

# Low Energy Laser Treatment in General Practice

Dr Bernard Brom  
PO Box 2229  
Dennesisg  
Stellenbosch 7601



Curriculum Vitae

### Bernard Brom

Bernard was born in Cape Town where he studied at UCT and qualified with a MB ChB in 1965. He opened his own holistic private practice outside Stellenbosch in 1975 where he uses homeopathy, acupuncture, herbal medicine and other biological preparations. He is a specialist in low energy laser and has published various articles on complementary medicine and other biological preparations. He is chairman of The Bioenergy Association and founding member of SACMA (South African Complementary Medicine Association). Bernard has 18 years experience in homeopathy but also trained in acupuncture all over the world - in acupuncture centres in Singapore, Taipei and Sri Lanka, and has published widely in this field.

### Summary

*After many years of experience with laser, I believe it to be an exciting and most useful tool for any GP. It is non-invasive, non-toxic, complications are rare and seldom serious, yet the results may be dramatic, especially in many conditions with permanent cure possible, which lasts a long time, if not forever. It supports the natural healing processes in the body, and a few areas of successful treatment are described.*

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Report

### Introduction

Lasers have extensive use in medicine. In general most doctors are aware of the use of lasers as a surgical tool. These lasers are usually 50W or more in power. Few doctors know of the usefulness of lower power lasers in general practice, or generally regard them as tools used by physiotherapists. These low powered lasers may be as low powered as 2mw or up to 30mw. These lasers and other low powered sources of energy will be transforming the practise of medicine over the next few years.

Any treatment should support the natural healing processes in the body

### What is Laser Light?

The word laser stands for "Light Amplification by Stimulated Emission of Radiation".

# Feature

There are three essential properties of laser light.

1. Monochromaticity ie all the emitting light has the same wavelength.
2. Coherence, ie the wavelengths of the light emission are in step or in phase with each other and travel in the same direction.
3. Non Divergence. This is only true of the neon helium lasers and not for the gallium arsenide lasers.

Terminology has been confusing and these weaker lasers have been referred to as soft lasers, mid lasers, low energy lasers etc. The new internationally accepted designation is Low Level Laser Therapy (LLLT) for this type of approach to treatment.

Most lasers sold to medical doctors today are of the gallium arsenide type because they are more robust and cheaper. The light emitted from the laser may be in the red area of the spectrum and therefore visible to the naked eye or in the infrared range and invisible to the naked eye. The wavelength of the light varies in the different lasers and there appears to be some controversy as to which wavelength is most effective for biological systems and for different medical uses. Some research suggests that the lower wavelengths at about 630nm may be the most effective. I have used lasers of many different wavelengths and found them all to be effective.

## History of Low Energy Laser

It is of some interest to know that the use of these lasers developed in the old Soviet Union. Perhaps the main reason has been the expense of more conventional approaches, in particular the use of drugs. Research has therefore been directed to the use of bio-energetic sources of energy rather than chemical sources. In the

Soviet Union there were many institutes of Bio-energetic research in its broadest sense. This included research into Psychic phenomenon and a book called "Psychic research behind the Iron Curtain"<sup>1</sup> was one of the very early classics in this subject. Other research looked at the effect of bio-electrical, biomagnetic and bio-electromagnetic phenomenon on and within biological systems.<sup>2</sup> All this research was often carried out within a single large building so that there was good communication between different scientists. Acupuncture was also of interest in these institutes, as acupuncture points are known to have lowered skin resistance, so that the possible electrical properties within the human organism were investigated.

It was in one of these institutes in 1923 that, a Russian biologist showed the possibility of cells emitting electromagnetic information which could have an effect on more distant cells. Further research<sup>3</sup> showed that scientists would simulate this stimulation using polarised light and even more effectively using laser light, ie lasers were shown to have marked biological effects on cell cultures. When this information became known to the acupuncture section of the institute, attempts were made to use lasers to stimulate acupuncture points instead of needles.

Thus was born the two main uses of low energy lasers:

- (a) To stimulate biological activity.
- (b) To stimulate acupuncture points instead of needles.

I will be confining my discussion to the use of low energy lasers only.

Reviewing laser research over the last 10 years reveals the following action of the low power laser on tissue.<sup>3</sup>

**Lasers have extensive use in medicine**

**Lasers stimulate acupuncture points instead of the needles**

**Low energy lasers have powerful effects on the body**

## Laser Research

1. Stimulation of microcirculation.
2. Anti-inflammatory effects.
3. Activation of local defence mechanism.
  - Changes in prostaglandin content.
  - Higher content of specific enzymes.
  - Increased production of cellular products.
4. Nerve growth stimulation.
5. Stimulated cell growth. Cancerous tissue and bacterial growth is not stimulated.
6. Reduced fibrous tissue formation eg following burns and surgery.
7. Oedema reduction by possibly increasing regeneration of lymph vessels.

## Discussion on Mechanism of Laser Action

This is a most exciting and interesting field of research and is bound to cause enormous changes in the way we view the body and all its physiological processes. In one sense it should not surprise us that such low power energy should have powerful effects on the body. It should be pointed out that in this low power there is no sensation, no heating effect and yet the results can be dramatic. For example, a tender point on the body may become painless and non-tender after 15 to 30 seconds irradiation. This effect may last hours or days or even be permanent.

Sunlight for example has profound effects on the plant and the pigment cells of the skin are also able to respond to light. Semion Rochkind,<sup>4</sup> working in the department of Neurosurgery, Tel Aviv, (Israel) has performed some elegant research using low powered laser on animals and man. In order to interact with

tissue, light has to be absorbed by the endogenous porphyrins existing in the cells. In previous studies they had shown that free radicals, possibly singlet oxygen, is generated in the cells during neon-helium irradiation. Porphyrins are known to be excellent photosensitisers. They postulate that these porphyrins transfer their excited energy to triplet oxygen raising it to its singlet state. Singlet oxygen is a highly reactive intermediate and in small amounts may have a role in biostimulation.

Light has both particle and wave properties and it will be necessary to investigate also its associated field properties on the cells.

Anyone who has practised acupuncture for some time cannot help but be impressed by the way a needle stuck into the ear or into an acupuncture point can have profound effects on parts of the body far removed from the needle. As indicated above, these results can be immediate and the effects last longer than the average anti-inflammatory.

It seems unlikely, therefore, that this is purely the result of a biochemical stimulation due to the needle effect. The ancient Chinese suggested that one was dealing with an energetic effect and they may yet prove to be correct. A body of evidence is slowly accumulating that, besides the nerve, blood, and lymph circulation, there is also some kind of electrical<sup>5</sup> or electromagnetic circulation which is not dependent on the more physical circulations, but is able to influence and control these circulations. How else is one to understand the co-ordination, controls and feedback loops that must be present in order to maintain balance and health within the human organism with its billions of cells.

Laser has similar effects to the

No sensation, no heating effect, yet dramatic results

Some kind of central controlling mechanism to co-ordinate the millions of biochemical processes in the body

needles and may also be influencing this bio-energetic processing. For example, I have experienced patients fainting during laser treatment as one not infrequently sees with needle acupuncture. This is a very interesting phenomenon and suggests clearly that the fainting is not merely a vasovagal response to having a needle passed through the skin or seeing a needle stuck in one's skin. The daughter of a good friend was brought to see me with a stiff neck. She was 15 years old and knew about the laser, having seen me use the laser before on my own children. She was not at all anxious about the procedure but as I was treating the points at the back of the head she became pale, collapsed from the chair and it took her about 15 seconds to recover from the faint. I have seen this happen to both older men and women over the years. One young man of about 28 years old also urinated and required almost 30 seconds to regain consciousness. It seems unlikely again that these effects could be purely biochemically motivated. I believe we are looking at profound bio-energetic effects which are able to influence the entire organism. This is not surprising as there must be some kind of central controlling mechanism to co-ordinate all the millions of biochemical processes happening every second within the organism. This controlling mechanism also must need pathways which can give it a rapid feedback on what is actually going on throughout the system. Only a bio-energetic mechanism of some sort would have the ability and speed to co-ordinate this process. The Chinese Meridian Theory based on energy pathways, and the more recent work of Professor Bjorn Nordenström<sup>5</sup> for example showing that there are Biologically Closed Electrical Circuits within biological systems, suggests that the bio-chemical, anatomical viewpoint of man may be too limiting

and preventing major breakthroughs in understanding the nature of health and disease.

## Laser and the Healing Process

The purpose of any treatment should be, above all, to support the healing processes in the body.<sup>6</sup> Symptomatic treatment is not the primary concern of the doctor, except in terminal disease. Healing is a natural process that belongs to the biological system and is going on all the time. It is the result of this healing that the body temperature, pH etc remains constant and all the toxins are removed and that each cell receives the nutrition it needs. Antibiotics do not heal anyone. They merely kill bacteria, the body does the healing. Similarly the surgeon does not heal anyone. He merely removes an obstruction and is dependent on the body's healing processes to do the healing for him.

Low energy lasers provide the GP with a tool to stimulate this innate healing capacity. It is thus a very special addition to any general practice.

## Clinical Application of Low Energy Lasers

The lasers can be used in three different modes.

- (a) As an acupuncture tool in order to stimulate acupuncture points. One applies the laser to the point for 15 to 45 seconds and then moves on to the next point. One can use two lasers at the same time in order to shorten the treatment time.
- (b) As a laser treatment in its own right. One may move the laser slowly over the area to be treated

Healing is a natural process in the body, and is going on all the time

Antibiotics do not heal anyone

Lasers stimulate the innate healing capacity of the body

# Feature

or move it from point to point, stopping at each point for a period of time. Some lasers have multiple head attachments in order to cover larger areas. At a recent exhibition in Germany, I saw demonstrated a laser with multiple diodes which could fit around the head. These are research models which are being used in some hospitals in Germany to treat chronic headaches and psychiatric problems. We will definitely be hearing a great deal more about this in the next few years.

- (c) Combining the acupuncture application and laser application. This is probably the most common way that I use the laser. In this case I will use the acupuncture points with the laser and treat the local problem with the laser. Occasionally I will use needles at the acupuncture points and the laser at the local problem.

In the following section I will discuss various applications of the laser treatment in general practice.

## Muscular-Skeletal Problems

This is the most useful area for laser treatment. This is also one of the most useful areas for acupuncture so that laser treatment and laser acupuncture can be easily combined to give superior results. It is not unusual to see results that most doctors would regard as impossible and that patients regard as miraculous. By this I mean that pain may disappear or be relieved 50% or more within a few minutes of treatment. The more one uses the laser the more likely one is to see this kind of result on a daily basis.

*Fibrocystic nodules or Trigger Points in*

the neck and shoulders will often disappear rapidly. Make sure that one has not missed any tender points by palpating carefully along the cervical and thoracic spine area and especially in the muscles masses attached to the scapula.

Patients often complain of tender points around the rib cage especially on the left side and are frequently concerned about heart disease. If there is a local tender point then treat it with the laser and the pain is often gone after one shot of 30 seconds radiation.

There are some areas where the use of acupuncture needles may be especially painful or even dangerous. In these areas the laser can be used. One of these areas where the needle is painful is under the foot. I have treated numerous patients with *spurs* under the foot very successfully. The good results I have obtained with the laser suggests that the pain of the spur is not due to the physical nature of the spur so much but due to the secondary inflammation. One will often observe patients with spurs bilaterally yet have pain only under one foot. Patients normally require between 5 and 10 treatments. The spur does not disappear but the pain does. One of the first patients that I treated many years ago has been pain free for more than 5 years despite the fact that she is an avid hiker up mountains. It is worthwhile to try treating painful *bunions* and even *plantar warts*. Again, I must remind the reader, that these low energy lasers do not burn or cut. They are much too low powered for that, but the treatment does go a long way to relieving the pain.

Strangely enough the treatment of *tennis elbows* with laser can be a disappointment. That is not to say that the laser does not work, but one

Low energy lasers do not burn or cut – but relieve the pain dramatically

Olympic teams carry lasers with them

The more tender the area of pain, the better the result with laser

## Feature

would expect a much higher percentage cure in a condition so close to the surface. Always try the laser first and expect dramatic improvement in at least 50% of cases. The others will require either a prolonged course of laser treatment, acupuncture or cortisone injections.

*Sports injuries*, in general, are an excellent area for laser treatment. I am told that many Olympic teams carry lasers around with them and I keep a laser at home for use by my family. Any tender, painful and swollen area which is the result of a sports injury should be treated as soon as possible with the laser. If the injury is acute, then treat even twice per day if possible. This applies to torn muscles, bruised areas and twisted joints.

*Back pain* responds so well to laser acupuncture that I seldom use needles for these patients. Although I use acupuncture points combined with tender points, others have treated the tender points only and obtained good results. This applies also to patients who return years after back surgery complaining of backache. Treating the tender points along the spine will often produce remarkable improvement in results.

*Osteoporosis* with pain along the spine can be treated in a similar way. Patients respond rapidly to treatment but need to return on a regular basis for boosters. This may be once per month or for a few treatments over a short period every few months. *Painful scoliosis* will respond in a similar way although there again patients require booster treatments at regular intervals.

I have found that the more tender the area of pain the better the result with the laser. Once again, one is very often able to notice such a rapid relief

of pain that it is interesting to consider the underlying mechanism. Chiropractors will claim that backs become out of alignment and need adjustments, Orthopods claim that the disc space is narrowed and needs surgery and yet in both these situations I have seen rapid improvement with the laser. Not everyone responds dramatically but with back pain being so common, it is not unusual to have a few patients per month responding rapidly. I have concluded, after more than 15 years of using the laser, that a great deal of pain is not due to pathology directly, but due to the associated inflammation or functional disturbance. That is, the system is not able to function well enough to maintain a pain free situation, but is not, on the other hand, so structurally damaged that the person is in permanent pain requiring surgery yet. The truth is that in the vast majority of medical conditions, symptoms and signs can fluctuate quite markedly. The rash of an eczematous condition with or without cortisone will tend to vary from day to day. This reflects the interaction between the pathogenic factors and the body's own innate healing processes. These factors are not fixed. Only structural damage has a more rigid nature, but this physical structural damage is still surrounded by, or immersed in, a liquid, energetic medium. The body is more than 65% water and on an atomic level 99,9% space. There is, therefore, a great deal of room for movement and this accounts, I believe, for this fluctuation in symptoms and signs. Laser cannot reverse structural damage within the space of seconds, so what it must do, is to improve function through stimulation of the innate healing capacity of the body's own systems, thus pushing back the pathogenic factors which are still functioning at the fluid/energetic interface of the pathology.

**A great deal of pain is not due to pathology directly, but to the associated inflammation or functional disturbance**

**Despite many years of experience, I am still shocked at the rapidity of the results**

# Feature

Two other musculo-skeletal problems which respond dramatically to the laser is *Osgood-Schlatters* disease and *Tibialis Anterior* muscle syndrome, or shin splints. Few treatments only are required and in the latter case the patients will often leave your rooms with most of the pain gone after the first treatment.

In *arthritis* of the joints, I tend to use acupuncture points with good success. Arthritis of the metacarpal joints and especially that of the base of the first metacarpal of the thumb which can cause enormous discomfort, responds dramatically to the laser used at the local tender areas. Despite many years of experience with the laser one is always a little shocked at the rapidity of the results especially when the patient has had pain for years. The results from even one treatment can last weeks or months. My impression is that perhaps we try too hard to use more power in medicine instead of less power. The weaker the energy, the closer we get to the body's own innate subtle energies and the more complementary these treatments become to what the body would do naturally to heal. The stronger the power we use to try and heal, the more irritating it becomes, so that the system has to try and defend itself against this intrusion.

*Carpal tunnel* syndrome will occasionally respond to laser treatment used locally and may save the patient an operation.

## Skin and Mucous Membranes

The laser has profound healing effects on the mucous membranes all over the body including the vagina. Although I have never tried to treat erosions of the cervix, it certainly would be worth a trial.

I have had success in treating a very malignant-looking ulcer on the back of the tongue in an elderly lady. Two biopsies had only yielded inflammatory tissue and a more formal biopsy was suggested, which she refused. The ulcer healed after about 5 treatments given once per week.

*Painful teeth* will often respond to the laser used at the point of tenderness, but the dentist should be consulted as well.

The laser will often give brilliant results in acute *herpes simplex* of the lips even extending to surrounding skin. Not only will the condition respond rapidly but if each recurrence is treated with the laser then the results are often curative. Similar results can be expected with herpes simple in other parts of the body as well.

*Tonsillitis* and *middle ear* infections are conditions in which I have occasionally used the laser with apparent success. This works especially well in the younger child. Painful ears frequently become painless and heal rapidly, especially if one can repeat the treatment twice per day at first. Irradiation for a few minutes is sufficient.

Certain other conditions of the skin will respond to laser treatment.

The most severe case of scalp *psoriasis* I ever saw, responded to the laser given at weekly intervals. The scales were millimetres thick but gradually disappeared over two months. The patient has remained free of psoriasis for some years now. Any localised area of psoriasis can be treated easily with the laser. I have never tried to treat more extensive cases because of the time involved, but imagine that this would also give good results. My impression is that

The weaker the energy, the closer we get to the body's own innate energies and the more complementary these treatments become

Surgery is the most important area for laser application

# Feature

the more scaly type of psoriasis responds much better than the more inflammatory types.

Chronic crusty, scaly and cracked thickened skin types of *eczema* will also respond to the laser. I have occasionally seen what appears to be a flare up of the eczema if used on the more acute weepy inflammatory types and would suggest a more cautious approach here. Only a few seconds irradiation at first given at infrequent intervals may, however, be successful.

*Warts* will respond to laser treatment. I have seen them turn black and fall off. The small multiple planar-type warts have disappeared suddenly, usually a few weeks after completing a course of 5 or 6 treatments.

*Leg ulcers* should respond to laser treatment but the results are often disappointing unless combined with other good nursing and ulcer management and improvement in the blood flow to the lower limb. Laser is however an important addition to the usual treatment.

Tender *breasts*, such as seen in fibroadenosis, will often respond dramatically to laser treatment. It can be quite time consuming if both breasts are involved as it requires very careful examination to find the tender points. Here too, the use of two lasers will cut down one's time. Nurses can easily be taught the technique of treating these cases. Two to five treatments are usually sufficient.

## Surgery

This is a most important area for laser application. It is difficult to imagine that this will not be standard equipment for any surgery both minor (such as outpatient procedures), as well as major surgery.

Some months ago I saw a 27 year old man who was helping a young lady lift some heavy weights in the gym when she slipped and 3kg of weight fell on both his thumbs. He sustained a crushing fracture of one distal phalanx and deep cuts, down to the level of the ligaments on the dorsal and ventral surfaces of the thumbs requiring stitching. There was some bleeding under the nail bed and I felt sure the wound would become infected. No antibiotics were given. I saw him on Friday. Changed the dressing on Monday plus laser to both sides. Dry dressing plus laser on Tuesday and Wednesday. By Thursday the wound was completely healed and no further dressing was required. What was so remarkable about this patient was the fact that despite the kind of injury which was a crushing, severe injury, he had only mild pain for 24 hours and no further pain after that. There was almost no swelling and no subsequent infection.

Similar results of improved healing compared to other forms of treatment have been reported in the literature. Healing is more rapid, there is much less swelling and considerably less pain. I usually irradiate the area after cleaning the wound for about 1 or 2 minutes only and again after stitching. My experience has been with a 2mw laser so that very little power is required to produce these effects.

In the department of Neurosurgery in Tel Aviv (Israel),<sup>7</sup> they experimented with a group of patients who had tethered spinal cords resulting from previous surgery for various spinal cord diseases such as myelomeningocele. The results of such surgery on adhesions is apparently not very good. The results of treating the above cases with laser during the surgery and for some days after the surgery showed good results and these patients were followed up for six months, with a



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continued improvement in most parameters. A 35mw neon helium laser was used in the above cases.

A number of studies have already been reported in which laser surgery is performed, using laser light as a surgical tool, together with low powered laser to stimulate healing processes during the same procedure.

Laser treatment used in surgery and on the post surgical wound will help to prevent adhesions, improve blood supply, decrease pain and lower the incidence of complications.

Scar tissue in my experience may be a cause of symptoms. Always treat any scar with the laser if there is any symptom close to, or possibly related to, the area of the scar, especially if the scar itself is tender. This may apply especially to patients who have had repeated operations over the same area and the scar is now thickened and tender. Feel for the tender areas and hold the laser every centimetre or so along these areas. If the pain is due to cut nerves rather than scar tissue, then the results are not nearly as satisfactory.

## Other Clinical Uses Reported in the Literature

I feel confident in stating that there will be no speciality which will not find a useful place for the laser.

In Ophthalmology the laser can be used directly on the eye tissue if used for short periods and at very low power. In a report from Russia,<sup>8</sup> they used the laser for various corneal problems including perforating wounds, burns, various ulcers and dystrophies resulting from cataract extractions.

A number of reports have appeared

showing the usefulness of the laser in dentistry.<sup>3</sup> All cases of Grade 1 and 2 hypersensitivity of dentine responded to laser treatment. Laser is effective in gingivitis, stomatitis, pain after extractions and any injury to the mucous membrane of the gums and mouth.

Low energy laser treatment of mucous membranes of the bronchial tissue and stomach have been attempted with promising results, using endoscopic techniques to treat bronchitis and peptic ulcers.

I should mention one report from Russia,<sup>9</sup> using the laser to treat acute nonspecific epididymo-orchitis because I successfully treated one patient with a chronic condition which had been resistant to conventional treatment. Although my patient never became pain free, his condition was improved by 80% and remains so for years after his last treatment. In the above report laser treatment appeared to do better than physiotherapy and surgery.

## Placebo Response

The placebo response is obviously more than a sugar coated pill and includes the atmosphere in the doctor's rooms, the attitude of the staff and particularly of the doctor himself. The laser machine itself has power as a placebo, as any other machine would have.

Despite this, it is not difficult to assess the laser effects and compare it to a placebo effect. There is no sensation from the laser so that one can easily switch the laser off without the patient knowing. I have repeatedly treated patients without informing them that they were actually having a treatment. They were unusually astonished to

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# Feature

discover that, after what they regarded frequently as an investigation only, their pain had diminished tremendously.

Animals and children will respond just as dramatically as adults. One would imagine that they are less influenced by the placebo effect or suggestion than adults, unless one is prepared to accept a much more open-minded and powerful placebo effect which includes various healing phenomenon between doctor/healer and patient. This would then beg the question why the laser is a better vehicle for this kind of healing than other methods.

A report by England et al,<sup>10</sup> comparing active laser to dummy laser, showed a significant improvement of active over dummy laser for all seven assessments in their study.

intensity of the light, and the eyes should be protected especially if using the stronger lasers. Photosensitising reactions can occur, especially as indicated above, if the laser is used for weepy inflamed eczema.

## Conclusion

The purpose of this article is to introduce medical doctors to Low Level Laser Therapy. It is an exciting tool to use because of its non-invasive, non-toxic application, and especially because it appears to be supportive to the healing processes within the body, it will become indispensable in any office or surgery.

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## Complications of Laser Treatment

Complications are rare and seldom serious. I am, however, against laser being sold to the general public for the following reasons:

Firstly, there is a big difference between a doctor treating his patient once or twice a week and patients using the laser every day or even a few times a day for prolonged periods. We know too little about the mechanism of laser irradiation to risk such haphazard use of the laser.

Secondly, patients can faint with the laser, as they not infrequently do, with needle acupuncture. Although patients recover quickly from a faint, because one is dealing with sick persons, an experienced person should be handling the laser and not a layman.

Other complications include possible damage to the retina as a result of the