia (abnormal social behaviour and failure to recognize what is real); major depression; and intellectual disability;
- Toxic psychoses or recreational drug use such as cocaine; (Meth)amphetamine; pemoline (dopamine-releasing agent); alcohol; tetrahydrocannabinol (marijuana); and so on. This is particularly common among younger males, presenting with sudden and transient symptoms of DI following regular use of such substances;
- Medication induced psychoses (due to antibiotic, steroids, anti-inflammatory drugs, etc);
- Brain pathologies including dementia; stroke; tumour; infection; vascular encephalopathy or traumatic brain injury. Older patients suffering DI more commonly fit into this category; and
- General medical conditions (secondary organic) such as: renal or hepatic failure; cancer; systemic rheumatic illnesses; type 2 diabetics; menopause and so on.

Characteristics of DI patients

- Most common in middle aged people, peaking between the ages of 40 and 60 years of age;
- Average female-to-male ratio is approximately 2:1 (1:1 in those younger than age 50 and 3:1 in those older than 50);
- Educational background does not appear to influence likelihood of disease. Sufferers range from not having completed a high school certificate to possessing a professional degree;
- Develop social isolation, often becoming self-employed and many will abandon families to avoid infesting them; and
- May have experienced a recent emotional trauma such as job loss, divorce/separation.

Symptoms of Delusional Infestation

- Continuous complaints of itching, crawling, biting sensations, especially on or in the skin;
- Patients provide of pieces of skin, lint, tissue paper, and other samples of 'parasites'. This behaviour is very characteristic and has been termed 'the matchbox sign'; 'baggies sign' or 'specimen sign' (Figure 1). Patients will collect multiple samples (both liquid and solids, including external and internal body fluids/solids);

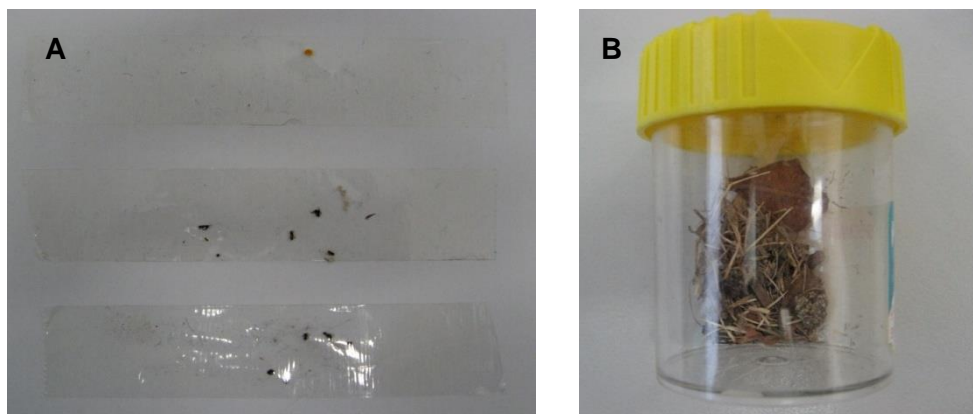


Figure 1: Typical specimens from DI patients sent for examination - A: Skin scrapings from patient's skin containing dust and lint often collected onto sticky tape. B: Urine collection container containing dust and plant matter.

- Patients will often volunteer extensive and elaborate descriptions of the pathogens or pests, including full descriptions of their life cycle and behaviours;
- In cases of 'intestinal parasites', DI patients may describe them as "unknown to medical science" and many explain bizarre and implausible life cycles. Patients often draw elaborate life cycles and morphologic stages of the 'parasites';
- Patients will have an extraordinary knowledge of where these parasites are located in their bodies or exactly how many parasites they are infected with;

- Express desperation, severe sleep disturbance and weight loss;
- About 8-12% of patients with DI will have a friend or relative who shares their symptoms (Shared DI);
- Average duration of DI can be 3.13 years across the different forms of DI (median, 1 year but the duration of the illness can be days to 35 years);
- Visit numerous family doctors, dermatologists, microbiologists and tropical disease specialists ('doctor hopping');
- Strongly reject possibility of psychological or other explanations;
- Patients may present their healthy pets to veterinarians or their healthy children to paediatricians for check-ups;
- Patients may exhibit radical behaviour such as quitting their job, burning/destroying furniture, abandoning their home, repeatedly applying insecticides to body and using home remedies such as gasoline and kerosene to treat "infestations". In other cases, patients mutilate their bodies by using mechanical force and instruments to kill or catch pathogens. They may also use other physical methods such as electric currents, fire, ice packs, fluids (washing, bathing, and soaking for hours), and radiation (solarium);
- In cases of infestation of the gut or body orifices, laxatives, enemas, ingestion or lavages with vinegar or chilli and/or manipulation with instruments often result in severe injuries; and
- DI patients have been known to resort to suicide.

Characteristics of imaginary pathogens

Imaginary pathogens can vary greatly in size, colour, behaviour and source of infection. Description of pathogens could be specific (mites, scabies etc) or non-specific (vermin, insects etc) and are often 'too small to see'. In general, the colour of the "pathogen" is often described to be black, white, grey, skin-coloured or they could change colour, usually from red to green. These imaginary "pathogens" can 'hide, change shape, jump or fly' to evade detection, especially when a medical practitioner is examining the patient.

Approaching Patients with Delusional Infestation

Please note that the following recommendations have not been widely researched. It is important that these recommendations are made only by an experienced General Practitioner (GP) or other experienced health practitioner. For all other parties involved, do not attempt to convince patients that the disorder is psychological.

DO:

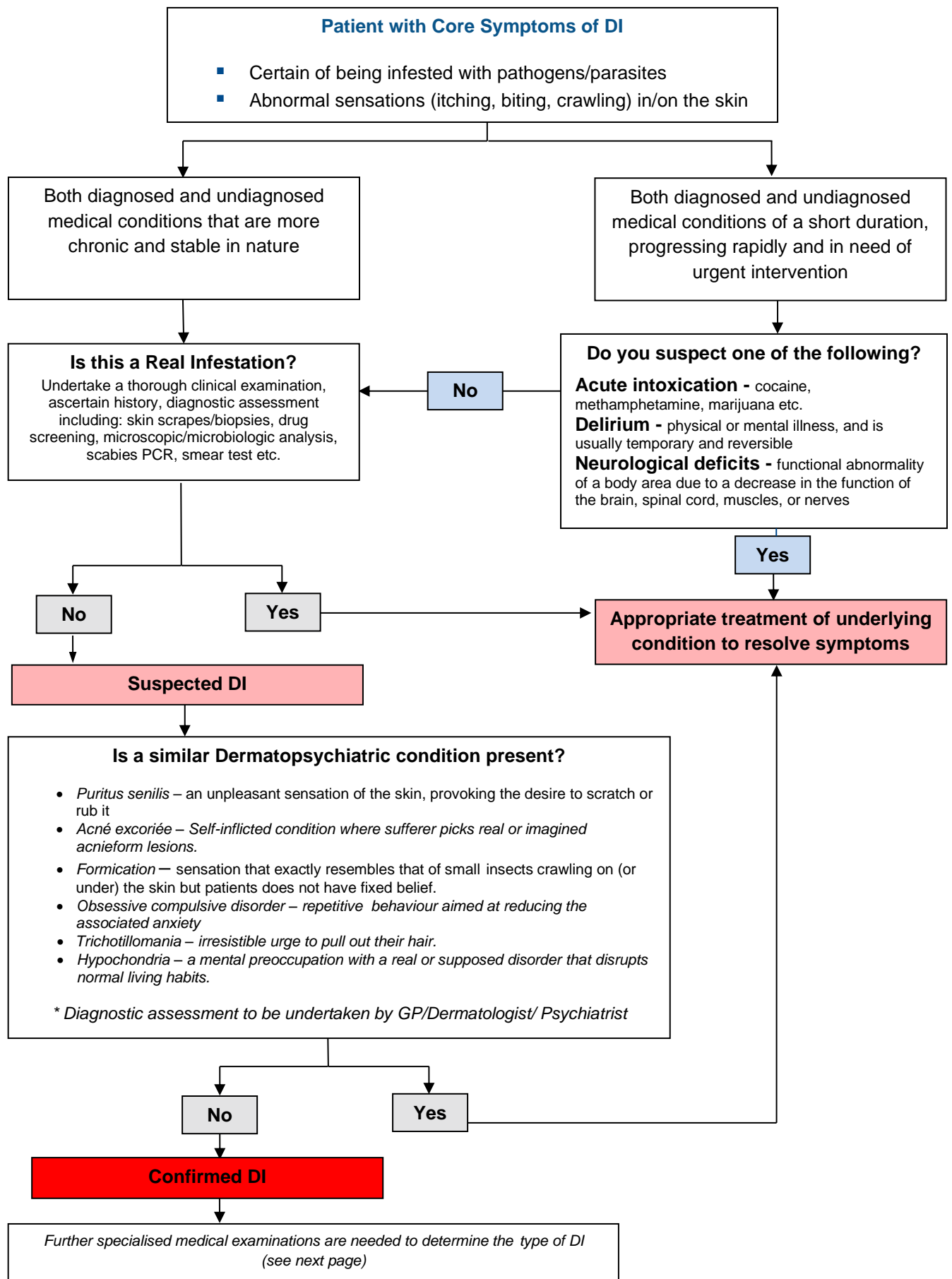
- take time; annotate the patients history, including trips to tropical locations;
- perform the diagnostic investigations needed (even if you are sure that the patient has no infection); clues to underlying medical or psychiatric problems may be revealed;
- check for triggering and contributing factors such as new medication or drug use;
- examine all specimens carefully, or refer specimens to the Medical Entomology team at the Department of Health for identification;
- be certain of the diagnosis;
- acknowledge the patient's suffering, show empathy and offer to help to reduce distress;
- paraphrase the symptoms ("you are itching"; "the sensations"; "the crawling" etc.) instead of reinforcing or questioning them;
- indicate that you are familiar with the problem and that you were able to help other patients not instantly, but after a while;
- use the term 'unexplained dermatopathy' if the patients asks for the diagnosis;
- ask the patient how the condition has affected his or her life to gain further insight into the patients history and mental state;
- ask patients with despair and signs of depression about suicidal ideation and evaluate any risk to others; and
- indicate that this may be due to over-activity in the nervous system and the result of normal neuron-adaptive processes in the brain.

DO NOT:

- try to convince the patient that the disorder is psychological or question the patient's beliefs;
- refer to this condition as "Morgellon's";
- attempt immediate psychiatric referral or try to establish psychopharmacological therapy too soon;
- use words like 'delusion(al)', 'psychotic', 'psychological', 'psychiatric' too early (this often leads to "doctor hopping");
- use phrases like "calm down"; "be happy it's not infectious"; "it is only psychogenic" and so on as this will upset the patient; and
- overlook aggression against or toward other health care professionals.

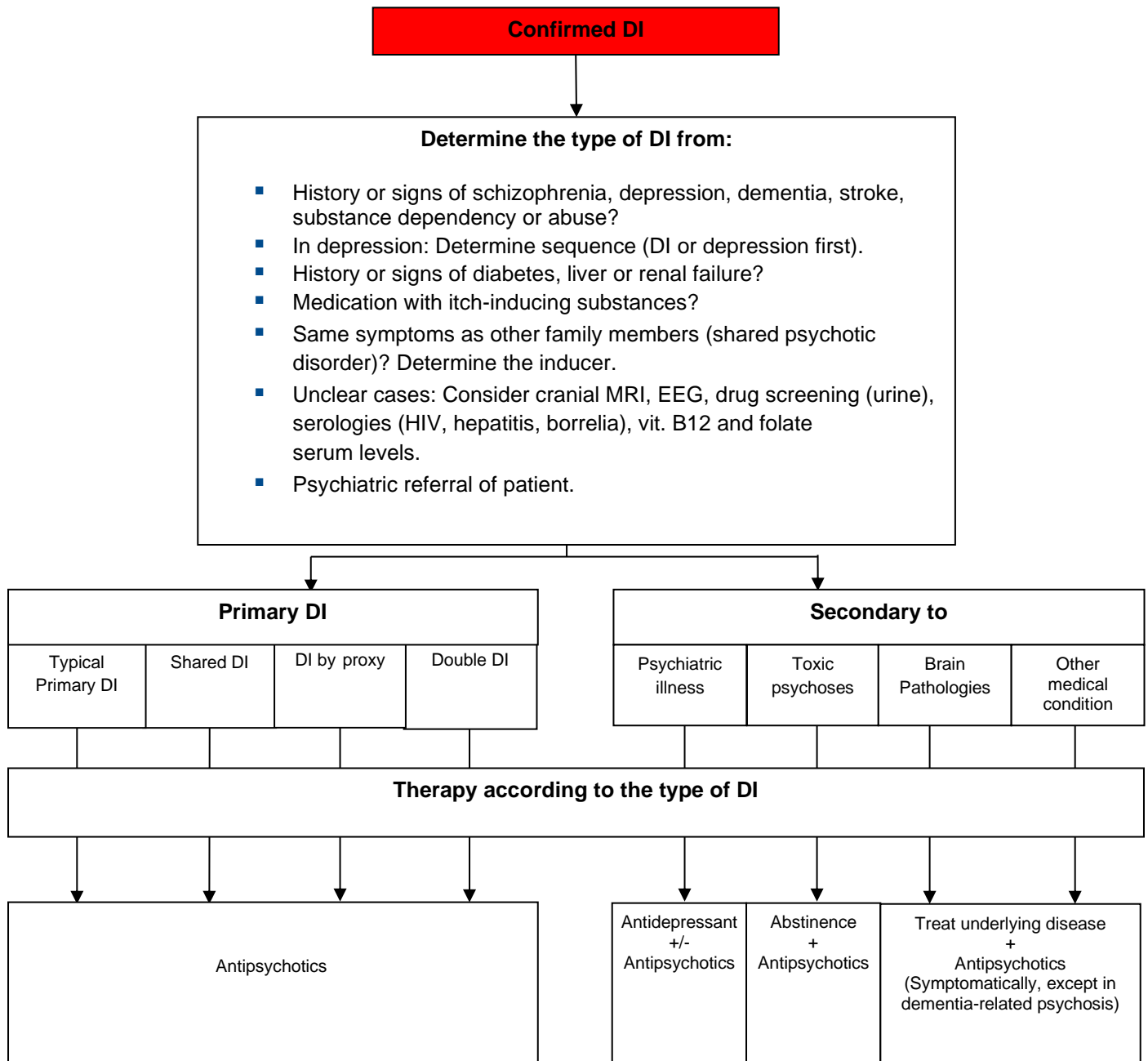
Diagnosis

The diagnosis of Delusional Infestation is a lengthy process involving the following steps:



Management

Once the diagnosis of DI has been confirmed and the patient referred to a psychiatrist, it is important to determine its exact nature. Primary DI is treated with antipsychotics, whereas secondary DI also requires the treatment of the underlying illness.



Laboratory tests that may help evaluate patients with DI include:

- Complete blood count and differential
- Erythrocyte sedimentation rate
- Serum glucose
- Serum electrolytes
- Liver function tests
- Albumin
- Total protein
- Thyroid function tests
- Serum total calcium
- Phosphorus
- Serum creatinine
- Blood urea nitrogen
- Vitamin B12
- Age-appropriate cancer screening
- Folate
- Iron studies
- Serum IgE (immunoglobulin E)
- Antinuclear antibody
- Rheumatoid factor
- C-reactive protein
- Urinalysis
- Urine toxicology
- Pregnancy test (if childbearing age)
- HIV (human immunodeficiency virus)
- Hepatitis C
- Rapid plasma reagin test for syphilis

List of medications and substances that can induce secondary delusional infestation:

- Amphetamines
- Methamphetamines
- Cocaine and its derivatives
- Tetrahydrocannabinol (THC)
- Alcohol
- Polysubstance use
- Methylphenidate (attention deficit hyperactivity disorder [ADHD] medications)
- Armodafinil, modafinil (narcolepsy medications)
- Bromide intoxication
- Dopamine agonists (anti-Parkinson's medications)
- Phenzelzine (monoamine oxidase inhibitors)
- Donepezil (cholinesterase inhibitors, Alzheimer's/dementia medications)
- Certain antibiotics (e.g. ciprofloxacin, clarithromycin)
- Corticosteroids
- Interferon a b2 plus ribavirin
- Topiramate (anticonvulsants)

Further Assistance

The Medical Entomology team within the Environmental Health Directorate of the Department of Health, WA can provide identification services for any invertebrates found during sample collection.

However, samples collected directly from the human body will only be identified if collected by GP's, medical practitioners and medical specialists to ensure samples pose minimal risk. Blood and other body fluids cannot be examined by the Medical Entomology team.

All findings of identifications, or lack thereof, will be reported back to the referring doctor, who can then make an informed diagnosis. The referring doctor can then support the patient in obtaining treatment from dermatologists/dermatology clinics or seek psychiatric treatment, if required.

Samples collected by Pest Management Technicians and Local Government, Environmental Health Officers can also be examined if collected from the surrounding environment of clients (and not directly from their body). Once again, no body fluids can be submitted for identification. However, fibre pills collected from the home, sticky tape samples from carpets or walls and dead insects from window sills can be submitted for identification.

All findings of identifications, or lack thereof, will be reported back to the Pest Management Technician or Environmental Health officer. However, only a GP can diagnose human diseases and mental disorders. If no evidence of infestation can be found, the client should be referred to a GP for further testing or referral to Dermatologist/Psychiatrists.

Samples should be collected into screw-top vials, labelled with an identification code (patient Surname or other; date of collection and any other relevant details from the patient's history) and double bagged before being sent to the Medical Entomology team. The Medical Entomology laboratory identification request form (refer to the following page) should be submitted with the sample to be examined. PDF/MS Word versions of this form can be downloaded from the Department of Health website or requested from the Medical Entomology team (medical.entomology@health.wa.gov.au).



MEDICAL ENTOMOLOGY LABORATORY IDENTIFICATION REQUEST FORM

Patient Information		Client Information - Laboratory	
Patient Name:	LAST NAME, FIRST NAME	LAST NAME, FIRST NAME	
DOB:	DD/MM/YY	Age:	PRACTICE NAME/ LAB NAME
Gender:		Address:	
Patient ID:		Tel No:	
Address (Suburb):		Email:	
Specimen sent date:		Specimen received date: <small>(For DOH use)</small>	

DETAILS ABOUT THE PATIENT

Symptoms:

Any travel history/other comments:

Details of the referring General Practitioner:

Name of the GP:

Contact Phone number:

Address:

Town/ Suburb:

State:

Postcode:

DETAILS ABOUT THE SAMPLE

Nature of the sample:

From where was sample collected:

Comments/Suggestions:

Name:

Signature:

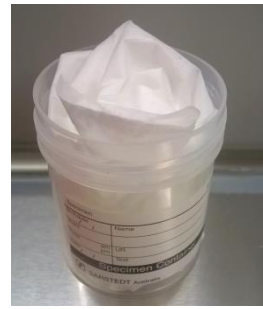
Date:

Patient's Sample Sending Guidelines for General Practitioners and Pest Management Technicians

The Medical Entomology team of the Department of Health do not accept any samples with blood or body fluid or suspected to be contaminated with body fluids or blood.

Specimen preparation

1. Collect the sample into a plastic vial (e.g. Urine Jar).
 - If the sample contains soft bodied invertebrates (eg worms, leeches, worm-like parasites, mites and ticks); they should be placed into 70% ethanol. Most soft bodied invertebrates decompose fairly quickly. Decomposed samples are harder to identify, thus these should preserve in ethanol).
 - Larger invertebrates (such as mosquitoes, moths, butterflies, beetles, bugs) can be placed into an airtight container. To prevent specimens moving and being damaged during transport;
 1. Place a piece of soft tissue to the bottom of the vial; create a well space by pushing the tissue down
 2. Place the specimen carefully to the well space.
 3. Fold the tissue edges gently over the specimen and allow the lid to be screwed on.



2. Clearly label the vial with;
 - Patient name;
 - Date of Birth;
 - Sex;
 - Date the sample was collected.
3. Place the vial in to a sealable plastic bag (Ziploc bag).
4. Seal the bag.
5. Place the bag with the vial into a second sealable bag.
6. Place the DOH specimen identification request form into the outer bag (the second bag).
7. Seal the second bag.
8. Sample bag should be placed in a foam esky and kept in the fridge until courier transfers samples to Medical Entomology.
9. Esky with the sample must be couriered to:

Medical Entomology,
37 Kensington Street
East Perth WA 6004
Tel: 08 9285 5500



Place the sample in sealable double bags; request form should go into the outer bag.

More Information

Entomological Services and Identifications

Medical Entomology

Environmental Health Directorate
Department of Health, Western Australia
PO Box 8172, Perth Business Centre, Western Australia 6849
Telephone: (08) 9285 5500
Email: medical.entomology@health.wa.gov.au

Pest and Disease Information Service

Department of Agriculture and Food, Western Australia
<https://www.agric.wa.gov.au/biosecurity/pest-and-disease-information-service-padis>

Dermatology Departments for referrals

Royal Perth Hospital

Dermatology Department
Telephone: (08) 6477 5016

Fiona Stanley Hospital

Dermatology Department
Telephone: 1300 855 275

Sir Charles Gairdner Hospital

Dermatology Department
Telephone: (08) 9346 1490

Selected References

1. Robles, D.T., Romm, S., Combs H., Olson, J., and Kirby, P. (2008). Delusional disorders in dermatology: a brief review. *Dermatology online journal*: 14(6) : 1-4.
2. Boggild, A.K., Nicks, B.A., Yen, L., Van Voorhis, W., McMullen, R., and Buckner, F.S. (2010). Delusional parasitosis: six-year experience with 23 consecutive cases at an academic medical centre. *International Journal of Infectious Diseases*: 14(4) : e317-e21.
3. Freudenmann, R.W. and Lepping, P. (2009). Delusional Infestation. *Clinical Microbiology Reviews*: 22: 690-732.
4. Lee, C.S. (2008). Delusions of parasitosis. *Dermatologic therapy*: 21(1): 2-7.
5. Kim, C., Kim, J., Lee, M., and Kang, M. (2003). Delusional parasitosis as 'folie a deux'. *Journal of Korean medical science*: 18(3) : 462.
6. Lepping, P., Rishniw, M., and Freudenmann, R.W. (2014). Frequency of delusional infestation by proxy and double delusional infestation in veterinary practice: observational study. *The British Journal of Psychiatry*: 160-3.
7. Hinkle, N.C. (2011). Ekbom syndrome: A delusional condition of "bugs in the skin". *Current psychiatry reports*: 13(3) : 178-86.
8. Monk, B., Rao, Y. (1994). Delusions of parasitosis with fatal outcome. *Clinical and experimental dermatology*: 19(4) : 341-2.
9. Wykoff, R.F. (1987). Delusions of Parasitosis: A Review. *Review of infectious diseases*: 9(3) : 433-7.
10. Freudenmann, R.W., Kölle, M., Schönfeldt-Lecuona, C., Dieckmann, S., Harth, W., and Lepping, P. (2010). Delusional parasitosis and the matchbox sign revisited: the international perspective. *Acta dermato-venereologica*: 90(5) : 517-9.
11. Lepping, P., Freudenmann, R. (2008). Delusional parasitosis: a new pathway for diagnosis and treatment. *Clinical and experimental dermatology*: 33(2) : 113-7.