

# Introduction to Helminthic Therapy

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## Introduction

Helminthic therapy involves the deliberate hosting of a controlled number of carefully selected, benign intestine-dwelling nematodes (worms) known as helminths. This is a type of organism with which people living in developed countries have gradually lost contact during the past 150 years as a result of the increasing use of shoes and toilets, and of changes in medical, agricultural and food preparation and storage practices.

Viewed from a medical perspective, helminthic therapy is an experimental form of immunotherapy used in the treatment of chronic inflammation, autoimmune disease and other immunological disorders including allergy. It can also be seen simply as another form of probiotic treatment, using tiny animals instead of bacteria, to reconstitute and enrich a depleted intestinal biome.

*“We think of these worms as kind of big probiotics.”* (Dr Paul Giacomin, Australian Institute of Tropical Health and Medicine.) [\[Link\]](#)

## A brief history of helminthic therapy

Helminths are among the 'heirloom species' that humans inherited from our primate ancestors and which have continued to coexist and co-evolve with us over millions of years to the extent that we are now incomplete without them and depend on their presence for the optimal functioning of our immune system. These symbiotic organisms train the developing immune system in infancy and continue to regulate immune function throughout adulthood for as long as they remain with us.

Evidence pointing to the importance of helminths for human health began to emerge in the 1970s, and included a [report](#) of higher levels of allergic disease in urban communities than in rural indigenous areas where levels of helminth infection were much higher.

By 1990, it had become clear from further scientific studies that, while autoimmune, inflammatory and allergic conditions have escalated in developed countries during the past century, they have remained much less common in parts of the world where helminths are still prevalent. It was this realisation that gave rise to the idea of reintroducing helminths into patients who have developed one or more of these conditions, in the hope that this intervention might rebalance their immune system and restore their health. The first indication that this might be an effective approach had already appeared in the *Lancet* in 1976, when a researcher had [reported](#) putting his own seasonal allergies into remission by infecting himself with hookworms.

Researchers began to consider the importance to health of what has become known as the [microbiome](#), and the theories formed by these pioneers have been refined through several stages, each being given a new title, viz. the [Hygiene Hypothesis](#), the [Old Friends' Hypothesis](#) and, most recently, [Biome Depletion Theory](#) and [Evolutionary Mismatch Theory](#).

During this process, helminths have been identified as being of special significance, and they are now considered to be [keystone species](#) of the human [multibiome](#), with profound importance for health. So much so that there are calls for them to be employed not only as a treatment for established disease, but also [as a preventative](#) to help eliminate the epidemics of allergic, inflammatory and autoimmune diseases that are today afflicting the populations of developed countries, and possibly also to offer protection against many degenerative diseases such as [atherosclerosis](#), [diabetes](#) and [cancer](#).

Many members of the medical profession remain sceptical about the use of live helminths, and some are overtly hostile, with the result that the use of these organisms in medical practice is being delayed until validated by clinical studies. Where helminths have already been the subject of clinical trials, most of these have employed methods that were designed to test pharmaceutical products and are unsuitable for the assessment of a natural therapeutic, especially one whose beneficial effects do not materialise for at least 12 weeks - the maximum period typically used in drug trials - and, in a few cases, have taken as long as 19 months.

As a consequence of these factors, millions of patients are being forced to continue to suffer the often devastating effects of immunological disorders, along with the frequently serious side effects produced by many of the pharmaceutical therapies currently prescribed to treat them. And this is in spite of the fact that four helminth species have already been identified as suitable and safe for use in therapy, are available for purchase via the internet and are currently being used by an estimated 7,000 individuals.

*"Although self-treatment with helminths cannot be recommended by medical professionals due to a lack of blinded, placebo controlled trials, neither should it be discouraged since the available evidence suggests that it is beneficial in most cases when practiced by knowledgeable individuals."* ([Parker and Morey](#), 2015)

*"What was a costly and sometimes risky venture into the unknown, undertaken by only a few 10 years ago, is rapidly becoming a readily available and well-established resource currently used by thousands of individuals."* ([Cheng et al](#), 2015)

*"In developed countries, where we are well nourished, worms are potentially good... If I had Crohn's disease, ulcerative colitis or multiple sclerosis, I would infect myself without hesitation."* ([Alex Loukas](#), Australian Institute of Tropical Health & Medicine, in [Life On Us](#), 2014)

A wide range of inflammation-related conditions, allergies, autoimmune diseases, and even neuropsychiatric disorders such as depression, anxiety, migraine headaches, bipolar disorder and Parkinson's disease have been effectively ameliorated by self-treaters using the available therapeutic helminths. [[Link](#)]

*"The results strongly support previous indications that helminth therapy can effectively treat a wide range of allergies, autoimmune conditions and neuropsychiatric disorders..."* ([Liu et al](#), 2016)

While citizen scientists continue to refine the use of live helminths, medical researchers have their sights set on the creation of drugs employing helminth-derived molecules, but these pharmaceutical products are still many years away, and if and when they do become available, some, if not all of them, are likely to present adverse side effects,

as are seen frequently with other single molecule drugs. Moreover, some researchers have suggested that no worm-derived pharmaceutical will ever match the efficacy of a live worm.

*"When you give someone a live worm, it's like giving them the factory that makes the products and letting the factory do what it needs to do... Evolution has already created this thing."* (David Elliott, University of Iowa.)

*"It's hard if not impossible to believe we could restore the immune system to 'normal' using a pharmaceutical directed at one cog in the immune apparatus, when in fact the entire apparatus is out of sync with nature. Pharmaceuticals do not effectively recapitulate biology derived from hundreds of millions of years of natural selection."* (William Parker, Duke University)

Although acceptance of helminthic therapy by the medical establishment is currently being hindered by the strong pharmaceutical bias of modern Western medicine, it is nevertheless predicted to become an essential part of healthcare in the future.

*"What was a costly and sometimes risky venture into the unknown, undertaken by only a few 10 years ago, is rapidly becoming a readily available and well-established resource currently used by thousands of individuals."* (Cheng et al, 2015)

*"Twenty years from now everybody is going to have a helminth, and no insurance company will begin to cover you if you don't have your helminths ... We're very confident in the science, that every single human being needs a helminth. It's part of our biology."* (William Parker, 2016)

It is recommended that anyone interested in joining the growing ranks of helminth hosts should read this **entire** document very carefully, along with the material at the links within it. This will help to increase the likelihood of a satisfactory outcome from using the therapy, and will save members of the online groups having to respond unnecessarily to questions that are answered here.

## Abbreviations

HD - the rat tapeworm, [Himenolepis diminuta](#)

HDC - the [cysticercoids](#) of the rat tapeworm, [Himenolepis diminuta](#)

HK - hookworm, usually referring to the human hookworm, [Necator americanus](#)

HT - helminthic therapy

HW - hookworm, usually referring to the human hookworm, [Necator americanus](#)

NA - the human hookworm, [Necator americanus](#)

TS - the porcine (pig) whipworm, [Trichuris suis](#)

TSO - the ova (eggs) of the porcine (pig) whipworm, [Trichuris suis](#)

TT - the human whipworm, [Trichuris trichiura](#)

TTO - the ova (eggs) of the human whipworm, [Trichuris trichiura](#)

WW - whipworm, usually referring to the human whipworm, [Trichuris trichiura](#), but possibly also [Trichuris suis](#)

## Helminthic therapy science

The following papers provide an overview of the therapeutic potential of controlled colonisation by benign helminths, and would be suitable resources to give to a doctor or anyone else who is unaware of the evidence and rationale for helminthic therapy. The first two papers provide validation for the practice of self-treatment with helminths.

### 1. [Practices and outcomes of self-treatment with helminths based on physicians' observations](#)

(2016) The first study to examine, through the eyes of their physicians, the practices and experiences of individuals who are self-treating with helminths.

### 2. [Overcoming Evolutionary Mismatch by Self-Treatment with Helminths: Current Practices and Experience](#)

(2015) This study probes the methods and outcomes reported by individuals who are self-treating with helminths and is an ideal basis for the education of physicians who need to discuss helminthic therapy with their patients.

### 3. [Ecological Medicine: Can intestinal worms cure us of our modern pandemics?](#)

(2015) An excellent article in its own right, this is also a good introduction to number 2.

### 4. [Evolutionary biology and anthropology suggest biome reconstitution as a necessary approach toward dealing with immune disorders](#)

(2013) Explains how the modern pandemics of autoimmune, inflammatory and allergic diseases are due to the loss of species - especially of helminths - from the human ecosystem.

## 5. Helminth–host immunological interactions: prevention and control of immune-mediated diseases

(2012) Summarises the science underpinning helminthic therapy.

## 6. Reconstituting the depleted biome to prevent immune disorders

(2010) Explains why replacing absent "old friends" may be the only reasonable therapy for a wide range of immune-associated disorders, including allergy, autoimmunity and autism.

## 7. Distribution of autoimmune disorders and helminths

A graphic showing that autoimmune diseases are much less common in areas where helminth infestation is high.

For a full list of scientific papers and articles from the media documenting the history and development of helminthic therapy from its beginnings up until the present day, see the document, [Helminthic Therapy in Science and the Media](#).

# Therapeutic helminths

For a helminth to be suitable for use in therapy, it must meet a number of generally agreed criteria. The following list is a composite drawn from several sources, including [here](#) and [here](#).

1. should not cause disease in humans at therapeutic doses
2. should not be a potential vector for other parasites, viruses, or bacteria
3. should not cause long-term symptoms in humans at therapeutic doses
4. should not alter its behaviour in patients with depressed immunity
5. should not be easily transmissible from the host to other people
6. should not be able to reproduce in a host, and thus prevent dosage from being controlled
7. should be easily eradicated from the host, if required
8. should be compatible with commonly used medications
9. should be easy to administer
10. should be amenable to production in large numbers
11. should be amenable to storage and transportation

There are currently four types of helminth available commercially for use in self-treatment.

### 1. Pig whipworm, *Trichuris suis* (TS)

Introduced for therapy in 2004

Sold as ova (TSO)

### 2. Human hookworm, *Necator americanus* (NA)

Introduced for therapy in 2006

Sold as larvae

### 3. Human whipworm, *Trichuris trichiura* (TT)

Introduced for therapy in 2009

Sold as ova (TTO)

### 4. Rat tapeworm, *Himenolepis diminuta* (HD)

Introduced for therapy in 2011

Sold as cysticercoids (HDC)

# Selecting a therapeutic helminth

## The scientific evidence

There have been no head-to-head clinical trials comparing any of the currently available therapeutic helminths, and there may never be any, due to the extremely high cost of mounting such studies and the lack of incentive for anyone to fund them. There is also little scientific evidence for the efficacy of individual helminths.

In the groundbreaking [Correale and Farez study](#) of 2007 in patients with multiple sclerosis, all the helminth-infected subjects benefited, even though they had 5 different species of worm between them. Therefore the species of worm may not make as big a difference to the outcome of helminthic therapy as might be imagined.

The only organism to be studied in the treatment of autoimmune disease, in well-designed trials at therapeutic doses, is TSO, which has been shown to be safe and effective [in ulcerative colitis](#), promising [in the management of](#)

**Crohn's disease**, as well as **in the treatment of relapsing-remitting multiple sclerosis** and **in dampening allergic airway hyper-reactivity**. TSO has also shown **significant results** in 70% of subjects with the inflammatory subtype of autism spectrum disorder (I-ASD) who took TSO in its original pH2.7 form.

Several other trials of TSO were conducted by the now defunct company, Coronado Biosciences, prior to the termination of its research programme early in 2015 following what appeared to be disappointing results. However, the apparent failure of these trials may have been due to poor trial design, including an inadequate assessment period of only 12 weeks and, especially, the insistence by the researchers on using a novel formulation of TSO with a higher pH than the product that had been employed successfully in previous studies and used to good effect by self-treaters for more than a decade. [\[Link, link\]](#)

The first trial of the hookworm, NA, to use a realistic dose and duration of colonisation was completed in early 2016 at Nottingham University in subjects with Multiple Sclerosis, but the results from this [trial](#) had not been published when this document was last updated.

There have been no clinical trials using the other available therapeutic organisms, TTO and HDC, although there is a detailed [case study](#) of an individual with ulcerative colitis who experienced almost complete remission of his symptoms after self-infecting with TTO, and a [further case study](#) showing several indicators of mucosal and systemic immune modulation following self infection with TTO.

## The anecdotal evidence

While data from clinical trials is still limited, the anecdotal evidence gathered by the self-treaters who have pioneered helminthic therapy for more than a decade is already significant and compelling. [\[Link, link\]](#) Apart from the study at the second of these links, there is little recorded anecdotal evidence for TSO and HDC, largely because users of these two organisms, and especially TSO, have been much less active on helminthic therapy social media sites. NA has been discussed extensively online since 2007, and TTO since 2009, originally on the [Yahoo Helminthic Therapy Forum](#) and, more recently, in the [Facebook Helminthic Therapy Support Group](#).

### NA (*Necator americanus*)

*“There is perhaps no better example of a therapeutic parasite than the hookworm, *Necator americanus*.”* [\[Link\]](#)

NA, which has the longest lifespan of the currently available therapeutic helminths, produces powerful systemic immunomodulation and its use appears to be effective in approximately 70-80% of cases of autoimmune disease, inflammation and allergy. [\[Link, link, link\]](#) The extent of its benefits can be seen in the hundreds of reports in this [compilation of success stories](#), most of which are from users of NA.

This organism causes a short-lived, but often itchy, rash at the inoculation site in most subjects, and may produce a very pleasant, if brief, “bounce” (see [below](#)) in the first few weeks following inoculation, as well as causing other, [well documented transient side effects](#) during the first few months. However, it does not cause any long-term ill effects.

It has occasionally been suggested by poorly informed commenters that NA might mis-migrate within a host and settle in various organs other than the intestine, but this is not the case. There is no literature describing such mis-migration [\[link\]](#) and several authorities have made it clear that NA does not mis-migrate in humans.

*“Over 700 million people remain infected with hookworms... Auto-reinfection, direct person to person infection, aberrant migration, and hypobiosis do not occur.”* [\[Link\]](#)

*“*Necator americanus* migration in humans is predictable, via the lungs (larvae) to the gastrointestinal tract (adults worms).”* [\[Link\]](#)

Mis-migration can occur with some of those species of helminth that are not adapted to living in humans, such as the roundworms (*Ascaris* species) of dogs and raccoons, which are well known for migrating to the brain and eyes after entering the wrong species. [\[Link\]](#) And there may be an increased risk of mis-migration in people who are severely immunocompromised, for example someone with HIV/AIDs. However, inoculation with NA has been reported to be safe, even in patients who are immune-suppressed. [\[Link\]](#)

Another factor for which NA is often wrongly blamed is excessive blood loss and consequent anaemia. This notion has arisen partly because NA is often confused with another prevalent human hookworm, [Ancylostoma duodenale](#) (AD), which causes nine times more blood loss than NA. In the case of NA, there is arguably a greater risk of anaemia attached to diagnostic blood testing [\[link\]](#) and blood donation than there is from hosting this species of helminth. The 1.09 liters of blood that has been estimated to be drawn each year by a colony of 100 NA is far less than the 2.88 liters that an adult weighing 100 lbs or more is permitted to donate annually.

## TTO (*Trichuris trichiura* ova)

The colon-dwelling *Trichuris trichiura*, which has an effect that is less systemic than that of NA, and more localised in the colon, is most frequently employed in the treatment of ulcerative colitis and colonic Crohn's disease, with or without the addition of NA.

TT can **cause allergies to flare** temporarily, and may **cause transient allergic-type reactions** in people who normally don't have allergies. These may include skin reactions or rashes, which typically start a few days after taking the ova, and may continue for 3-6 weeks, but which are usually mild and short-lived. In a few cases, these side effects can persist for longer, even **up to 8 weeks** after taking TTO. The worst recorded allergic reaction to TT is described [here](#), but such a severe response is extremely rare.

Some other conditions may flare temporarily after taking TTO, including herpes. Someone who already suffers frequent or severe outbreaks of herpes may see these **worsen and increase in frequency** for up to three months after inoculation with TTO, before returning to the pattern seen before inoculation. Constipation can be another short-term consequence of adopting human whipworms. [[Link](#), [link](#)]

In general, any side effects following inoculation with TTO are likely to be mild, subside quickly, and be easier to cope with than those produced by NA.

*"I had light side effects with TTO. On doses 1-3, I had some diarrhea, but by dose 4, I was diarrhea free."* [[Link](#)]

The side effects following supplementary inoculations with TTO typically become less severe with each successive dose but, in a few people taking larger doses, side effects may continue to appear briefly after each new dose in the long term.

*"Whipworms have much less side effects (than hookworms), for me, and last a month at the very extreme. I can take a dose of 500 human whipworm and the side effects last a week (5 days). Mostly gut upset then I'm back to my usual self."* [[Link](#)]

There is an extremely small possibility that human whipworms might cause anaemia (anemia) over time. However, the type of anaemia involved is not due to low iron levels, so cannot be treated by iron supplementation. It has been speculated that this form of anaemia might be due to active suppression of the formation of blood cellular components in the bone marrow, rather than as a result of bleeding. The likelihood of this phenomenon occurring in someone using therapeutic doses of human whipworm is thought to be vanishingly small, and, if it were to occur, it may - according to one physician member of the helminthic therapy community - be amenable to remediation by taking Erythropoietin (EPO).

In spite of the eventualities mentioned above that may follow inoculation with TTO, the potential benefits of hosting the human whipworm are such that it can be well worth persisting with. [[Link](#), [link](#), [link](#)] If necessary, NA can be hosted in addition to TT in order to reduce the possibility of an allergic reaction to the latter and to provide additional systemic inflammation control. [[Link](#)]

Although most people with ulcerative colitis seem to do best using TTO, with or without NA, colitis has also been treated successfully using NA alone. A few people have felt less well after adding NA on top of TTO, while a few others have reported being less well after adding TTO to an existing colony of NA. [[Link](#)]

It has occasionally been suggested that TT might be able to multiply within a host, but this is not the case since the eggs of the human whipworm need to be deposited in soil, where, given suitable conditions, they will embryonate after two to three weeks. It is only at this point that they become infective so, unless a user of TT ingests further embryonated eggs, their colony will not increase.

## TSO (*Trichuris suis* ova)

TSO has a localised effect in the colon [[link](#)] similar to that of TTO, so is particularly effective in the treatment of diseases affecting this section of the intestine. It has also proved to be effective against autoimmune disorders affecting other parts of the body, such as Lupus and Crohn's disease [[link](#)] but may not be as effective against MS as NA. [[Link](#)] TSO can also be effective in autism [[link](#), [link](#), [link](#)], perhaps more so than any of the other worms [[link](#)] although the extent of its effect is dependent on the sub-type of autism exhibited [[link](#)] and NA is reportedly helpful in addressing some of the medical co-morbidities that accompany autism. [[Link](#)] TSO has been reported to efficiently dampen allergic airway hyper-reactivity [[link](#)] and has been claimed to be very effective in the treatment of food and contact allergies, [[link](#)] although less effective than NA against seasonal allergies.

As with other helminth species, TSO may cause transient side effects when first introduced, especially minor gastrointestinal problems and mild spasms.



*“TSO caused me a few days of looser stools and a rumbling gut, then it settled down around the 4 to 5 day mark.” [\[Link\]](#)*

In some people, temporary mild side effects may continue to be experienced following all doses in the long term.

*“I feel fine after 3 days of gut upset.” [\[Link\]](#)*

Approximately 80% of people who take at least one full course of TSO (10 doses, one of which is taken every 2 weeks), may achieve disease remission, and it has been claimed by the producer of TSO that around 60% of these subjects will continue to experience remission for between 1 and 3 years.

*“I finished taking them in mid 2013 and am seeing the effects starting to wear off now (late 2015), so the 10 doses appear to last for about 2 years.” [\[Link\]](#)*

During this time, some users of TSO may not need any further doses at all, while others might need to take an occasional supplementary dose. By taking further doses every 2 or 3 months, some subjects have been able to maintain remission for many years, although the level of success is likely to depend on the severity of a subject's condition at the start of treatment. One individual with ulcerative colitis has reported being in remission for 9 years after taking a single course of TSO during a clinical trial.

There are, however, at least some users of TSO who don't continue to experience benefit after completing a course of 10 doses, and these individuals need to maintain the treatment long term.

*“I did not go into remission though with 10 doses of 2500 TSO.” [\[Link\]](#)*

### **HDC (*Hymenolepis diminuta* cysticercoids)**

While anecdotal evidence about this latest addition to the list of therapeutic organisms is still limited in comparison with that available for NA and TT, pointers are emerging in the helminthic therapy groups, where reports indicate that the HDC experience follows a similar course to that seen with other helminths, beginning with the possibility of initial transient side effects, and leading to eventual success in many cases.

As with the other therapeutic helminths, HDC can cause initial side effects, some of which have been found to be quite challenging by a few users.

*“HDC does not have less side effects for everyone, it caused me a huge amount of discomfort.” [\[Link\]](#)*

And it has been reported that approximately 1% of paediatric patients may experience severe gastrointestinal pains with the use of HDC, although these symptoms are resolved by the administration of an anthelmintic drug. [\[Link\]](#)

A number of successes have been reported by HDC users, e.g.,

*“... my hay fever has been much better on HDC. Barely noticed it this year.” [\[Link\]](#)*

as well as some failures, e.g.,

*“... I'm on HDC and they do not seem to help with food reactions sadly, i was ready to run for a 1kg bar of chocolate in the name of science!”*

There are reports from subjects who have previously used NA that the effects of HDC can be gentler and more subtle than those produced by hookworms.

*“HDC seemed gentler / more subtle all around than NA”*

but others have obtained more relief after adding, or switching to, NA.

*“After I'd been taking HDC for a while and established that there is no extra benefit for me in hosting HDC as well as NA, I killed off the hookworms to see what the HDC could do on their own. Unfortunately, nasal congestion returned within 48 hours of terminating the NA, and this persisted to such an extent that, after 5 weeks, I was desperate to restock with hookworms. Within two days of taking a dose of 40 HW larvae, the congestion receded. In the weeks that followed, I experienced symptoms that are typical after inoculating with NA, indicating that the HDC, which I had continued to take, were not effectively modifying my immune response to the new NA.”*

HDC users frequently report a welcome elevation in mood, especially in the first few days after inoculation.

*"I like how it (HDC) puts me in a good mood for a day or two when I first take it."*

However, HDC can also have an adverse effect on mood.

*"The response I had from the HDC was sweating, feeling sick but it was also especially agitation and depression." [\[Link\]](#)*

*"I'm 1 week in, and the one HDC impact that I can be pretty certain of has been on my mood. The first night and into the following morning, I was ecstatically happy, like totally giddy, and it was great. Then on the fourth night and into the following morning I was in the throes of an anxiety greater than I have ever known... I have never experienced the kind of hopeless anxiety that I did that night." [\[Link\]](#)*

As larger numbers have begun using HDCs, more reports of adverse side effects have emerged. These have revealed transient problems very similar to those seen with hookworms, but have also included reports of a need for larger doses once the "honeymoon period" of the first 6 months is over, and continuing into the long term.

The fact that a fresh dose of HDC needs to be taken every two weeks, coupled with their very short shelf life, means that maintaining a regular dosing schedule can be an issue with this species.

*"I did once miss a dose for 30 days, and there was hell to pay on that account. My immune system went crazy for about a week, until I could get a new dose." [\[Link\]](#)*

*"My supplier shipped the HDC to the wrong address and a second attempt did not arrive." [\[Link\]](#)*

More examples of users' experience with HDC can be found in the **HDC Experience**, one of the documents in the [Files section](#) of the Facebook Helminthic Therapy Support Group.

In June 2016, a researcher at Duke University commented that William Parker's team had been unable to determine much difference between the effect of HDC and TSO. [\[Link\]](#)

## Comparing human helminths with non-human helminths

NA and TT have both become very well adapted to living in humans during millions of years of cohabitation and coevolution with mankind. This longstanding relationship allows them to grow to maturity in the human gut and enter into an on-going, dynamic, two-way chemical dialogue with their host's immune system. The resulting immune modulation prevents the worms from being overwhelmed, and provides their host with benefits that are maintained for as long as the worms survive.

The survival of human helminths depends to a large extent on the vigour of the host's immune response. NA is reported to survive for 3-10 years [\[link\]](#) but to be capable of living for up to 15 years, [\[link\]](#) and possibly even 18 years. [\[link\]](#) However, in a few hosts, it may die in as little as three months. TT can survive for more than 2 years, but may die in under a year.

TSO and HDC are both adapted to non-human species, the natural host of the former being the pig, and the latter normally being found in rats. As the human gut is an alien environment for both these organisms, they only survive in humans for a short time, typically just a couple of weeks, during which time the molecules they secrete/excrete distract the host's immune system.

The fact that TSO and HDC rarely mature in humans has led some commentators to speculate that these non-human helminths may not be as effective, therapeutically, as the human-adapted worms, NA and TT, and it may be that helminth efficacy is enhanced in the case of mature, egg-producing worms. [\[Link\]](#)

The view that human-adapted helminths such as NA and TT might be more effective, therapeutically, than non-human worms like TSO and HDC, was discussed in detail in this [support group thread](#). This idea has also received support from [William Parker](#), who has referred to human helminths as our true "old friends", and TSO, HDC and other helminths that prefer non-human hosts as, at best, our "old semi-acquaintances."

People who have switched from using TSO to either NA or TT have often done so because they are much cheaper. However, many who have made this transition have subsequently commented that they have found the therapeutic benefits of NA and TTO to be greater than those of TSO.

*"I previously tried TSO and it dampened the UC somewhat, but not to the extent that human whipworms (TT) have." [\[Link\]](#)*

*"I tried pig whipworm way back but it had zero effect on me. It wasn't until I got on human worms (both NA and TT) that I saw the extreme positive effects that the worms give." [\[Link\]](#)*



## Response time

All the helminth species have shown themselves to be capable of producing surprisingly rapid results in some cases, although benefits rarely become consistent with any species until at least 12 weeks after the first inoculation.

Some self-treaters have reported that the non-human helminths, TSO and HDC, have produced benefits more rapidly in their case than the human helminths, NA and TTO.

*"TSO relieves my symptoms the quickest of all helminths."* [\[Link\]](#)

*"They (TSO) started working after the second dose."* [\[Link\]](#)

*"After one week of ingesting 2500 TSO, I am delighted to report that I am breathing like a person who doesn't have asthma or allergies. I blew a 430 on my peak flow monitor, which is excellent for my age and height. Before therapy, the best I could do was 350. My nasal congestion is markedly improved as well."* [\[Link\]](#)

*"HDC is very fast acting for me... By the 3rd or 4th day my burning sore lungs are no longer sore."* [\[Link\]](#)

However, HDC and TSO have not always delivered benefits so quickly.

*"TSO took 4½ months to kick in for me..."* [\[Link\]](#)

*"... about this assumption that HDC works faster. It definitely doesn't for me."* [\[Link\]](#)

And there are reports of NA delivering rapid benefits in some cases.

*"It's been exactly a week since my first inoculation of 25 HW... my asthma got much better at day 2. Also my allergies seem to have gotten a little better... I feel great right now actually. Its awesome to be able to breathe in a 100%"* [\[Link\]](#)

*"On the second day after my new gut buddies (NA) moved in, their ministrations brought significant relief from the nasal congestion that I had had, on and off, for most of my life."* [\[Link\]](#)

## Shelf life

After extraction from beetles, HDCs will not survive for more than 48 hours if kept in saline, or 2 to 3 weeks if stored in the special nutrient solution developed for this species by Biome Restoration. Doses of HDC from sources other than Biome Restoration will deteriorate rapidly after extraction, so should be used within 24 hours of being harvested - not 24 hours after receipt.

NA larvae can remain viable for many weeks, but it is recommended that doses of NA be used as quickly as possible, and preferably within 3 weeks of shipping.

In contrast, whipworm ova (both TSO and TTO) can remain viable for a couple of years if stored in a refrigerator, so keeping a supply of these in reserve can be a useful insurance for users of NA against the loss of their colony, or an interruption in its benefits following the use of antibiotics. Since TSO usually produces results more rapidly than TTO, this is the ideal species to keep for such an emergency.

*"I keep TSO for emergencies, such as, if I have to take antibiotics, or I accidentally ingest something that harms my (human) helminths."* [\[Link\]](#)

## Dosing frequency

A disadvantage of the need for regular re-dosing with the non-human helminths (TSO and HDC) - every 2 or 3 weeks in most cases - is that this can result in self-treaters forgetting to take doses, and a few HDC users have reported experiencing a return of symptoms if they have deviated from the usual fortnightly dosing regimen. These include the mother of a child with Crohn's disease who reported that he began to bleed on two occasions as a result of delays in taking his doses of HDC, and others have reported suffering a sudden return of symptoms due to delays in taking HDC.

*"Missed a dose, no fault of anyone, life just got in the way... Been w/o for a month. Horrific dysautonomia, which is constant dizziness, neck pain..."* [\[Link\]](#)

*"I did once miss a dose for 30 days, and there was hell to pay on that account. My immune system went crazy for about a week, until I could get a new dose."* [\[Link\]](#)

It is also possible to forget to re-dose with NA and TTO but, since human worms don't usually all die at the same time, the return of symptoms in their case is normally much more gradual, so users of NA and TTO can forget about dosing until they begin to see a gradual return of the symptoms of their disease, which typically only occurs every few years.

## The “bounce” and other neuropsychiatric benefits

The “bounce” is a brief period of temporary, yet sometimes profound symptom relief that is accompanied by a sudden feeling of unusual wellness, and perhaps also by a strong sense of calm, focus, happiness and lightheartedness.

All the therapeutic helminths can produce this effect and, when it occurs after inoculating with hookworms, it does so in the first few weeks following inoculation, typically around the end of week one, perhaps as early as day five and even as late as week two. It may appear for only 3-4 days but can last about a week and, rarely, for two or even three weeks. It may appear more quickly after taking TSO or HDC.

*“I also experienced a significantly elevated mood that night after taking just 10 HDC, the elevated mood lasted until the end of the next day.” [\[Link\]](#)*

*“I get a nice “bounce” (from TTO) that lasts for about a week...” [\[Link\]](#)*

*“My mood was the first indicator that TSO was working. I became calmer and happier despite my physical symptoms.” [\[Link\]](#)*

One advantage of using the organisms that are dosed every couple of weeks (TSO and HDC, as well as TTO which can be taken at similarly frequent intervals) is that this regular dosing regimen can produce a “bounce” after every dose.

*“... every dose of HDC's is followed by a delightful stream of energy that lasts almost a week.” [\[Link\]](#)*

*“I almost always get that lovely “bounce.” My thinking becomes clearer and my mood becomes calmer and more content. It happens when I top-up with TTO or TSO, not as obvious with NA.” [\[Link\]](#)*

However others have found that this effect may reduce over time.

*“The first day I take HDC it usually puts me in a really nice mood, especially the first time I did it. It's not exactly euphoric but I noticed it and counted on it... First time, (it lasted) 48 hours. Second time, 24 hours. Third time, 12 hours. Fourth time, 12 hours.”*

Although NA is dosed much less frequently than the other therapeutic helminths, it too can deliver a very pleasant “bounce” in the first few weeks.

*“My (NA) bounce effects: increased energy/decreased fatigue; able to tolerate lower temperatures without usual adverse reactions; able to tolerate foods with less adverse reactions; reduction in eczema inflammation and clearer complexion (observed by wife!!!); increased sense of emotional well being; increased quality of sleep - had first dream I could remember the details of for longer than I can recall.” [\[Link\]](#)*

Users of NA have also reported long-term improvements in neuropsychiatric function, and the potential for NA to enhance mental health can be seen from the accounts in the **Anxiety** and **Depression** sections of the **Helminthic Therapy Success Stories** collection, and from comments such as the following, the first of which was made 6 weeks after inoculation with 25 NA larvae.

*“What is already interesting is my steady and calm mind.”*

*“I have been depressed most of my life. That eased a bit with IV magnesium. But it changed dramatically about 20 weeks after starting hookworms. My mood improved dramatically and I just felt happy - my psychological issues just disappeared.” [\[Link\]](#)*

## Hosting multiple worm species

It is clear, both from scientific studies and the personal experience of helminthic therapy self-treaters, that a single species of worm is all that is required in most cases to modulate host immunity and halt existing immune-related disorders, as well as protecting the host from the development of many other conditions associated with a helminth deficiency. However, different species of helminth can produce different effects.

*"I use 3 species of helminths and each one has particular characteristics and effects."* [\[Link\]](#)

*"I reacted to HDC and HW completely different..."* [\[Link\]](#)

And researchers have hypothesised that exposure to multiple intestinal worms may promote even stronger immunological regulation. [\[Link\]](#)

One particular benefit provided by hosting a second species of worm is that this may help to reduce the increased attrition sometimes experienced in cases where subjects have a disease affecting the preferred location of the worm species they're already using. For example, subjects with Crohn's disease are susceptible to inflammation in the small intestine, which is where NA resides, with the result that these worms have more difficulty attaching in order to feed. Consequently, they tend not to survive in Crohn's patients for as long as they might do in hosts with other diseases.

It may therefore be advantageous for Crohn's sufferers to host a second species that lives elsewhere, such as TT or TSO, both of which live in the colon. Similarly, subjects using TT to treat colitis may have difficulty maintaining a whipworm colony due to colonic inflammation hampering attachment by these worms, so they might benefit from also hosting NA which contribute systemic inflammation control.

Another possible reason for users of NA and TT to add a further species would be to ensure a more rapid response when first commencing therapy. Temporarily using either TSO or HDC at this point might speed remission, since these species are reported to produce rapid results more reliably.

*"I do think starting with TSO is great because you get a therapeutic colony right away. Also, I think having the TSO on board minimizes side effects from the human worms."* [\[Link\]](#)

TSO or HDC could also be useful to hosts of NA if their colony were to sustain accidental losses following the use of some types of antibiotic, for example. TSO is ideal for this purpose since, unlike HDC, this organism remains viable for years if kept in a refrigerator. A supply of TSO could therefore be kept in reserve by users of NA to provide assurance that they will never be without the benefits of worms.

*"... what really helped her ... was 2 doses of TSO that she had while waiting for the (hookworm) colony to start working again."* [\[Link\]](#)

*"Keeping TSO on hand to bridge the gap while rebuilding a (hookworm) colony works for me too."* [\[Link\]](#)

This may not be necessary for users of TT if they are dosing on a regular basis, in which case they will usually have a supply of TSO in their fridge that they can reach for if required.

If switching from one species to another, there may be a hiatus in benefits until the new species is able to fully take control of immune modulation, so it may be best to maintain the previous species until this point.

*"I took HDC for a year. HDC worked really great. I felt very well... Changing from HDC to TSO was like starting from scratch. All my symptoms came back and took 4½ months to get back to where my best was while taking HDC."* [\[Link\]](#)

## Helminthic therapy in practice

Helminthic therapy is contraindicated for subjects with certain diseases, and some conditions require a much more gradual approach to dosing. An experienced provider can help to ensure that the self-treater's suitability for the therapy is carefully assessed, based on their medical history, and that a dosing regimen is determined that will enable them to make progress as quickly and cheaply as possible while avoiding the worst side effects.

*"I now realise that the dosage, intervals and maintenance of Helminthic Therapy is ongoing and requires lots of attention, which if I'm being honest I wasn't expecting."*

*"Self treatment is hard. I'm still figuring out the right species and number of worms best for me, 5 years into this. For some of us, it's much more complicated than 'take worms, get better.'"*

The **Hookworm Dosing and Response** document contains much more detail about the use of NA. This guide, which is essential reading for anyone considering self-treatment with NA, is available from the Files sections of the [Facebook Helminthic Therapy Support Group](#) and the [Yahoo Helminthic Therapy Forum](#). For a detailed explanation of what to expect after inoculating with NA, see the [Hookworm Timeline](#).

Helminthic therapy is typically very slow to deliver benefits when compared with drugs. For the majority who do respond, significant improvements do not usually materialise until at least 3 months after the first inoculation, with most people only seeing improvement in their condition between 3 and 5 months. Some may only start to improve between 6 and 12 months and a few may even have to wait for as long as 18-24 months.

Once improvements do begin to materialise, some people can experience a sudden and dramatic reduction in symptoms, while others may respond more gradually over a period of time, possibly three years or more.

Helminthic therapy is also not a one-size-fits-all solution, nor a one dose fix. Dosing needs to be tailored to the unique needs of each individual, and continued indefinitely in the vast majority of cases.

It is not yet possible to predict exactly who is likely to benefit from helminthic therapy, but statistics compiled from responses to a survey carried out by one provider of human helminths showed that 70-80% of those who self-treated with NA experienced an improvement in their health. [[link](#), [link](#), [link](#)] The [report](#) of a [survey](#) conducted by researchers from Duke University showed that treatment with HDC was effective in more than 90% of cases, although this apparently higher efficacy of HDC in comparison with NA is likely to be at least partly due to the fact that users of HDC tend to be relatively less ill than those who use other therapeutic helminths.

Helminthic therapy is not always a complete solution on its own, and some self-treaters need to combine this therapy with other treatments, either complementary or pharmaceutical. For example, one subject has said:

*“My personal efficacy is quite low without entocort. Without it, I need to take the HDC about weekly to get any effect on my sinuses, and the effect still isn't as good as with it.”*

There are many examples of both successful and unsuccessful outcomes in the [Helminthic Therapy Success Stories](#) collection, which presents thumbnails, with links, to more than 460 personal accounts by people who have used helminthic therapy to treat almost 100 different medical conditions.

There are very few doctors who understand helminthic therapy, let alone have any practical experience with it, although a few medics are using HDC in some client groups, especially children with autism [[video](#)] and a few doctors may recommend that patients with various autoimmune conditions try TSO.

Experience with the human helminths, NA and TT, is almost entirely limited to self-treaters and their commercial suppliers, who, together, know far more about how to use human helminths to improve health than the vast majority of doctors and medical researchers. In addition to the resources in the Files sections of the [Facebook Helminthic Therapy Support Group](#) and the [Yahoo Helminthic Therapy Forum](#), the helminth providers are an excellent source of information about the organisms that they sell. This being the case, the following FAQs by the helminth providers are an invaluable source of information.

[Autoimmune Therapies FAQ](#) (NA and TTO)

[Worm Therapy FAQ](#) (NA and HDC)

[Biome Restoration FAQ](#) (HDC)

[Wormswell FAQ](#) (NA)

[Symbio FAQ](#) (NA)

Since this therapy is still at the experimental stage, there are not yet any definitive guidelines for its use. Therefore, each would-be helminth self-treater should familiarise themselves with as much information as possible before proceeding. The documents in the Files sections of the [Facebook Helminthic Therapy Support Group](#) and the [Yahoo Helminthic Therapy Forum](#) are there to help self-treaters with this process, and they represent the best information available beyond what can be gleaned about each species from those who supply them.

## Working with a doctor

Using helminthic therapy is very similar to taking a bacterial probiotic, which most people do without involving their doctor, but it can be helpful to have the support of a physician while self-treating with helminths. For example, they will be able to prescribe an immunosuppressant drug to ease helminth side effects if these become unduly troublesome, or prescribe an anthelmintic drug if termination of a worm colony were to become necessary. But exactly how much to involve a physician is a matter for each self-treater to decide for themselves, based on their knowledge of their own practitioner.

Helminthic therapy is currently not an approved treatment anywhere in the world, so few doctors are willing to condone it. Since many fear losing their licence, it's important not to ask for a doctor's permission to pursue the therapy, nor request their co-operation in it, as this could place them in a difficult position. All that is required from a doctor is that they continue to provide their patient with the routine medical care that they normally provide while the patient is using the therapy.

If a helminthic therapy self-treater decides to tell their doctor what they are doing, the language used can be important, because, if a doctor thinks that their permission or approval is being sought, they may feel they have no choice but to refuse to cooperate with the patient in any way. However, if they are simply informed of the patient's intention to pursue the therapy, this lets the doctor off the hook and gives them the option of ending the relationship if they feel uncomfortable about it.

One HT self-treater who found it necessary to locate a new doctor in order to obtain a prescription for prednisone to help ease the initial side effects after inoculating with hookworms did this by identifying all the most alternative and "hippie-looking" doctors in his area and emailing them. While most of them declined to help him, two agreed, and the one he selected carried out before-and-after blood tests and was willing to prescribe whatever he needed.

## Combining helminthic therapy with drug treatments

No problems have been reported by anyone starting HT while already taking one of the following immunosuppressive medications.

**Cyclosporin**; synthetic **corticosteroids** including **prednisone** and its active metabolite, **prednisolone**; the **thiopurines**, **azathioprine** and **mercaptopurine**/6-MP (purinethol); the **TNF inhibitors**, **infliximab** (Remicade), **adalimumab** (Humira), **certolizumab pegol** (Cimzia) and **golimumab** (Simponi); **humanized antibody** drugs, e.g., **omalizumab** (Xolair); **humanized monoclonal antibody** drugs such as **natalizumab** (Tysabri); and **recombinant fusion protein** drugs such as **etanercept** (Enbrel).

In fact, it can be an advantage to be taking one of these drugs in the early stages of helminthic therapy because they reduce, and often completely prevent, the transient side effects often caused by the introduction of helminths.

People who are already taking a daily dose of prednisone when they begin helminthic therapy - often 15 or 20 mg per day - experience little or no side effects after inoculation, and those who have used this drug on a short-term basis specifically to reduce side effects have found that 5 or 10 mg per day is usually sufficient for this purpose.

*"We've found that a half-pill (5 or 10 mg?) of Prednisone per day is enough to kill any of those symptoms from dosing."* [\[Link\]](#)

*"I was having bad diarrhea every day from worm flu starting around week three or four. 5mg of prednisone per day helped a lot (I'm 135 pounds). I am in week 7 now and stopped taking prednisone a few days ago (after tapering off)."* [\[Link\]](#)

*"5-10 mg/day completely alleviated my GI symptoms after my first inoculation."* [\[Link\]](#)

If prednisone is used specifically to relieve side effects, the prescribing doctor will determine a taper to wean their patient off the drug and, if the symptoms return, they may be willing to defer the taper.

Since immunosuppressive drugs can help human helminths to become established by reducing intestinal inflammation, anyone who is already on one of these drugs should resist the temptation to stop taking them too soon after starting helminthic therapy and, since the majority of those who respond to this therapy don't see significant benefits until at least 3 months after their first inoculation, it would arguably be unwise to stop taking an immunosuppressant drug before this. In fact, many users have found it best to continue with the drug treatment beyond this point because some people only start to improve between 6 and 9 months, some only after 9 months, and a few not until between 18 and 24 months. And even helminth hosts who see early benefits can continue to experience periodic exacerbations or flares of their disease for up to 2 years.

In view of this wide variation in experience, each individual must decide, in consultation with their physician, how long into their therapy to continue with an immunosuppressive drug before beginning, very slowly, to taper the dose. However, one human helminth expert has been very specific about this and advised waiting until a full therapeutic colony of hookworms or human whipworms has been in place for eight months, or five months have elapsed after achieving a substantial improvement in symptoms. [\[Link\]](#)

This is particularly important for subjects with Crohn's disease, or one of the other intestinal diseases, because they tend to have a very vigorous immune response to helminths, so suddenly stopping a drug that has been keeping this response in check may cause a rebound effect that could result in a flare and, potentially, a loss of worms.

A few drugs are harmful to helminths, and those that can adversely affect NA and TT are listed in the **Human Helminth Care Manual** in the Files sections of the [Facebook Helminthic Therapy Support Group](#) and the [Yahoo Helminthic Therapy Forum](#). These drugs include oral and injected antibiotics, the effects of which can be such that there may be little point in anyone using NA, and possibly TT, if they need to take antibiotics regularly, or on a long-term basis. Those drugs that are incompatible with TSO are listed [here](#), and those that are best avoided by users of HDC are listed briefly [here](#).



## Helminth providers

This section contains a lot of detail that is critically important for anyone looking to obtain therapeutic helminths, but feed-back indicates that a significant number of readers overlook some of the details that are most important to them. Since this has caused unnecessary inconvenience and increased expense in several cases, readers are urged to review the following details very carefully.

While four of the companies sell their products by the dose, two only offer contracts for 2 or 3 years, so, to assist readers in comparing the cost of obtaining helminths from each of the companies, the approximate *annual* cost from each company is shown in bold.

If you are unable to have your selected helminths delivered direct to your home, you could have them shipped to another country and either travel there to collect these yourself, or arrange for someone who lives there to receive and re-ship them to you. However, a potential problem with traveling to collect hookworm larvae is that these may succumb to freezing during transit, including while in the cargo holds of planes, so doses may be dead on arrival at their destination, potentially resulting in a wasted journey for the person collecting them.

Most of the following details were supplied by the providers themselves and were believed to be correct at the time of publication, but they may change without notice, so should be confirmed by contacting the providers directly.

### Tanawisa

Founded: 2004.

Owner: Detlev Goj.

Organism: TSO.

**Ships worldwide, excluding Russia.**

Supplies doses of 500, 1,000 and 2,500 ova, with special offers on packs of 10 doses.

**Cost per year: \$5,200** for the most frequently used dose size of 2,500 ova, if taken every 2 weeks and purchased in multiples of 10 doses. A very small number of users may require up to 7,500 ova every two weeks.

Individual discounts are available.

Customer support is provided via telephone and email.

### Autoimmune Therapies (AIT)

Founded: 2007.

Owner: Jasper Lawrence.

Organisms: NA and TTO.

**Ships worldwide, including to the US.**

Supplies doses of various sizes, determined according to each client's individual needs.

Offers a 3-year contract for \$2,900 which includes all doses required and unlimited customer advice and support.

**Equivalent cost per year for each of the first 3 years, for either NA or TTO, is approximately \$1,000, reducing to \$750 per year from year 4.**

Payment plans are available, and **discounts** in validated cases of financial hardship.

(NB. Response to emails can be very slow, and reliability fluctuates.)

### Worm Therapy

Founded: 2008.

Organisms: NA and HDC.

Based in a clinic in Tijuana, Mexico.

(This provider declined to provide or confirm any further details for inclusion here, citing the US FDA's regulations and **import policy**. The details that follow have been gleaned from other sources.)

**So far as is known, NA and HDC are shipped to all destinations, excluding the US.**

Offers a 2-year contract for NA costing \$2,000, which includes all doses required and full customer advice and support, but US residents have to collect their doses in person from the clinic in Tijuana.

**Equivalent cost per year for NA is approximately \$1,000.**

**HDC are priced per dose.**

### Biome Restoration Ltd

Founded: 2013.

CEO: Judy Chinitz.

Organism: HDC.

**Ships worldwide, including to the US.**

Supplies doses of various sizes on a pay-per-dose basis, with discounts for multi-vial purchases.

**Cost per year: £750 (pounds sterling) for customers outside the UK who require 30 HDC every 2 weeks, ordered via automatically renewing subscription, or £900 (pounds sterling) including VAT for UK residents.**

International delivery and expedited delivery options are extra, and some individuals may need doses of more than 30 HDC and/or more frequent dosing. For example, some users take 60 HDC every 2 weeks, or 30 every week, either of which will double the cost.

No medical advice is provided, but assistance is available with how to use the HDC.

## Wormswell

Founded: 2014.

Owner: Nathan.

Organism: NA.

**Ships worldwide, excluding the US.**

Will supply a dose of 5 larvae for \$85 USD, 10 larvae for \$130 USD, or between 25 and 40 larvae for \$200 USD.

**Cost per year: variable.** [\*]

Payment is only accepted in Bitcoin.

Communication is via email only.

No medical advice is offered, but information about the therapy is provided, along with email support.

## Symbbio

Founded: 2016.

Contact: Simon.

Organism: NA.

**Ships worldwide, including to the US.**

Supplies doses of various sizes on a pay-per-dose basis according to individual requirements. A single dose costs \$200 USD and there is a special introductory offer of 3 doses for \$450 USD, valid for 2 years from the date of purchase.

**Cost per year: variable.** [\*]

Payment is currently only accepted in Bitcoin.

Communication is via email only.

No medical advice is offered, but information about the therapy is available, along with email support.

[\*] With providers who sell hookworms by the dose, the actual cost is dependent on the number of doses that might be required to achieve disease remission. In some cases this might only be a single dose, while, in others, an eventual colony size of between 100 and 150 hookworms may be required. Further doses will also be needed, over time, to offset losses due to gradual attrition, which varies greatly between individuals, a few of whom may need supplementary doses up to 4 times each year, indefinitely. Replacements would also be needed following any accidental losses due to the use of certain general anaesthetics, some antibiotics and a few other substances, all of which are detailed in the **Human Helminth Care Manual** in the Files sections of the [Facebook Helminthic Therapy Support Group](#) and the [Yahoo Helminthic Therapy Forum](#).

There are individuals who are supplying HDC and charging a wide variety of prices, from no cost at all up to 8 times more than the prices charged by Biome Restoration. This is mainly happening in the US, where the supply is often routed through, or arranged by, medical practitioners who are serving the autism community. However, most if not all of the HDC supplied by these individuals are placed in saline so may not be viable unless used within 24 hours of being harvested (not 24 hours after receipt). [\[Link\]](#)

## Choosing a provider

The savvy 21st century consumer will understandably be hesitant about handing over their hard earned cash to an internet worm trader, so may wish to solicit testimonials from others before committing to buy. However, purchasing helminths for therapy is not like buying a regular consumer product, and testimonials about helminth providers will actually not help most prospective users of helminthic therapy. All the providers listed above are trustworthy vendors, but they don't all ship to every country and, as can be seen from the details above, they each offer different organisms, services and pricing options, all of which need to be considered carefully by each prospective buyer. In most cases, the decision about which provider to use will actually make itself, depending on the choices that are made regarding the options.

Once the information in this document has been used to determine which organism is likely to be best for the individual, the choice of provider will immediately be narrowed down to between one and four companies and, if there are still decisions to be made about the other options, these will reduce the field further, often to a single company, which is why there is no point in seeking provider recommendations from other self-treaters.

It must be remembered that these companies are commercial entities and, as such, their owners are keen to promote their own products. This can result in some of them occasionally exaggerating the benefits of their own worms and/or misrepresenting the attributes of the worms sold by their competitors, sometimes even claiming that their own worms are cleaner, safer or more powerful than the alternatives, or that their competitors' products will cause worse side effects, and possibly even multiply within a host or mis-migrate to the wrong parts of a host's body. However, none of these claims is true for any of the four helminth species discussed in this document. (See [this study](#).)

## Considering the cost of helminthic therapy

At first sight, helminthic therapy may appear to be expensive, especially to those who live in countries with free health care, but a number of factors need to be taken into consideration, including the following.

1. Compared with other treatments used for the conditions that helminthic therapy treats, it is extremely cost-effective. For example, TSO, which is the most expensive of the therapeutic helminths, is only 1/5th of the cost of Remicade, and the other helminths are considerably cheaper than this.

*“What we ended up paying for 3-years worked out to be cheaper than any hospital bill we would ever get.” [\[Link\]](#)*

*“I’ve spent a fortune trying to get well with very little success. My human helminths will be \$2900 for 3 years. That seems like a bargain at a little less than \$1000 a year.”*

*“It may sound like a lot up front, but depending on the health issues you are treating it can save money in the long run. I have been on HWs for about a year and I have decreased my medication, stopped my twice monthly IV therapy that cost \$145/bag, and reduced my visits to the doctor. In addition I feel better and my quality of life has improved tremendously, for which there is no price tag.”*

*“I have actually spent more on various probiotics each month.”*

2. There is a good chance that helminthic therapy users will be able to earn more after treatment than they could before.

*“Since taking helminth therapy I am able to work, full time and then some, allowing me to make money to support myself and have a meaningful life of contribution and giving, instead of going broke, being a burden and dependent on charity. For those who think Helminthic therapy is expensive I suggest you recalculate the cost of your health care bills and the value of quality of life. I am grateful for helminthic therapy and for those who make it possible. It has literally saved my life!” (Subject with Crohn’s disease.)*

*“Coming up to 3 year anniversary of starting Helminthic therapy. Overall things very good. No significant relapses. Holding down very well paid job and loving it.” (Subject with Multiple Sclerosis.)*

3. People who smoke, and many others with a variety of interests and hobbies, often pay out far more than the cost of helminths just to provide themselves with pleasure and entertainment.

4. Please look *\*carefully\** at the details presented above for each of the providers. There is considerable variation in what is on offer. The options include discounts and payment plans and you may be able to work out something unique if you talk to each of the providers who are offering the species of worm that you want.

If you still can’t find a package that you can afford, there is always the option to grow your own NA, HDC or TTO, and incubating the first two of these is within the ability of most people if they follow the detailed instructions that are available in the Files section of the [Helminth Incubation group](#).

However, if you intend to use hookworms, it is recommended that you obtain your starter dose from an established provider because this will avoid the risk of possibly acquiring a different species of worm, or an unwanted infection, from a donor. See [“Hookworm incubation issues”](#) below for more about the risks.

## DIY helminth incubation

Of the four species of helminth being used in therapy, three are suitable for home incubation.

1. Rat tapeworm, [Himenolepis diminuta](#) (HDC)
2. Human hookworm, [Necator americanus](#) (NA)
3. Human whipworm, [Trichuris trichiura](#) (TT/TTO)

The [Helminth Incubation group](#) on Facebook is dedicated to the discussion of the cultivation of these three species, and its Files section contains a number of different incubation methods for them.

The only therapeutic helminth that is not being cultivated on a DIY basis is TSO, the ova of the pig whipworm, [Trichuris suis](#). The incubation of this helminth not only involves a complex process spanning many months, but it also necessitates the use of pigs, which introduces a potential risk of TSO recipients becoming infected with the porcine tapeworm, [Taenia solium](#), which can cause epileptic seizures and other neurological problems in humans

as a result of its larvae entering the bloodstream and forming cysts in the brain. Due to this risk, donor pigs need to be maintained in sterile conditions, as they are by Tanawisa, the only commercial producer of TSO.

In terms of risk, HDC is the least problematic, since only a small number of cysticerci (perhaps between 0 and 60) will be found in each beetle dissected, whereas a single batch of TTO or NA may contain thousands of infectious organisms, with a potential to cause serious illness if not very carefully managed during incubation and inoculation. For example, one of the risks with TTO is that, if too large a dose was ingested, this could cause [rectal prolapse](#). TTO is also more challenging to grow than either HDC or NA.

There is additional risk attached to using organisms obtained from private growers, due to the possibility that some, or all, of these may not be the species they are claimed to be, or that they, or the liquid containing them, may be contaminated by other microorganisms. It is therefore recommended that any incubation process is begun by obtaining a dose of the organism to be cultivated from a reputable commercial source that guarantees its product contains only the specified species and that this is free from contamination by any other organism.

HDC and NA are both available for purchase as a single dose. (See the list of providers, [above](#).)

An online [group](#) was set up to facilitate the exchange of materials between private hookworm growers, although willing donors are still difficult to find.

*"I am in the US and have had no luck in finding a donor and just gave in and bought my doses..."* [\[Link\]](#)

Also, anyone pursuing this option must be cognizant of the attendant risks and, before commencing, should explore the legality of doing this in their particular locality.

What regulations there are are often imprecisely defined, so are open to interpretation, making it difficult to predict exactly how a regulatory authority might react if someone in their jurisdiction were identified as having supplied or received helminths, or been involved in their cultivation.

While the precise legal position concerning helminths is still uncertain and untested in many countries, it is clearer in the US, where hookworms, whipworms and rat tapeworms are currently classified by the Food and Drug Administration as biological agents (i.e. drugs), as defined in Section 351 of the Public Health Service Act, and subject to an [Import Alert](#).

## Hookworm incubation issues

Some would-be hookworm hosts may consider traveling to an area where these worms are endemic, in the hope of deliberately acquiring their larvae in the same way that the locals do - accidentally, by walking barefoot in open-air latrines. For a number of reasons, this is not a good idea, as is explained [here](#) by someone who did this.

Anyone seeking hookworm larvae from someone who is already cultivating their own supply, or faeces containing hookworm ova, needs to consider several issues. Included amongst these is the risk of inadvertently acquiring a different type of helminth, such as the less desirable species of hookworm, [Ancylostoma duodenale](#), which causes nine times more blood loss than the therapeutic hookworm, NA, and can be passed in a mother's milk and even cross the placenta to infect a foetus. Even more risky is the roundworm, [Strongyloides stercoralis](#), which is autoinfective and potentially hyperinfective, with a [risk of fatality](#). The eggs of both these species are virtually identical to those of NA.

Another issue is that an untested donor may prove to be a source of any one of a range of pathological bacterial and viral infections.

*"I've been asked by over 20 people to donate feces, but I always refuse, one because I don't want to be responsible if something goes wrong, and two, I have IBD and terrible gut flora and don't want anyone exposed to my possible gut pathogens."*

Yet another often overlooked issue is the risk of legal action against a donor of hookworms or hookworm-infected materials.

The donation of larvae or infected faeces could expose the person supplying them to legal action by the recipient's relatives in the event of that recipient dying after using the donated material. The grieving relatives might sue the donor in the belief, whether right or wrong, that the donation was somehow responsible for the death of their loved one. Someone contemplating the use of donated materials may think that their relatives would never react in this way, but death can spark unpredictable and irrational behaviour in family members, and the fact that the organisms had been given away rather than being sold would not necessarily free the donor of liability. The outcome of such a scenario would only be revealed after it had been tested in a court of law, and this could be a very costly and stressful process for those involved.

There will be some, who, in spite of these issues, will decide to pursue the procurement of a donation of either hookworm larvae or infected faeces, and, in the latter case, will attempt to incubate the eggs thus obtained, but those who attempt hookworm incubation should be aware that not everyone finds this process as simple or straightforward as some others have.

Even with the help of good instructions, success is not guaranteed. A few people, especially those living in a suitable climate, have found hookworm incubation easy, but many others have failed, some of them repeatedly. Some, including highly educated professional individuals, have found that they just can't grow any larvae at all, whatever they try.

Here are comments, written with hindsight, by two of those who have tried to incubate their own hookworms.

*"I have a bio degree and took several micro labs and it still took me over 40 hours and several months to get incubation done right. Fortunately i was highly educated on safety."*

*"Although this is not rocket science, it is actually far more difficult to successfully incubate viable HW and produce safe doses than people realise. If nothing else, someone with no laboratory background is probably going to spend so much of their time getting this to work, it would actually work out far cheaper and much quicker to get a job on the side to pay for the therapy. Even with a strong scientific/laboratory background it will probably take many months at least to get your first dose, and that is assuming a significant amount of work each day on the incubations. Working with live organisms requires some art. It is not purely science."*

Those who consider growing their own hookworms tend to fall into two groups. Firstly there are those who genuinely can't afford the prices charged by commercial providers, and, fortunately, these individuals are able to secure discounts from some of the companies, and/or arrange payment plans. Secondly, there are those who choose the DIY hookworm culture route because they object to having to pay for the treatment on principle. Unfortunately, the sometimes reckless attitude displayed by some in this group not only threatens their own safety and possibly that of those around them, but could also have much wider implications.

A number of reports have already surfaced about people who have successfully incubated hookworm larvae but, then, due to a lack of appropriate knowledge, sloppy technique, or just plain carelessness, have taken unbelievable risks with their health. One individual attempted to collect larvae for inoculation without a microscope, using only a magnifying glass, while others have chosen not even to bother counting out a number of larvae with which to inoculate.

A medical doctor, who hosts therapeutic helminths himself, has reported seeing the arm of one individual who he estimated had probably inoculated with many hundreds of hookworm larvae at the same time, and possibly even thousands. The person's entire upper arm was completely covered by the resulting rash. Fortunately this individual sought medical assistance, was treated immediately with steroids, and followed the advice he was given to eliminate the worms.

This experience serves as an example to all who might consider DIY hookworm culture. Even though this individual is well educated and has a job requiring intelligence, his research had obviously not been sufficiently thorough to ensure his safety, and this scenario is unfortunately repeated all too often.

What is perhaps of greatest concern about incidents like this, is that their ramifications could extend well beyond the people who are directly involved. If news of such a story were to be picked up by the media, it would undoubtedly be seized upon by news-hungry journalists and milked for profit by publishers. This publicity could result in regulatory crackdowns that could well impact the ability of others to access this therapy, and there are now thousands whose health depends on them being able to obtain helminths. There are also millions of others who are desperately ill, but have not yet heard about this therapy, and who, as a result of the actions of some thoughtless individual, might never get the chance to try it.

So it is hoped that anyone intent on hookworm incubation will take great care in sourcing their live materials, and then proceed with the utmost caution, conscious of their responsibility for the health and safety of others.

## Online support

### Facebook Helminthic Therapy Support Group

This is the largest and most active helminthic therapy group on the internet. It is a rich source of information, encouragement and support for those contemplating or already using the therapy.

### Yahoo Helminthic Therapy Forum

This was the original helminthic therapy forum, with a searchable archive of over 11,000 posts dating back to the first use of hookworms as a therapy in 2007.



Both of these groups have a Files section stocked with a range of documents created specifically to help enquirers understand the therapy, and to enable those who are already hosting helminths to manage their worm colonies more effectively.

*“Seriously, those files are some of the best references for any medical treatment I have EVER seen.”* [\[Link\]](#)

Included amongst these files is a [Hookworm Timeline](#) which details what a new host of NA can expect in the days, weeks, months and years following their first inoculation, and a [Human Helminth Care Manual](#) that sets out what is known currently about preventing harm to an NA or TT colony.

#### [Facebook Helminth Incubation group](#)

This group focuses on the discussion of all matters relating to the incubation of NA, HDC and TTO.

#### [Yahoo Hookworm Donors group](#)

This is a meeting place for people interested in the donation or receipt of hookworm larvae or eggs.

## Additional resources

#### [Helminth Therapy For Intestinal & Immune Health](#)

A pin board featuring links to more than 1,300 articles about helminthic therapy, gut health and their relationship with autoimmune diseases.

#### [Don't let worms give you the squirms!](#)

An article for those who are interested in helminthic therapy but are reluctant to try it because of an aversion to worms.

## Further information

Enquirers who use a search engine to locate information about helminthic therapy will find many good sources, such as research papers and the main sites of the helminth providers. Unfortunately, mixed in amongst these are many less good sources, including a veritable graveyard of neglected websites and blogs, many of which were created several years ago by people experiencing bursts of enthusiasm for the therapy but who have since reduced, or even ceased, their active involvement in the helminthic therapy community. Consequently, some of the information on these sites is out of date and may be misleading. In some cases, they may be perpetuating misconceptions about the therapy that date from a time when much about it was still a matter of conjecture.

Even the [helminthic therapy page](#) on the Wikipedia site contains inaccuracies and some very misleading details.

Authors who rely on these, and other less than accurate sources, or on academic papers that have been written from a narrow research perspective, inevitably also perpetuate inaccuracies.

By far the best source of information about helminthic therapy is the self-treaters who frequent the [Facebook Helminthic Therapy Support Group](#) and the [Yahoo Helminthic Therapy Forum](#), as well as the documents contained in the Files sections of these two groups.

## Disclaimer

The information in this document is offered for general informational purposes only. It is not intended for use in the diagnosis, cure, mitigation, treatment or prevention of any disease, nor as a substitute for the advice of a qualified healthcare professional. It has not been approved or evaluated by any governmental organisation concerned with the regulation of healthcare or drugs anywhere in the world. The accuracy, validity, effectiveness, completeness or usefulness of this information cannot be guaranteed. Anyone who chooses to make use of this information does so at their own risk and no responsibility or liability whatsoever is accepted for the use or misuse of this information by others.

## Document history

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