

**Feasibility Study
for a
Power Assisted Exercise Gym**

on behalf of

West Berkshire Neurological Alliance

with



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C836

Profundus Consulting Ltd.
PO Box 519, Reading RG7 5YZ, U.K.
Tel +44(0)118-971-2948; e-mail info@profundus.com

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West Berkshire Neurological Alliance



Newbury & District

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The report layout is optimised to facilitate double-sided printing with all main sections beginning on a right-hand page (i.e. odd-numbered)



Doug Burns, reigning 'Mr Universe', who has Type 1 Diabetes

1. Executive Summary

We can confidently state that a Power Assisted Exercise Gym, co-located with a hydrotherapy pool, will provide many health and fitness benefits, will be of great benefit to the community and has the scope to generate a significant surplus, which can be put to reserves or used to subsidise needy users.

This report represents an extension to a feasibility study completed in December 2006 looking into the potential for a hydrotherapy pool for the benefit of the West Berkshire community.

The West Berkshire Neurological Alliance (WBNA) issued a brief requiring an examination of the feasibility for a Power Assisted Exercise Gym (PAEG) as an additional, incremental facility co-located with the proposed hydrotherapy pool adjacent to the West Berkshire Community Hospital.

We thank those who have contributed information and views (see Appendix A).

The government is keen to promote exercise for all and, indeed, has instigated an Inclusive Fitness Initiative which entreats existing fitness facilities to create an inclusive service, increasing participation by disabled people. While we would all like to see disabled users treated equally in public and private fitness centres, there is a fundamental dichotomy between this objective and our scheme to build a centre of excellence, comprising hydrotherapy pool and PAEG for users with neurological and other disabilities.

Further, most of the professionals we have spoken to in the course of this work have told us that MS sufferers, stroke victims and others with comparable complaints need a special environment and special care. Also, they are often embarrassed to exercise with able-bodied people; this is often the reason they do no exercise at all before visiting a PAEG.

West Berkshire Council is especially keen to promote health and fitness for its citizens and sponsors a major initiative called 'Activity for Health', which comprises the running of activities for various groups at the Council's leisure centres. It is proving to be a great success and ways should be explored to partner this initiative in order to provide it access to the PAEG.

Put simply, power assisted exercise is the use of exercise equipment which incorporates motors to assist the user in achieving the range of movements required. Most equipment permits the user, if they wish, to add his/her contribution to the exercise.

There are several types of equipment:



Toning tables. Originally invented in the 1930s in the USA, toning tables enjoyed a boom in the 1980s and were seen as products for beauty salons, spas and 'well being' centres, mainly appealing to overweight ladies. This perception results in some degree of scepticism from the medical profession but toning tables can provide improvements in mobility and flexibility for some severely disabled patients. It is notable that they are used in many of the UK's MS Therapy Centres.

Upright machines. This group of machines is a modern development pioneered by Shapemaster Ltd. Their design owes more to modern gym equipment, where systems of pulleys and weights permit the user to exercise a range of muscle groups. Power assisted machines include motors which determine the movements for users who can add as much or as little of their own effort as they can and wish.



Cycling machines. Both examples available through distributors in the UK are imported from Germany where they are popular. They are proving to be well accepted in cardiac rehabilitation units, MS centres and hospital physiotherapy departments.

Vibrating equipment.

Vibrating tables, platforms and pads might be considered to be power-assisted, even though not strictly providing exercise but conferring certain related benefits.



Other examples of PAEGs were sought. The Brain and Spinal Injury Centre (BASIC) in Salford is closest to the concept of the West Berkshire facility. It is affiliated to the nearby Manchester Clinical Neuroscience Centre at Hope Hospital. Even though BASIC is open only four days per week and it does little or no marketing it has attracted 120 regular users, with stroke victims and MS sufferers being its two largest groups.

Others include the Tibshelf Cardiac Rehabilitation Support Centre, in Derbyshire, and many of the UK's 50 or so MS Therapy Centres.

Shapemaster is rolling out a network of 'Feel Good factories' - fitness clubs equipped with its equipment. While these are aimed at the overweight ladies market it is notable that they also attract clients for therapeutic reasons. For instance, its flagship centre, in Stoke-on-Trent (which attracted 420 members in its first 30 weeks of operation) includes 20 MS sufferers and four clients with fibromyalgia.

Equipment suppliers claim a vast array of benefits for their products. Some are vague (e.g. 'toning') and some extravagant but there is considerable empirical evidence that in general their products improve muscle function (or reduce wastage), improve circulation and promote a feeling of well-being.

There is little medical, scientific or academic research available to back up these claims but several studies are being conducted at Leeds Metropolitan University. The pilot for one has been completed. It has allowed its leader, Dr Ron Butterly, to state with some authority some real benefits of power-assisted exercise:

1. It is safe - no injuries and accidents, which is important for the older generation, especially when overweight.
2. Users can do as much or as little as they wish - the amount of power which they contribute can be varied; in practice, most users begin fairly passively to regain flexibility and confidence and later begin to contribute meaningfully towards a proper workout.

3. The assisted power means that users do not have to overcome inertia at the start of an exercise - it is the middle range which is most beneficial.
4. There is a much improved range of movement for most users.
5. There is a considerable mood enhancement effect.

This study will be repeated in a more rigorous manner in early 2008 and it has also spawned other, subsidiary work, with studies looking into the mood enhancement effect and examining benefits to cardiac patients.

It is strongly recommended that all users of the PAEG are referred, either by a hospital or a GP, and that they receive an assessment by a qualified physiotherapist. We expect that clients with a wide range of medical conditions will benefit from assisted exercise. These include:

- Neurological disorders - stroke, MS, fibromyalgia and cerebral palsy are expected to make up the majority of such users.
- Musculoskeletal problems - arthritis and those with spine/neck/back injuries and disorders.
- Cardiovascular - especially rehabilitation following angioplasty and bypass surgery.
- Diabetes - sufferers are constantly being urged to undertake exercise in order to help manage their condition.
- COPD - chronic bronchitis and emphysema sufferers.
- Obesity - especially those with morbid obesity, defined as having a BMI above 40.

While the categories above represent the medical conditions most likely to benefit from assisted exercise it ignores a very substantial commercial opportunity - the overweight ladies market segment, pursued with much success by salons and spas. We suggest there is scope for a 'fitness club' to run alongside the mainstream work to utilise the gym's assets during non-core times. At the very least it will generate additional funds which can be used to cover operating costs and reduce prices for therapy users.

There are too many unknowns to be definite about the size, shape and contents of a PAEG. This is a very new concept, not just in the UK but in the world. We can draw on some of the experience of BASIC, in Salford, and note what is happening elsewhere but at the end of the day we advocate caution but flexibility. We propose initially a large space with a minimum of equipment. As numbers build then decisions can be made about what additional equipment to purchase. Additionally, suppliers, who are all keen to expand into the health sector, have generally indicated a willingness to work closely with the gym, to provide machines on trial or sale and return or to offer generous part exchange terms.

We recommend providing a space of about 1600 sq ft, which is sufficient for 20 machines. It should either be divided by a moveable partition or possibly an L-shaped space would work. Initial purchases of equipment should be:

- one toning table - one which combines several functions; either Shapemaster's 'Multimaster' or the 'Multitone' from Slim Images.
- a set of six Shapemaster 'Easytone' upright machines;
- one vibrating machine - either Body Action or VibroGym;
- two cycling machines, either Thera-vital (preferred) or Medimotion;
- one conventional treadmill.

The total cost of this equipment is £45,000 at list prices. In the financial model we amortise it over four years and allow 5% of purchase cost each year to cover repairs and maintenance. As gym usage expands so will the equipment inventory. It is better that later purchasing decisions are based on experience and demand rather than unreliable early guesswork. However, retaining a budget of £4000 per machine would be wise.

One of the beauties of co-locating the PAEG with the hydrotherapy pool is the potential to share peripheral facilities, including:

- toilets - including those providing access for the disabled;
- changing facilities and showers - which are not generally provided in PAEGs, though there is evidence that a small proportion of clients would use them if they were;
- office/reception - for dealing with subscriptions, bookings and other administration;
- social area - for clients and also for their carers and drivers, while waiting;
- car parking - including spaces for the disabled.

Staff, too, will be shared between the pool and gym. One of two qualified physiotherapists will already be on duty at all times for the pool and that person can also be available for assessments and advice in the gym when required. A gym 'trainer', who is relatively unqualified, will also need to be present at all times in the gym and this results in two additional members of staff.

Promotion of the gym (brochure, website, PR, etc.) will take place alongside the similar activity for the pool.

We advocate a pay-as-you-go pricing system for the gym, at £6 per nominal 40-minute session. However, with season tickets' or monthly subscriptions we anticipate the average income per session being some 15% lower than this figure. Additionally, like the pool, there will be further subsidies for those who need them, paid for out of a pool generated by fund-raising activities.

Should it be decided to also run a fitness club in the gym beside the therapy sessions then we recommend a £30 per month subscription - a formula which is proven to be widely accepted at such clubs across the country.

In the financial model we describe four scenarios:

| | No fitness club | With fitness club |
|----------------------|-----------------|-------------------|
| Minimum therapy use | 100 users | 300 users |
| Expected therapy use | 200 users | 400 users |

It is inconceivable that the number of regular therapy users will be less than 100 and we expect at least 200. The addition of a fitness club, which we assume will have to be limited to about 200 users, will make a huge difference to the model, which is summarised below:

| £K | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|-----------------|--------------|-------------|-------------|-------------|
| Fixed costs | 37.0 | 37.0 | 37.0 | 37.0 |
| Equipment costs | 13.2 | 16.8 | 20.4 | 24.0 |
| Revenues | 40.8 | 81.6 | 112.8 | 153.6 |
| Surplus | (9.4) | 27.8 | 55.4 | 92.6 |

2. Introduction

2.1 Background

West Berkshire Neurological Alliance (WBNA), an umbrella group for eighteen local charities with an interest in people affected by neurological conditions, commissioned this study.

It was co-funded by West Berkshire Council and the Newbury & District Multiple Sclerosis Society.

Towards the end of 2006 the WBNA commissioned a feasibility study for a hydrotherapy pool. Profundus Consulting Ltd. won the tender to conduct that study and the report is available for reading and downloading at www.profundus.com/html/downloads.shtml. Throughout 2007 negotiations for land and funding have continued. Meanwhile, the WBNA saw an additional opportunity: to create a Power Assisted Exercise Gym (PAEG) in the same centre.

Profundus was invited to bid for this additional work and again won the contract. While this report examines the feasibility of such a facility it should be stressed that it is not a feasibility study for a stand-alone gym; rather it covers the feasibility of an additional, incremental facility at the same site.

Hence, some issues, such as location, are not covered within this report.

Besides examining the demand for and design of a PAEG the invitation to tender included a request to perform an iteration of an outline combined business model for the pool and gym.

2.2 Methodology

A visit was made to BASIC and several other PAEGs were visited or discussions held with their managers, staff and clients.

Visits were also made to some equipment suppliers, with e-mail correspondence and telephone conversations with others.

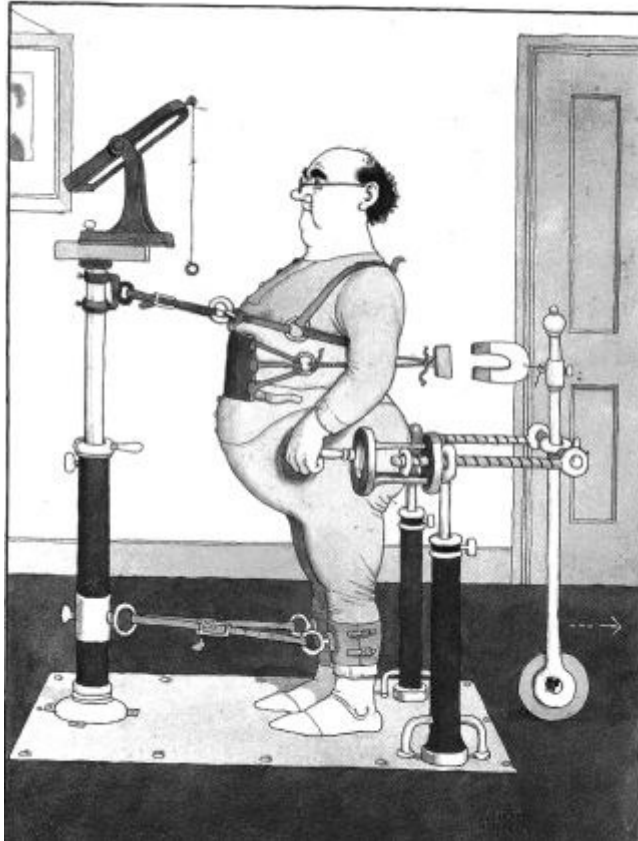
These two sources resulted in introductions to researchers who told us of the research with which they were involved and of other relevant research in this field. This was also supplemented (to little effect) by a very thorough internet search.

Local physiotherapists were a source of useful information and opinion and West Berkshire Council was also sounded out for its views.

Last but not least, the WBNA - our client - was a source of information and inspiration.

Hence a large portion of the work that went into this study comprised information collection. There followed analysis (in the course of which the need for some additional information was identified), conclusions and recommendations.

A great many people helped Profundus in the course of this study and our thanks go to them for their time and concerned assistance. They are listed in Appendix A.



3. Power Assisted Exercise

3.1 What is power assisted exercise?

Put simply, power assisted exercise is the use of exercise equipment which incorporates motors to assist the user in achieving the range of movements required.

Most equipment permits the user, if they wish, to add his/her contribution to the exercise (that is, adding strength in the same direction as the motor, not resisting it).

Power assisted exercise equipment was pioneered in America in the 1930s by Dr Bernard Stauffer. His wife was a polio survivor and he sought a means of reducing her muscle wasting. He used his knowledge of physiology and anatomy and devised a motorised exercise table, which he dubbed an Induced Rhythmic Motion (IRM) table.

3.1.1 Toning tables

The IRM was the forerunner of what is now widely known as a 'toning table' (see example right: the 'Home-tone Plus-Pro' from Slim Images Ltd.). The user lies on the table, various parts of which move in order to provide passive exercise. It is said to offer "14 exercises from 3 movements concentrating on legs, hips, thighs, buttocks, abdomen, back and shoulders".



This type of machine can be found widely in beauty salons, spas and 'well-being' centres.

It represents the largest segment of the market for power assisted exercise equipment and is said to appeal mainly to overweight ladies aged 40+.

This results in some degree of scepticism when a PAEG for those with neurological disorders is discussed with people who know only of toning tables. Unfortunately this group not only includes fitness enthusiasts but also many GPs and even some physiotherapists.

It should be noted that the 'toning table' has little to do with 'muscle tone' in the medical sense. Tone is defined as a characteristic of a muscle brought about by the constant flow of nerve stimuli to that muscle. Abnormal muscle tone can be defined as: hypertonus (increased muscle tone, as in spasticity), hypotonus (reduced muscle tone; flaccid paralysis) or atony (loss of muscle tone).

3.1.2 Upright machines



A modern development is equipment which owes much more to modern gym equipment where systems of pulleys and weights permit the user to exercise a range of muscle groups. One supplier, Shapemaster, has pioneered a range of equipment where the user sits upright and engages with bars and steps to mimic the conventional equipment, except that it incorporates motors.

The example shown is from Shapemaster's 'Easytone' range and is designed to exercise the user's shoulders, arms and thighs.

3.1.3 Cycling machines

Another type of equipment again is typified by the Medimotion 'Viva Full body', shown right. Much of its design is in common with a regular cycling machine but it is designed for use by somebody in a wheelchair and there is optional power-assistance.



3.1.4 Other equipment

Vibration tables, platforms and pads are said to be beneficial for a range of disorders, with the best-justified claims being for osteoporosis.

Finally, we have found references to an indoor horse riding machine produced by the Japanese company, Matsushita. The 'Joba' apparatus imitates the passive crouching and straightening movements of horseback riding. A study, in Japan, of people with diabetes demonstrated significant benefits.

3.1.5 Robot assisted exercise

A brief mention should be made of Robot Assisted Exercise. This is a new and potentially exciting field of development but is one which is unlikely to fit into the concept of a PAEG as defined in this study.

An 'exoskeletal' or 'wearable' robot is a portable neurobotic device that combines a lightweight, motorised brace with a computerised system that detects electrical impulses from the muscles. The system detects and then processes the signals and translates them into the desired motion, amplifying the movements of the weakened muscles.

Such robots are especially useful in providing assisted power for stroke victims.

3.2 Examples of PAEGs

3.2.1 BASIC

Only one other example could be found, anywhere in the world, of a fully equipped PAEG which is (almost) dedicated to users with a range of neurological disorders. The Brain and Spinal Injury Centre (BASIC) - see www.basiccharity.org.uk - is in Salford and is affiliated to the Manchester Clinical Neuroscience Centre at the nearby Hope Hospital (which, interestingly, also has its own hydrotherapy pool).

Since 1994 BASIC, a registered charity, has provided counselling, information and support services for patients and their families following a brain or spinal injury. In 2005 it launched Body BASIC, an assisted exercise suite with fifteen machines. Other services provided include acupuncture, aromatherapy, yoga, a memory workshop, confidence building classes and various classes and workshops in IT, art, pottery, gardening, creative writing, etc. Together, all of these facilities and services provide what is described as an 'holistic package'.

The majority of patient clients are referred by Hope Hospital, which has 5000 neuro out-patients and 3000 neuro in-patients each year. The image problem of power assisted exercise is said to engender conservatism among other potential referrers, such as GPs. All users are first given an assessment by a qualified physiotherapist, either from Hope Hospital or the centre's own.

There are 120 such members, each paying £25 per month (and also £25 for the initial assessment by a physiotherapist). Each month there is a churn of about ten members (i.e. about ten cease membership and are replaced by about ten new members). 60% are stroke survivors and MS represents the second largest group.

BASIC does very little marketing on its own account. However, recently it has made Body BASIC available to 'regular customers' - that is those interested in toning and weight loss. This group, which tends to be ladies who either live or work very locally (many at Hope Hospital), now add a further 30 members, who mainly use the facilities in the evenings and pay a subscription of £28-30 per month.

BASIC is open from 10am to 8pm between Monday and Thursday each week. Originally BASIC operated pay-as-you-go pricing but it found that this was difficult and time-consuming to track and collect and there was also some nervousness about holding cash in the less than salubrious area, so it switched to monthly subscriptions. Income is now running at about £3900 per month, which is said to more than cover the operating costs of Body BASIC.

Most of the 15 pieces of equipment were supplied by Shapemaster and we were told by staff that they all get used fairly equally. A typical usage pattern results from an assessment suggesting, say, four different machines. A patient will attend for a period of typically 50-75 minutes and do circuits of three minutes on each machine with rests between.

Space in the 45 x 24 ft room is tight and staff say that it would be advantageous to have more available. Sometimes they have to pull-out the very heavy machines to permit easy access by wheelchair users. There are no changing or showering facilities - some say that this is not a disadvantage since typical users do not work up a sweat, however the resident physiotherapist feels it less than ideal.

Staffing is complex, with several part-time staff, some undertaking shared roles (for instance, the acupuncturist also works in the gym) and some volunteers. In all there is approximately one full time equivalent staff attending to the needs of gym users. Staffing reception and management are both shared functions across the whole of BASIC.

3.2.2 Tibshelf Cardiac Rehabilitation Support Centre

Tibshelf, in Derbyshire (near the M1 between Nottingham and Sheffield), has a social enterprise which offers a programme which includes regular gym equipment and power assisted equipment. Besides those in need of cardiac rehabilitation referrals are for stroke victims, those with diabetes and patients with MS and other neurological disorders.

Other users include overweight middle-aged ladies but, according to the CEO, most drop off after three or four weeks.

In all there are 22 pieces of equipment, including Shapemaster and Medimotion machines. There are hundreds of users who come from far and wide to use the facilities. They pay £3 per session. Typical minimum usage is three 30 minute sessions per week and the maximum is six or seven sessions per week.

In summary, Tibshelf is a no-nonsense fitness centre in a North Midlands ex-mining village. People go there to get fit and well - not for toning.

3.2.3 MS Therapy Centres

The Multiple Sclerosis Resource Centre (www.msrc.co.uk) co-ordinates the activities of about 50-60 autonomous MS Therapy Centres around the UK (there is one in Reading).

Many have power assisted exercise equipment supplied by Shapemaster, Slim Images, VibroGym or Medimotion. They tend to favour toning tables over upright machines because acute sufferers need passive stretching rather than any degree of exercise.

One of the larger centres, at Bedford, say that its aims (of neuro-physiotherapy) are to:

- improve and maintain joint mobility
- improve and maintain balance and co-ordination
- delay muscle spasms
- maintain general fitness
- maintain normal patterns of movement

These in turn will help limb control, reduce spasticity, improve strength, aid walking and act against further secondary complications.

It has two toning tables and four Motomed (Medimotion) bikes.

An article on exercise available at the Bedford Centre also highlights the benefits of the Medimotion assisted exercise cycle:

"As we talk, Philip is peddling away on the 'Motomed' bike, which monitors movement, tells you how far you've cycled, and warns you if you are about to into spasm. "The first time Phillip went on this bike he was very stiff, says Margaret. "But since he's been using the bike he's much more supple. It's made such a dramatic difference."

The Coventry Centre is smaller and has only one, 'Multimaster' (multi-functioned) toning table, a Medimotion bike and various other equipment, including a 'Vibrogym' and a 'Balance Master'.

The manager stressed how helpful she had found Shapemaster, who supplied the toning table. It was initially provided on trial. Other Easytone products were also lent but not bought.

3.2.4 Newark & District MS Information and Support Centre

This organisation is affiliated to the MS Society. It provides a range of services to MS sufferers and owns two pieces of power assisted exercise equipment.

For a long time it has had a Slimtone 'Multitone' toning bed and this has proved very popular and beneficial. More recently it has bought a Cyclone 'Theravital' exercise cycle, which the manager rates as "extremely good and of great benefit to patients". It is also used by one or two stroke victims and again it is thought to be highly beneficial.

It has participated in a trial of vibration therapy pads which has been conducted by Vibrant Medical and considers that these are more suitable for MS patients than vibration tables.

3.2.5 Feel Good Factories

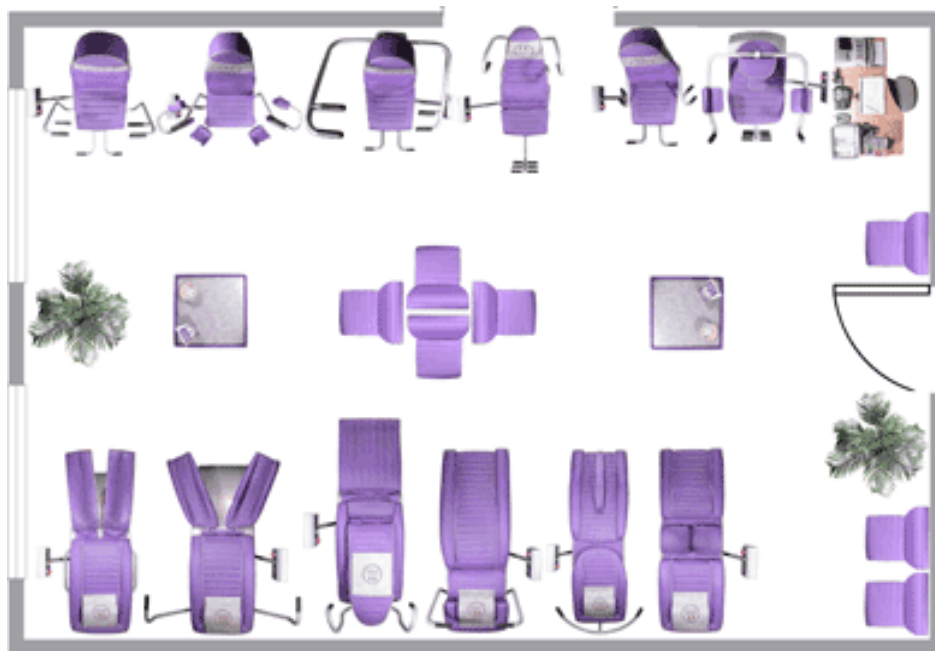
The leading equipment manufacturer, Shapemaster (see section 4.1), is opening its own chain of PAEGs - dubbed 'Feel Good Factories'. While these are PAEGs aimed at the larger toning market, rather than addressing health issues *per se*, they are included because they represent an excellent example of what can be achieved commercially with some good marketing.

The first was opened in March 2006 by converting the demonstration suite at the company's factory (at Honley, just south of Huddersfield). A second followed at the Tollgate Hotel, Blurton (a suburb of Stoke-on-Trent) and a third at the 10Bridge Health and Wellbeing Clinic at Chester. There are plans to open several more during the next twelve months, including the most southerly, at Whitney (near Oxford).

The flagship branch is at Stoke, which attracted 420 members in its first 30 weeks of operation. Annual membership is £360, with half paying up front (discounted by £30) and half by monthly direct debit. The centre is open from 9.00am to 8.15pm Monday to Friday and 9.00am to 2.00pm on Sunday. Typically 150 members attend each weekday. Although the centre originally had twelve pieces of equipment (six 'Powertone' beds and six 'Easytone' upright machines) but increasing membership forced expansion into a separate room with nine more machines.

The manager of the Stoke centre estimates that 35% of all users have arthritis to some degree, though few join specifically because of it. However, about 20 MS sufferers and about four with Fibromyalgia have membership specifically to ease their conditions. In the case of overweight ladies, GPs do not refer patients directly but several suggest to their patients that they should join a gym, so this has become an indirect source of clients.

Shapemaster has now developed a standard layout for its Feel Good Factories, equipped with a set of six of its Easytone machines and a set of six of its Powertone machines, shown below:



3.2.6 JJ's

JJ's is a hairdressing and beauty salon in the village of Brimpton, a few miles SE of Newbury. The reason for including it here is that it is the only establishment in West Berkshire with a range of power assisted exercise equipment. The owner-manager is considering whether to dispense with them during 2008 because they consume a lot of space and do not pay their way.

It has eight early Shapemaster toning tables. While they are used mainly for "toning and relaxation", there are six to eight regular users for health reasons. Most of these suffer from rheumatism or arthritis and one has MS.

3.3 Benefits of power assisted exercise

It is probably true that more benefits accrue for the majority of users from the modern upright equipment compared to toning tables, since there is less of a tendency among users of the latter to contribute their own power; toning tables represent a greater degree of passivity.

3.3.1 Toning tables

Though dismissed by many physiotherapists, the benefits of toning tables should not be ignored. In an April 2007 article published in an online magazine, www.worldwidehealth.com, Andrew Mackey (MD of Slim Images Ltd.) postulates that regular use of toning tables:

- relaxes over-used muscles;
- tightens under-used muscles;
- improves posture;
- improves blood circulation;
- improves lymph fluid circulation.

The same company conducted an informal study of thirty users at the Newark and District MS Information and Support Centre in 2004. Highlights from the results are:

- Most found it easy to get on and off the tables.
- After one week's use all users reported improved circulation - some minor, some dramatic. After 30 days use most reported improved circulation.
- Many reported improved mobility after a week and saw most improved flexibility after 30 days.
- The majority scored 'feeling of wellbeing' very highly.
- Users were unanimous in saying that using a toning table was an enjoyable experience, was relaxing, was easy to use and that they would recommend them to other MS sufferers.

3.3.2 Vibration equipment

- Researchers wondering why a cheetah purrs concluded that the vibrations help to stimulate blood circulation and warm its muscles.
- In the 1970s the Soviet Union experimented with vibration training for its athletes, seeing improvements in muscle strength and flexibility and reduced recovery times after exercise. Similar research continues now in Italy and Israel.
- It is also said that vibration-based training was used on US astronauts to help prevent osteoporosis, an unfortunate side effect of a gravity-free environment.

Claims (by equipment supplier VibroGym) are equally extravagant for those with a variety of ailments, though many might have some foundation and empirical backing. Vibration training is said to benefit:

- Osteoporosis
- Arthrosis
- Rheumatism
- Lower back complaints
- Pelvic Instability
- Whiplash
- Lung emphysema
- MS
- Blood circulation
- Lymph drainage

3.3.3 Less passive assisted exercise

The remainder of this discussion of benefits refers to the less passive types of assisted exercise - upright machines, power assisted cycles, etc. It has to be said that there has been very little research in this field, so much of the attributed benefits are based on empirical evidence only.

This will change soon, because there are a series of studies being undertaken at Leeds Metropolitan University at the instigation of Dr Ron Butterly, Principal Lecturer in Exercise Physiology.

His team has completed a pilot study of middle-aged women who take little or no exercise and lead a sedentary lifestyle. In the pilot he found:

- a) their flexibility usually improved markedly;
- b) their blood pressure sometimes improved;
- c) in most cases there was a very marked 'enhanced mood state' - in other words, a feeling of well-being.

The study will be repeated in a more rigorous manner in early 2008. Meanwhile the data on mood enhancement is being analysed in a separate study by a psychologist.

However, the pilot has allowed Dr Butterly to state with some authority some real benefits of power-assisted exercise:

1. It is safe - no injuries and accidents, which is important for the older generation, especially when overweight.
2. Users can do as much or as little as they wish - the amount of power which they contribute can be varied; in practice, most users begin fairly passively to regain flexibility and confidence and later begin to contribute meaningfully towards a proper workout.
3. The assisted power means that users do not have to overcome inertia at the start of an exercise - it is the middle range which is most beneficial.
4. There is a much improved range of movement for most users.
5. There is a considerable mood enhancement effect.

The pilot is also spawning other new studies. One is being conducted by Dr Sean Carroll and Dr Lee Ingle, who are both cardiologists. They have just received approval for two studies, one using assisted exercise machines and the other exploring the benefits of a 'periodic accelerator' (vibrating bed) on patients with angina. Both studies will be reported in mid-2008. They are hoping to later extend these trials to pre- and post-bypass patients.

Another in the future, under Dr Butterly, will look at the benefits of assisted exercise on MS sufferers. This is dependent upon a grant from the MS Society.

Two other published studies, of peripheral interest, are:

- A programme undertaken by researchers in Kentucky and reported in the September 2004 American Diabetes Association Scientific Sessions. Eleven elderly people with type 2 and peripheral neuropathy underwent a twelve-week supervised programme comprising resistance training for the lower extremities. Measured benefits were:
 - improved muscle strength in the calves and hamstrings
 - a reduction in waist circumference;
 - improved blood pressure;
 - improved cholesterol;
 - improved vibration sense in both feet.
- A programme in Japan to measure the benefits of the Matsushita 'Joba' riding machine (mentioned in 3.1 above). This was a study of people with diabetes, aged 59 to 75 years,

who used the Joba for 30 minutes per day, four days per week for twelve weeks. the main findings were:

- a significant increase in insulin sensitivity;
- significant decreases in triglycerides and percentage of fat;
- no change in fasting blood glucose, A1Cs (glycosylated haemoglobin) or total cholesterol.

Besides the studies mentioned above most evidence of benefits is empirical or anecdotal. Below are some case studies taken (and summarised) from the BASIC website.

Laura Perry, 18, Derbyshire

In 2004 Laura had what was described as a 'funny turn', followed by some painful and distressing symptoms, which included numbness and an excruciating headache.

At first it was diagnosed as a migraine but the symptoms persisted and, after a brainscan, she was diagnosed with Chronic Fatigue Syndrome. In fact, she suffered from ME.

She lost her job, became depressed and put on a lot of weight. After eight months she knew she must do something about it and contacted BASIC. She visited the gym and was given a personal 'prescription' for exercise.

Exercising gave her a lot more energy; she also lost a stone and a half in weight. Laura went on to get herself a job, a house and a social life. Although she still gets attacks, when she cannot speak or see, she says she is able to live her life again.

Roger Ennis, 57, Bolton

Roger fell victim to MS when he was 51. MS attacks the central nervous system. It erodes part of the brain and spinal system but can then lie dormant with an unpredictable outcome when symptoms re-emerge.

He had to give up his job as a university lecturer and he became inactive. His walking became difficult and he had to use a stick. He also suffers from fatigue, making it hard to get any motivation to walk.

With little support by way of physiotherapy available to him on the NHS, Roger remained positive and determined to help himself. He joined the BASIC gym and since then his mobility and stamina have greatly improved. He says his greatest problem was getting the right sort of exercise - it was too difficult to use a mainstream gym and often when he got there he had no energy to use the equipment. He says the powered exercise machines move his limbs whether he is in the mood or not.

He says that now the centre is the only thing that keeps him active. He gets lots of advice and everybody is really friendly; it's somewhere he wants to go, rather than a chore.

Glynis Shaw, 53, Manchester

Glynis had a brain tumour removed in 1998. During the operation she suffered a stroke, leaving her with paralysis down one side of her body. She underwent four months of physiotherapy before she was allowed home with full-time carers. She learnt to sit in a chair on her own, then gradually managed to stand and walk independently.

Initially she attended BASIC for aromatherapy massages that helped to de-stress her mood and relax her. Then she joined the gym. After three months she had lost ten inches from her waist and she also found that regular exercising stopped her muscles from deteriorating

through lack of use. Glynis is continuing to lose weight and build muscles in her arm and she also finds that visiting BASIC lifts her spirits.

Ann Kurley, 53, Manchester

When Ann was diagnosed with a spinal tumour she was terrified after being told that she might lose her ability to walk. Although she found it difficult to stand or to get up she went into denial until the condition became so bad that she could no longer ignore it.

In 1993 she had the tumour removed and at first had no feeling in her legs or back. The twelve years that followed were a long struggle to regain her balance and learn to walk again.

She joined a conventional gym but it did more harm than good because she was doing things she shouldn't have been. She then attended BASIC during early trials in September 2005. A neuro-physiotherapist prescribed a programme of exercises that was suitable for her condition and since then there has been no stopping her.

Ann explained: "The muscles in my legs had become very weak over the years. Now the machines are building the muscle definition on my legs which is improving my walking – I'm keeping it, and determined to improve my condition, and keep fit."

Other testimonials include one from a lady with arthritis who was able to take up ballroom dancing again. Another said that after visiting a PAEG her kitchen was larger..... When asked how she said that she was now able to reach the top shelf again!

3.4 The Inclusive Fitness Initiative

The government is keen to promote fitness for the disabled - not in special, separate centres but within existing fitness centres. In 1998 it established the 'Inclusive Fitness Initiative' (IFI - see www.inclusivefitness.org.uk) describes itself as "*a programme that supports the fitness industry to become more inclusive, catering for the needs of disabled and non-disabled people alike. Through a range of projects and products the initiative has supported facilities across England to create an inclusive service, increasing participation by disabled people.*"

The IFI awards accreditations to approved fitness sites (the only one in West Berkshire being the Kennet Leisure Centre, Thatcham, where it is said the special facilities provided for the disabled are hardly ever used).

An accreditation process also exists for equipment but no mainstream fitness equipment has yet met its demands. The eight products to do so include a water cooler, two ramps, a parking system and matting.

In the course of preparing this report we have attempted to engage the IFI in a discussion about the concept of power assisted exercise but this was not successful. Two of the equipment manufacturers we have met have also had disappointing dealings with the IFI. One said that the modifications demanded of their product for accreditation would render it unsuitable for users in wheelchairs.

Despite the shortcomings of the organisation promoting inclusive fitness, its objectives are worthy. We would all like to see disabled users treated equally in public and private fitness centres. However, there is a fundamental dichotomy between this objective and our scheme to build a centre of excellence, comprising hydrotherapy pool and PAEG for users with neurological and other disabilities.

Further, most of the professionals we have spoken to in the course of this work have told us that MS sufferers, stroke victims and others with comparable complaints need a special environment and special care. Also, they are often embarrassed to exercise with able-bodied people; this is often the reason they do no exercise at all before visiting a PAEG.

3.5 'Activity for Health'

West Berkshire Council is especially keen to promote health and fitness for its citizens, as evidenced by its 'Partnership Health and Well Being Strategy (2006-2009)' (available from www.westberks.gov.uk). Its aims, by working in partnership, include:

- improving life expectancy and decreasing health inequalities;
- promoting well being through the adoption of healthy lifestyles;
- reducing health inequalities by targeting the most disadvantaged and vulnerable groups.

One of its major initiatives is called 'Activity for Health' which comprises running activities for various groups, at the Council's six leisure centres. The target set by the Council for 2006 was 300 participants, thereafter rising by 50 each year.

Classes include:

- 'New Hearts' - cardiac rehabilitation.
- 'Easy Breathing' - for those with COPD
- 'Moving Forward' - to help clients cope with anxiety and depression;
- 'Steady Steps' - falls prevention exercise classes for the elderly.
- 'Activ8' - weight management for the obese children;

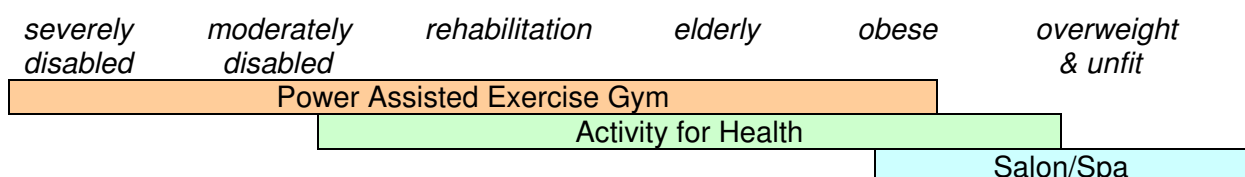
In the main clients use conventional exercise equipment, such as treadmills. All clients are referred by GP practices and now all eleven practices in West Berkshire actively refer. All users pay a small charge to cover the costs of running the classes, which are generally run by freelance specialists (who are paid about £10 per hour). 'Activity for Health' is a great success and there are 150 clients per week at Northcroft Leisure Centre alone.

Although this initiative provides many examples of disabled users not being too embarrassed to use conventional fitness centres alongside able-bodied people, the key is that they attend in groups, with common disabilities.

Those who run 'Activity for Health' are frustrated by the lack of space available within the area's leisure centres (for instance, we saw one example where a class for elderly people had to resort to borrowing a squash court). They see a West Berkshire PAEG as an additional facility where they will be able to run classes.

This may well be feasible. It certainly seems that this initiative overlaps considerably with the objectives of the PAEG. Conversely, the PAEG would not wish to 'compete' for clients in persuading GPs to refer their patients when this has already been done.

However, it should be noted that there is an overlap and not a complete match in objectives and targets. Targets might be thought of in terms of their position on a spectrum thus:

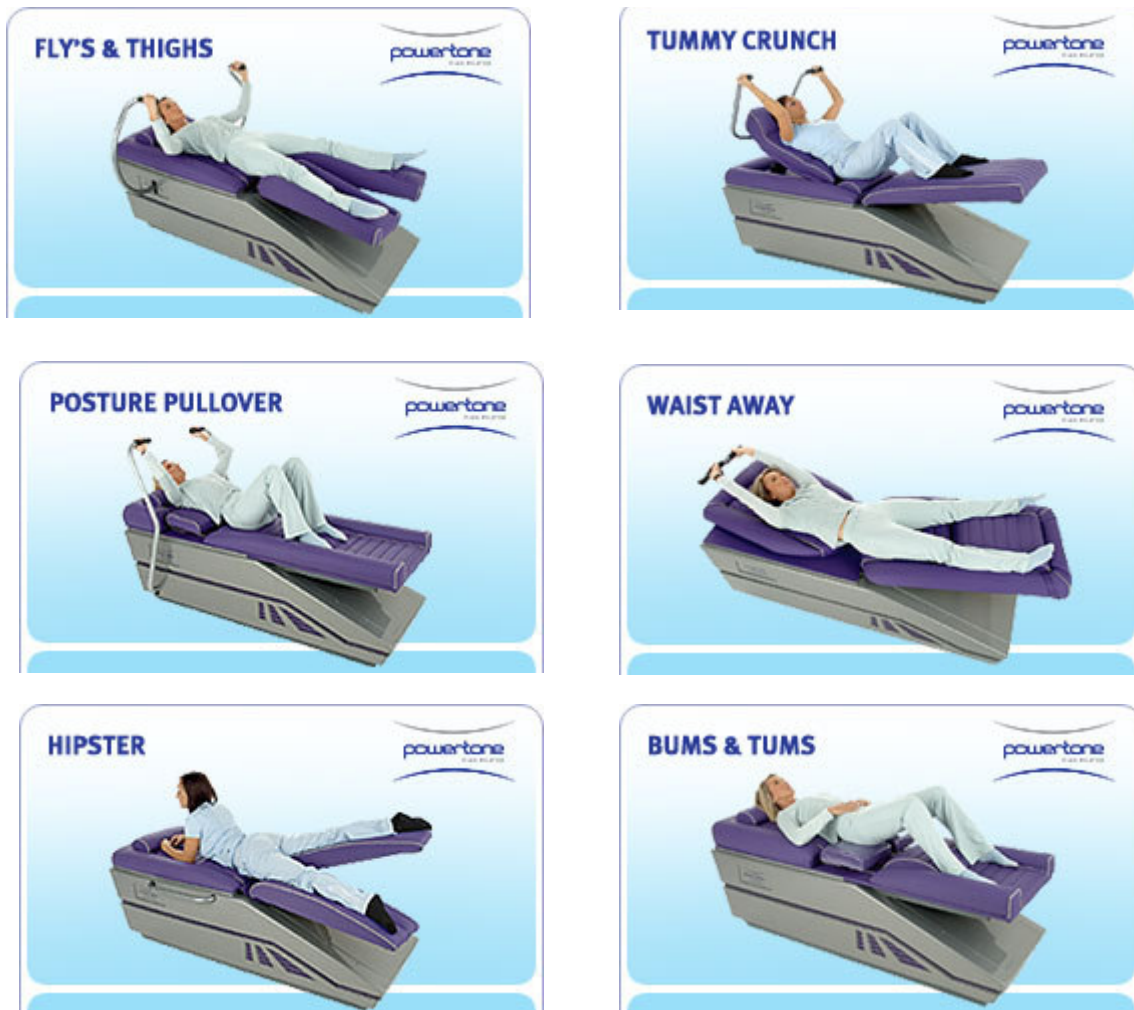


4. Equipment Suppliers

A number of suppliers of power assisted exercise equipment have been identified.

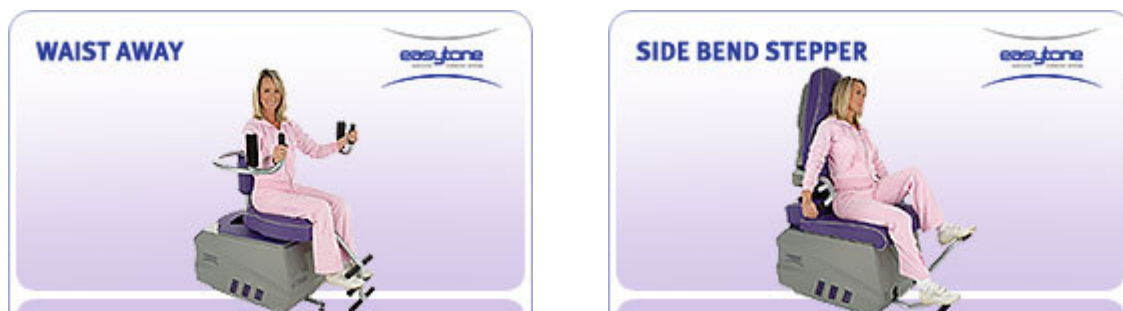
4.1 Shapemaster (www.shapemaster.co.uk)

Huddersfield-based Shapemaster Ltd. was founded in the 1980s and originally imported toning tables from the USA. The founder retired and his engineer, Howard Blackburn took over as MD. The company began to manufacture its own products, now known as the Powertone range of toning tables.



These products are very successful in the salon/spa market, which forms 90+% of Shapemaster's sales. 'Bums & Tums' incorporates a vibrating massager. The Multimaster is a variant which combines several exercises into one table and targets the home market.

The Easytone range are the equivalents in upright machines.





Again, there is a variant, called The Enabler. It is more wheelchair friendly since the arms can be folded out of the way for mounting and dismounting. It is considered to be especially suitable for use in care homes and the Australian government is considering putting one into every care home in the country.

On the face of it, the Easytone range is most suitable for a PAEG.

Shapemaster will have a turnover of £1.3 million in 2007, with profit before tax running at 15%. In 2008 it is expecting a turnover of £1.6 million.

The company has some very successful distributors, notably in Australia, but is also opening its own PAEGs, called 'Feel Good Factories' in the UK (see section 3.2). There is also a plan to start up a sister company, to include a manufacturing unit, in the USA.

Shapemaster is very serious about the medical market. It equipped BASIC, at Salford, it supports Dr Ron Butterly's research at Leeds Metropolitan University and it has embarked on a number of other initiatives, such as loans of machines to worthy recipients.

The price for a set of six Easytone machines is £25,500. This figure includes a year's warranty and three days training. Lead time is five weeks and leasing through a third party is available. The MD offered to do a special deal for WBNA, under which there is flexibility to trade in or swap out equipment after a period of operation, when it is better known which equipment is most effective and popular for its clients.

A set of six Powertone machines is also priced at £25,500; the Multimaster is £6600 and the Enabler is £500 more than a single Easytone machine.

4.2 Slim Images (www.slimimages.co.uk)



Peterborough-based Slim Images Ltd. was founded in 1987. It refers to its toning tables as “passive exercise equipment for the home, business and rehabilitation use”.

We understand that 40% of the company’s sales are to the home sector. However, it takes the rehabilitation segment seriously and has collected many interesting case studies and testimonials. Some of its toning tables are installed in MS Therapy Centres, such as Newark (see section 3.3 for a survey of Newark users).

The price of the Multitone table (shown above), which is the model recommended for commercial use, is £3995.

Slim Images also distributes a ‘Vibration Toning’ device (see photo right), also manufactured in Peterborough by what appears to be an unrelated company, Body Action Ltd. (www.bodyaction.co.uk).

This is a vibrating platform designed to prevent age-related muscle loss and to increase flexibility, blood-flow and balance. It is said to benefit people with osteoporosis, arthritis, MS, Parkinson’s disease and stroke victims.

This product, too, can be found in many MS Therapy Centres, where they are spoken of highly.

Its price is £3495.



4.3 VibroGym (www.vibrogy.com and www.bettervibrations.com)



Netherlands-based VibroGym claims to be the leading supplier of vibration platforms. Among its 22 distributors worldwide is Power Products Global Ltd, based in London.

Its two principal products are the ‘VibroGym Domestic’, at £2500 and aimed at home users, and the ‘VibroGym Professional’ (photo left), aimed at salons, spa and clinics and priced at £5000.

There are said to be several hundred installed in the UK and a map on the UK distributor’s website shows where (the nearest to West Berkshire is at a Swindon health and fitness centre).

Some MS Therapy Centres have this equipment.

The company is keen to present the scientific concept and medical benefits of vibrating machines. This is covered in section 3.3.

4.4 Vibrant Medical (www.vibrantmedical.co.uk)

Vibrant Medical Ltd. is a Sheffield based company which manufactures vibrating pads for use in the treatment of Cellulitis / Erysipelas and Leg Ulceration. the company is currently researching its use to treat MS patients and is also interested in other applications, including stroke victims.

The Newark & District Information and Support Centre was one of the triallists and came to very positive conclusions. It is especially beneficial to patients who are too disabled to stand on a vibrating table.



4.5 Cyclone Mobility (www.thera-trainer.de and www.cyclonemobility.com)



The Thera-vital power assisted cycling machine is manufactured in Germany by Medica Medizintechnik GmbH. It is distributed in the UK by Cyclone Mobility & Fitness Ltd., which also manufactures customised wheelchairs.

The Thera-vital (see photo left) exercises both legs and arms (but not both together). The latest model has a great many useful features, such as a colour screen displaying 'the road ahead' (which shows whether more effort is being put into one side and hence 'steering' is in that direction), a downloadable clinical analysis after the session has been completed, a spasm detector and a pulse monitor (especially useful for cardiac patients).

Despite its wealth of features, it has a good graphical user interface and is easy to use.

Pricing is unbundled, with a basic Thera-vital trainer priced at £2395, a dozen options available and a fully-featured model £3850. Cyclone Mobility will provide equipment on sale or return for initial trials.

In the same range are the Thera-live, with a lower specification and designed for home use, the Thera-joy, for use from a bed, and the Thera-activ with no power assistance but still designed for use from a wheelchair.

4.6 Medimotion (www.motomed-medimotion.co.uk)

Medimotion is the UK distributor, based in Carmarthenshire, of MOTomed machines, manufactured by German company Reck, which has a further 120 distributors in 67 countries.

Its products are all based around cycling, with 'full-body' models also incorporating a hand-crank but only one function can be used at a time. All products are designed to be used from a wheelchair and the amount of power assistance can be varied, down to nothing.

The products are said to have been designed specifically for MS and CP patients but the full range of disorders for which they have been found to be effective also include spastic and

rheumatic illnesses, Parkinson's Disease, muscular dystrophy, stroke victims, polyneuropathy and osteoporosis.

There are many electronic features and it is not easy to use. However, one useful feature is that the equipment detects resistance by the user, which suggests a spasm. It then stops and slowly reverses direction.

Medimotion equipment (sometimes referred to as MOTomed machines) have been found in many MS Therapy centres and physiotherapy departments of hospitals (including West Berkshire Community Hospital). They are spoken highly of.

There are five products:

- Viva Lower Body;
- Viva Full Body;
- Viva2 Lower Body;
- Viva2 Full Body;
- Viva Gracile - lower body, for children.

The one shown in the photograph is the Viva2 Full Body, with the patient using the lower body option.



Prices range from £2650 to £4000, the latter price being for the Viva2 Full Body.

4.7 Biodex (www.biodex.com and www.iprsgroup.com)



Biodex is a US company whose products are distributed in the UK by Suffolk-based IPRS.

Its mobile 'unweighing system' (shown to the left) comprises a harness in a frame to provide partial weight bearing.

It is typically used in conjunction with a conventional treadmill. While this combination is not assisted exercise in the sense that motors are incorporated, as in the other machines described in this section, the weight bearing capability of the frame provides assistance to many patients who would not otherwise be able to exercise on a treadmill.

Prices are very high. The support system is priced at £5195 and a treadmill from the same supplier is the same price (but £4000 or less from many other suppliers)..

4.8 Slender You (www.slenderyou.com and www.slenderyou-europe.com)

Slender You is the leading supplier of toning tables in the USA. It was founded in 1983 and mainly addresses the salon market. It distributes in Europe through a representative in the Netherlands.



The range of equipment shown is sold for €47,480 (approx £33,000).

No examples of these products being installed in the UK have been discovered.

5. The Market

An extensive review of the market was conducted for the Hydrotherapy Pool Feasibility Study of December 2006. This will not be repeated here but additional analysis is added to reflect the incremental opportunity provided by the PAEG.

However, it should be said that it is far more difficult in this case to gauge the market. It is almost a virgin opportunity, there being very few other similar PAEGs in the UK from which their experiences can be drawn upon, and certainly none in or near to West Berkshire.

For this reason the risk is higher and the necessary margin for error needs to be greater. However, the impact of these points can be mitigated by building into the business model greater flexibility.

5.1 Demographic profile

In section 4.1 of the Hydrotherapy Pool Feasibility Study it was ascertained that while the population of West Berkshire is 145,000, in the main catchment area it is about 100,000. It is more than possible that some potential upside to this figure will exist if clients travel from further afield - Reading, Wiltshire, Hampshire, Oxfordshire. Indeed, they would be more inclined to do so for a PAEG, where none exist in their areas, than for a hydrotherapy pool, where other facilities exist in Reading, Swindon, Oxford, Highclere, etc.

Even so, this information is of limited value. Stoke-on-Trent's population of 240,000 supports a PAEG which in just 30 weeks of operation attracted a membership of 420. But to say that this suggests, based on arithmetic alone, that West Berkshire could attract 175 ignores the fact that the West Berkshire PAEG would be largely aimed at different market segments.

5.2 Segmentation

The prime objective of a PAEG co-located with the West Berkshire Hydrotherapy Pool is to provide additional facilities to a similar group of clients (reference is made to those identified and discussed in sections 4.2 and 4.3 of the Hydrotherapy Pool Feasibility Study):

1&2. Hospital in-patients and out-patients

There is substantial evidence from BASIC that this will be an important source of clients. It is also worth noting that the Physiotherapy Department of the West Berkshire Community Hospital has already invested in some power assisted equipment. Its staff are frustrated by the lack of space in the Physiotherapy Department gym and would welcome a larger facility.

3. Referrals from GPs

Our previous analysis concluded that once GPs were sufficiently well-informed about the benefits of hydrotherapy then this source would yield 800 clients per annum. There is no reason to suppose that this should not also become a prime source of PAEG clients, directly and/or through the 'Activity for Health' programme. Indeed, there will be a very considerable overlap of conditions which would benefit from either or both (this will be discussed later).

4. Self-referrals

While it is unusual for a hydrotherapy pool to accept self-referrals we recommended it. The case for a PAEG is less clear cut and this, too, will be discussed later.

5. Private clinics

We expect this to be a small source of clients, for both the pool and gym.

6. Support groups

Demand for the hydrotherapy pool for groups will be high and it was anticipated that many would run specific classes, with the pool being closed to others. There is no history available of any PAEG doing this; after all there is basically just one exercise, or set of exercises, being available on one machine and furthermore only one machine can be used by one person at a time.

Having said that, if a group were hiring the pool then it might be natural and easy for some or all of it to go on to do some further exercise in the gym. However, until the case is proven we shall conservatively exclude support groups from our analysis.

This does not mean that, for instance, MS sufferers will not use the gym. We are fairly sure they will, but as individuals rather than in a group.

7. Special schools and centres

It is quite likely that this will become a source of gym clients. However, unlike hydrotherapy, most such establishments have no experience of assisted exercise, rarely appreciate its benefits and we cannot therefore predict their potential usage.

8. Ante- & post-natal

There is some evidence that assisted exercise helps some post-natal conditions - for instance, strengthening the pelvic floor. However, we think classes are unlikely but individuals possible.

9&10. Sports clubs and Learning to swim

Not applicable.

11. Aquarobics

In the sense that aquarobics is a popular means of providing gentle exercise to the elderly and infirm there is likely to be considerable overlap here, but for individuals rather than classes.

12. Other groups

In the feasibility study for the pool we reflected experiences at other pools that there was a potential market for recreational groups, ranging from children's parties (which would not be permitted) to groups of Muslim women (which might). Demand from similar unexpected sources is less of a possibility with a gym. So, it should be omitted, while bearing in mind that this is another potential source of upside.

The traditional assisted exercise market

In the case of a PAEG there is one major market segment which is insignificant in the case of a hydrotherapy pool: overweight, middle-aged ladies. In theory, men, too, but in practice there is usually a marked reluctance on the part of men to attend salons and spas for 'toning'.

It is widely accepted that obesity is a serious health issue, especially when it is linked to other conditions, such as diabetes and cardiac problems. In such circumstances we anticipate GPs not hesitating in referring such patients to a PAEG.

But at the other end of the spectrum should this community facility be made available to otherwise healthy middle-aged clients looking to achieve some 'toning'? In between the two extremes there is a grey area comprising middle-aged people who are a little overweight and who are unable or disinclined to undertake other forms of exercise and who would benefit. Where should the line be drawn?

This is a truly enormous market segment. For instance, within 30 weeks of opening the Stoke-on-Trent Feel Good Factory had secured 420 memberships worth £145,000 revenue per year. Such financial potential raises the prospect of seeking clients from this group in order to help finance the running costs of the gym and pool. Then the whole community benefits.

In our further analysis we assume that the line will be drawn somewhere in that grey area between the two extremes. However, exactly where is a matter to be decided by the Board of Trustees.

5.3 Medical conditions

There is a considerable overlap between the medical conditions which benefit from hydrotherapy and those for which assisted exercise is of benefit. However, it is worth looking at this in more detail. Hydrotherapy pool statistics are taken from Appendix D of the feasibility study, which comprises an analysis of referred clients to the Thamesdown pool, at Swindon.

5.3.1 Musculoskeletal

851 (61%) of pool users came in this category, of which 39% were arthritis sufferers and 37% represented spine/neck/back problems.

We would expect rather lower, but still significant, figures for a PAEG.

5.3.2 Neurological

166 (12%) of pool users had neurological disorders, the most common being cerebral palsy, fibromyalgia and MS. Stroke victims represented a relatively small proportion at Swindon but rather greater elsewhere.

There is considerable evidence that this group of patients benefits greatly from assisted exercise, possibly even more so than from a hydrotherapy pool. Also, many MS Therapy Centres throughout the UK have invested in assisted exercise equipment.

At BASIC 60% of clients are stroke victims, with MS sufferers being the second greatest group of users.

5.3.3 Post-operative and accidents

Post-op accounts for 11% of pool users, with hip and knee replacements being the most common, while accidents account for 5%, a large proportion of which are fractures.

We would expect doctors of such patients to recommend they did not use the more aggressive types of fitness equipment, such as cycling machines, during their recuperation. However, passive exercise would do no harm. Nonetheless, experience at other PAEGs suggest that these will be a very small segment.

5.3.4 Cardiovascular

While cardiac problems represent a surprisingly small segment, at just 2%, for the pool we expect it to be rather greater for the PAEG. It is notable that the Tibshelf Cardiac Rehabilitation Support Centre (even though it has broadened its remit) is one of the largest assisted exercise centres in the country and is fed largely from GP referrals.

Some early findings from the Leeds Met studies suggest benefits to cardiac patients, particularly from vibrating equipment.

More stringent than normal health and safety measure will be required to accept cardiac patients. For instance, somebody trained in the use of a defibrillator will need to be on hand. For these reasons clients with cardiac conditions might need to be separated into a special class or only accepted between certain times.

5.3.5 Diabetes

Diabetes sufferers are constantly urged to undertake exercise in order to help manage their condition. The national charity, Diabetes UK, suggests walking, dancing, swimming, household jobs, golf, bowling and cycling. Assisted exercise does not figure in their recommendations. However, it clearly has a place when those with diabetes are older, overweight or have other conditions which might prevent more strenuous activities.

It is notable that research has been undertaken in the USA and in Japan (see section 3.3) on the value of assisted exercise for diabetes sufferers.

Clients with diabetes also figure rarely among users of hydrotherapy pools - not surprisingly, because hydrotherapy is more about mobility than exercise. There is clearly scope to attract diabetes sufferers to a PAEG - one in 30 of the population of the UK has been diagnosed with Diabetes (equating to 3300 in our catchment area). However, this would only be achieved through education and over a period of time.

5.3.6 COPD

Chronic Obstructive Pulmonary Disease (COPD), which encompasses both chronic bronchitis and emphysema, is one of the commonest respiratory conditions of adults in the developed world. In the UK, it is estimated that 18% of males and 14% of females aged 40-68 years may have developed features of COPD.

While COPD does not figure in any research into the benefits of assisted exercise and assisted exercise is not listed as a treatment by COPD specialists and associations, nonetheless physiotherapists consistently cite it as a disease whose sufferers benefit from mild exercise.

5.3.7 Obesity

This has been covered in section 5.2. According to WHO classifications people with a BMI between 30 and 40 are officially 'obese' and those above 40 have 'morbid obesity'. A large number of such people are treated by their GPs who might refer them to a PAEG.



6. Design and Staffing Issues

There are too many unknowns to be definite about the size, shape and contents of a PAEG. This is a very new concept, not just in the UK but in the world. We can draw on some of the experience of BASIC, in Salford, and note the successful formula being rolled out in the Shapemaster 'Feel Good Factories'. But at the end of the day we advocate caution but flexibility. It is reasonable to make the following assumptions:

- A PAEG associated with a hydrotherapy pool beside the West Berkshire Community Hospital will be synergistic with both. There will be a very small amount of cannibalisation - clients going to the gym instead of hydrotherapy, and vice versa - but this will be more than outweighed by the effect of this becoming a centre of excellence which attracts clients from a wider area and with a broader range of needs. Furthermore, the centre envisaged will be a stunning, state-of-the art example of a community's care for those unfortunate to suffer from a range of disorders and disabilities. The publicity from this will attract additional clients.
- It is easy to envisage 100+ regular clients, each visiting two or three times each week for treatment and the alleviation of symptoms of medical conditions. This figure could be more than double or possibly even treble. Referrals from the hospital and from GPs are likely to be the greatest source of clients.
- Then there is a potentially massive impact of a policy decision. It is entirely reasonable that obese clients be welcomed, through the normal referral process. However, if GPs are encouraged to also refer overweight but not obese clients then there could be a step increase in demand. If self-referrals were to be accepted as well - straying into the salon/spa segment of the market - then there will be a further (huge) step in demand.
- We can find a justification for equipping the gym with examples from each of the four main types of assisted exercise machines:
 - toning tables,
 - upright powered exercisers,
 - vibration devices,
 - cycling machines,
 - and also a treadmill.

What proportion of each is a moot point and is dependent upon the mix of clients, which is in turn dependent on the factors discussed above. Space for a maximum of twenty pieces of equipment is justified.

For these reasons we propose initially a large space with a minimum of equipment. As numbers build then decisions can be made about what additional equipment to purchase. Additionally, suppliers, who are all keen to expand into the health sector, have generally indicated a willingness to work closely with the gym, to provide machines on trial or sale and return or to offer generous part exchange terms.

6.1 Size and shape

Here we can draw on some solid experience. BASIC is 45 x 24 ft = 1080 sq ft and has fifteen pieces of equipment (and a desk). It is rather cramped and would more comfortably hold twelve, given the access constraints of typical users. However, 24 ft is a good width that works well; 20 ft would be a minimum - any less and access problems emerge; any more would be wasted.

Let us assume a width of 22 ft and 80 sq ft per machine. This leads us to describe a space, for twenty machines, of 1600 sq ft, ideally about 22 x 73 ft.

However, one single room will not be optimum. Either two rooms or a moveable partition in the middle of one will provide greater flexibility. In the early days the second space might be used for other purposes, such as a meeting or training room, and later it might be decided to deliberately split the groups of machines between rooms - for instance, keeping one for clients with severe disabilities, and hence requiring greater support, access space and a different mix of equipment, and the other for those with less severe problems. Another possibility is an L-shaped room.

6.2 Equipment choice

As stated above, we see a justification for equipping the gym with examples from all four of the main types of power assisted machines, and also a treadmill:

Toning tables

Shapemaster sells a set of six, each with different functions ('Tummy Crunch', 'Bums & Tums', etc.). Since those using toning tables are likely to be the more severely disabled, looking for general flexibility and mobility improvement, we would find it difficult to justify all six.

Shapemaster also sells a variant which combines several exercises, the Multimaster. While it targets the home market, if it can be confirmed that it is robust and reliable enough for the continual use it would get in a busy gym then it could prove popular and a successful choice.

Slim Images also manufactures a multi-exercise product, known as Multitone, specifically for commercial use. This is the other serious contender and there is little to choose between the two.

We recommend an initial purchase of just one toning table for the use of severely disabled clients (members of a fitness club would be encouraged to use upright machines, cycling machines and the treadmill).

Upright machines

Here, Shapemaster is in a class of its own, with its Easytone range. A set of six, with each providing a range of different exercise, is likely to be at the core of the gym's equipment collection.

Experience of others, including BASIC, suggests that no one model is used appreciably more than any other and we recommend initial purchase of a set of all six.

Vibration machines

There is a growing body of opinion, backed by some useful experiences in MS Therapy Centres, that vibration tables/platforms can prove beneficial, not only for disorders such as MS but also for specific ailments, notably osteoporosis.

BASIC has one, which is used but not as much as its twelve Easytone machines.

We recommend the purchase initially of one machine, either from Body Action, via Slim Images, or from VibroGym's UK distributor.

It may well be that by the time purchases are made the vibrating pad of Vibrant Medical might be proven for those with disabilities too severe to stand on a table/platform. So, this too could prove to be a viable additional purchase.

Cycling machines

Powered cycling machines are proving to be very beneficial for those with less severe disabilities. An initial purchase of two is recommended, either from Cyclone Mobility or Medimotion. The Cyclone 'Thera-vital' is preferred, as it has more features, is easier to use and is slightly cheaper.

Treadmill

While a treadmill is not power assisted, having one, for use in cardiac rehabilitation and to get the elderly and obese walking in a safe environment, would be worthwhile.

There is a question mark over whether a Biodex 'Unweighing System' is also justified, for use with the treadmill. Examples of their use are hard to find. So, for the moment, we recommend that such a device is considered as a possible later addition.

Conclusions

One toning table, a set of six upright machines, one vibrating table/platform, a treadmill and two cycling machines totals eleven pieces of equipment at a cost of about £45,000 (at list prices).

Toning tables and treadmills, both being the size of single beds, require above average space; the vibrating table/platform needs rather less, being little larger than a weighing machine; other equipment needs space between these two extremes.

As gym usage expands so will the equipment inventory. It is better that later purchasing decisions are based on experience and demand rather than unreliable early guesswork. However, retaining a budget of £4000 per machine would be wise.

As a footnote we should also say that if the Board of Trustees decides to expand significantly into the 'overweight ladies' salon/spa market segment then purchase of some more non-powered exercise machines, such as treadmills and perhaps rowers, might be justified.

6.3 Other facilities

One of the beauties of co-locating the PAEG with the hydrotherapy pool is the potential to share peripheral facilities, notably:

- toilets - including those providing access for the disabled;
- changing facilities and showers - which are not generally provided in PAEGs, though there is evidence that a small proportion of clients would use them if they were;
- the 'static hoist' (a portable access device) considered essential for the pool, though probably rarely used, will also be seldom required in the gym, but it is important that one should be available.
- a defibrillator and other safety equipment;
- office/reception - for dealing with subscriptions, bookings and other administration;
- social area - for clients and also for their carers and drivers, while waiting;
- car parking - including spaces for the disabled;
- air-conditioning system - while the air in the pool area will normally need to be cooled (because it is heated by the water), that for the gym will more often than not require warming; so, there are potential energy-efficiency gains.

With all of these facilities already provided for the pool, the only significant incremental building cost is for the room. It should be located conveniently for all of the facilities mentioned above and, very importantly, there should be at least two closed doors between the gym and the pool (because the very high humidity of the pool area corrodes equipment).

So, the obvious building layout might be a central section with office, social area, etc. Behind it would be the changing rooms, toilets and showers. Then to one side the pool and the other the gym.

6.4 Staffing

The feasibility study for the hydrotherapy pool described minimum staffing levels of two physiotherapists, one of which is manager of the whole facility, and two unqualified assistants.

This level of staffing would be sufficient for the recommended pool opening hours of 9.00am to 8.00pm weekdays and 10.00am to 1.00pm on saturday and sunday mornings. It would seem to make sense for the gym to have the same opening hours as the pool and this is assumed.

The gym would require two 'trainers' (i.e. further unqualified assistants), so that one was present at all times. Additionally a qualified physiotherapist should be available for assessments and to occasionally provide advice to trainers and clients.

So, here too there is a potential economy: no additional physiotherapist would be necessary; the one on duty at all times for the pool could also cover the gym.

The two gym trainers could be kept separate from the pool assistants or, to provide greater flexibility and job interest, the group of unqualified assistants could be expanded to four, with two on duty at all times.

7. Marketing

Again, much of what was written in the Hydrotherapy Pool Feasibility Study is pertinent here and to a great extent the gym will piggy-back on the pool.

7.1 Promotion

In the pool feasibility study we recommended the appointment of a part time promotions manager, on a voluntary basis, with expenses paid. That person would address (often through placing contracts with local companies):

- brochure
- directories
- posters
- website
- PR
- visits

All of these are equally applicable to the gym and we stress the importance of the last - to invite for visits potential referrers: hospital consultants, physiotherapists, GPs, Practice Managers, organisers of support groups, etc. Because a PAEG will be a new concept to many of these people it is essential they see it in action.

7.2 Pricing

The basis of pricing recommended for the pool was 'pay-as-you-go' - that is £6 per nominal 40-minute session, with subsidies available for those who justify them.

The majority of PAEGs are priced on a monthly subscription basis, but then most are salons/spas addressing the toning market. BASIC originally had pay-as-you-go but switched to subscriptions for practical reasons, rather than because they felt a subscription-basis was better. Tibshelf also operates on a pay-as-you-go basis.

Because pay-as-you-go made sense for the pool and all of the administrative procedures will be in place for that method, we recommend it as standard for the gym, too.

£4 per nominal 40-minute session (with an average after subsidies of £3) is recommended. This is affordable and comparable with other PAEGs which offer a £30 per month subscription.

There could also be scope to purchase 'season tickets' or monthly subscriptions; or a hybrid scheme, with a low subscription supplemented by a smaller pay-as-you-go charge. Should the PAEG host 'Activity for Health' classes then these, too, are likely to be subject to some sort of group booking scheme. These types of pricing schemes are best discussed after further research nearer to launch and then piloted.

However, in our business plan it is assumed that the average price paid is 15% lower than the £4 per session price, to cover whatever discounts are made available. In addition, some subsidies may be available out of fund raising activities. These are separate and will not be deducted from gym revenues.

7.3 Fund raising

We do not anticipate a shortfall in revenue against operating costs but that does not necessarily mean that fund-raising activities will be irrelevant. If they result in lower standard prices or a greater number of subsidies available to those who need them then fund-raising will be worthwhile.

Any fund raising should be for both the pool and gym together, organised by the 'Friends of West Berkshire Hydrotherapy Pool and Gym', or some such name.

8. Financial Model

A detailed financial model was included in the Hydrotherapy Pool Feasibility Study. This is now re-examined by considering incremental operating costs and incremental revenues resulting from the provision of a PAEG.

As before, capital building costs are not covered by this analysis but equipment depreciation costs are.

8.1 Scenarios

Projections are dependent upon two main issues:

1. ***The take-up of demand for therapy-related use.*** It is reasonable to put in a minimum of 100 regular users, since BASIC achieves 120 with no marketing, 'Activity for Health' 150 at Northcroft and Tibshelf several hundred. 200 would be a more reasonable expectation, drawing on an expected high profile, synergy with the hydrotherapy pool, working together with 'Activity for Health' and there being no other similar PAEG facility anywhere in the south of England.
2. ***Whether the gym is opened up to those without medical conditions.*** A separate fitness club could be formed, with monthly subscriptions and members only permitted during non-core hours for therapy use - say, 12.00 to 2.00pm and 4pm to 8pm. We would expect to have to limit membership to a maximum of, say, 200.

Hence we can examine four scenarios:

| | No fitness club | With fitness club |
|----------------------|-----------------|-------------------|
| Minimum therapy use | 100 users | 300 users |
| Expected therapy use | 200 users | 400 users |

The following projections use data, such as staff costs, researched at the time of the hydrotherapy pool study and they all relate to the position in year three of operation, on the basis that it will take two full years to build numbers up to the anticipated ongoing levels.

8.2 Operating costs

As for the pool, the majority of costs are fixed. Indeed, for the most part they are related to staffing levels. The gym must have one 'trainer' (i.e. unqualified assistant) available at all times. Given the anticipated hours of opening this means two additional members of staff, at a gross salary of £13,500, plus NI of £1,100 and pension of £800 = £15,400. Allowing a further 10% for temporary staffing during periods of holiday and sickness results in a total staffing cost of £34,000 pa.

Other fixed costs will be minimal. Having already allowed a figure for insurance of £5,000 for the pool alone it would be prudent to raise this by £1,000 to allow for an added gym. Perhaps £2,000 to cover incremental energy use and cleaning costs would be reasonable.

Communications costs, marketing and office sundries are expected to be absorbed into the general figures already provided.

The only costs which are dependent upon the level of activity are those associated with equipment. We have previously described a minimum equipment level of eleven machines (at an average price of £4,000) and this would equate to Scenario 1 described.

Scenario 2 might require 14 machines, scenario 3 17 and scenario 4 a full room of 20 machines.

If these are depreciated over four years (or leased, resulting in a similar outcome) and a maintenance and repair allowance of 5% is provided, then equipment costs would be:

| £K | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|------------------------------|-------------|-------------|-------------|------------|
| Machines | 11 | 14 | 17 | 20 |
| Cost | 44 | 56 | 68 | 80 |
| Depreciation (25% pa) | 11 | 14 | 17 | 20 |
| Maintenance (5% pa) | 2.2 | 2.8 | 3.4 | 4 |
| Total equipment costs | 13.2 | 16.8 | 20.4 | 24 |

8.3 Operating revenues

The assumptions here are:

1. That for therapy oriented use there will be a 'pay-as-you-go' fee of £4 per session, with an average discount of 15% (though there might be more subsidies available, paid for by fund-raising activities).
2. Users will attend an average of 2½ times per week ("2 to 3 times per week" is said to be typical, as for BASIC, though Tibshelf is higher). However, we assume users will only be available to use it in 48 weeks of the year.

Hence, income from this type of user will be £4 x 85% x 2½ x 48 weeks = £408 pa.

In the case of the fitness club we assume a £30 per month subscription (with no discounts available).

No group bookings are assumed, though this could represent some upside potential for the overall revenue figures.

| £K | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|-----------------------|-------------|-------------|--------------|--------------|
| Therapy use | 40.8 | 81.6 | 40.8 | 81.6 |
| Fitness club | - | - | 72.0 | 72.0 |
| Total revenues | 40.8 | 81.6 | 112.8 | 153.6 |

8.4 Surpluses

And hence the anticipated surpluses resulting from each scenario are:

| £K | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|-----------------|--------------|-------------|-------------|-------------|
| Fixed costs | 37.0 | 37.0 | 37.0 | 37.0 |
| Equipment costs | 13.2 | 16.8 | 20.4 | 24.0 |
| Revenues | 40.8 | 81.6 | 112.8 | 153.6 |
| Surplus | (9.4) | 27.8 | 55.4 | 92.6 |

Some of the surplus is expected to be put to a Capital Reserve, at the Trustees' discretion. The remainder can be used to subsidise needy users.

8.5 Combined Profit & Loss

Assuming Scenario 4 then the combined profit and loss for the centre in year 3 of operation will be as follows:

| £K | Pool | Gym * | Total |
|-----------------------------------|------------|------------|------------|
| Staff costs | 106 | 34 | 140 |
| Depreciation of plant & equipment | 8 | 20 | 28 |
| Maintenance & repairs | 6 | 4 | 10 |
| Other costs | 32 | 3 | 35 |
| Total costs | 152 | 61 | 213 |
| Revenues | 192 | 154 | 346 |

* Only the incremental costs are shown. If the gym were to be established separately then there would be substantial additional costs, especially for staff and 'other'.

8.6 Risks and sensitivities

As stated near the beginning of this analysis, for a number of reasons we can be far less certain about the demand for the PAEG than we can for the hydrotherapy pool. However, some of the uncertainties and risks can be mitigated by proceeding with caution and flexibility.

It is worth considering the impact of some of the most significant risks:

- If the PAEG is used only for therapy - perhaps because a policy decision rules out the parallel running of a fitness centre - then scenarios 3 & 4 are ruled out. We believe that scenario 1 represents a minimum and 2 a more reasonable expectation and scenario 2 still turns a significant profit.
- If the average income per therapy user were to be less than £408 - perhaps because the average use per week is twice rather than 2½ times then revenue falls by 20%.
- Even if there is a fitness centre it could, in the future, be subject to competition. A fitness spa or 'Feel Good factory' opening in Newbury High Street could suck away most of its business.
- Alternatively we might find it difficult to attract 200 fitness centre users because of its location, adjacent to a hospital, and its limited availability in core therapy hours.
- In several of these pessimistic scenarios there are feasible responses which will reduce costs and/or raise revenues from alternative sources. Notably, one additional trainer rather than two might be employed (saving £17,000 pa) and if half of the gym space is unused then it could be deployed for related activities, such as pilates classes, aromatherapy or an MS Therapy Centre.



Appendix A - Acknowledgements

We are grateful to the following for providing information and assistance during the course of this study:

Sponsors of the study

- John Holt, Liaison Officer of **West Berkshire Neurological Alliance**

Researchers

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- Dr Sean Carroll, Teaching and Research Group Leader, **Leeds Metropolitan University**

Other PAEGs

- Wendy Edge (Director), Linda Kelly (Centre Manager) and other staff at **BASIC**.
- John Coupe (CEO) of **Tibshelf Cardiac Rehabilitation Support Centre**.
- Val Woods, manager of the **Bedford & Northants MS Therapy Centre**
- Zoe Seville-Edden, manager of the **Coventry Mercia MS Therapy Centre**
- Heather Coffey, manager of the **Newark & District MS Information and Support Centre**
- Natalie, manager of the **Honley Feel Good Factory**
- Jeanette, manager of the **Tollgate (Stoke) Feel Good Factory**
- Claire, proprietor of **JJs hairdressing and Beauty Salon, Brimpton**

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- Martin (Southern Sales Manager), **Cyclone Mobility Ltd.**
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- Linda Andrews, Senior Physiotherapist, **West Berkshire Community Hospital**
- Wendy Young, Senior Physiotherapist, **West Berkshire Community Hospital**
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West Berkshire Council

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- April Peberdy, Physical Activity Development Manager; on the staff of Berkshire West PCT but currently working within **Cultural Services**

Others

- Louise Sugden, local paraplegic athlete



Appendix B - Profundus Consulting Ltd.

Profundus is a specialist consultancy dedicated to providing research services, strategic advice and fast-track implementation programmes.

The main market of Profundus has historically been the information and communications technology (ICT) industry. However, in recent years this has shifted towards local and regional government bodies, mainly in the UK.

The range of consultancy skills available include:

- market studies
- market modelling
- business planning
- market entry strategies
- satisfaction surveys
- market testing
- product launches
- distribution strategies

Some Profundus clients

Telecommunications operators:

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Scottish Development Agency

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Cornwell Management Consultants

Others:

BBC
Japanese Inst. of Overseas Investment

Examples of Profundus Projects

- SciSys Ltd. won a major contract on behalf of the Office of Fair Trading to review its consumer helpline service, 'Consumer Direct', in order to provide recommendations for improvements to existing systems and processes and for future proofing them in the event that are volumes increased. Profundus was responsible for **information gathering and stakeholder consultation** - ascertaining information and views from a wide range of parties involved - and then formulating recommendations regarding improvements.
- A confidential study for the Covert Investigations Policy unit of the Home Office included a **series of interviews** with senior representatives of telecommunications operators, ISPs, Ofcom and others. From the resulting analysis a number of recommendations were made concerning future operations.
- Cornwell Management Consultants plc, won a major study on Public Sector Broadband Aggregation for the Welsh Assembly. Profundus was subcontracted to manage and lead one of the three parallel tasks, to **ascertain the present and future requirements of public sector bodies** in Wales, in respect of telecommunications generally and broadband in particular. We then contributed to the appraisal of options and business planning.
- A manufacturer of consumer durables, enjoying considerable success with its core product, was beginning to see a flattening of sales in the face of increased competition. Profundus was tasked to **undertake research and produce a market model**, which would be used for forecasting and strategic decision making.

- A county council secured grant funding for the development of a broadband strategy. Profundus was contracted to undertake a **demand assessment** to determine demand levels **by location, sector and user types** and then to build a sophisticated demand model, including a geographic representation of demand using a GIS tool. Finally, Profundus was asked to recommend a number of **strategic options**.
- The research arm of a Japanese bank was conducting a review of **investment opportunities** in the European and US telecoms industries. Profundus was invited to prepare papers on each, expressing views of events, key issues and future prospects.
- An overseas operator wished to explore new ways of utilising the paging networks of several European countries. Profundus **researched the current state of the paging market** in five countries and produced profiles of the principal operators in each. In addition, forecasting indices relevant to **a number of new applications were researched** in order that an advanced forecasting model could be developed.
- A leading manufacturer of electronic organisers required a **study of its customer base** in order to ascertain how closely the profile of its users matched company targets and to check likes and preferences for a future development programme.
- A software company was finalising plans for the launch of a new office product aimed at SMEs. Wanting to understand more about the current practices and needs of this group of customers, the client commissioned Profundus to **research a number of case studies**.
- A training services company believed that it could extend its sphere of operation to certain Eastern European countries. Profundus was commissioned to **research the markets** in Romania and the Czech Republic **and to conduct interviews** in those countries with potential customers.
- Profundus contributed to a major EC study on the future of mobile communications. The project **examined marketing, technical, political and social issues**, described a likely future scenario and made recommendations for regulation.
- For the consultant to a UK merchant bank, Profundus undertook a **confidential assessment of the marketing plan** for a software house seeking additional funding.

The consultant for this study was **Kevin Carter**, the managing director of Profundus. He has over 25 years experience in marketing, business development and research, latterly as a consultant specialising in the marketing of products and services in telecommunications and information technology. He has led and participated in a wide range of assignments in the UK and the Europe.

Assignments include market studies, business planning, strategic marketing reviews, market modelling and acquisition studies. A particular feature of many studies has been market segmentation, and especially an understanding of small businesses.

Kevin has personal specialisations in market modelling and market planning, but the majority of his work now is to project manage his company's studies. He became a full member of the Chartered Institute of Marketing over 25 years ago. He is well known on the conference circuit and has at various times been a media spokesman.

Kevin has lived, with his family, in West Berkshire for 23 years. He has a good knowledge of locations, familiarity with local issues and a number of useful local contacts. He has participated in the running of various fund-raising activities on behalf of local and national charities, including the running of an annual croquet tournament at multiple locations across the country in aid of Cancer Research UK.