BioTherapeutics, Education and Research Foundation position paper: Assessing the competency of clinicians performing maggot therapy

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Abstract

In its mission to optimise the quality of patient care and the level of clinician training within the fields of biotherapy, the BioTherapeutics, Education and Research (BTER) Foundation and its Maggot Therapy Competency Committee identified qualities and achievements assessed to be the minimum standards that health care professionals should attain in order to be deemed competent in maggot therapy. The set of six standards were selected to reflect the same high degree of professionalism that is used by the Accreditation Council of Graduate Medical Education for assessing other medical specialists, but with an emphasis on the principles and practice of maggot therapy. For each domain in which competency is expected, the rationale has been explained, specific competencies have been articulated, and methods for demonstrating or evaluating those competencies have been suggested. Applicable to any clinician applying maggot dressings professionally, these recommendations should assist those who wish to identify, assess, or achieve competency in maggot therapy. Specifically, these six competencies include: (1) knowledge about wound care in general and maggot therapy in particular; (2) skill in general patient care, to a level commensurate with their professional role; (3) ability to communicate effectively with colleagues, patients, and the general public; (4) professional and ethical behaviour; (5) ability to deliver systems-based health care; (6) incorporation of continuing education and quality improvement into their practice.

Keywords

clinical competence, educational assessment, maggot, professional competence, wound
1 | INTRODUCTION

Maggot therapy is a method of treating wounds by using medical grade fly larvae. In essence, maggot therapy is a controlled, therapeutic maggot infestation (myiasis). Medicinal maggots were first cleared for marketing in the United States by the Food and Drug Administration in 2004. The brands currently marketed are indicated for ‘debriding non-healing necrotic skin and soft-tissue wounds, including pressure ulcers, venous ulcers, neuropathic foot ulcers and non-healing traumatic or post-surgical wounds.’

The clinical safety and efficacy of maggot debridement therapy (MDT) is well-documented,¹ and will not be reviewed here. As with any other modality, maggot therapy outcomes are optimised when therapists are adequately educated and experienced. The purpose of this position statement is to help define ‘when therapists are adequately educated and experienced’ in the context of maggot therapy, and thereby provide guidance to those seeking to identify, evaluate, or achieve competency in maggot therapy.

Since 2013, the BTER Foundation has held discussions with wound care and maggot therapy experts in an effort to identify the minimum competencies that should be expected from maggot therapists. This position statement communicates the consensus reached by the BTER Foundation’s Maggot Therapy Competency Committee (MTCC). This position paper is not intended to serve as a procedure manual or course synopsis. The goal of this document is to establish a framework, not the details, for the education and evaluation of competent maggot therapists. It can stand as the foundation supporting those organisations wishing to provide quality education and/or certification in maggot therapy.

The MTCC recognises that the art of wound healing demands so much more than just technical knowledge. Competent care providers should also be able to function within their communities, with an attitude and behaviour that optimises patient care. Therefore, in addition to compiling a list of skills and knowledge-based topics that all competent maggot therapists should master, the Committee has identified five additional domains in which competency should be expected from the professional maggot therapist, who should also be a competent wound care therapist. In total, these core competencies are consistent with, and modelled after, the six domains of competency expected by the Accreditation Council for Graduate Medical Education (ACGME) from every other medical professional.² ³

These competencies are defined so as to be applicable to any clinician applying maggot dressings professionally. Of course, since clinicians differ in their professional education, scope of practice, licensure and community of practice, the specific knowledge and skills used to define competency within each domain may need to be tailored to the practitioner’s role on the wound care team.

These proposed minimum competency requirements apply only to health care professionals. In some communities, clinicians are not available to apply the maggot dressings, so patients and their family or friends are called upon to perform the treatments. They often do so with great care and skill, but they should not be held to the standards of a health care professional, as outlined in these recommendations, since they are not prescribing nor recommending therapy, nor are they applying maggot dressings for remuneration. Since the non-health professional cannot diagnose nor prescribe, nor perform any medical services other than applying and removing the dressings, the non-health professional must work under the supervision of a physician or other competent therapist who can perform those necessary tasks and will ultimately assume medical responsibility. Therefore, the competency of non-health professionals who assist in care by applying, managing and/or removing the maggot dressings may need to be judged solely on the basis of their manual skills, their ability to follow the prescribers’ directions, and their sound judgement.

2 | ACRONYMS AND DEFINITIONS

ACGME: Accreditation Council for Graduate Medical Education.

BTER Foundation: BioTherapeutics, Education, and Research Foundation. The mission of the BTER Foundation is to advance healthcare through education and research in biotherapy (the medical use of live animals).

Chronic wound: A wound which fails ‘to proceed through an orderly and timely process to produce anatomical and functional integrity, or [which proceeds] through the repair process without establishing a sustained anatomical and functional result.’ ⁴

Competency: ‘An observable ability of a health professional related to a specific activity that integrates knowledge, skills, values and attitudes. Since competencies are observable, they can be measured and assessed to ensure their acquisition. Competencies can be assembled like building blocks to facilitate progressive development.’ ⁵

Debridement: wound treatment in which the necrotic tissue and debris (including exudates, biofilm, foreign material, etc.) are removed.⁶

Maggot therapy: wound treatment using special (‘medicinal’) live disinfected fly larvae applied to the wound within dressings that contain or confine them. Synonyms include: maggot debridement therapy, larval therapy, larval debridement therapy, biosurgery, biodebridement and larvenase biodebridement (https://webcmce.net/courses/WND105)

MDT: maggot debridement therapy.

MTCC: Maggot Therapy Competency Committee; the committee established by the BTER Foundation to identify the core elements of competency in maggot therapy.

3 | POSITION STATEMENT REGARDING PROFESSIONAL COMPETENCY AS A MAGGOT THERAPIST

It is the opinion of the BTER Foundation and the community experts on its Maggot Therapy Competency Committee (MTCC) that in order to be considered competent in maggot therapy, a health professional must demonstrate competency in each of the following six domains:
1. Knowledge about wound care in general and maggot therapy in particular
2. Skill in general patient care, to a level commensurate with their professional role
3. Ability to communicate effectively with colleagues, patients and the general public
4. Professional and ethical behaviour
5. Ability to deliver systems-based health care
6. Incorporation of continuing education and quality improvement into their practice

For each domain in which competency is expected, the rationale has been explained, specific competencies have been articulated and methods for demonstrating or evaluating those competencies have been suggested.

3.1 | Competency #1: knowledge about maggots, maggot therapy and wound care

3.1.1 | Rationale

Most wounds heal quickly and normally, regardless of the specific treatment administered. Nature sees to that. Similarly, medicinal maggots most often will effectively debride a wound, regardless of the level of experience of the therapist; nature sees to that, too. However, sometimes wound-healing or maggot therapy does not proceed normally, and when this occurs, problems can result. A truly competent maggot therapist can prevent or minimise the occurrence of these events, and mitigate them when they do occur.

If the maggot therapist does not fully understand maggot anatomy and behaviour, they will not always be able to select the optimal materials to build an appropriate non-routine dressing, or anticipate and prevent the escape of larvae. If the therapist does not fully understand the physiology of wound healing, they will not always remember to identify and correct the underlying deficiencies that may ultimately prevent a wound from healing. Thorough knowledge about maggots and maggot therapy is only a small part of the knowledge base which is expected from a competent clinician, because maggot therapy may not always be the optimal treatment. Only with a solid understanding of wound healing and the various wound healing modalities available will a maggot therapist—or any other wound care specialist—be qualified to discuss and select the best treatment options, whether or not those options include maggot debridement.

3.1.2 | Specific elements of this competency

At a minimum, a wound care therapist considered competent in maggot therapy should have a working knowledge of:

1. General wound care
   A. Normal wound healing physiology
   B. Pathophysiology of delayed or abnormal wound healing
   C. Specific wound types—aetiology, epidemiology, differential diagnosis and wound-specific management algorithms
   D. History and examination of the patient with a wound
   E. Standard and non-standard treatment options
   F. How to select the most appropriate wound care

2. Maggots and maggot therapy
   A. History and current status of maggot therapy
   B. Myiasis and maggot biology
   C. Maggot therapy as a controlled, therapeutic myiasis
   D. Production of medical grade maggots
   E. Assessment and preparation of patients prior to MDT
   F. Choosing the optimal maggot dressings
   G. Application and removal of maggot dressings
   H. Maggot therapy indications and contraindications
   I. Adverse events and how to prevent or mitigate them
   J. Starting and running a maggot therapy program (regulations, protocols, documentation, legal issues)
   K. Reimbursement issues

3.1.3 | Demonstrating/evaluating this competency

- Evidence of successful professional training in wound care and maggot therapy
- Examination and certification, recognised and endorsed by a professional wound care society
- Formal and evaluated observation of actual practice performance
- Evaluated and documented prior experience

3.2 | Competency #2: good skills in general patient care

3.2.1 | Rationale

A health care provider, competent in maggot therapy, should be, first and foremost, a competent health care provider.

3.2.2 | Specific elements of this competency

Competency requirements for health care providers depend largely on the specific role and function of that health care provider: physician, podiatrist, dentist, naturopath, nurse, physical therapist, etc. Specific skills and expectations will differ for each specific area of practice. Nevertheless, there are many shared characteristics that should be expected from all health care providers:

1. Complete and appropriate history taking.
2. Thorough and proper physical examination.
3. Care must be delivered in a safe, effective, timely, efficient, patient-centered, equitable, compassionate, appropriate and confidential manner.
4. Care must be delivered in a manner appropriate to the clinical setting (hospital, clinic, extended care facility, home, etc.).

3.2.3 | Demonstrating/evaluating this competency

Proficiency in general patient care could be demonstrated by:

- Evidence of successful professional education and training (degree, postgraduate education, and licensure) in a relevant health care field (medicine, surgery, podiatry, dentistry, nursing, physical therapy, osteopathy, naturopathic medicine, etc.)
- Professional licensure
- Formal and evaluated observation of actual practice performance
- Evaluated and documented prior experience

3.3 | Competency #3: Good communication skills

3.3.1 | Rationale

Effective communication is crucial to all forms of health care. Without clear instructions, a patient may not be able to follow through with the treatment plan, nor prevent another wound from developing in the future. Without effective communication, a primary health care provider may not follow through with the treatments or safeguards recommended by a colleague or specialist. Without clear and complete documentation, future therapists may not be able to determine the precise care that was previously provided, and whether or not that care was successful.

3.3.2 | Specific elements of this competency

To be considered competent, a maggot therapist must be able to communicate on the level, and in the manner, that is understood by the audience at that time: clinician, patient, family member, or general public. To that end, the proficient therapist is expected to be able to:

1. Communicate effectively with patients, families and the public, across a broad range of socioeconomic and cultural backgrounds.
2. Communicate effectively with other health care providers and health-related agencies.
3. Effectively describe the clinical condition, past history, treatment plans and goals, and preventive health care measures (education) to other health care workers, patients, and the general public.
4. Maintain comprehensive, timely, and legible medical records and documentation.

3.4 | Competency #4: professionalism

3.4.1 | Rationale

Professionalism encompasses speech and behaviour that makes others feel welcome and comfortable. The health care provider must recognise that physical well-being is optimised by mental and emotional well-being. To facilitate open communication, to function well within a multidisciplinary wound care team, and to make patients feel safe and comfortable, therapists must act and speak professionally, respectfully and ethically at all times.

3.4.2 | Specific elements of this competency

1. The competent health care provider, proficient in maggot therapy, must treat every patient with dignity, respect, compassion and empathy.
2. Competent therapists must be aware and sensitive to issues of cultural diversity, ethnicity, gender, age, confidentiality, autonomy, and any other individual characteristics of their patients, colleagues, and the public with whom they have contact.
3. Patients should be given the opportunities to ask questions regarding their therapy, wound, or prognosis.
4. The competent therapist is not expected to be perfect, but is expected to disclose conflicts of interest and accept responsibility for any errors or complications of therapy.
5. The competent therapist, acting professionally, puts the interests of the patient ahead of their own personal interests. This sometimes means recognising that the patient would be better served by transitioning to another care provider, due to issues such as conflicts or duality of interest, not connecting well with the patient, or when another health care provider could provide better or more appropriate care based on their skill set or knowledge base.

3.4.3 | Demonstrating/evaluating this competency

Professional attitude and behaviour could be demonstrated by:

- Formal and evaluated observation of actual practice performance
- Evaluated and documented prior experience (letters of recommendation)
- Certificate of good standing in a professional wound care society
3.5  |  Competency #5: delivery of systems-based health care

3.5.1  |  Rationale

The wound care therapist does not work in isolation. The competent therapist works in multiple inter- and intra-disciplinary circles in order to optimise patient care. For example, in order to optimise care, the wound care therapist may involve the dietician and endocrinologist to improve diabetes control, the podiatrist and physical therapist to provide off-loading, the social worker to assist with finding transportation to and from the appointment centre, and so forth. The competent therapist understands the differences and limitations of various health care settings, such as hospital-based, clinic-based, extended stay and hospice care.

3.5.2  |  Specific elements of this competency

The competent therapist is able to:

1. Work effectively with other members of the various health care delivery settings.
2. Advocate for the patient to receive the quality care that is needed, both within the system and also from other systems, when necessary.
3. Participate in inter-professional teams to enhance patient safety and the quality of care.
4. Identify system errors and obstacles, and implement system solutions.
5. Design a maggot therapy program that seamlessly integrates with the existing wound care team, and with the rest of the medical setting.

3.5.3  |  Demonstrating/evaluating this competency

Proficiency in delivering systems-based health care could be demonstrated by:

- Evidence of successful professional training (degree and licensure) in a relevant health care field (medicine, surgery, podiatry, dentistry, nursing, physical therapy, osteopathy, naturopathic medicine, etc.)
- Certificate of good standing in a professional wound care society
- Formal and evaluated observation of actual practice performance
- Evaluated and documented prior experience (letters of recommendation)

3.6  |  Competency #6: pursuit of continuing education and quality improvement

3.6.1  |  Rationale

In health care, our knowledge, understanding, technology and treatment recommendations are constantly evolving. In order to remain competent, it is essential that health care providers continue their learning and improvement even after their formal training and licensure.

3.6.2  |  Specific elements of this competency

The truly competent maggot therapist has the motivation and habits for self-evaluation, critical review of scientific evidence, and lifelong learning, such as:

1. Searching for and identifying their own professional strengths and deficiencies
2. Setting learning and improvement goals
3. Participating in learning activities
4. Locating, reading and evaluating published studies within the fields of maggot therapy specifically and wound care generally, as well as in their other specialties
5. Reporting new findings or experience with new technologies to colleagues or the general medical community
6. Periodically participating in performance reassessment

3.6.3  |  Demonstrating/evaluating this competency

The pursuit of continuing education and quality improvement could be demonstrated by:

- Evidence of successful professional training (degree and licensure) for which ongoing education and quality improvement are a significant requirement
- Evaluated and documented prior experience (such as peer-reviewed publications)
- Certificate of good standing in a professional wound care society
- Professional licensure
- Letters of good standing
- Evidence of continuing education
- Periodic re-assessment of performance

4  |  IMPLICATIONS FOR FURTHER DEVELOPMENT OF QUALITY SPECIFICATIONS

The goal of this position paper is to create a framework for assessing competency among maggot therapists. The next step in the process of optimising clinician competency is for an organisation with experience and expertise in professional certification to offer certification of competency in maggot therapy, based on this or similar criteria. The ideal organisation to do this might be one that already assesses and certifies wound care clinicians. The BTER Foundation holds that it would be a conflict of interest for the same organisation to provide both maggot therapy training and maggot therapy competency certification. The BTER Foundation has thus far focused on clinician...
training, and plans to continue this effort rather than provide competency certification ourselves.

Once an organisation decides to develop a program to certify competency, assessment procedures and tools can be assembled using the criteria outlined in this proposal. Knowledge base and clinical judgement are commonly assessed with written tests covering facts and case scenarios. Creating an objective and semi-quantitative tool for assessing skills and past performance is more difficult, but should be possible by awarding weighted points for various past activities. For example, one point could be awarded for each professional licence or certification, up to two; one point could be awarded for each hour of wound care continuing education units taken during the prior 3 years, up to a maximum of 5 h; two points could be awarded for each hour of an approved maggot therapy course taken over the past 3 years, up to a maximum of 4 h (eight total points); three points could be awarded per patient treated with maggot therapy over the prior 3 years, for a maximum of 10 patients. An example of an evaluation form can be found in Figure 1. In this example, points can be attributed to each relevant competency domain and then totalled for a final score.

FIGURE 1  Sample assessment tool for evaluating evidence of quality performance as a competent maggot therapist. Some items, such as course certificates, medical records and letters of support could be submitted by the applicant. Other items, such as written examination, would be evaluated by the assessing organisation. With scoring guidance, each item in the assessment could be given a weighted, semi-quantitative rating, assigned to the appropriate competency domain, and then totalled for a final score.

5 | CONCLUSIONS

The BTER Foundation has issued criteria within six general categories by which competency can be objectively assessed. These criteria...
assess not only knowledge and performance of maggot therapy and wound care, but also assess a therapist's profession character and their ability to work with clients and colleagues. The criteria were generated and approved by the expert members of the Maggot Therapy Competency Committee, and accepted by the BTER Foundation Board of Directors in 2021. It is intended that these criteria will be helpful to those who wish to achieve competency themselves, and those who need to assess competency in others.

Once maggot therapy certification programs are offered, therapists will no doubt strive to improve and demonstrate their competency, and wound care delivery systems will require such certification. Based on years of interaction with the general public, the BTER Foundation knows well that patients living with chronic wounds already demand maggot therapy competency from their wound care providers.

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CONFLICT OF INTEREST
Ronald Sherman declares the following conflicts of interest: He is a co-founder of Monarch Labs (Irvine, CA), which produces medicinal maggots and other medicinal animals. Monarch Labs split off from Dr. Sherman's University laboratory when its maggot-producing activities fell under FDA regulations. To minimise conflicts of interest, Dr. Sherman accepts no compensation for his work at Monarch Labs, nor for his work for the BTER Foundation. His wife, however, is paid a salary for running the lab. No other contributors have any conflicts to declare.

DATA AVAILABILITY STATEMENT
Data sharing not applicable - no new data generated, or the article describes entirely theoretical research.

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