Sector Analysis.
Medical technologies 2005.

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Content.

1 Definition of medical technology.

When we try to define the term ‘medical technology’, we find that this is no easy task. What exactly is medical technology? Is an infusion bag medical technology? A disposable syringe? An ultrasound scanner? An NMR scan? If we claim that an imaging procedure that uses high-end technology such as nuclear magnetic resonance tomography is medical technology, it is unlikely that anybody will contradict us. But what about an infusion bag? Is that bag considered medical technology because it is used to administer drugs? Or does it have to be manufactured in a particular way, such as Fresenius Kabi’s three-compartment bag for nutrition therapy, to be called medical technology? Even the trade associations like Spectaris or the Federal Association of Medical Technology (Bundesverband Medizintechnik, BVMed) are of little help in this regard because the product portfolios of the companies in these organisations are often very extensive, ranging from high technology to the simplest products. Given this situation, we are using our own definition of medical technology.

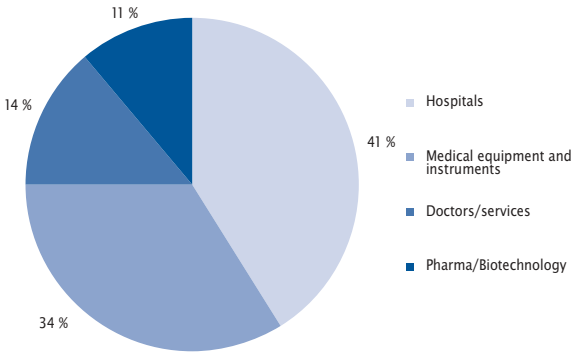
We define medical technology as those products and methods that are developed, manufactured, distributed and used to diagnose and treat diseases based on scientific, engineering - in particular physical - findings.

This definition excludes simple medical products such as wound dressings, compresses or conventional disposable or re-usable syringes. Our definition of medical technology also excludes in vitro diagnostic methods, which by legal definition are medical products as these are often based on biotechnological methods.

2 „One“ medical technology market?

As there are no clear boundaries between the different definitions of medical technology, opinions as to the actual size of the market vary substantially. According to the OECD, the global health care market has a volume of approximately USD 3.3 trillion, around one-third of which is attributable to ‘Medical Equipment and Instruments’, while the much criticised „price drivers“ - pharmaceuticals and biotechnology - make up only around 11 percent of this market volume. This ratio has scarcely changed over the years and fluctuates by no more than a couple of percentage points.

Healthcare market worldwide (app. USD tn 3.3)

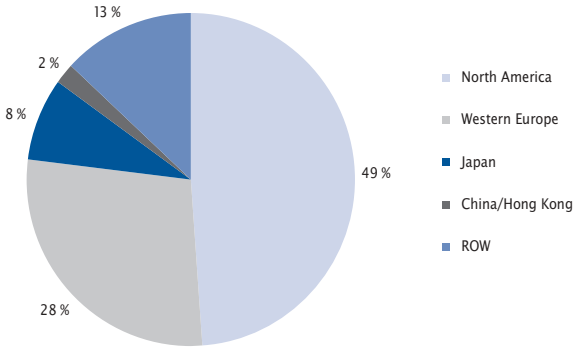


Sources: OECD, BB Medtech, LBBW

‘Medical Equipment and Instruments’ covers a much greater number of products than our definition of the term medical technology. On the other hand, it shows that the market for medical products generally accounts for a very large share of global health care expenditure, whereas only a comparatively small percentage of this expenditure is attributable to the pharmaceutical and biopharmaceutical industries.

Dividing the health care market up into regions shows us what we probably already knew: North America has the largest share of the market.

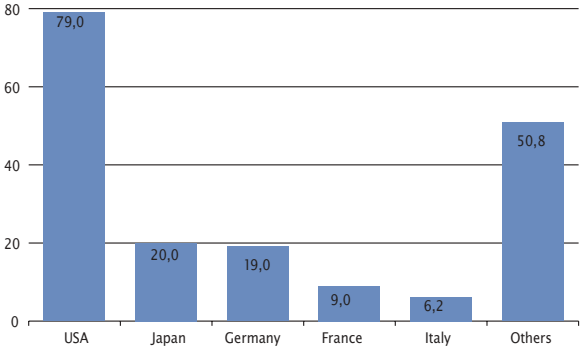
Healthcare market worldwide



Sources: Medistat, Philips Medical Systems, LBBW

If we now try to define what the medical technology market actually is, we find that some of the sources differ substantially. According to BVMed, for example, the medical technology segment had a volume of € 184 billion in 2003.

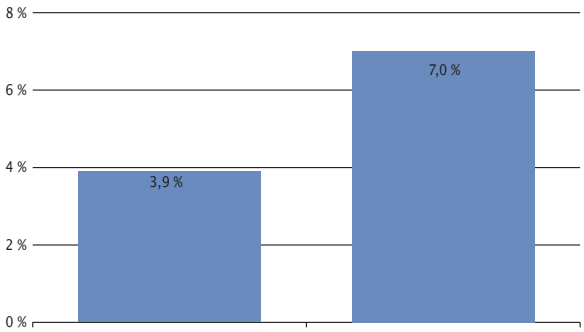
Medical technologies market according BVMed (€bn 184 in 2003)



Source: BVMed, LBBW

BVMed puts annual global market growth at 7 percent, which in our opinion is only conceivable if the global market is presented in USD terms. Given the dominance of the USA in the medical technology sector and the continued weakness of the US dollar against the euro, German medical technology companies as a whole are very unlikely to top the market growth of 3.9 percent achieved in 2003.

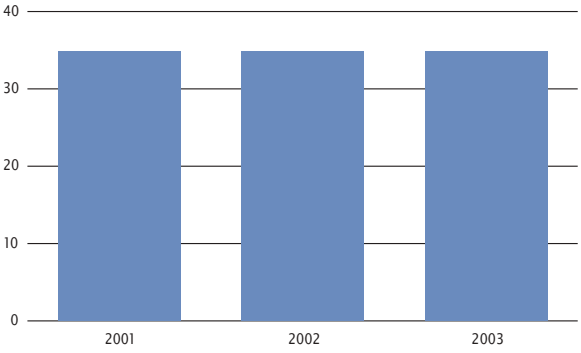
Growth rates 2003



Source: BVMed, LBBW

The trade association Spectaris, which focuses on the optics, medical and mechatronics industries, bases its statements on these sectors having generated total sales of € 34.9 billion in 2003; however, this figure has remained unchanged for the third year in a row. This is almost double the sales figure cited by BVMed for the medical technology sector.

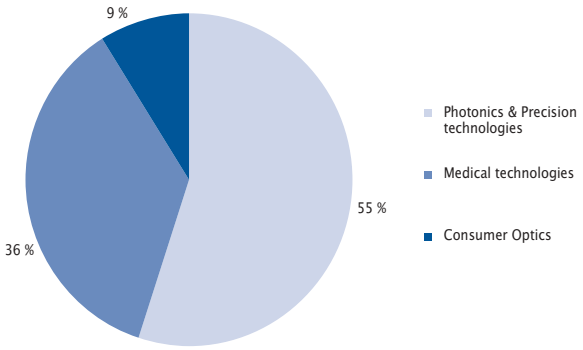
Industry revenues according Spectaris (€bn)



Source: Spectaris, LBBW

This difference is largely due to the fact that Spectaris used a different data basis for recording its data. This can be seen in the following chart.

Sector revenues

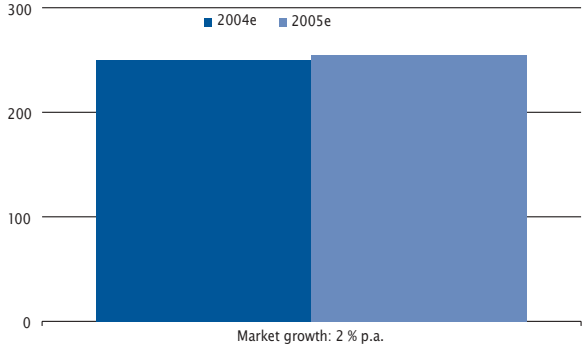


Source: Spectaris, LBBW

However, if we take the figure of 36 percent for the medical technology sector this would result in sales of € 12.5 billion, which is also at odds with BVMed's publications. Yet, this is merely further proof that the two associations have different definitions for the term medical technology and thus a different basis for collecting the data they publish.

The differing perceptions of the scale of the market can also be seen in the forecasts of individual companies. Drägerwerk, for example, assumes a global market volume for medical equipment of € 250 billion. It is, of course, important to remember here that BVMed and Drägerwerk obviously define medical technology in different ways, which explains why their assumptions as to the size of the market differ. Furthermore, in its definition of the global market for medical equipment, Drägerwerk anticipates annual market growth of no more than 2 percent.

Medical devices according Draegerwerk (€bn; 2004e)



Source: Drägerwerk, LBBW

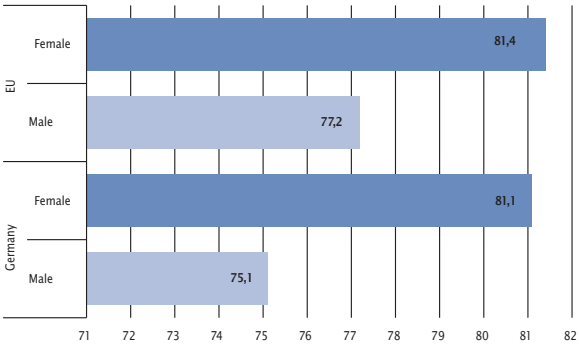
In our opinion, the overview of the different perceptions of medical technology and the related market data makes one thing clear: there is no „one“ market for medical technology. This is why there is not much point in considering the market as a whole. For an assessment of markets and companies, the markets must be broken down into the smallest possible segments, so that only the market or markets in which the company in question is active are considered in each case. There is no point in trying to squeeze a company that specialises in one specific medical technology method into an analysis of the market as a whole, which is diluted by a large number of other methods and equipment.

3 Selected growth areas of medical technology.

Medical technology is often described as one of the boom sectors of the coming decades. Is that really the case? And if so, why? Are there differences between the individual areas of medical technology?

It is impossible to provide straightforward answers to these questions. First, we can state that demographic developments are providing good opportunities for growth in the medical technology sector. People are generally living longer.

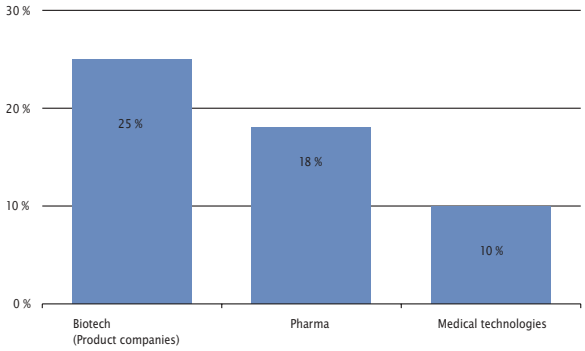
Life expectation of a newborn in years (Statistics of 1999/2001)



Source: DESTATIS, LBBW

This increases the demand for health care services per se, because many diseases that we know today typically occur with old age, such as degenerative diseases of the skeletal or muscular system, the joints or internal organs. At the same time, people who are growing older want to stay fit and healthy for longer and accordingly make greater demands on their health care service providers, such as physicians and hospitals. These can exploit the progress made in the biotechnology and pharmaceutical industries, but also in the medical technology industry, and benefit from the results that these sectors are likely to be able to produce in the future, due to the continued high level of investment in research and development.

Average R&D expenses in % of revenues



Source: LBBW

Averaging 10 percent of companies' sales, R&D expenditure in the medical technology sector does not seem very high compared to that of companies in the pharmaceutical and biotechnology sectors. It is important to remember, however, that the regulatory approval processes for medical technology products are usually a lot simpler than those applicable to drugs. Clinical trials are often much less labour-intensive and in some cases they are not necessary at all.

EU Directive on clinical trials

A new EU Directive on clinical trials entered into force on 1 May 2004. After this Directive took effect, there was some uncertainty concerning the potential implications for the regulatory approval procedures for medical technology products.

Up to now, medical technology equipment had to be CE certified, something that did not usually necessitate clinical trials. It is therefore popular among equipment manufacturers to launch new products in Europe first because it is comparatively easy to obtain regulatory approval there. Users also value this simple procedure because it ensures that new products reach the users quickly. In the past, however, this advantage was seldom exploited: artificial invertebral disks, for instance, have been approved in Europe for around 15 years but are still a long way from achieving the market potential now attributed to them after being approved for the first time in the USA (Charité by J&J).

Moreover, the innovation cycles in the medical technology sector are relatively short. According to

the European Medical Technology Industry Association, many products have a life cycle of less than 18 months. We believe that this is a gross understatement, as product life cycles of between three and five years are more usual. However, large-scale clinical trials would inevitably make the development and marketing of the products slower and more expensive, which would have considerable repercussions for the small - often the most innovative - companies in particular.

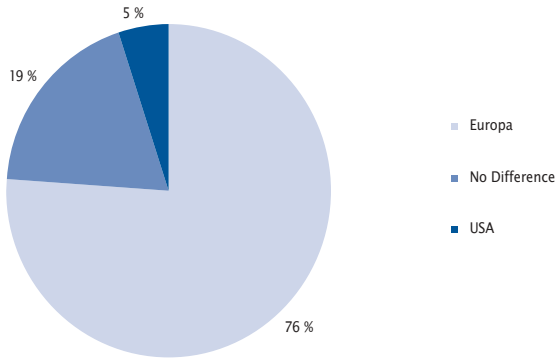
The critics of the existing regulation regard the EU Directive as a means of aligning the approval procedures for medical products with those for drugs. Even if they are not necessarily aiming for a complete harmonisation of the procedures, which would entail extensive clinical trials on these products like those usually required for drugs, the proponents of stricter approval procedures advocate the alignment of procedures to the US standards. They claim that this will guarantee not just the safety but also the effectiveness of the procedures.

Judging by the EU Commission's current stance on the issue, it is rather unlikely that clinical trials will become mandatory for medical equipment in the foreseeable future. Combinations of medical technology and drugs are a different story, however. The European Medicines Agency (EMEA) believes that changes are necessary in this field. According to the EMEA, the Directive should apply to medical technology products that contain or use drugs and would subject them to extensive, generally random, controlled testing. The industry in contrast thinks that it should also be taken into consideration whether the drug supports the medical technology product - as in the case with the now established drug-eluting stents (also known as drug-coated stents) - in which case the European Medical Technology Industry Association believes that no action is necessary, or whether the medical technology product supports the drug, e.g. in implanted pumps.

As yet, there is no conclusive, standard European regulation; in many cases, individual decisions are made and national guidelines interpret the Directive in different ways. A reliable, general, uniform regulation would certainly be desirable and in the interests of legal certainty.

US companies also appreciate the advantage of earlier market launch in Europe. A survey carried out among the members of the US Advanced Medical Technology Association (AdvaMed) in 2003 concluded that more than three-quarters of the companies believe that the time to market in Europe is faster and only five percent believe that approval in the USA is quicker.

Faster to market: Europe or USA



Quellen: AdvaMed, LBBW

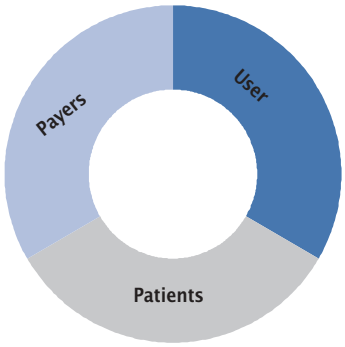
So, what areas of medical technology currently hold the most promise? Which markets are especially large or are likely to experience particularly high growth? Where can innovation leads be expected?

This study is unable to provide more than rudimentary answers to these questions. Many markets are still being established and can only be analysed for their potential: Examples include dental implants and artificial invertebral discs. Large markets often mean lots of competitors, some of which may also be very large and dominant players that make it difficult for newcomers to enter the market. It is also extremely difficult to forecast innovation leads. We already looked at the example of artificial invertebral discs, which have been in use in Europe for 15 years but are only being recognised now for their significant market potential and market growth since the first product was approved in the USA. Drug-eluting stents are in a similar position: the metal stent and the antibiotic already had approval as individual products. This meant that the combination of the two products as a drug-eluting stent did

not require extensive, complex clinical trials prior to approval, something that resulted in a complete shake-up of the stent market.

In this section, we will be looking at selected methods of diagnosis and treatment where medical technology is used. All of the methods we chose as examples involve appreciable improvements for the user, the patient and the organisations bearing the costs. We consider these interest groups to be important success factors for a medical technology product.

Success factors of medical devices



Source: LBBW

In our opinion, there is little point in ranking the three success factors in order of importance because, in some cases, there are also substantial regional differences involved.

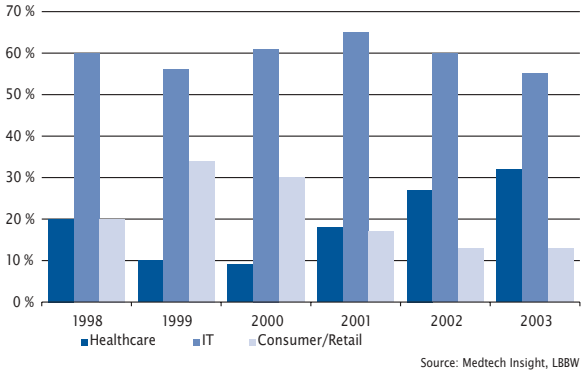
Patients in Germany, for example, tend to be poorly informed. At best, they know which benefits they are generally entitled to, but as health service patients they usually know nothing about the costs of potential treatment. By contrast, in the USA and other countries that have a higher number of self-pay patients, or at least patients with private health insurance, there is a greater level of cost awareness.

In Europe, users have relatively fast access to innovative medical technology. (We have already addressed this issue.) They are nevertheless relatively unwilling to develop these innovations into a medical standard, as we also explained before, taking the example of artificial invertebral discs. In the USA, on the other hand, the time to market is often delayed on account of the regulatory framework, but the products - provided that they make the user's job easier or provide a financial benefit (lower-cost nursing care or follow-up treatment, for example) are accepted and catch on much faster than in Europe.

The organisations bearing the costs also apply different approaches from region to region, often depending on the way in which the health care system is organised. In Germany, for instance, many medical technology companies have criticised the virtually anti-innovation attitude of the health insurance schemes. One example of this charge that we can identify with is their refusal to reimburse the costs of positron emission tomography (PET), which from a medical perspective is the best solution for diagnosing metastases in cancer patients. In the USA, a blanket refund is made, which was extended last year to the diagnosis of Alzheimer's, a degenerative neurological disease. Another example is extracorporeal shock wave therapy (ESWT). This has in principle the same function as extracorporeal shock wave lithotripsy (ESWL), which is used to destroy kidney stones, but ESWT can also be used to treat calcaneal spur or other calcifications on bones or limbs, for example. Many orthopaedic specialists offer this method and the follow-up costs are much lower than if the calcification had been removed surgically. Nevertheless, German health insurance schemes do not reimburse the costs for this treatment.

But if medical technology is such an interesting growth area, why do so few medical technology companies seek a stock exchange listing or - at the very least - venture capital financing? If we consider the percentage breakdown of venture capital funding in different areas, we can see that an increasing amount is going to health care.

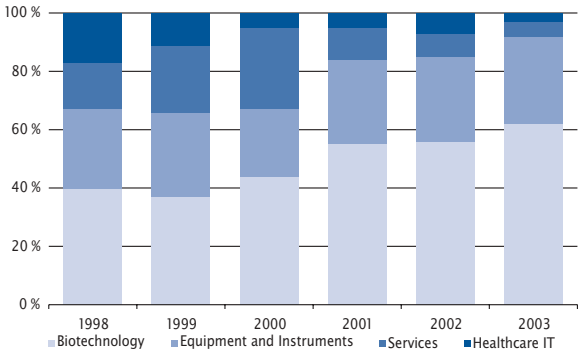
VC financings



Source: Medtech Insight, LBBW

The breakdown of this funding within the health care sector, on the other hand, shows that more and more funds are being invested in biotechnology, whereas the percentage going to medical equipment and instruments remains more or less the same and the importance of services is decreasing rapidly.

VC in the healthcare sector



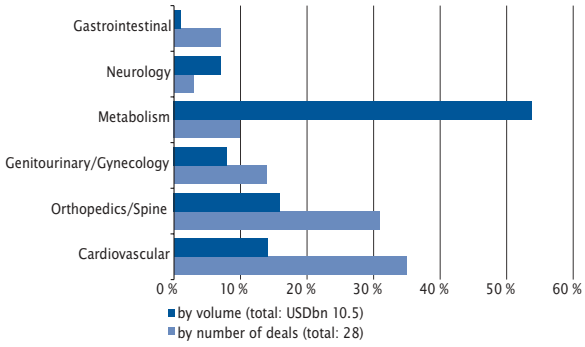
Source: Medtech Insight, LBBW

It must be remembered that IPOs are a fairly unusual way for medical technology companies to obtain financing. The preferred exit strategy of VC or private equity investors in the medical technology sector tends to be to sell the company to another - generally larger - company in the same industry. This is where the clear dominance of the large market players comes into play. Between 2001 and 2004, over half of all M&A transactions involved three companies:

- Medtronic,
- Boston Scientific and
- Johnson & Johnson.

The largest coup of all was the takeover of the cardiology specialist Guidant by the Johnson & Johnson conglomerate for around USD 25 billion. These mega-deals aside, the M&A landscape between 2001 and 2004 is as follows:

M&A in medical technologies



Sources: Medtech Insight, LBBW

One explanation for the comparatively small volumes invested or traded in medical technology in the VC area, but also in M&A, is the low cost of development. Generally speaking, biotechnology products require much more extensive clinical trials than medical technology products. In Europe, the only requirement for the majority of medical technology products is still just the CE certification (we addressed this problem earlier in our discussion of the new EU Directive on clinical trials). The revenues that can be generated with biotechnology products are also frequently much higher than those that can be achieved with medical technology products. The exception also proves the rule in this case because, with sales of over USD 500 million, Guidant's pacemakers and other cardiology products are blockbusters - a relatively unusual phenomenon in the medical technology industry. The expectations surrounding such products can also be seen from the high purchase price, which amounted to more than six times Guidant's sales.

3.1 Diagnosis.

Diagnosis is the act of identifying a disease from its signs and symptoms that culminates in a statement or conclusion from such an analysis (Merriam-Webster Online Dictionary). As reasonable and simple as this definition may be, it illustrates one of the oldest and still most pressing problems in the area of medicine: a physician has to know which disease a patient is suffering from, only then might he be able to treat him or her properly. „Might be able" in this context is slightly confusing, however, because treatments are still only available for approximately one-third of the around 30,000 known diseases, and treatment does not automatically mean a cure. This makes it all the more important to diagnose diseases correctly.

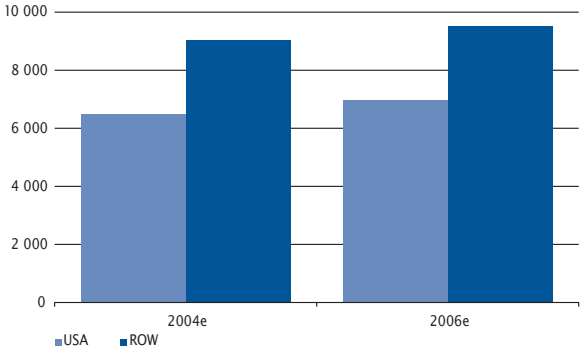
3.1.1 Imaging procedures

Imaging procedures allow doctors to look inside the body, something they could not do without these technologies. Some of the most important and most common imaging procedures in our opinion are ultrasound, X-ray technologies and their advancements, magnetic resonance imaging, nuclear magnetic resonance imaging and positron emission tomography.

We regard the global market for these procedures as a tight oligopoly. The industry's big three - GE Medical, Philips and Siemens - have a combined market share of around 70 percent; Toshiba is in fourth place and is only a major player in Japan. Unfortunately, these companies do not tend to disclose detailed information on their market share, so it is impossible to provide a more detailed analysis at this point.

The market itself had a volume of USD 15.5 billion last year. We feel that annual growth of around three percent, as forecast by relevant sources, is realistic given the significant amount of progress in product development and the extension of some of the cost refund commitments by the health insurance schemes.

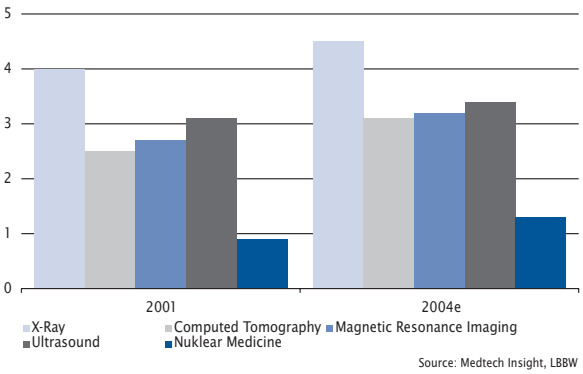
World market imaging systems (USDm)



Source: Medtech Insight, LBBW

Breaking down the data according to individual procedures is also not an easy task. Take Siemens Medical's communication policy, for example: while the company discloses that in magnetic resonance imaging its market share increased by six percentage points and its sales by 69 percent (source: Siemens, Financial Market Day, 17 February 2004), it does not publish absolute figures. We are therefore basing our analysis on generally available market data and our own research.

Imaging Technology devices (USDbn)

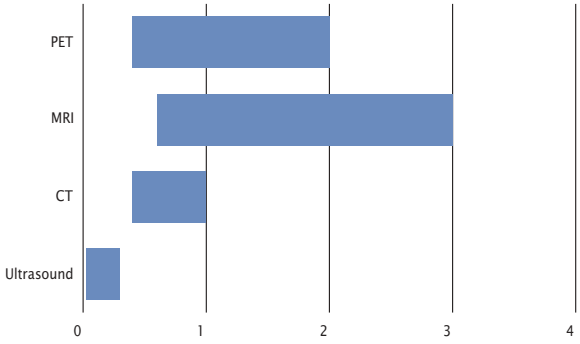


Source: Medtech Insight, LBBW

Apart from their suitability for certain diagnoses and their quality, price is one of the main considerations when deciding to invest in imaging procedures. The following diagram classifies the procedures, which we will analyse in more detail below, into a price range. Its bandwidth is determined in part by conditions on the market, some markets being more price-sensitive than

others. Other determining factors are the equipment in the scanners and thus, in many cases, their performance.

Price ranges for imaging equipment (€m)



Source: Philips Medical Systems, LBBW

3.1.1.1 Ultrasound

Medical ultrasound scans, also known as sonographies, work with sound waves that have a frequency of 1 to 30 MHz.

Sonography (ultrasound scans) involves scanning the parts of the body to be examined using echography. Here, ultrasound waves are generated in a transducer and irradiated through the skin in pulses of short duration using a coupled medium (e.g. a water delay line to compensate for dead skin). The ultrasound waves are absorbed, scattered, diffracted and reflected to varying extents on skin, tissue or organ layers. A piezoelectric receiver in the transducer picks up the reflected waves as echoes, turning them into an alternating voltage that can be displayed on the monitor as a curve or a spot of light.

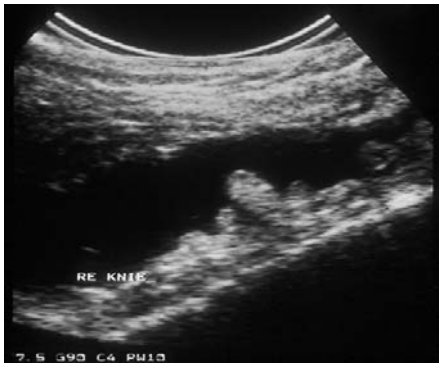
During its development, sonography passed through different levels of sophistication. The simplest method is the so-called A-method (A stands for amplitude). This is a one-dimensional image that only shows the amplitude and thus the sound reflection as well as the distance from the transducer. It was used in topographically uncomplicated scans.

The M-mode allows moving interfaces to be displayed. The movement causes changes in the distance between the transducer and the reflected surface and thus in the time taken by the ultrasound waves to travel from the transducer to the piezoelectric receiver. If this time is displayed on the monitor as a curve, higher values mean a greater distance between the transducer and the tissue, and the slope of the curve shows the speed of movement.

The B-mode (B stands for brightness) produces the two-dimensional, black and white image that results from scanning the relevant body part in slices in two directions. The B-mode is the most common procedure used today.

These simple images nevertheless require a lot of practice before they can be used for diagnostic purposes.

Sonography of a right knee joint

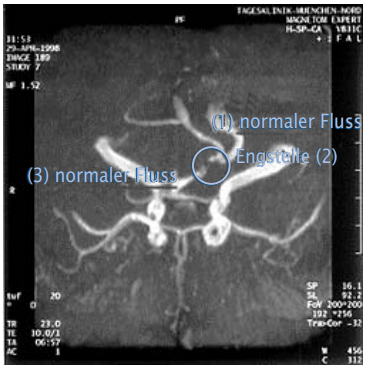


Source: http://www.radiosynoviorthesis.Com/fotos/fotos-gross/ultraschall-Gross.jpg

Gynaecologists, who use this equipment on a daily basis, cope with it particularly well. For the patient, on the other hand, having to have almost every single pixel of the printed ultrasound image explained is highly unsatisfactory. In addition, the physician's work could be made so much simpler if the images were easier for users and patients to interpret, i.e. if they could be understood right away. This is particularly important in the field of gynaecology for the early diagnosis of - in some cases - severe disabilities: X-ray diagnoses are avoided where possible to prevent damage to the foetal tissue.

It is these desires, if not necessities, that have driven the development of sonography forward over the past 20 years. Doppler sonography (colour, spectral, power Doppler, etc.), for example, can be used to create 3-D images of the perfusion of organs and vessels. This means that vascular constrictions or obliterations can be identified without the need for more invasive procedures such as catheter angiography.

Doppler-Sonography for vascular imaging



Source: http://www.joerg-rudolf.lehrer.belwue.de/physik_os/referate/doppler-Dateien/image018.gif

The Doppler ultrasound method is used to measure the blood flow rate in vessels and the heart. Here, a Doppler effect is used to transmit the ultrasound echo from the erythrocytes to the receiver.

The Doppler effect is defined as the change in the observed frequency of any type of wave due to the relative motion of the source and the receiver (this is why the tone of the whistle of a passing train seems to get higher as the train approaches and lower as it departs). In this process, the Doppler effect is used to monitor the echoes reflected from the erythrocytes which have a higher or lower frequency depending on the speed of their flow.

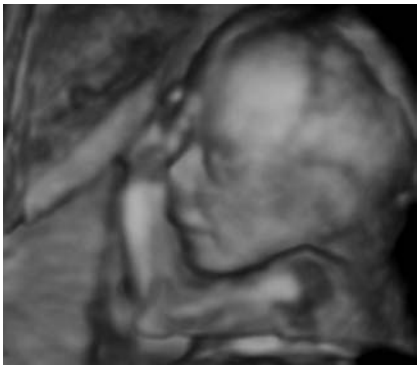
In a directional Doppler ultrasound, it is also possible to determine the flow velocity (to or from the receiver).

In a pulsed Doppler ultrasound, the site of analysis can be chosen by gating the emission and reflection of the ultrasonic waves.

Colour duplex sonography uses the pulsed Doppler method in a multi-gate process to display the vessel geometry and flow behaviour of the vessel contents.

The progress that has been made in ultrasound technology in terms of the three-dimensional imaging of the scanned object can be seen even more clearly in the image quality. It is now possible to show detailed, three-dimensional images of a foetus in the mother's womb or of vascular systems - something that can be a very valuable diagnostic support during surgical procedures.

3D-Sonography

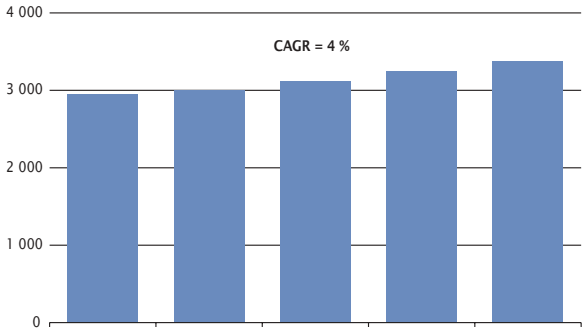


Source: http://www.Praenatalnet.de/3dg26.jpg

Due to the fact that ultrasound is very easy to use, has practically no side effects and is reasonably priced - at least if a basic scanner is used - ultrasound is now a very common means of diagnosis. Around 40,000 scanners are currently in use in Germany alone (source: Sonoring Deutschland).

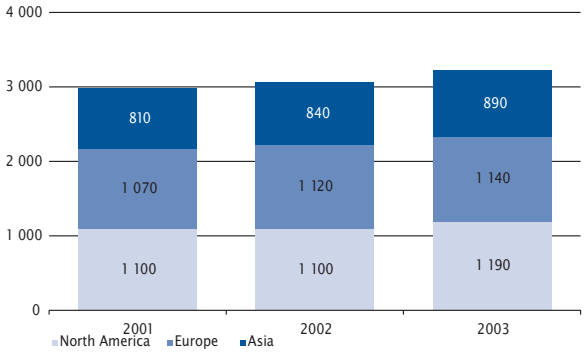
Today, the global ultrasound market has a volume of around € 3 billion and we are forecasting annual growth of four percent. Scanner manufacturers are capitalising on the scanners' ease of use and low cost - factors that facilitate rapid market entry for these companies in developing and emerging countries.

Ultrasound market worldwide (€m)



Source: Philips Medical Systems, LBBW

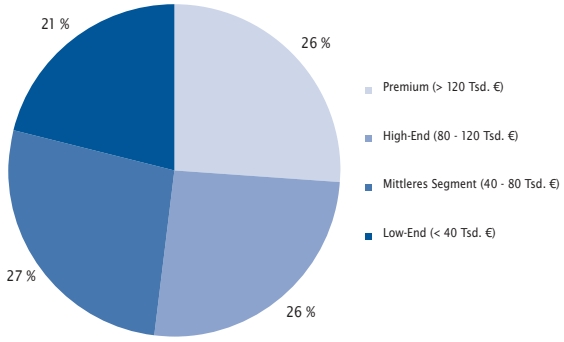
Ultrasound market by region (USDm)



Source: Philips Medical Systems, LBBW

The global market data can be broken down again by price segment (from low-end to premium).

Ultrasound by price

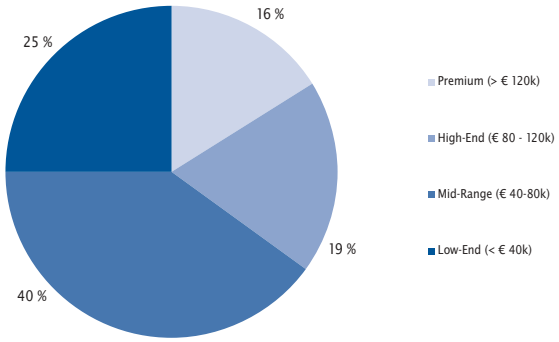


Source: Philips Medical Systems, LBBW

The market is growing at different rates in different regions of the world, with the markets in industrialised countries generally at saturation point. Regions with greater potential for growth and development are also experiencing higher growth rates in the ultrasound market.

Given the economic conditions, it is not surprising that developing and emerging countries are experiencing higher growth in the mid- and low-price segments than in the range of the high-price or even premium scanners that are now widespread in the industrialised countries. We believe, however, that developing regions will also see a marked trend towards higher-quality scanners during the next five to ten years.

Ultrasound by price

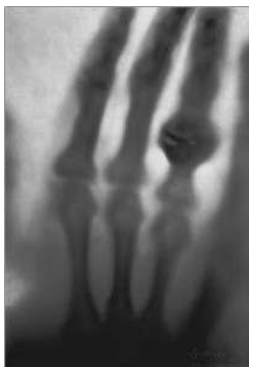


Source: Philips Medical Systems, LBBW

3.1.1.2 X-ray technology/computer tomography

X-ray technology has come a long way since its early days. People all around the world are familiar with the first radiograph of the hand of Dr Roentgen's wife which, despite its primitive quality, illustrates the potential of this method.

First known X-ray picture



Source: http://www.Ketweb.de/ketStudie/abbildungen/Kap1.html

X-ray diagnosis is a branch of medicine that is used to indicate pathological processes triggered by morphological or functional changes to organs or parts of organs that are made visible with roentgenological methods.

A diagnosis is performed on the basis of fluoroscopy images or radiographs, sometimes using contrast media. Excluding any preparation of the patient, the whole process - from the imaging of the object to the diagnosis - can be divided into four stages. X-ray technology is crucial in the first three.

I. Generation of the X-ray intensity pattern
II. Conversion of the X-ray intensity pattern into a luminant distribution of density, i.e. into a visible image
III. Examination (including examination tools)
IV. Evaluation, diagnosis

All four stages must be harmonised to obtain a maximum of information that is of importance for the diagnosis and treatment while minimising the patient's exposure to radiation.

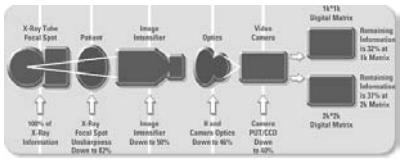
X-ray machines are now standard hospital equipment and even relatively small towns have radiology practices that specialise in X-ray diagnostics.

Minimising exposure to radiation, in particular, has become increasingly important since the side effects of X-ray diagnosis became known: X-ray dermatitis or even radiation carcinoma may be fairly infrequent but they are nevertheless pretty extreme examples. The radiation exposure in X-ray diagnosis has been reduced substantially over the years and the risk to the patient is now generally a small or justifiable one.

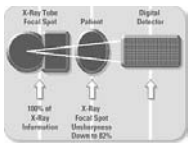
However, in conventional X-ray diagnosis, a very skilful doctor is still needed. Although, for example, a broken bone or foreign bodies, such as a forgotten pair of scissors in the abdominal cavity of a patient who has been operated on, can be easily identified by a layman, it generally takes a proficient diagnostician to distinguish between healthy and diseased soft tissue. X-ray contrast media can be helpful in this context, as they make visible the blood supply in certain tissue regions.

Digital radiology, which has become very popular in recent years, is not changing the actual process of conventional radiology itself. The only difference is in the cassette, which contains an image plate. This latently stores the radiograph. In a reader, the image is activated by a laser, made visible, recorded and digitised. In this form it can then be stored and called up again at any time, eliminating the need for a darkroom, a printing plate processor and an extensive archive to store developed radiographs.

Traditional X-Ray



Digital X-ray



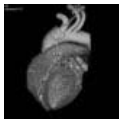
Source: GE Healthcare

Patients' exposure to radiation is being drastically reduced (between one-third and 90 percent, according to different sources). This is partly due to the fact that more image data is stored on the image plate than in conventional methods, where data is lost through optical aids. Also, as digital radiographs can be processed on the computer at a later stage, there is generally no need to take repeat radiographs if the original ones were incorrectly exposed.

While traditional X-ray diagnostics involves two-dimensional images, computer tomography (CT), a further development of X-ray technology, is able to create a three-dimensional computerised image from multiple layers of individual images. For this, a rotating X-ray source radiographs the object in one slice and the transmitted radiation is received by stationary detectors and then processed into images on the computer. The machine then changes level and repeats the procedure. Repeating this process several times makes it possible to turn the individual images into a single three-dimensional image on the computer.

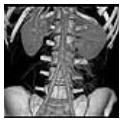
This procedure initially required the patient to lie still in the machine for a long time, as any movement could interfere with the diagnosis. However, the development of CT scanners has not stagnated by any means. Today's gold standard is what is known as multi-slice CTs, which now work with up to 64 slices per rotation (GE: Light Speed VCT, Siemens: SOMATOM 64-slice CT, Philips: Brilliance CT 64, Toshiba: Aquilion 64-Slice CT). These scanners allow 64 slices (of 0.6 mm each) to be taken simultaneously, and a high rotation speed (< 400 ms) ensures that the scanning is performed rapidly so that an involuntary movement by the patient is no longer a major problem. The new equipment offers very high resolution and a very clear image of the organs scanned.

Computertomographies



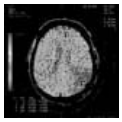
Heart

- Comprehensive view within five seconds
- Greater vessel visualisation
- Shorter breathholds



Thorax

- Ruling out of critical conditions:
  - Aortic dissection
  - Pulmonary embolism
  - Coronary artery disease



Brain

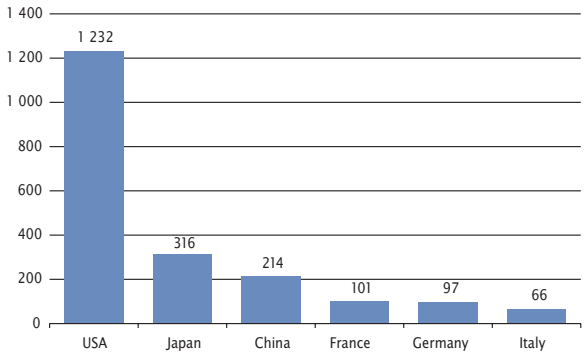
- Stroke diagnostics:
  - Perfusion
  - Blood flow
  - Penumbra

Sources: GE Healthcare, LBBW

A whole body scan can be performed in around half a minute and its possible applications are not just limited to the three examples that we gave in the above chart. CTs can also be used to diagnose cancer, to scan the abdominal cavity and the spinal column and, finally, they can be used in complementary operation diagnostics, i.e. as a control tool in operations, which is particularly important in minimally invasive procedures.

The US market is the most important market in this area as well. This is primarily evident from its volume, which is four times the size of the second largest market.

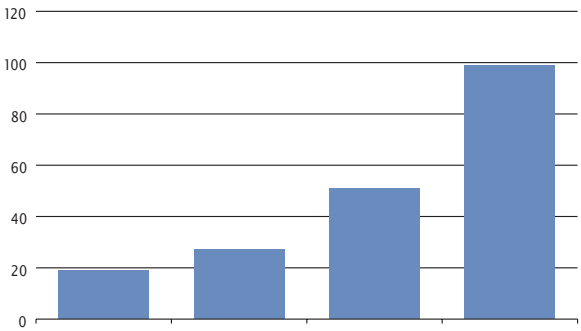
TOP 6 CT markets (2003; €m)



Source: Philips Medical Systems, LBBW

The dominance of the US market also becomes clear when we look at the substantial increase in treatment figures in the USA since the introduction of multi-slice CT. The major manufacturers are forecasting further sustained, double-digit growth.

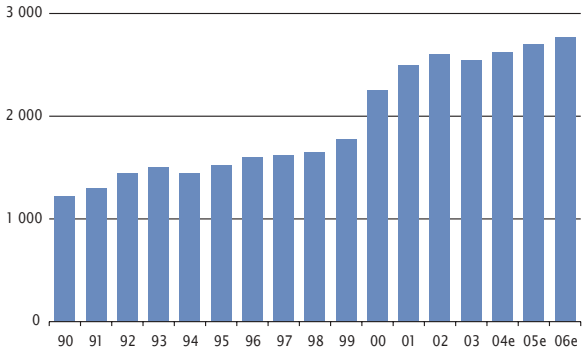
CT procedures USA (m)



Source: Philips Medical Systems, LBBW

This assumption is partly reinforced by recent experiences: the innovation leads created by the multi-slice CTs broadened the range of applications and simplified the procedure for both the physician and the patient. We also feel that the scanners' potential has not yet been fully tapped; there is still substantial potential for growth in the area of stroke diagnosis, for example. On the other hand, we should not forget that other imaging procedures that are in competition with CT have also taken huge strides (we already gave examples of these in our discussion of ultrasound). Recently, however, a trend has emerged of combining different scanners, such as hybrid scanners made up of positron emission tomographs (PET) and CT. This trend is driving up treatment figures. We will discuss PET and hybrid PET/CT scanners in more detail later.

CT equipment market worldwide (€m)



Source: Philips Medical Systems, NEMA, COCIR, JIRA, LBBW

In light of this situation, our estimates for further growth in this market are on the conservative side. We are forecasting a CAGR of 2.75 percent for the next three years.

3.1.1.3 Magnetic resonance imaging

Magnetic resonance imaging (MRI), also called nuclear magnetic resonance imaging, is used to display internal organs and tissue. In contrast to roentgenological examinations, which use X-rays, MRI works with magnetic fields and radio waves.

MRI is a computerised imaging procedure that involves absorption of very high-frequency radio waves by certain atomic nuclei that are subjected to a stationary magnetic field. This changes the proton densities and releases energy when the high frequency is switched off (relaxation parameters). On this basis, an image of the tissue to be examined can then be put together in different slices; the thickness of the slices is left to the discretion of the user. This gives the diagnosing physician plenty of scope when examining the tissue being scanned.

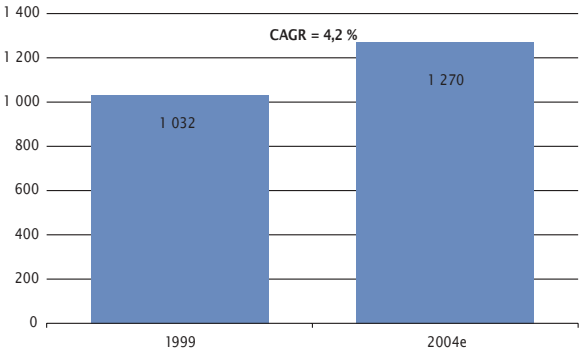
Patients should be aware that metal implants, such as pacemakers, prostheses or other metal objects in the body, generally rule out the possibility of an MRI scan.

MRI is undoubtedly a gold standard for displaying images of internal organs and tissue. However, it must also be borne in mind that these scanners are much more expensive than CT scanners, for example (up to € 1.0 million for a CT scanner compared with up to € 3.0 million for an MRI scanner) and often take longer to set up. Furthermore, CT has advantages over MRI with regard to the display of bony structures, which contain less hydrogen atoms that are able to absorb radio waves.

The industry has addressed patient-specific problems, such as claustrophobia in the „tube“, or heavily obese patients who until now simply did not fit into an MRI scanner, by bringing out new systems with larger tubes. These were presented at MEDICA 2004, for example. The larger tube diameter makes claustrophobic patients feel less apprehensive and allows some heavily obese patients to take advantage of an MRI scan for the first time.

The MRI market has grown by over four percent in the past few years.

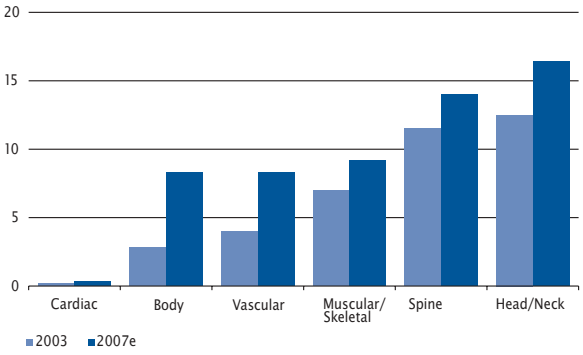
Worldwide MRI market (USDm)



Source: GE Healthcare, LBBW

We have available indication-based estimates for the development of MRI treatment figures, some of which forecast substantial double-digit annual growth. In view of the technical progress that has also been made in the area of MRI and the resulting expansion of the range of applications, we feel that this is realistic. Back in 1998, for example, a brain scan took one-and-a-half minutes; nowadays, the same procedure can be done in less than 10 seconds.

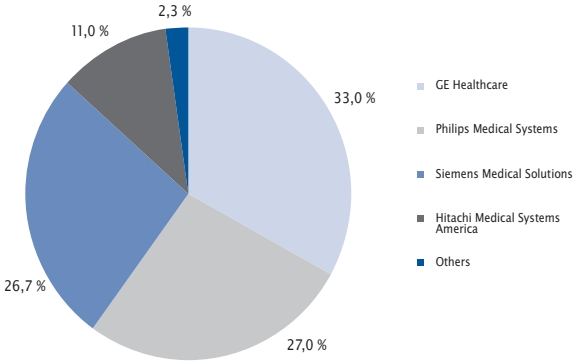
MRI procedures (m)



Source: GE Healthcare, LBBW

However, as in the case of the CT market, it should also be noted here that higher treatment figures do not automatically mean higher sales revenues: more capacity will be utilised at hospitals and clinics and, as MRI is in competition with other imaging procedures, a certain price pressure can be expected as a consequence - even if this market is again largely dominated by the „big three“. We have up-to-date market data for the USA, but this is not directly transferable to other regions because in Europe Asian manufacturers like Hitachi take a back seat. Conversely, the dominance of the big three in Japan, still the most important Asian market, is not nearly as pronounced as in Europe or the USA.

MRI market shares in the US (2003)

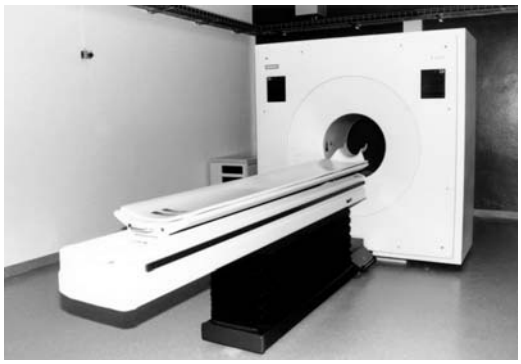


Source: Medtech Insight, LBBW

3.1.1.4 Positron emission tomography

Positron emission tomography (PET) is radiological photofluorography that is used to diagnose diseases in organs or tissue. Instead of radionuclides, however - which emit gamma radiation - PET uses positron sources. Prior to the scan the patient must take or be administered radiopharmaceuticals. These accumulate particularly intensely, or preferentially, in tumour tissue, for example. The activity distribution of the radiopharmaceuticals is then recorded in a computer tomography and converted into a tomogram. PET systems are designed as ring systems so that all the radiation in a plane can be detected. A distinction is made here between dual-headed systems, which are cheaper but take a lot longer to produce measurements, and full-ring systems. Multi-ring systems moreover give the PET camera a larger „field of view", allowing several slices to be detected at the same time. By connecting the individual layers in the shape of a fan, it is also possible to use the scanner in 3-D mode.

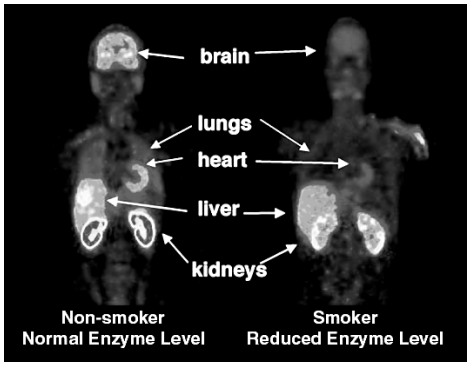
PET device



Source: http://www.petdiagnostik.ch/bilder/pet_02.jpg

PET is particularly useful for showing metabolic processes. This is particularly interesting because tumours, for example, consume increased quantities of glucose. PET can thus be used to indicate the presence of tumours anywhere in the body.

PET scan example



Source: http://www.drugabuse.gov/Newsroom/03/PET9-08.jpg

PET nevertheless has a limited resolution of around 2.5 mm. It is therefore difficult to precisely localise small metastases in the body. This requires either an additional CT scan, which enables the exact location to be identified, or the use of a hybrid PET/CT scanner from the very beginning. We will discuss hybrid scanners in more detail later.

Apart from their physical fuzziness, one major drawback of PET scans, on the German market at least, is that they are not refunded by the German health insurance schemes. Even though a court ordered the Leipzig guild health insurance fund to refund the cost of a PET scan following treatment of a patient suffering from Hodgkin's lymphoma (cancer of the lymphatic system), in order to be able to rule out possible metastases in September 2004, in our opinion, this was a one-off ruling that does not signal a turnaround in the refund policy in Germany.

In the USA, the world's most important medical technology market, the situation for PET is somewhat different. Patients suffering from a oncological disease were guaranteed reimbursement of the costs for a whole body scan of around USD 1,450, plus a refund for the radionuclide used as the contrast agent (usually [18F]-FDG) of almost USD 325. The patients themselves also made a contribution of around USD 290. The hospitals are responsible for collecting this contribution.

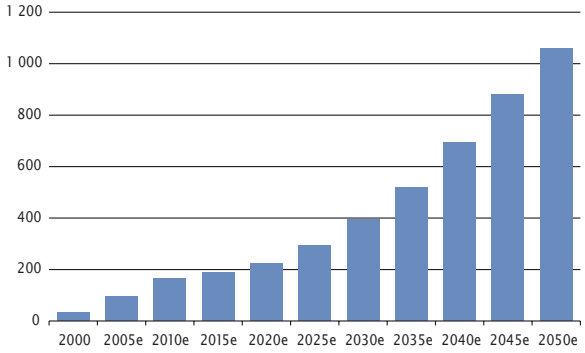
A sum of USD 772 was refunded for a cardiological PET scan, plus the cost of the contrast agent, bringing the total Medicare refund to around USD 1,097. Patients were also required to make a contribution to the costs for this procedure.

In the area of oncology, so much data is now available that Medicare has adjusted the amounts that it refunds. Since 1 January 2005, only USD 1,400 is reimbursed for a whole body scan, including the contrast agent FDG. At present, however, this adjustment only applies to hospitals. So-called IDTFs (Independent Diagnostic Research Facilities), which include joint practices and similar facilities, are currently reimbursed an average of USD 2,500 per whole body scan. There are even regional differences, and the maximum refunds for IDTFs are around the USD 3,000 mark. In the medium term, these refunds can be expected to be reduced to more or less the amounts that the hospitals are paid.

The death of Ronald Reagan moved Alzheimer's into the spotlight of many discussions on health care policy. Reagan had suffered from Alzheimer's for a long time. Meanwhile it had been scientifically proven that PET scans can detect Alzheimer's, or the plaques appearing in the brain, at an early stage. Following a short trial period, it was then decided in September 2004 that Medicare should cover the costs of a PET scan for Alzheimer's. Here, too, the costs refunded only amount to USD 1,450 plus the standard amount for the contrast agent. Again, the patient has to contribute USD 290. No changes were made to the refund policy for a diagnosis of Alzheimer's in 2005.

Early diagnosis of Alzheimer's is crucial because, as a disease that typically affects old people, Alzheimer's is one of the main cost drivers of an ever-aging population. The Medicare data available for the USA can generally be applied to Europe as well, even though the volumes may differ slightly on account of the differences in organisations bearing the costs or cost refund systems.

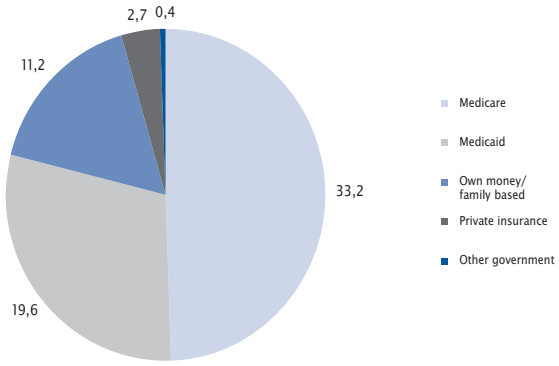
Medicare spending on Alzheimer's disease (USD bn)



Source: Alzheimer's Association, Medtech Insight, LBBW

The fact that Medicare expenditure in 2000 of USD 31.9 billion was only a fraction of the total cost of treating Alzheimer's is a clear indication that there is likely to be another substantial rise in overall expenditure on Alzheimer's.

Total costs of Alzheimer's in the US 2001 (USD 67 bn.)



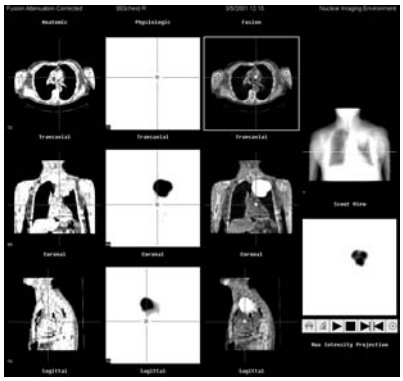
Source: Alzheimer's Association, LBBW

3.1.1.5 Hybrid scanners

We mentioned before that one of the disadvantages of PET is the resolution of the tomogram, which does not allow the exact location of a possible tumour to be pinpointed. A CT, on the other hand, can identify the precise position of a tumour, but it is not able (or not sufficiently able) to diagnose metabolic degradation (such as changed enzyme values).

These problems can be solved with hybrid scans that combine a PET and a CT. The advantages of the one system compensate for the disadvantages of the other: PET provides the physiological information and CT the anatomical information so that the scanned tissue can be identified and located with as much precision as possible.

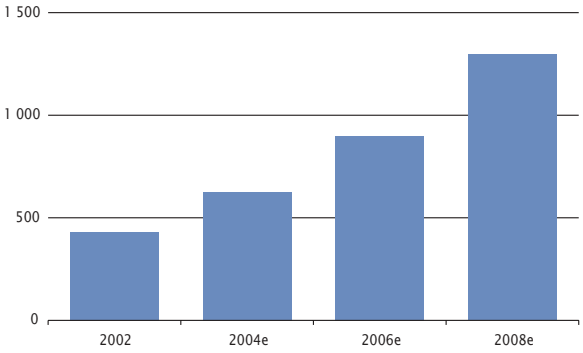
PET/CT



Source: GE Medical Systems Europe

Given the disadvantages of the individual scanners, demand for the hybrid scans is expected to grow substantially in the coming years. Our forecasts are based solely on the data available for the USA, because the situation in Europe as regards refunds for PET and, hence, combined scans is much less positive than in the USA. Not everywhere is as bad as Germany, where currently only the 10 percent privately insured patients are reimbursed for the cost of a PET scan, but this is partly due to the fact that there are greater numbers of privately insured patients in other countries. Private health insurance companies factor the savings potential in follow-up costs into their refund calculations to a much greater extent than the German public health insurance schemes, for example.

US market for hybrid PET/CT-systems (USDm)



Source: Medtech Insight, LBBW

3.1.2 Other methods of diagnosis

The imaging procedures presented here are undoubtedly among the most important methods of diagnosis that use medical technology, but they are by no means the only ones. We do not have to go as far to define blood tests with ready-made test kits, possibly even using so-called bio-chips, as medical technology.

Almost all physicians still use standard methods of diagnosis, such as examining the pupils, feeling parts of the body or simply looking into the mouth. This has little to do with medical technology, however. In many cases, doctors do not resort to medical technology unless they cannot identify the problem on the basis of what they see.

Due to the vast number of diagnostic methods available, apart from the imaging procedures performed outside the body, it is simply impossible to come anywhere close to describing all of them, which is why we have to limit ourselves to selected examples at this point.

3.1.2.1 Imaging from inside the body

As precise as the imaging procedures described above may now be, there are still uncertainties in diagnosis that can be clarified with other methods of diagnostics. If a precise diagnosis cannot be made from outside the body, then it must be made from inside. The usual procedure is to insert a miniature camera into the body through a natural opening and guide it to the site of examination.

Endoscopy is a diagnostic procedure that is used to examine body cavities and hollow organs, such as the windpipe, bronchial tubes, the stomach and large intestine, directly using an endoscope. An endoscope is a tube-like, flexible or rigid instrument that consists of a cold-light illuminator and an optical system (camera). Cold light is used to prevent heat damage to the organs being examined. The optical system guides the light from the light source at the tip of the endoscope to the diagnosing physician. The physician's line of vision can be set to focus straight ahead or at an angle of up to 45°. Different types of endoscope can be differentiated depending on the optical system used.

In a rigid endoscope, the optical system comprises a number of prisms and lenses arranged in succession.

The fibre endoscope, often abbreviated to fibroscope, can be easily bent and is therefore a flexible endoscope. The optical system used here is made up of bundles of optical fibres. This allows a larger area to be examined with greater illumination.

The electronic endoscope is an advancement of the fibre endoscope. At the tip it has a CCD image converter chip that functions as a miniature TV camera, allowing the image to be reproduced on a monitor.

Source: http://www.m-ww.de/enzyklopaedie/diagnosen_ther apien/endoskopie.html

This can be oral, i.e. through the mouth, if an oesophagoscopy - an examination of the gullet - is being performed. This process involves swallowing a tube. It can also be combined with a biopsy, a loop stone extraction or removal of foreign bodies. The physician observes the movements of a surgical instrument (a sling, forceps or a similar instrument) through the inserted camera and can guide it to the exact location of the tissue to be examined or removed.

A more detailed examination of the stomach is called a gastroscopy.

If this type of examination is performed on the windpipe, it is called a bronchoscopy.

Similarly, a rectoscopy and a colonoscopy are performed by introducing a camera into the anus. In this connection, it is also possible to make a diagnosis in conjunction with minimally invasive surgery, such as the removal of a cyst.

Video capsule endoscopy is an alternative to intestinal examinations using a conventional endoscope and has been available for a number of years. In this process, the patient has to swallow a capsule measuring approximately 11 mm by 26 mm that contains a tiny camera and a transmitter that continuously sends the video data recorded to a receiver that the patient wears on a belt around his or her waist. After being swallowed, the capsule moves through the entire digestive tract, transmitting images for around six hours. This is particularly useful for examining the around three-and-a-half metre long small intestine, which conventional endoscopy methods find almost impossible to access. The capsule is then excreted naturally.

Capsule Endoscopy

Source: Given Imaging Ltd.

Traditional endoscopy still predominates over video capsule endoscopy in the stomach, rectum and colon.

In principle, the capsule is indicated for all diseases of the small intestine that cannot be identified - or not with sufficient accuracy - using conventional examination methods. These include in particular:

- Unexplained bleeding in the gastro-intestinal tract (angiodysplasia, varices, polyps),
- Chronic intestinal inflammation, e.g. Crohn's Disease,
- Familial adenomatous polyposis (FAP, Peutz-Jeghers syndrome, etc.).

Whether the capsules may also be beneficial in the case of unexplained illnesses, such as chronic abdominal pain or chronic diarrhoea, has not yet been investigated sufficiently. This is a decision which currently has to be made on a case-by-case basis by the attending physicians.

This method is not yet sophisticated enough to replace conventional gastroscopy or colonoscopy; the capsule cannot stay in the body long enough and air insufflation is not possible. It is also impossible to remove tissue specimens (biopsies). As far as we are currently aware, standard endoscopic procedures, such as gastroscopy and colonoscopy are far superior in their precision to the capsule method when used in the gullet, stomach and colon.

For whom is capsule endoscopy unsuitable?

All patients with passage disorders of the gastro-intestinal tract - especially patients with one of the following disorders:

- Adhesions,
- Known, deep diverticula of the small intestine,
- Intestinal obstruction (mechanical ileus),
- Severe constipation (intestinal pseudo-obstruction),
- Diabetes-related constipation (diabetic gastroparesis).

Due to the lack of knowledge about the precise risks involved, this method is not suitable for:

- Patients with pacemakers,
- Patients who have had a large number of previous operations on the abdomen,
- Pregnant women.

Who foots the bill?

Generally speaking, capsule endoscopy is an outpatient procedure. Inpatient use is only required when patients are hospitalised as their general well-being is seriously affected.

Since there is no guarantee as yet that the health insurance schemes will cover the costs, the situation as regards refunds should be clarified with the respective health insurance company before the procedure takes place.

The following report on a study on the side effects of NSAIDs (non-steroidal anti-inflammatory drugs), which include aspirin, shows how important minimally invasive capsule endoscopy has now become.

Houston. According to a study on video capsule endoscopy published in the journal Clinical Gastroenterology and Hepatology (2005 in press), users of non-steroidal anti-inflammatory drugs (NSAIDs) are not just at risk of heavy abdominal bleeding; they also have an increased risk of developing lesions in their small intestine: 71 percent of the chronic NSAID users had experienced a bleeding mucous lesion somewhere in their small intestine.

NSAIDs provide great benefit in terms of headache relief, inflammable joint diseases and prevention in the context of cardiovascular diseases. However, the risks are underestimated by the majority of patients and also by some doctors: in industrialised countries, more people die from NSAIDs-related bleeding complications than from AIDS or cervical cancer. In a press release on the new study, the American Gastroenterological Association (AGA) said that NSAIDs cause around 16,500 deaths and 103,000 hospitalisations in the USA each year.
The study examined 41 patients via video capsule endoscopy. The patients had to swallow capsules

measuring approximately 11 mm by 26 mm. These contain a tiny camera that takes continuous shots during its journey through the gastro-intestinal tract. The data is sent via a transmitter to a data recorder that the patient wears on a belt around his or her waist. At the end of the scan, the doctor can look at the images recorded on the computer. This form of diagnosis is generally used to find the source of unexplained gastro-intestinal bleeding in cases where its source could not be identified by either gastroscopy or colonoscopy. In this case, the root of the problem is presumed to be in the small intestine, which can only be inspected by way of video capsule endoscopy.

Of the 41 patients interviewed by David Graham of Baylor College in Houston/Texas (not the FDA employee of the same name, who became known as a result of the Vioxx(r) affair), 21 were chronic users of NSAIDs. They had taken the antiphlogistics for at least 90 days for relief of arthrosis, rheumathoid arthritis or non-specific joint pain. A comparison was drawn with a group of 20 people who had not taken NSAIDs.

The study showed that 71 percent of the NSAID users had lesions in their small intestine, whereas these were only prevalent in ten percent of the control patients. Most of the lesions were minor. In 19 NSAID users and two control patients, the video capsule endoscopy showed only slight or no erosion. However, five NSAID users suffered severe mucosal defects. They each had more than four erosions or even severe ulcerations that were not observed in the control group.

Whether the lesions led to ailments could not be determined conclusively on account of the small number of people surveyed. For this, the authors plan to conduct further studies. They believe that video capsule endoscopy could be important in the future for identifying the reasons for the complaints of NSAID users who sometimes suffer from dyspepsia. Other indications of hidden bleeding are anaemia and hypoalbuminaemia, which are always a cause for alarm in NSAID users.
Source: http://www.aerzteblatt.de/v4/news/newsdruck.asp?id=18734

3.2 Therapy.

Making the correct diagnosis is only one step on the road to finding a cure - if there is a cure at all - but it is a very important one. If a disease is identified, the next step is its treatment, i.e. a therapy.

Therapy does not automatically guarantee a cure. In some cases, it merely slows down the progression of a disease, something which works very well, for example, in patients suffering from neurological disorders, such as Alzheimer's or Parkinson's disease. Autoimmune diseases such as AIDS are also not (yet) cured today; their development is slowed or, at best, halted for some time. If the progression of a disease can be stopped, this is referred to as remission.

Treatment can take the form of pharmaceutical, biotechnological or medical technological therapy. The scope of our study is restricted to selected medical technology methods that can either cure patients or at least improve or stabilise their condition, or slow down the progression of their disease.

It would be utopian in an analysis of the sector to want to list and analyse all available therapies based exclusively or only partly on medical technology. A mega-trend similar to that evident in diagnostic imaging procedures has, of course, also emerged in the area of therapy. We can see this in minimally invasive surgery (MIS).

Scalpels, cameras and other such instruments have become smaller and smaller over time, with the result that many operations that previously required a „big cut" can now be carried out with a minimum of invasion. Großhadern hospital in Germany, for example, carries out the following minimally invasive surgeries:

- Removal of the gall bladder
- Cleaning of the bile ducts
- Inguinal hernia operation
- Femoral hernia operation
- Appendectomy
- Oesophagectomy
- Surgical removal of oesophageal diverticula
- Microendoscopic surgery in Zenker's diverticula

- Removal of benign oesophageal tumours
- Antireflux surgery
- Closure of traumatic, congenital or acquired diaphragmatic hernias
- Partial gastrectomy (tumour, ulcer, diverticulum)
- Sewing tissue over gastric ulcers
- Vagus nerve transection in helcosis
- Attachment of gastric fistula (enterostomies)
- Partial removal of the small intestine
- Partial or total removal of the large intestine
- Attachment of an ileostomy (artificial anus)
- Proctocolectomy
- Removal of cysts on the liver, spleen and adrenal gland
- Partial hepatectomies
- Total or partial splenectomy
- Total or partial removal of the adrenal gland
- Partial pancreatectomy
- Surgery on pancreatic cysts
- Spinal surgery (partly in cooperation with the orthopaedic clinic)
- Adhesiolysis
- Diagnostic laparoscopy

It naturally costs money to develop the instruments and technologies needed to perform the above-mentioned surgeries with minimum invasion. Accordingly, the equipment is also substantially more expensive than a simple scalpel. So what is the advantage of innovation in medical technology?

It should be pointed out at this stage that there is not just one but a whole range of benefits to be gained. For instance, the doctor has a clearer overview of the operation and does not need to poke around in a large wound, which may bleed to a greater or lesser extent.

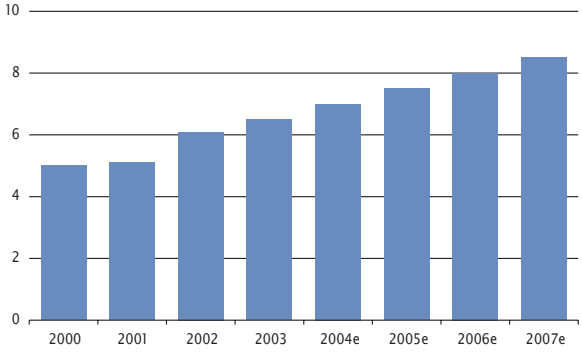
The operation is also less stressful for the patient, since the wound sites are always significantly smaller than in conventional surgery. Often, minimally invasive surgery can also be performed on an outpatient basis. This is not just beneficial for the patient, who can be discharged sooner; it also means that the hospital can reduce the average duration of stays of its patients - something which is becoming increasingly important in times of diagnosis-related groups (DRGs).

Ultimately, patients are usually able to work sooner than if they had had conventional surgery, and so can resume their active working lives again.

It should be noted, however, that the advantages of these new procedures are often not seen by those footing the costs due to the organisation of many national health care systems. Being able to return to work sooner benefits both patients and employers, but the costs for the new technologies must be covered by the hospitals and charged on to health insurance schemes. This sometimes leads to conflicts of interest that prevent new technologies from being launched.

Minimally invasive surgery is a very complex field in which there is a large variety of applications, and development is extremely different in the markets for the individual applications. However, some rough estimates about the market as a whole are forecasting that minimally invasive surgery will substantially increase its share of all surgical procedures by 2010.

MIS market (€bn)



Source: W.O.M. World of Medicine, LBBW

From an economic perspective, too, i.e. in terms of market volume, the past few years have seen high single-digit annual growth, which companies in this market expect to continue in the years to come.

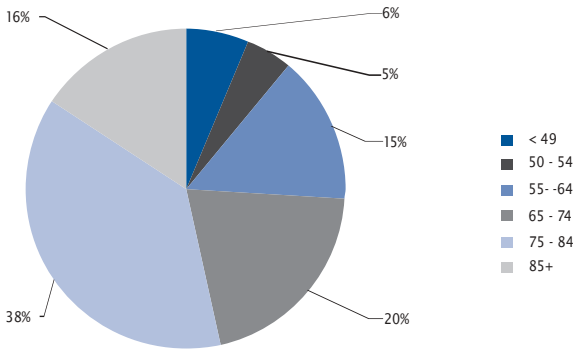
Our aim in the following section is to describe selected forms of therapy using medical technology, in which minimally invasive surgery also plays a key role. This is not our only selection criterion, however: the need for new forms of therapy (such as for strokes) and the large, existing market with a sustained, high level of growth (in dialysis, for example) are important as well.
We will begin with the forms of selected therapy, starting „at the top" of the human body, and will first deal with strokes.

3.2.1 Strokes

Strokes are the third most common cause of death in industrialised countries after cardiovascular diseases and cancer. In Germany, strokes affect 50 percent of the over-65s. Around one-quarter of those who suffer a stroke die within the next twelve months. Only 10 percent of patients are able to resume their normal working life after a stroke and 70 percent are reliant on permanent, more or less extensive care. The resulting costs for national health care systems amount to 3 percent of total health care costs in the largest western countries. By comparison, only about 10 percent of costs are attributable to the administration of all prescribed drugs.

Strokes mainly affect people over the age of 50. The risk of having a stroke doubles every ten years after the age of 55.

Stroke cases per age group (US)



Source: ASA, LBBW

The risk factors specified also include genetic predisposition, gender and ethnic origin. In the USA, the incidence of stroke is higher among men, coloured people and Hispanics than among people of Asian and European origin.

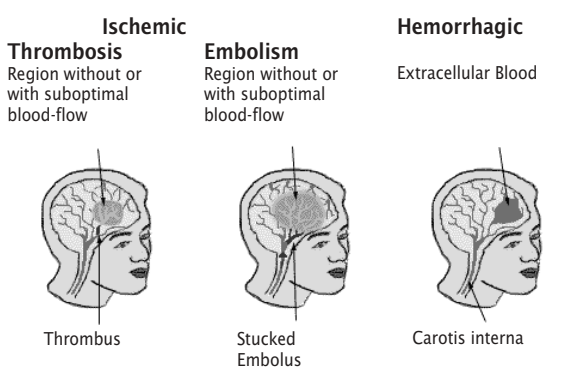
2001	Prevalence	Incidence	Mortality*
Total	4 800 000	700 000	163 538
Ischaemic cerebral infarction	--	88%	7,60%
Haemorrhagia	--	12%	37,50%
Men	2 100 000	47%	63 177
Women	2 700 000	53%	100 361

* After 30 days

Source: ASA, Medtech Insight, 2003

Individual lifestyle and certain surgical procedures can also increase the risk of a stroke. High blood pressure, cardiac fibrillation, smoking, a poor diet (cholesterol), excessive amounts of alcohol, diabetes, cardiovascular problems and stress are some of the greatest risk factors. A stroke can be triggered by three things, which are explained in simple terms below.

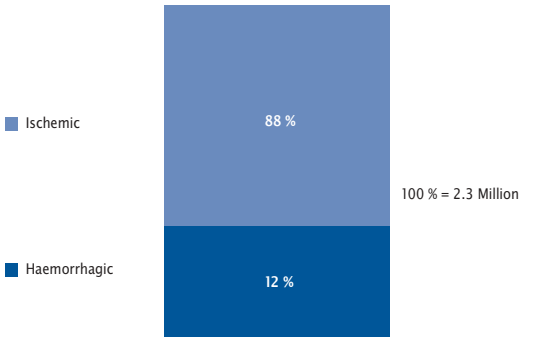
Stroke



Source: Medicine Worldwide

The most frequent cause of a stroke is the closing of vessels as a result of arteriosclerosis, which is facilitated by the above-mentioned risk factors. In arteriosclerosis, plaques (fatty deposits) build up over time and constrict the vessels. The coagulation cascade activated in this way ultimately leads to the formation of a blood clot (thrombus), which closes off the cerebral artery. At night in particular, when blood pressure falls, small constrictions can be enough to trigger vascular obliteration. An embolism somewhere in the body can also cause an ischaemic stroke. The thrombus (embolus), which consists of accumulated cells, blood cells, cholesterol and the vessel adhesive fibrin, is carried through the bloodstream to areas with little blood flow, where its progression is then halted. If the embolus is taken to the brain via cerebral arteries, its passage can be blocked in the narrow blood vessels and the resulting lack of blood flow causes a stroke.

Type of stroke



Source: ASA, LBBW

A brain haemorrhage (haemorrhagic stroke) can occur if the blood pressure increases suddenly. The artery bursts, causing a massive brain haemorrhage. According to Medicine Worldwide, 80 percent of these injuries are fatal.

The nerve cells surrounding a thrombus, embolus or the burst cerebral artery die within a few minutes due to a lack of oxygen. The bodily functions controlled by this part of the brain are thus irreversibly destroyed, since brain cells - in contrast to most of the body's cells - cannot regenerate themselves. This necrotic zone is surrounded by a relatively wide area called the penumbra, in which the nerve cells survive the infarct, but have an inadequate supply of oxygen and nutrients. Neuroprotection is still possible in this zone.

The longer the blood vessel remains closed and is undersupplied, the larger the size of the necrotic area becomes, since the cells of the penumbra also die off. Experiments on animals discovered two factors that are responsible for permanent destruction of the cells of the penumbra: intracellular calcium concentration and the formation of free oxygen radicals. Drugs called neuroprotective agents are administered to deal with these factors.

After a stroke, dying nerve cells release messenger substances that set off a chain reaction of complex processes - the „ischaemic cascade", which triggers an inflammatory reaction and toxic processes. This can cause severe damage when the brain's circulation recommences after breakdown (or removal) of the blood clot (reperfusion damage). The ischaemic cascade is responsible for a large percentage of the paralysis and cognitive disorders observed in stroke patients. After a few weeks, there is also an increased incidence of depressive states - in addition to physiological disorders - the causes of which are still unclear.

Diagnosing a stroke is not a trivial matter and misdiagnoses can lead to irreversible damage later on. For a doctor, a patient's previous medical history is the first thing to look at, since the symptoms that occur are not exclusive to cerebral infarction. Since time is a decisive factor with respect to the treatment and severity of permanent damage, simple preliminary tests have been created to dissociate the symptoms from other diseases. US physicians developed a rapid test with which even a layman could identify a stroke within several minutes. This test, the CPSS (Cincinnati Prehospital Stroke Scale), goes through a list of key stroke symptoms, such as smiling, lifting (and holding) both arms up, and formulating a coherent sentence. In a study, more than 74 percent of participants correctly assessed the symptoms of a stroke („Ärztliche Praxis", 19 February 2004). In Germany, however, further educational campaigns will be needed to familiarise relatives of risk patients with this subject.

For several years now, the use of rapid diagnostic tests has been examined in clinical trials. Within 15 minutes, the rapid test developed by the US biotech company Biosite can detect six brain proteins in the blood that are typical of strokes. If this test is approved, it could already be used in ambulances. Another rapid protein test developed by SyncX, a Nanogen subsidiary, can

differentiate between an ischaemic and haemorrhagic stroke from a blood sample. This test also still has to undergo clinical trials before being launched on the market.

After a patient has been hospitalised, an ECG and an EEG can be used to rule out a heart defect, and changes in brain waves can be used to detect the initial physiological signs of a stroke.

A haemorrhagic stroke (bursting of a cerebral artery) can be established using computer tomography (CT). To identify an ischaemic stroke, on the other hand, a special CT - a perfusion CT - or an imaging procedure based on magnetic resonance imaging (MRI) is required. Whereas CT technology is widespread, the expensive, but non-radioactive MRI test is still only available at special clinics. According to estimates by the German Stroke Foundation, only about half of the 135 certified stroke centres in Germany have an MRI scanner.

We already mentioned above how important timing is in the treatment of strokes. In the case of ischaemic strokes, every minute taken to break down a blockage in the cerebral artery (thrombolysis) counts, since the sooner this happens the earlier damaged and undersupplied cells can be supplied with oxygen and nutrients. In the case of a haemorrhagic cerebrovascular event, on the other hand, thrombolysis with a coagulation inhibitor substance would have critical effects, as the blood flow originating in the brain has to be stopped as quickly as possible. For this reason, efficient and time-saving diagnostic techniques that can differentiate between these two types of stroke are vital.

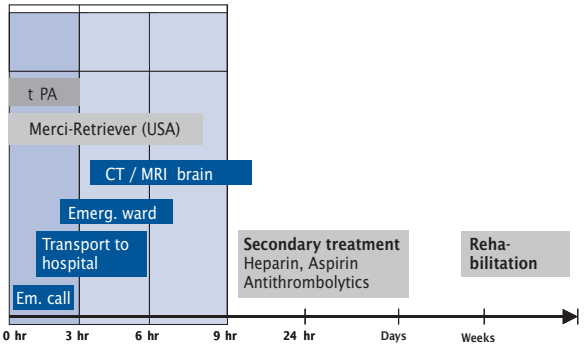
In practice, the difficulties in diagnosing a stroke go against the time effect. In the USA, special training schemes are available to those affected by stroke and risk groups, so that they can recognise stroke symptoms in good time. In spite of this, only 5 to 11 percent of patients reach the hospital within the first three hours. Admittedly, patients in the USA have to travel longer distances than patients in Europe and, according to the ASA (American Stroke Association), 99 percent of the population can reach a stroke centre within five hours.

In an optimistic scenario, a stroke would be recognised so fast that the patient would arrive at a specialist hospital within the first four to six hours and a reliable diagnosis using CT or MRI would begin. At this stage of a stroke there is no approved drug for thrombolysis, since the only drug, t-PA, can only be administered during the first three hours following a stroke; only 3 percent of patients are therefore treated with t-PA.

For this reason, when patients are hospitalised they receive routine acute treatment with antihypertensives, blood glucose infusions and additional fluid before diagnostic procedures begin. An acute, causal treatment is only carried out after reliable diagnosis and - in the case of ischaemic stroke - includes the administration of thrombolytics within the first three hours. If the thrombosis can be dissolved, blood thinning and anti-thrombotic drug combinations are administered as secondary therapy.

Even though new drugs for treating an ischaemic stroke are currently undergoing clinical trials, an important step forward in medical technology to treat this condition has been taken with the Merci(Retriever.

Time lines and possible treatment of stroke - today



Source: LBBW

In August 2004, the FDA granted approval for a medical device that can be used to remove a cerebral thrombus. This approval covers the general re-channelling of blocked blood vessels and is not specifically recommended for treating cerebrovascular events. The experts were surprised since the FDA's neurological committee was still opposed to granting approval in March 2004 on account of safety aspects.

The Merci(Retriever developed by Concentric Medical consists of three components:

1. Retriever corkscrew
2. Microcatheter
3. Balloon catheter

Merci®Retriever

Source: Concentric Medical

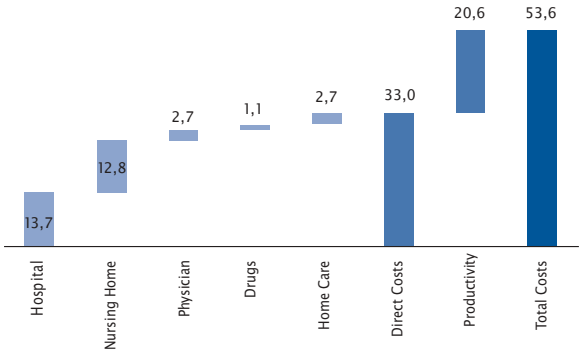
The microcatheter is used to navigate through the arteries to guide the retriever to the blood clot. It is pierced through the clot and is then pulled back, which gives it its corkscrew structure. The thrombus and the retriever are retracted into the balloon catheter and taken up inside it. This temporarily inflates the balloon catheter and interrupts the blood flow so that remains of the clot cannot break off and cause further blockages.

Approval was granted despite a lack of randomisation and placebo control. The primary study endpoint was also controversial, since only the removal of 30 percent of the blood clot was stipulated. In the MERCI trial, the blood clot was dissolved in over 50 percent of the 141 patients. However, the mortality rate was 40 percent and, after unsuccessful re-channelling attempts, the condition of some patients deteriorated. It should be noted, however, that the physician plays an important role in the success of the treatment. According to statements by the Board of Directors of Concentric Medical, the developer and manufacturer of the Merci Retriever, individual physicians with sufficient practice have an 80 percent success rate.

The FDA approval makes it possible to use the Merci Retriever for up to eight hours after an ischaemic stroke. This system is to be supplied to the 170 stroke support centres in the USA at a price of USD 3,000 and four people will be responsible for marketing it. Physicians require extensive training to use the application, since the probability of success was below 50 percent in the clinical trial. According to statements by the company, the reimbursement of costs is limited.

It is very difficult to make predictions about the market for such a product. First of all - as mentioned before - there are only 170 stroke support centres in the USA that have INRs (interventional neuroradiologists) who could be persuaded to use this therapy. In addition, the product is entering a market that is currently dominated almost exclusively by tPA: this market could, however, see other drugs - from Renovis or Paion, for example - playing a major role within the foreseeable future, provided the outcome of clinical trials for these drugs is successful. With this in mind, we have confined our analysis of the market to cost considerations. Strokes incur high costs, both directly (treatment and care costs) and indirectly (inability to work or decrease in productivity). These follow-up costs amount to almost USD 54 billion per year in the USA alone. Similarly high costs can also be calculated for Europe, as the number of cases is comparably high.

Annual cost to US society (USD bn.)



Source: Paion AG, LBBW

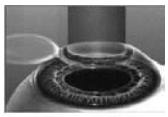
3.2.2 Refractive surgery

Refractive surgery is a branch of ophthalmology. It deals with the correction of visual defects (short-sightedness and long-sightedness or corneal astigmatism). The method used for this is based on lasers (Laser in Situ Keratomileusis, or LASIK) and is regarded as the most state-of-the-art laser operation for curing or improving visual defects.

LASIK

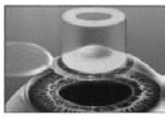
After your eye has been completely numbed using "eye drop" anesthesia , an eyelid holder will be placed between your eyelids to prevent you from blinking.

Next, an instrument known as a microkeratome makes a protective flap in the cornea. During this process you may feel a little pressure, but no discomfort. You will be asked to look directly at a target light while the laser reshapes the cornea, usually in less than a minute.



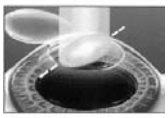
LASIK Nearsightedness

To treat nearsightedness, the cornea must be made flatter. This is accom-plished by removing tissue from the center of the cornea.



LASIK Farsightedness

To treat farsightedness, the central cornea must be made steeper. This is accomplished by directing the laser beam to remove tissue from around this area.



LASIK Astigmatism

To treat astigmatism, the cornea must be made more spherical. By changing the pattern of the beam, tissue is removed in one direction more than the other.

Then, the protective flap is folded back in place where it bonds securely without the need for stitches. After LASIK, some patients report a slight discomfort that usually goes away within twelve to twenty-four hours.

Source: http://www.customlasereye.net/theprocedure; LBBW

Today, the LASIK method generally uses an excimer laser.

The excimer laser is a cold-light laser in the invisible ultraviolet spectrum (wavelength: 193 nm) that, with the right control and calculation, penetrates the corneal tissue by just a few thousandths of a millimetre and removes it.

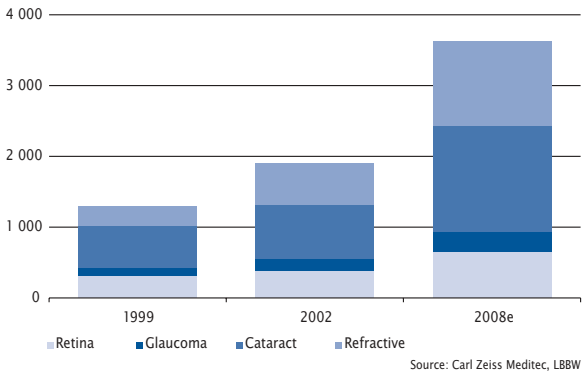
Using the computerised laser beam control of the excimer laser, the corneal astigmatism of a short-sighted eye can be changed such that a natural concave lens forms, which ideally then causes the light rays to meet on the retina.

The cornea is about 0.5 mm thick at its centre and about 1 mm thick at its edge. To correct the visual defect, the laser ablates an approximately 0.1 mm thick piece of the central cornea. Without touching the eye, the excimer laser painlessly removes at most 20 percent of the approx. 0.5 mm thick corneal surface, depending on the respective visual defect. The total ablation diameter is about 6 to 7 mm. There is no damage to the surrounding layers of tissue. Ideally, the procedure alters the refractive power of the cornea enough to correct the original visual defect.

Source: www.augeninfo.de

There has been substantial growth in the market for refractive surgery, especially in comparison with other fields of ophthalmology.

Ophthalmology markets (€m)

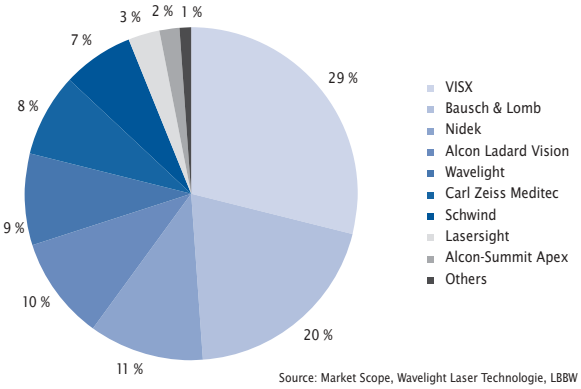


Source: Carl Zeiss Meditec, LBBW

The growth drivers are, firstly, a population that is continuously aging on average. As visual defects can also be age-related, the market is growing with the age of its customers. Secondly, the increase in global literacy is driving the market forward: human literacy and visual defects are interrelated. This factor is fuelling growth in the market, especially in emerging countries and countries of the developing world. Thirdly, the market is also influenced by aesthetic considerations. For many people, glasses are not just a visual aid; they are also a hindrance: factors such as indentations on the nose, restricted field of vision, or simply the appearance of the glasses are some of the downsides. This is partly why contact lenses are so popular. Contact lenses have other disadvantages, however, possibly resulting in eye irritations or even complete incompatibility. Even Ephraim Kishon was aware of the problems of putting in and taking out contact lenses, as told in his story „The best wife in the world".

Refractive surgery offers an alternative that has now been established for quite some time. For a long time, this field of medical technology was also almost completely dominated by the USA, both with regard to surgery and the equipment sold.

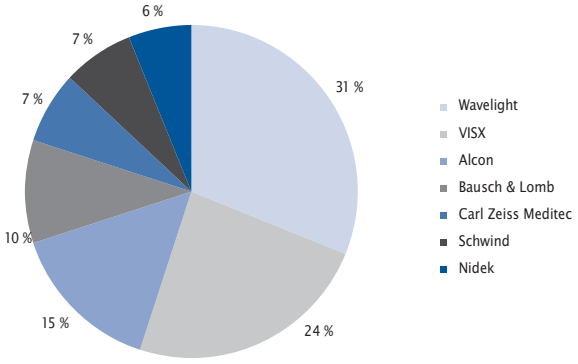
Installed base refractive lasers 2004e



Source: Market Scope, Wavelight Laser Technologie, LBBW

Yet, times have changed. On the one hand, the market is going through a consolidation phase, as shown by the acquisition of VISX by Advanced Medical Optics. On the other hand, innovative companies are penetrating the market with new solutions, and many of these innovative companies are also German. Examples include Wavelight Laser Technologie, which is the first European company to be granted FDA approval for a refractive laser, the ALLEGRETTO Wave, and Carl Zeiss Meditec, which is still working on obtaining FDA approval for its MEL 80, but can naturally score points for it in Europe with the Carl Zeiss brand name. This can also be seen clearly from the sales figures.

Refractive lasers sold (2003)



Source: Medical Laser Insight, LBBW

It should be noted that refractive surgery is typically a self-pay market. State health insurance schemes do not usually cover any of the costs; the regulations agreed with private insurance companies often vary due to the freedom of contract. In Germany, visual aids, i.e. glasses and contact lenses, are generally no longer reimbursed by the health insurance schemes (see section 33 of the German Social Security Code V (SGB V). For the refractive surgery market this means that, in most cases, it will not be at any disadvantage with regard to the reimbursement of costs for competitor products. For patients, therefore, it comes down to what is less expensive: glasses, which will have to have at least their lenses changed over the years; contact lenses, which also have a limited useful life and require lens care products; or the other option, refractive surgery.

Admittedly, patients have more to consider than just the costs. Many potential patients simply have inhibitions about eye surgery, never mind being operated on with a laser, especially when they were told at school never to look directly at a laser. A lot more educational work still has to be done in this field - something that certainly cannot produce results overnight. In addition, the sector repeatedly suffers from exaggerated reports on the potential side effects of LASIK.

Potential complications of LASIK

- In principle, the risk of severe complications when patients are selected correctly is less than 1 percent.
- A patient's vision may be over- or undercorrected, possibly necessitating a secondary procedure or additional correction with glasses in certain situations, e.g. when driving.
- After LASIK treatment some patients may find they cannot see as well at dusk or in the dark, and they may see „halos" and double contours when driving at night, for instance; in a worst-case scenario, they may be unable to drive at night.
- Some general diseases, such as rheumatism, may cause disruptions or delays in the healing process.
- In rare cases, the corneal flap may become displaced up to several days after LASIK treatment, e.g. through rubbing of the eye, necessitating another operation.
- The worst conceivable side effect would be severe scarring of the cornea with substantial deterioration in vision. If, contrary to expectations, this type of scarring should occur, the only way to treat it would be to perform another operation, a corneal transplant.
- In extremely rare cases there may be a weakening of the cornea with swelling and significant sight deterioration, or an infection with scarring.

Source: www.marien-hospital.de

Apart from the established excimer lasers, so-called femtosecond lasers are currently the innovation that is providing the most fuel for discussion in the sector.

The femtosecond laser that is being used in Femto-LASIK instead of the microkeratome (like a plane) to prepare the corneal flap sends ultrashort light pulses at speeds of several hundred femtoseconds (1 fs = millionth of a billionth of a second). By strongly focusing the laser beam, it is possible to temporarily generate very high energy densities inside the cornea. Photodisruption only occurs at the focal point, i.e. the tissue is severed. The tissue outside the defined area remains the same. It is possible to make a complete, level incision by lining up thousands of these laser pulses one after the other. The resulting corneal flap can then be lifted using a precision instrument.

Source: www.frevis.de

From this definition it is clear that the femtosecond laser is not currently used to actually correct the visual defect: it is merely used to make the initial corneal incision so that the cornea can be lifted like a lid („flap"). Until now, this procedure was carried out using a mechanical instrument, the microkeratome. The femtosecond laser can now replace this mechanical intervention, allowing an incision to be made in the cornea that requires no physical contact with the eye.

The clear leader in this field is the US company IntraLase, which also successfully went public in October 2004 - a step less unusual for US medical technology companies than for European companies. In September 2004, IntraLase already had an installed base of 180 INTRALASE FS(devices world-wide, and a 15 percent market share in the USA alone of all corneal incisions conducted in preparation for refractive surgery. In December 2004, IntraLase also announced that it had won over one of the European opinion leaders in refractive surgery, Prof. Thomas Neuhann from Munich, for INTRALASE FS®.

The German company 2010 Perfect Vision also operates in this field. This company also has CE and FDA approval for its FEMTEC™ laser, which can make principally the same type of incision as IntraLase's product. However, 2010 Perfect Vision is lagging behind IntraLase where marketing of its products is concerned. And if we also bear in mind that the market leader in the ophthalmologic technology market, Carl Zeiss Meditec, is also researching applications for femtosecond lasers, it is obvious that companies such as 2010 Perfect Vision are under pressure to market their products quickly. If Carl Zeiss Meditec were to

launch a similar device on the market in the foreseeable future, the company could benefit from its existing business relationships with users and from the reputation that the Carl Zeiss brand enjoys - advantages that 2010 Perfect Vision has yet to establish for itself. We already discussed this problem further above in the context of the refractive lasers developed by Wavelight Laser Technologie and Carl Zeiss Meditec.

Apart from the fact that refractive surgery is a vast, still largely untapped market which mainly targets self-pay patients, and European companies have a disproportionately high share of this market which is still innovation-driven, market consolidation is already taking place. Whether the merger between Carl Zeiss Ophthalmic and Asclepion Meditec counts in this context is questionable as Carl Zeiss previously had not been active in this market, making the merger more of an expansion of Carl Zeiss's portfolio. On the other hand, it means that a well-known name in ophthalmology is now associated with the area of refractive surgery, something that has clearly not made life any easier for the established suppliers, as can be seen from above sales figures.

The last major transaction in this field was the acquisition of VISX by Advanced Medical Optics (AMO) by way of a combined stock and cash deal that valued VISX at just under USD 1.3 billion. With its market leadership in refractive surgery (in terms of the installed base), VISX expands AMO's eye surgery and eye care business.

The types of transactions that have taken place in the ophthalmology market over the past few years signal a definite trend towards a system offering. For example, in December 2003 Carl Zeiss Meditec acquired a small software company specialising in medical applications and, in the autumn of 2004, the US laser diagnostics specialist LDT. Following its majority takeover, the acquisition of all interests in IOLTech, whose range of products covers implants and surgical instruments for the eye area, is currently underway.

In our opinion, the acquisition of VISX by AMO should also be seen in this context. Wavelight Laser Technologie also announced at its last analyst conference in autumn 2004 that it planned to step up its activities in the area of diagnosis and intraocular surgery. This has certainly not been made any easier by the takeover of IOLTech by Carl Zeiss Meditec; however, Wavelight Laser Technologie should be viewed in a slightly different light than Carl Zeiss Meditec.

While Carl Zeiss Meditec has clearly positioned itself as a systems provider for ophthalmologic equipment, Wavelight's business strategy involves establishing the company as a systems provider for medical laser systems. These also include laser systems for aesthetic applications. We see Wavelight's plans to move into the area of intraocular surgery as an attempt to round off its ophthalmology portfolio.

3.2.3 Coronary stents

Coronary stents are small, metal pipes - made from wire mesh or metal tubes, for example - that are used to treat occlusion and stenoses in the coronary arteries.

Through an access point (shunt), usually in the patient's groin, the constricted area is dilated under X-ray via a blood vessel. Following this procedure, or at the same time, a stent is inserted permanently into the affected section of the vessel to support it, usually with the help of a balloon catheter; the stent is then distended and is thus fixed in position.

In some cases a restenosis may develop after implantation. To avoid this happening, drug-eluting (drug-coated) stents can be used. These drugs prevent a restenosis from forming.

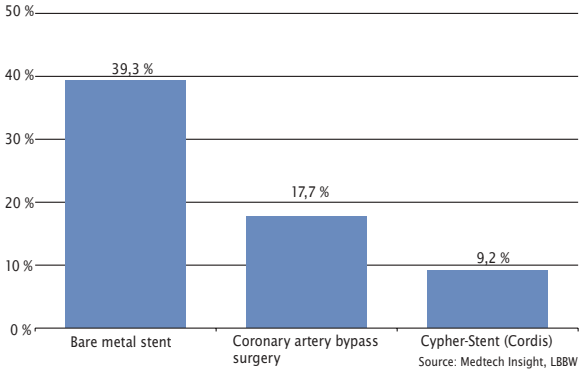
But, as these stents are considerably more expensive than uncoated ones, coated stents are often not used in an effort to minimise costs. Tests have nevertheless shown that patients who were given coated stents had to return to the hospital much less frequently. Particularly in patients from risk groups, such as diabetics or patients with longer blood vessel constrictions, coated stents can significantly reduce the restenosis rate.

A few years ago, some companies were still pinning their hopes of product development in this area on radioactivity. One German company, Eckert & Ziegler, was also involved in this trend as a supplier of radiation sources to Novoste, its development partner. The results were promising, showing that balloon dilation followed by temporary radiation of the vessel walls significantly reduced the rate of restenosis. However, since the procedure involved the use of radioactive materials, the cardiologist required the assistance of a radiologist.

With the arrival of drug-eluting stents, a coup took place that nearly caused the potential market for radiation therapy in this area to collapse completely: the metal stent had already been approved, as had the antibiotic with which it was coated, so approval for the combination product was granted very quickly. Clinical successes proved that the coated stents significantly reduced the rate of restenosis and the stent could be inserted by the cardiologist alone, so the radiologist's assistance was no longer required during operation.

In our opinion, the high level of clinical efficiency is the main reason why the coated stents are widely accepted by users, despite being more expensive: fewer secondary complications mean lower costs for hospitals and, if hospitals only receive a case-based lump sum, also intended to cover any complications, the advantage for the clinic is obvious. It goes without saying that coated stents also provide considerable relief for patients who no longer have to worry about restenosis rates of up to 30 percent, as is the case with the simple metal stents.

Major adverse cardiac events, MACE



Boston Scientific, a manufacturer of the leading drug-coated Taxus stents, expects that by the end of 2004, drug-eluting stents (DES) will have a market share of 85 percent in the USA. The global market is estimated at USD 4.6 billion for 2005, with the USA alone accounting for USD 3 billion.

In Europe, the average market share of DES was low at around 35 percent, although there were significant regional differences. The share in Switzerland and Portugal, for example, was around 70 percent, compared with less than 15 percent in Germany, also due to differences in cost reimbursement regulations. In spite of this low market penetration, the DES market share is also expected to increase in Europe to around 90 percent by 2008. The efficiency gains became evident in studies in which Taxus and Cypher, the competitor product of Cordis (a Johnson & Johnson entity), were compared with metal stents.

3.2.4 Dialysis

Dialysis is a form of therapy for terminal renal insufficiency, in other words kidney failure. The causes of renal insufficiency are varied:

- Diabetic nephropathy (over 20 percent): kidney damage from diabetes mellitus
- Chronic glomerulonephritis (about 20 percent): chronic form of glomerulitis
- Interstitial nephritis and chronic pyelonephritis (about 15 percent): chronic inflammation of the kidney and renal pelvis
- Hypertonic vascular nephropathy (about 10 percent): kidney damage due to high blood pressure
- Polycystic kidney disease (about 10 percent): congenital kidney malformation with numerous cysts that generally result in renal insufficiency after the age of 40
- Analgesic nephropathy (about 5 percent): damage due to certain analgesics
- Systemic diseases (about 5 percent), e.g. vasculitides or SLE (systemic lupus erythematosus): a connective tissue disease also affecting the kidneys; vasculitides = disease of the blood vessels of the kidney)
- Unclassified causes (about 15 percent)

In the final stage of the disease, kidney function fails completely. This can be treated with dialysis or an organ transplant. However, there is still a huge global shortage of suitable donor organs and, in our opinion, the elimination of this problem by way of xenogenic transplants is still a long way off. Animal experiments to date, in any case, do not promise a quick remedy, so that most patients are left with no other choice but to undergo dialysis.

The aim of dialysis treatment is to replace the natural kidney function as far as possible after kidney failure. Substances that a healthy person's kidneys would normally excrete in the urine (metabolites, medication, certain food components, etc.) are removed from patients with failed or limited kidney function via synthetic „filters". Dialysis also removes excess water, since most dialysis patients urinate very little, if at all. Dialysis can be carried out in a number of different ways.

Haemodialysis
In haemodialysis, the patient's blood is „cleaned" outside the body in what is called a dialyser (dialysis machine), and excess water is removed before the blood is returned to the bloodstream. Since haemodialysis „cleans" the blood outside the body, it is necessary to create a point of access (shunt) to the patient's bloodstream. During dialysis, 200-300 ml of blood a minute are removed from the patient via this shunt, cleaned and then returned. This type of vascular shunt is created by surgically joining an artery in the forearm that takes blood from the heart to the hand, to a vein in the forearm that takes blood from the hand back to the heart. During dialysis, the patient's blood and the „cleaning solution" (dialysate) bypass each other in the artificial kidney (dialyser) separated by a semi-permeable membrane. Substances that are in a higher concentration in the blood (metabolites, medication, etc.) pass through into the dialysate and are removed. Of course, only substances with molecules smaller than the size of the pores in the membrane can permeate the membrane.

In order to avoid substances needed in the blood (sodium, calcium, potassium, etc.) from being removed, sufficient quantities of these substances are added to the dialysate.

Generally, it is capillary dialysers that are used in practice. These have a plastic tube with 10,000 to 15,000 individual capillaries that form the semi-permeable membrane and transport the patient's blood. The dialysis solution flows around these capillaries.

The dialysis result depends, among other things, on the surface area of the capillaries, i.e. the area where the blood and dialysis solution „touch". The larger this area, the greater the efficiency of dialysis. A capillary dialyser has a surface area of around one to two square meters.

The physical phenomena that take place at the synthetic membrane of the dialyser also occur in the body, with each individual cell wall as the membrane. Once the blood has been cleaned by dialysis, it can again take up substances from the body's tissues. This is referred to as internal dialysis.

Overall, the haemodialysis procedure has few complications. This is ensured, among other things, by state-of-the-art dialysis machines with sensitive monitoring mechanisms.

As this treatment exposes the body to changes (detoxification, elimination of water, etc.), incidents cannot be ruled out completely.

- If detoxification happens too quickly or from a very high to a low concentration, or if too much water is removed, blood pressure falls and the patient may suffer from headaches, muscle cramps (usually starting in the calves) or vomiting. This is called dialysis disequilibrium syndrome.
- Headaches, circulatory disorders or an increase in blood pressure at the end of dialysis may be attributable to an excessively high hematocrit value (red blood cell count), caused, for example, by an excessively high dosage of erythropoietin and intensified by the elimination of water during dialysis.

- An overly sharp decline in the potassium level during the treatment can lead to cardiac arrhythmias.
- Although the high level of technology used makes it practically impossible for air to get into the patient's bloodstream, this is still theoretically possible if the machine is used incorrectly or has a serious defect.
- Carelessness can cause a cannula to slip out of the puncture site. This will result in blood loss if not noticed immediately.

Peritoneal dialysis

In peritoneal dialysis, the exchange processes to eliminate toxins and water do not occur outside the body in an artificial kidney as in haemodialysis; rather they take place at the patient's abdominal lining (peritoneum).

The abdominal lining is a thin layer of tissue with small pores, a good blood supply and a surface area of 1-2 m2. It is therefore a sort of membrane through which water and substances such as drugs and metabolites can permeate. This takes place via the physical phenomena osmosis, diffusion and convection.

The desired elimination of excess fluid is controlled by the concentration of glucose in the dialysis solution. The higher the glucose concentration in the dialysis solution (1.5 to 4.25 percent), the greater the volume of water eliminated. However, this also depends on the nature of each individual patient's abdominal lining.

Under strictly aseptic conditions the bag is changed once in the morning, when the patient gets up, and then a further three times during the day, every four hours as a rule. For this, the old dialysate is first drained from the abdominal cavity into an empty bag; then the bag containing the fresh, heated dialysis solution is attached to the catheter to bring the new fluid into the abdominal cavity. The bag containing the used dialysate is weighed. The difference between the inflow and outflow is equivalent to the amount of fluid drawn from the body; the result is recorded. Both the outflow and inflow take place with the help of gravity, i.e. the bag is lowered for the outflow stage and raised for the inflow stage. The bag change takes between 30 and 60 minutes, depending on the volume of dialysate, the skill of the patient, etc. The outflow stage accounts for between 15 and 30 minutes of this time and inflow for between 10 and 20 minutes. The remainder of the time is taken up with anything that needs to be done before or after the procedure. In principle, the bag can be changed in any place with suitable hygienic conditions, e.g. at home, at work, in transit (hotel or similar).

In peritoneal dialysis, both patients and their (intimate) partners often find the constant presence of the catheter disturbing. It is, in any case, more of a burden than the vascular shunt created for haemodialysis. The catheter may close over or become displaced due to bowel movements. PD also exposes the body to high glucose levels: firstly, this requires diabetics to increase their insulin dosage and, secondly, it sometimes results in weight gain and frequently in dyslipidaemia. Besides, the procedure often raises blood glucose levels in non-diabetics. The main complication of PD is peritonitis. This can be triggered by the entry of pathogens via the catheter, along the catheter tunnel or into the bloodstream. The frequent use of dialysis solutions with a high glucose content and the substantial amount of fluid eliminated as a result may - due to the increase in serum sodium - lead to an increase in blood pressure.

Advantages of peritoneal dialysis over haemodialysis

- As the procedure can be carried out at home, patients are largely independent of the dialysis clinic
- The continual process reduces the cardiovascular strain
- Bags can be changed at the workplace
- Less time-consuming
- Shorter training times (than with home haemodialysis)
- Painless, as there is no need to puncture the skin
- No blood loss, less anaemia
- Dietary specifications relatively liberal
- Easier to travel

- Cheaper (70 percent of the cost of haemodialysis)

Disadvantages of peritoneal dialysis compared with haemodialysis

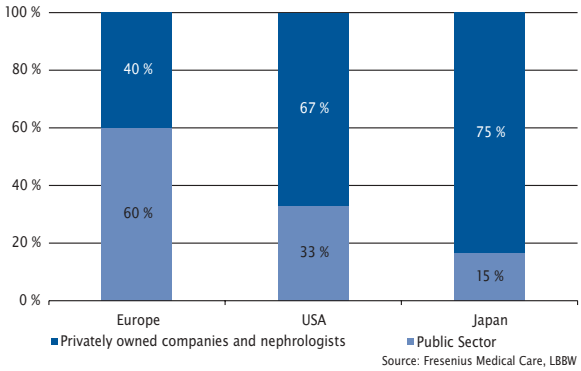
- Catheter must be worn permanently
- Risk of peritonitis
- More space needed for dialysis materials
- Lots of waste due to packaging and disposable items
- Occasional back pain due to additional strain on the spine
- Bathing forbidden
- Elderly and disabled require assistance with changing the bags
- Protein loss of 5 - 20g a day

Source: www.dialyse-net.de

Almost 90 percent of all dialysis patients treated world-wide opt for haemodialysis. In Mexico (LBBWe: 60-70 percent), where the number of dialysis clinics is limited, and in the United Kingdom and South Korea (LBBWe: between 50 and 60 percent in each case), there is a higher percentage of peritoneal dialysis patients.

The high percentage of haemodialysis patients requires a large number of dialysis clinics. In 2003, there were almost 22,000 clinics treating an average of just over 50 patients. World-wide, 53 percent of these clinics are run privately, while the other 47 percent are state-run. There are, however, substantial regional differences that are also due to the different health care and health insurance systems.

Dialysis centers' carriers

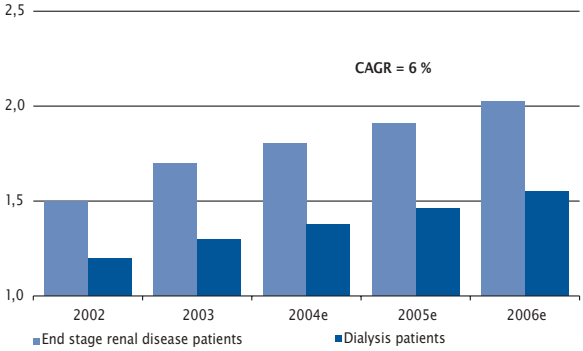


Source: Fresenius Medical Care, LBBW

The data for Japan only includes nephrologists - private companies there are still not permitted to run dialysis clinics.

For many years now, the dialysis market has been characterised by a steady rise in the number of patients. At the end of 2002, the number of patients being treated for terminal renal insufficiency world-wide was 1.5 million; by the end of 2003, this number had already risen to 1.7 million. Of these patients, 1.2 million received dialysis treatment in 2002 and 1.3 million in 2003. Forecasts for further growth in patient numbers fluctuate between 5 and 7 percent. There is a conflict here between greater health consciousness in many industrialised countries on the one hand and the adoption of bad eating habits in emerging countries on the other. Realistically, however, we are predicting annual growth of 6 percent.

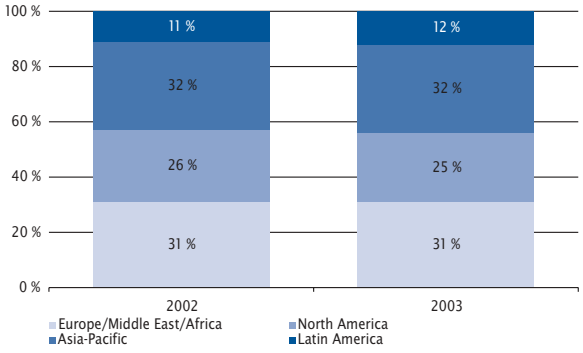
ESRD and dialysis patients (m)



Source: Fresenius Medical Care, LBBW

Looking at the regional distribution of dialysis patients, we can see an obvious concentration in the industrialised countries.

Dialysis patients by region

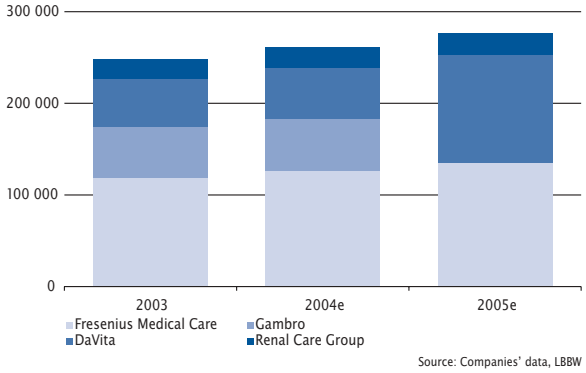


Source: Fresenius Medical Care, LBBW

However, a significant increase in the number of patients is particularly evident in emerging countries. The number of patients in South Korea, for example, is increasing at an average rate of 12 percent per annum.

So who are the major players in the dialysis market? It should be noted that the market has changed substantially over the past year. Until now, there were four major players in the dialysis services sector and the market situation was as follows.

Dialysis patients

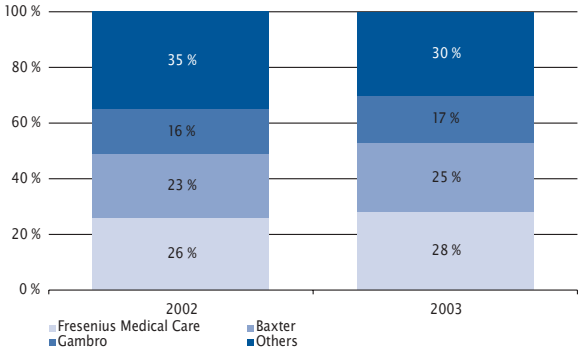


Source: Companies' data, LBBW

At the end of 2004, Gambro and DaVita announced the acquisition of Gambro's dialysis division by DaVita. Although this has no impact on Fresenius Medical Care's leading global position, it relegates the company to second place in North America.

In terms of the market for dialysis products, on the other hand, DaVita does not play a significant role.

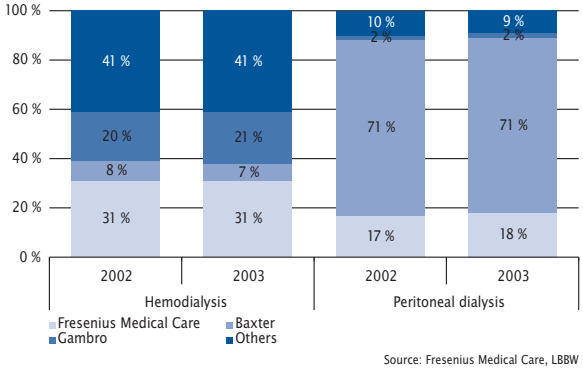
Market shares dialysis products



Source: Companies' data, LBBW

The increasing market consolidation with regard to dialysis products is also becoming evident: the market shares of the major players are growing, while those of smaller companies are shrinking. If we look at the market from the point of view of individual types of dialysis, this effect is not quite as obvious.

Market shares dialysis products by dialysis type



Source: Fresenius Medical Care, LBBW

On the whole, however, the dialysis market is and shall remain an interesting area of activity, at least for the major players. We cannot currently perceive any serious short-term or medium-term competition, such as from the field of biotechnology, for dialysis. In the long term, i.e. within a timeframe of at least 15 years, alternative therapies may possibly emerge in the form of xenogenic transplants. The results so far have not, however, been impressive enough to raise hopes among patients for the short term or cause the suppliers of dialysis products and services to lose any sleep. It

nevertheless is always a good idea to keep an eye on new developments and this is what the major players are doing.

Companies could be faced somewhat sooner with indirect competition from better methods to prevent or treat primary diseases. For example, better preventive measures against or better treatment of diabetes could at least potentially put a damper on growth in patient numbers.

However, lets not forget that countries such as India and China are assuming the bad eating habits of many people in industrialised countries due to increasing westernisation: this results in higher incidences of diseases such as diabetes, which means that the related secondary conditions that can occur - terminal renal failure, for example - are also on the increase. In the short to medium term, we therefore do not expect the growth in the number of patients requiring dialysis to slow down significantly; it is more likely to remain at an annual level of around 6 percent.

3.2.5 Brachytherapy

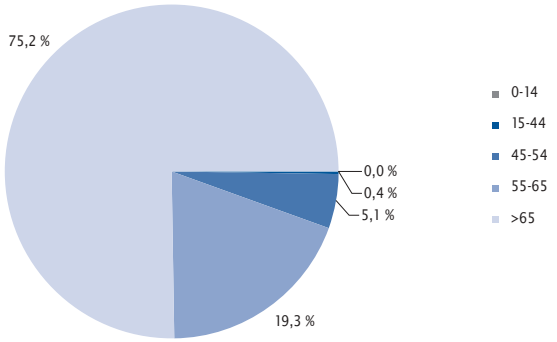
Brachytherapy is a form of therapy that can be used to treat cancer. It involves short-distance radiation and treatment consists of the temporary or permanent insertion of radiation sources in the region of the tumour.

Apart from treating tumours, brachytherapy for a long time was also one of the big hopes for the prevention of restenoses following treatment of vascular constrictions in the heart. However, the market for this form of treatment largely collapsed after the arrival of drug-coated stents.

Currently, the most interesting indication for brachytherapy is the treatment of early-stage prostate cancer. Prostate cancer is the second most common cause of death in Germany among organ-related cancers. If a tumour is caught early enough, it is usually possible to treat it with brachytherapy: the tumour is limited to a specific area, there are no adhesions with the surrounding tissue and no metastases have formed yet (referred to as T1 or T2 tumours). Larger tumours, adhesions and metastases (T3 and T4), on the other hand, can no longer be treated with brachytherapy. These require surgical intervention and chemotherapy.

An analysis of the age structure of the diseases shows that prostate cancer is generally typically a geriatric disease that can, however, also affect younger men in rarer cases.

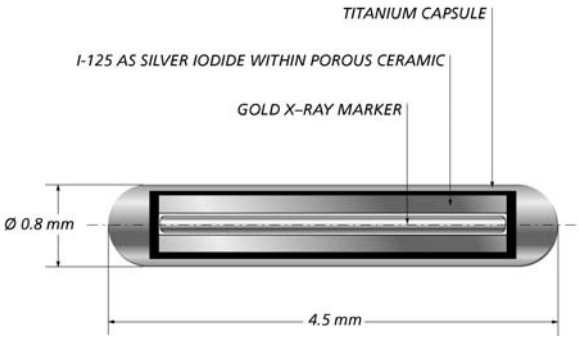
Incidence of prostate cancer by age



Source: Globoscan, LBBW

Brachytherapy of the prostate involves a one-off, permanent implantation of small radioactive „seeds“ in the affected area of the prostrate.

Iodine-Seed

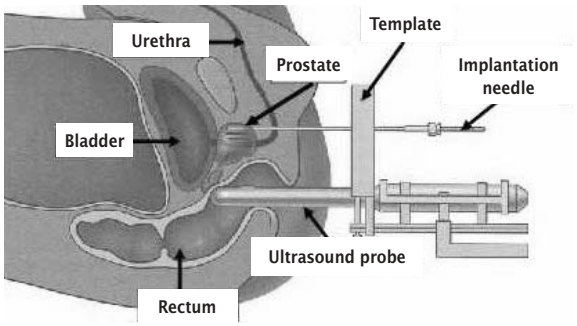


Source: Eckert & Zieglere

This is only used in early-stage, localised tumours. The sources of radiation used are iodine125 seeds or palladium103 seeds. This form of brachytherapy falls under the heading of low-dose rate (LDR)

therapy. Another type of treatment is temporary high-dose rate (HDR) brachytherapy with iridium192. We shall only be looking at the LDR therapy.

Brachytherapy of the prostate



Source: http://www.uro-koeln.de/Brachytherapie/body_brachytherapie.html

The actual therapy involves implanting the seeds in the prostate through a hollow needle with the help of ultrasound. The seeds emit radiation locally and for a limited time, damaging the cancer cells but only a minimum amount of the surrounding healthy tissue. These seeds remain in the prostate permanently. The surgery is minimally invasive and can be performed on an outpatient basis. The success rates are high and there are much fewer side effects as compared with other methods of treatment, such as prostatectomy, i.e. the removal of the prostate gland.

The benefits of LDR seed therapy are evident from the freedom from tumours measured - in various risk groups of patients - after five years.

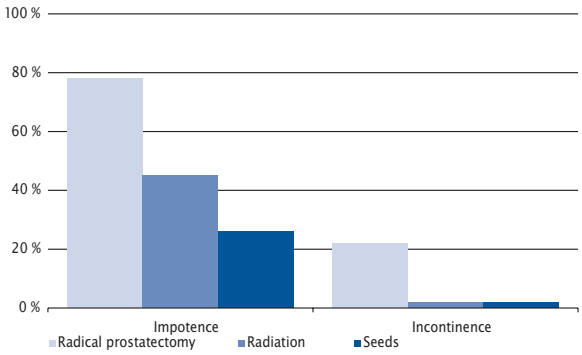
5 years without tumor

	Radical prostatectomy	3D conformal radiation	Seeds	Seeds & external radiation
Risk				
low	85 %	95 %	94 %	94 %
average	65 %	79 %	82 %	84 %
high	32 %	60 %	65 %	69 %

Source: http://www.urologie-vaterstetten.de

Side effects - often incontinence and impotence - are the main factors affecting the patient's quality of life after surgery. These risks can be reduced considerably if prostate cancer is diagnosed early and treated with LDR brachytherapy.

Side effects (% of patients treated)

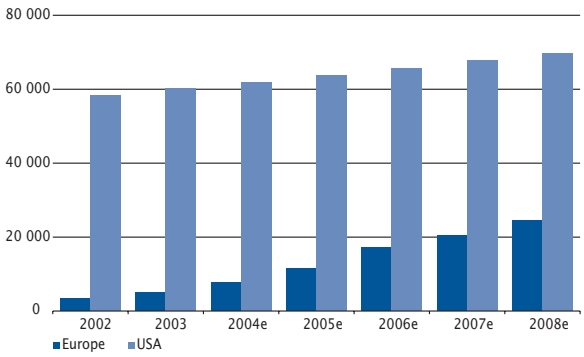


Source: http://www.urologie-vaterstetten.de

Since early-stage cancer is a prerequisite for the use of brachytherapy, early detection plays a dominant role. There is widespread usage of early screening services for prostate cancer in the USA. Tumours are therefore recognised early and can be considered for minimally invasive brachytherapy. The number of brachytherapies for prostate cancer has multiplied in the USA since the introduction of the treatment. The number of cases has now reached a high level. We are expecting the number of cases to increase by 3 percent annually, mainly due to demographic changes.

Europe, on the other hand, has a much poorer starting point for the development of brachytherapy for prostate cancer. Here, an average of just one man in six goes for screening. We consider annual growth of 50 percent a realistic estimate for a review period until 2006; after that, growth should level off at 20 percent.

Seed treatments



Source: Eckert & Ziegler, LBBW

In our opinion, there are two main problems involved in this therapy. Firstly, there is the reluctance of men to go for regular screening. In our opinion, the scientific discussions on this, i.e. what the right indicators are for diagnosis, are of secondary importance: the availability of methods such as digital rectal examination and a blood test for PSA (prostate-specific antigen) means that the majority of the prostate carcinomas that are not discovered until it is too late could be detected at an earlier stage.

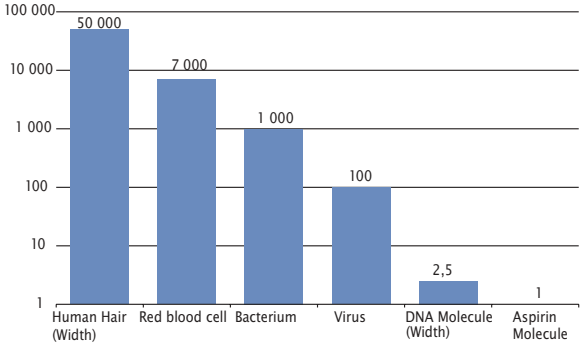
Secondly, there are huge discrepancies between cost reimbursement regulations in Europe's various state health insurance systems, and even within these systems. In Belgium, for example, material costs for brachytherapy are refunded; in France, the government finally decided at the end of 2004 - after a very long time - to adopt a policy of general cost refunds; and in Germany this form of therapy was registered in the DRG catalogue in hospitals, but is not yet generally reimbursed, for instance, on an outpatient basis.

3.2.6 Nanotechnology - The future of medical technology?

Nanotechnology is the construction, manipulation or modification of substances and equipment so small that they have to be measured in nanometres, i.e. a billionth of a metre or a millionth of a millimetre.

Most people's power of imagination fails to grasp the concept of what a nanometre, or nanotechnology, actually is. As a result, products that can be measured in millimetres unfortunately are classified among this category again and again, although they actually are totally misplaced here. The following table provides an overview of the dimensions used in nanotechnology.

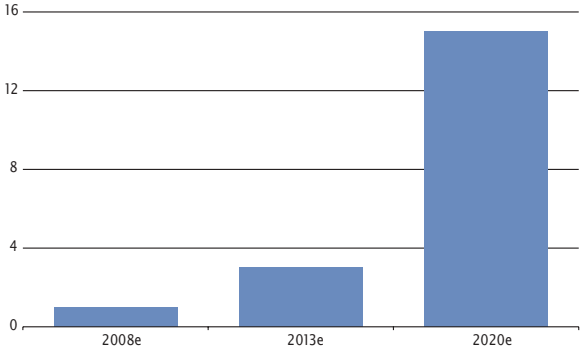
Size in nanometers



Source: Medtech Insight, LBBW

The only substances or equipment usually classified as nanotechnology are those measuring less than 100 nanometres. Nanotechnology is already established in many areas of human life. Surface coatings are certainly one of the best-known applications. Skin creams and sun screens can be improved with nanotechnology in such a way that the skin can absorb the creams much faster. The possibility of working at the atomic level already has researchers fantasising about developing drugs that exclusively destroy tumour cells and leave healthy tissue completely untouched. Current market forecasts and the US National Science Foundation are predicting that the global nanotechnology market will reach a volume of USD 1 billion in 2008, which will then triple by 2013, ultimately reaching a possible USD 15 billion by 2020.

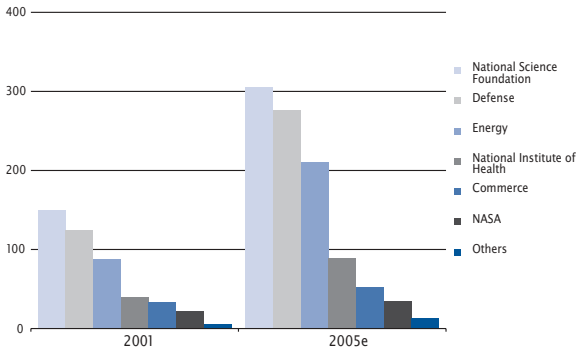
Market estimates nanotechnology (USDbn)



Source: Medtech Insight, National Science Foundation, LBBW

The fact that nanotechnology is also taking on an important role in the area of health care is evident from R&D promotion initiatives: the US „National Nanotechnology Initiative“ combines financial support for ten different institutions.

National Nanotechnology Initiative (USDm)



Source: Medtech Insight, LBBW

In September 2004, the National Institute of Health (NIH) undertook to provide funding of USD 144.3 million in support of a five-year project to develop new, nanotechnology-based products for the prevention, diagnosis and treatment of cancer.

The projects include, for example, a miniature silicon lattice coated with monoclonal antibodies. The aim is for antibodies to bind with certain tumour markers, which would measurably alter the conductivity of the lattice, thus making the diagnostic method 100 times more sensitive than any other methods to date.

Similar concepts are being pursued in therapy: in this case, nanotechnological drug-delivery systems, i.e. quasi drug containers, would be coated with monoclonal antibodies. These antibodies would, in turn, bind to tumour cells so that the drug would only be delivered - or released in the areas of the body - where it is needed to fight tumour cells. This would reduce the side effects caused by damage to healthy cells, which unfortunately cannot be avoided in conventional cancer therapies such as chemotherapy.

Another application for nanotechnology in diagnostics is equipment for imaging procedures such as CT or MRI. The promising research in this area concerns supraparamagnetic iron oxide nanoparticles (SPION). These particles are between 10 and 300 nanometres in size and are taken up in the body by macrophages. SPIONs can be detected using CT or MRI. Larger accumulations of macrophages may indicate inflammatory processes.

The one thing all the projects have in common is that the first signs are very promising, but it will be some time before these progress from the research and development phase and become a marketable product. Should this become a reality, the scope of application is vast and thus the market potential very high.

4 Selected Companies.

BB Medtech

BB Medtech is a Swiss investment company that focuses its investments on listed, mid to large-sized, profitable and high-growth companies in the medical technology sector. As a rule, the so-called core investments make up over 5 percent of the investment portfolio, although smaller investments are possible as well. Private equity investments are allowed to make up no more than 10 percent of the portfolio volume. The portfolio is managed actively; BB Medtech's yield target is set at 15 percent per annum.

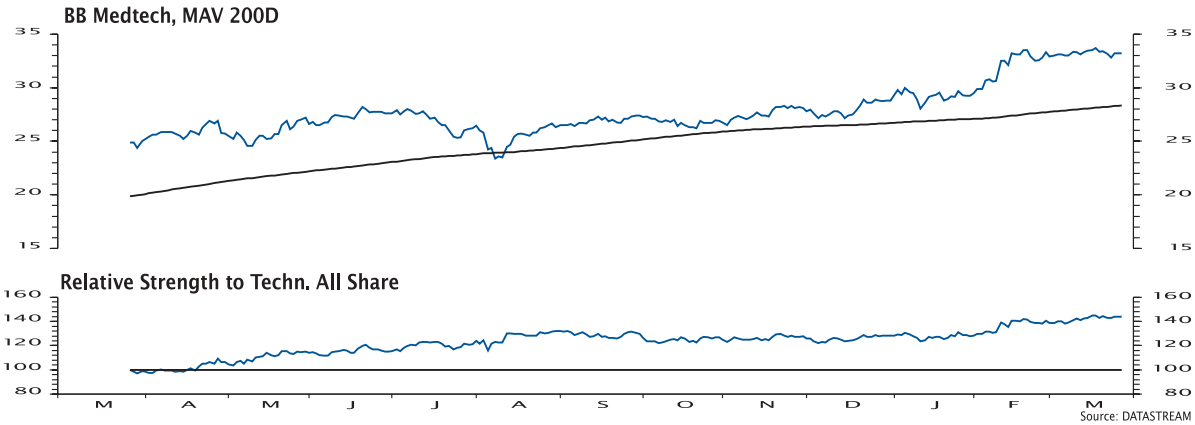
Price:	**33.04 €**
Target Price:	**38.00 €**
Rating:	**Buy**

Core holdings	**31.12.2002**	**30.06.2003**	**31.12.2003**	**31.12.2004**
Nobel Biocare	72,8 %	69,0 %	62,0 %	68,4 %
Synthes	4,3 %	14,4 %	15,7 %	9,2 %
Drägerwerk	0,7 %	9,3 %	18,5 %	13,7 %

Source: BB Medtech, LBBW

Share data	**31.12.2002**	**30.06.2003**	**31.12.2003**	**24.03.2005**
NAV	17,60 €	17,80 €	23,80 €	37,10 €
Price	14,40 €	14,13 €	19,35 €	33,04 €
Premium/Discount	-18,2 %	-20,6 %	-18,7 %	-10,9 %

Source: BB Medtech, LBBW



Source: DATASTREAM

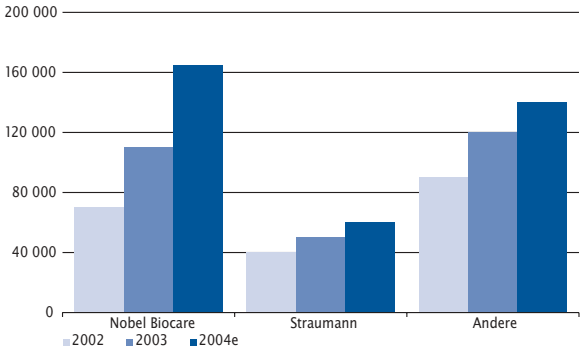
BB Medtech's core investments.

Nobel Biocare

Nobel Biocare is a dental specialist that provides crowns, bridges and implants, focussing on innovative implant systems.

Although the market for implants is already 40 years old, it has recorded significant growth only in recent years. This is primarily due to products that are both innovative and easy to implant, and the manufacturers' efforts to train users.

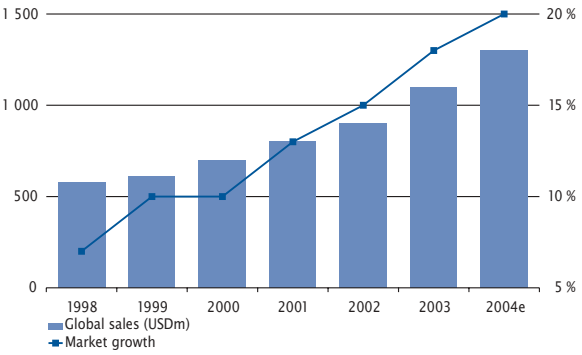
Number of trainings



Sources: Nobel Biocare, BB Medtech, LBBW

The thus newly gained users contributed considerably to the market growth of about 20 percent, which, in our opinion, can be maintained for the next few years.

World market dental implants



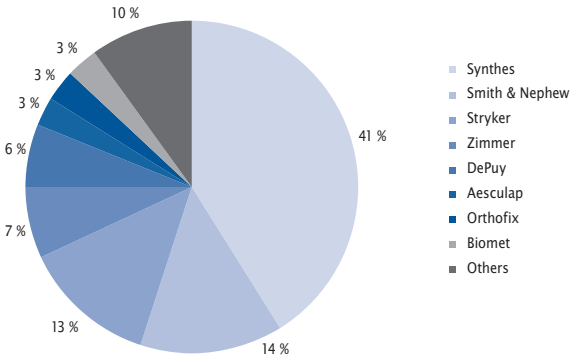
Source: Nobel Biocare, BB Medtech, LBBW

Synthes

Synthes, one of the world's leading orthopaedics companies, specialises in injuries as well as the spine and cranio-maxillofacial area (CMF, head and facial area).

Synthes is the market and innovation leader in the trauma area by a clear margin. This is mainly due to the close cooperation and licensing agreements with the AO Foundation - Association for the Study of Internal Fixation (Arbeitgemeinschaft für Ostheosynthesefragen).

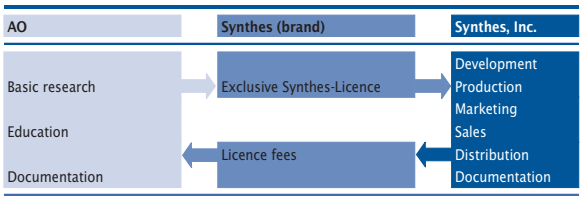
World market trauma (2003; USDbn. 2.2)



Source: Synthes, LBBW

The AO is the world's leading institution for the basic research within traumatology. Synthes holds the marketing rights for AO research results on a license fee basis. AO on the other hand uses the license fees amongst other things to fund further research and train internationally active surgeons and other hospital staff, using products developed by Synthes.

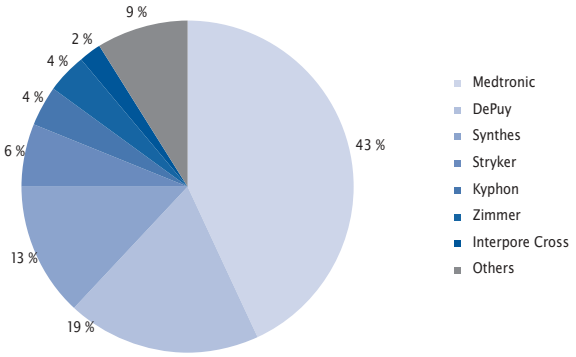
Cooperation AO - Synthes



Source: Synthes

Synthes currently is only small fry in the spine segment but could soon mutate to a major player. Through the acquisition of Spine Solutions, Synthes has complemented its range of products with an artificial spine and is likely to enter this market following FDA approval, which is expected for the end of 2005.

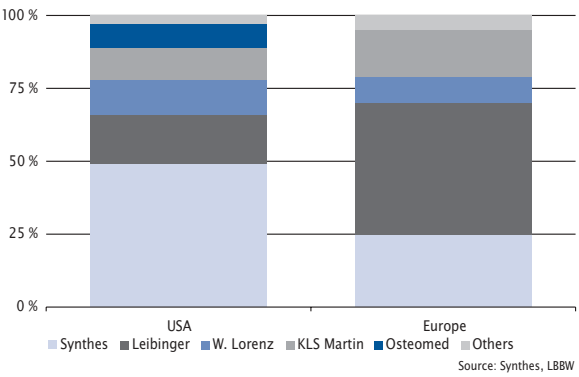
World market spine (2003; USDbn 3.1)



Source: Synthes, LBBW

In our opinion, the CMF area is a sensible addition to the range of products, representing real growth potential. With a market volume of just under USD 400mn for Europe and the US together, this small division of Synthes is well able to survive as Synthes is the market leader by a clear margin in the American CMF market with a share of almost 50 percent.

Market shares CMF (< USDmn 200 each)



Source: Synthes, LBBW

Drägerwerk

Drägerwerk is represented in the medical technology market and the market for safety solutions with its subsidiaries, Dräger Medical and Dräger Safety, respectively.

Although the Safety division might be attractive from an investor's point of view (sound sales base, margins that are increasing slowly but surely), BB Medtech's decision to invest in Drägerwerk primarily must have been based on the Medical division.

For a more detailed overview of Drägerwerk, please refer to the analysis of Drägerwerk in this industry report.

Valuation.

Applying conventional multiplier or DCF models to an investment company such as BB Medtech makes no sense. Theoretically such valuations could be carried out for individual investments and then apportioned to BB Medtech's enterprise value on a pro rata basis. However, this approach has its limits; two, to be precise.

On the one hand, third parties cannot carry out a valuation based on a multiplier or DCF model for private equity investments owing to the fact that the necessary information is not available. At present this affects only one investment (Vascular Innovations) which makes up for less than one percent of the portfolio volume recorded in BB Medtech's books.

On the other hand, the current composition of BB Medtech's investment portfolio is only disclosed every three months. This means that any significant changes that occur during that period are not reflected in an up-to-date valuation without the necessary information.

Recommendation.

BB Medtech is not just a fund investment. It seems to make sense to include the investment company in the portfolio against this backdrop. Over the last four years an investment would have turned out well, even realising BB Medtech's yield target of 15 percent. A trading-oriented investor would have been able to use fluctuations in the discount to the net asset value during this period, thus achieving a higher yield.

On the whole, BB Medtech is an interesting basic investment in the medical technology sector. The portfolio provides a certain amount of risk diversification. However, in our opinion a higher risk diversification, reflected in a lower concentration on Nobel Biocare, is desirable. All the investments hold good market positions and potential. Against this backdrop we can expect a certain price appreciation potential.

We therefore reiterate our 'buy' rating for BB Medtech shares. Our price target lies at € 38.00.

Profit and Loss Account (in '000 CHF)	2001	2002	2003	2004
Gains from marketable securities	0	0	175 782	225 352
Interest income	174	99	72	19
Dividend income	1 452	1 271	2 646	4 978
Other income	0	1	0	2
Losses from marketable securities	-21 142	-15 460	0	0
Interest expenses	- 784	- 60	- 13	- 36
Foreign exchange losses net	-1 719	- 614	- 223	- 10
Administrative expenses	-1 647	-1 659	-1 774	-3 012
Other expenses	-2 267	-3 100	-1 886	-2 536
Operating income before taxes	**-25 933**	**-19 522**	**174 604**	**224 757**
Taxes	- 12	- 91	- 89	- 36
Net income	**-25 945**	**-19 613**	**174 515**	**224 721**

Sources: BB Medtech, LBBW

Balance sheet (in '000 CHF)	2001	2002	2003	2004
Liquid funds	4 928	67 624	2 384	1 392
Receivables from brokers	0	6	687	0
Marketable securities	436 620	332 374	551 517	788 815
Other assets	172	95	120	40
Total assets	**441 720**	**400 099**	**554 708**	**790 247**
Short-term borrowings from banks	8 391	0	8 000	5 000
Marketable securities short	800	1 404	0	0
Payables to brokers	3 935	0	2 422	1 157
Other short-term liabilites	282	354	163	531
Tax provisions	22	16	4	21
Share capital	32 000	32 000	32 000	32 000
Treasury shares	- 155	- 842	-2 957	- 806
Additional paid-in capital	435 485	435 485	435 485	435 485
Retained earnings	-39 040	-68 318	79 591	316 859
Total liabilities and shareholder's equity	**441 720**	**400 099**	**554 708**	**790 247**

Source: BB Medtech, LBBW

Carl Zeiss Meditec

Carl Zeiss Meditec (CZM) is specialised in ophthalmic equipment systems. Its product range includes simple diagnostic equipment like slit light microscopes as well as complex diagnostic devices such as a laser system for the diagnosis of glaucoma that was added last year following the acquisition of American LDT. Products also include therapeutic laser systems that are used, for example, in refractive surgery.

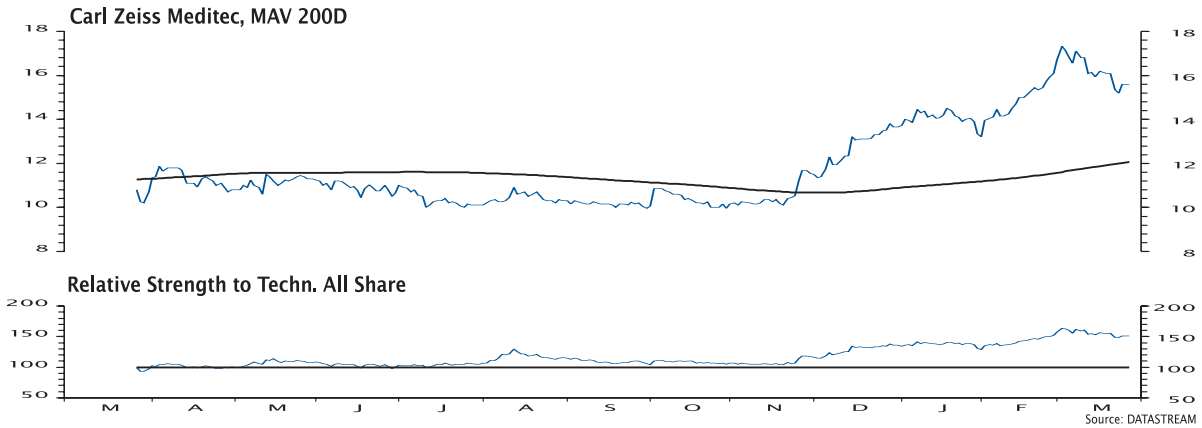
Price:	**15.70 €**
Target Price:	**19.00 €**
Rating:	**Buy**

Share data	EPS current €	EPS previous €	PSR	EV/EBITDA	PER
2003/04	0,44	0,44	1,4	13,9	35,3
2004/05e	0,68	0,68	1,4	9,1	23,0
2005/06e	1,00	1,00	1,2	6,8	15,7
2006/07e	1,13	1,13	1,1	6,1	13,9

Source: Carl Zeiss Meditec AG, LBBW

Company data	Revenues € m	EBITDA € m	EBIT € m	EBIT-Margin	Net profit € m
2003/04	234,9	31,8	26,3	11,2 %	12,6
2004/05e	318,1	48,4	40,6	12,8 %	19,9
2005/06e	377,4	65,2	56,8	15,0 %	29,6
2006/07e	412,3	72,7	63,7	15,4 %	33,6

Source: Carl Zeiss Meditec AG, LBBW

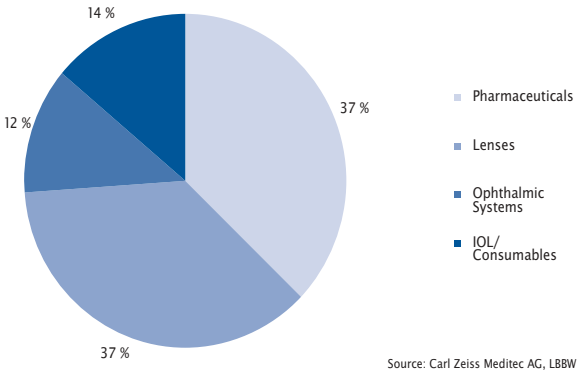


Source: DATASTREAM

Market and position.

With its products, CZM operates in a market with a total volume of just over USD 17bn.

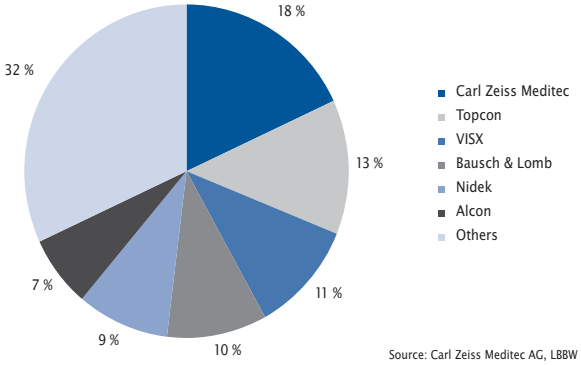
Ophthalmology market (USD 17,3 bn)



Source: Carl Zeiss Meditec AG, LBBW

The company, however, is not active in all market segments. The market for CZM's ophthalmic device systems is currently worth USD 1.3bn and by acquiring IOLTech, CZM has entered into the big USD 2.4bn market for intra-ocular lenses.

Worldwide market shares ophthalmologic systems
(Without phako machines and surgical microscopes; USD 1,3 bn)



Source: Carl Zeiss Meditec AG, LBBW

We feel that CZM's 18 percent share in a market that is growing at 10 percent p.a. (in excess of 10percent p.a. in the IOL segment) demonstrates its strong position.

Valuation.

Valuations by multiples

As a result of the large number of devices and systems offered by CZM, there is a number of listed companies which may be included in the group of peer companies. Care should be taken, however, not to compare CZM with medical laser specialists such as Wavelight Laser Technologies. CZM's product range, for example, does not include cosmetic or surgical laser technology. However, for CZM, refractive surgery is only an addition - albeit a very attractive one - to the ophthalmic equipment systems it offers. We consider the best comparable member of the peer group to be Advanced Medical Optics, which, following its acquisition of VISX, has also gained a strong position in the refractive surgery market.

Company	Currency	Price	EPS			PER			EV	EBITDA			EV/EVBITDA		
			04e	05e	06e	04e	05e	06e		04e	05e	06e	04e	05e	06e
Advanced Medical Optics	USD	36,53	0,62	1,78	2,21	58,9	20,5	16,5	1861,4	n.a.	n.a.	n.a.	22,9	9,2	8,0
Alcon	USD	87,35	2,62	3,14	3,68	33,3	27,8	23,7	26 705,5	1 327,0	1 474,0	1635,0	20,1	18,1	16,3
Bausch & Lomb	USD	73,99	2,93	3,41	3,95	25,3	21,7	18,7	4 127,0	404,8	442,2	488,3	10,2	9,3	8,5
Laserscope	USD	32,00	0,66	0,80	1,06	48,5	40,0	30,2	672,8	16,8	30,9	n.a.	40,0	21,8	-
VISX	USD	23,49	0,82	0,96	1,13	28,6	24,5	20,8	1 037,2	72,5	87,6	99,8	14,3	11,8	10,4
Wavelight*	EUR	14,60	0,54	0,63	0,85	27,0	23,2	17,2	117,1	10,2	12,6	15,4	11,5	9,3	7,6
Average							26,3	21,2						13,3	10,2
Median							23,8	19,8						10,6	8,5
Carl Zeiss Meditec*	EUR	15,70	0,50	0,8	1,0	31,2	20,6	15,2	440,2	35,9	52,6	67,0	12,3	8,4	6,6

*alternative fiscal year; adapted to calendar years

Source: Bloomberg, LBBW

A fair value of € 19.78 would result from equally weighting the median values of the 2005 and 2006 multiples.

Discounted Cash Flow Method

The assumptions of our DCF model are:

Calculation data

Equity ratio	70,0 %	Revenue growth	8,0 %
Debt ratio	30,0 %	EBIT margin	15,0 %
Risk free interest rate	3,7 %	Tax rate	40,0 %
Market premium	6,0 %	Provision ratio	9,5 %
Company specific premium	2,5 %	Depreciation ratio	2,0 %
Beta	1,5	Investment ratio	2,0 %
WACC	10,0 %	Working capital ratio	20,0 %
		Sustainable growth	1,0 %

Source: LBBW

Based on five-year analysis and increasing growth rates as shown in five-year projections the DCF was calculated as shown in the following table:

DCF Model € mn	2004/05e	05/06e	06/07e	07/08e	08/09e	09/10e	10/11e	11/12e	12/13e	13/14e
Revenues	**318,1**	**377,4**	**412,3**	**447,4**	**483,2**	**521,8**	**563,6**	**608,6**	**657,3**	**709,9**
Growth (yoy)	*35,4 %*	*18,6 %*	*9,3 %*	*8,5 %*	*8,0 %*	*8,0 %*	*8,0 %*	*8,0 %*	*8,0 %*	*8,0 %*
EBIT	**40,6**	**56,8**	**63,7**	**72,3**	**78,9**	**78,3**	**84,5**	**91,3**	**98,6**	**106,5**
EBIT margin	*12,8 %*	*15,0 %*	*15,4 %*	*16,2 %*	*16,3 %*	*15,0 %*	*15,0 %*	*15,0 %*	*15,0 %*	*15,0 %*
Taxes	-15,2	-21,0	-23,9	-27,4	-30,2	-31,3	-33,8	-36,5	-39,4	-42,6
Tax rate	*-38,8 %*	*-38,0 %*	*-38,0 %*	*-38,0 %*	*-38,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*
Amortisation/Depreciation	-7,8	-8,4	-9,0	-9,7	-10,4	-10,4	-11,3	-12,2	-13,1	-14,2
to revenues	*-2,5 %*	*-2,2 %*	*-2,2 %*	*-2,2 %*	*-2,2 %*	*-2,0 %*	*-2,0 %*	*-2,0 %*	*-2,0 %*	*-2,0 %*
Provisions	27,9	29,4	31,0	32,8	34,6	49,6	53,5	57,8	62,4	67,4
to revenues	*8,8 %*	*7,8 %*	*7,5 %*	*7,3 %*	*7,2 %*	*9,5 %*	*9,5 %*	*9,5 %*	*9,5 %*	*9,5 %*
Change	1,6	1,5	1,6	1,7	1,8	15,0	4,0	4,3	4,6	5,0
Cashflow from operating activities	**34,9**	**45,7**	**50,4**	**56,3**	**61,0**	**72,4**	**66,0**	**71,2**	**76,9**	**83,1**
Investments	4,3	5,2	6,2	7,5	9,0	10,4	11,3	12,2	13,1	14,2
to revenues	*1,4 %*	*1,4 %*	*1,5 %*	*1,7 %*	*1,9 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*	*2,0 %*
Working Capital	79,5	85,2	91,1	96,4	101,2	104,4	112,7	121,7	131,5	142,0
to revenues	*25,0 %*	*22,6 %*	*22,1 %*	*21,6 %*	*20,9 %*	*20,0 %*	*20,0 %*	*20,0 %*	*20,0 %*	*20,0 %*
Change	29,7	5,7	5,9	5,3	4,7	3,2	8,3	9,0	9,7	10,5
Free Cashflow	**0,8**	**34,8**	**38,3**	**43,6**	**47,3**	**58,7**	**46,3**	**50,0**	**54,0**	**58,4**

Source: LBBW

These projections and an assumed final growth rate of 1.0 percent return an enterprise value of € 525.3m or € 18.48 per share. We ran a sensitivity analysis on this amount and obtained the following results:

Sensitivity analysis

Value of equity (€ mn)

	Discounting rate		
Growth	9,0 %	10,0 %	11,0 %
0,0 %	531,6	499,2	469,4
1,0 %	559,8	525,3	493,4
2,0 %	595,0	557,8	523,5

Source: LBBW

Value of equity per share (€ mn)

	Discounting rate		
Growth	9,0 %	10,0 %	11,0 %
0,0%	18,71	17,57	16,52
1,0%	19,70	18,48	17,36
2,0%	20,94	19,63	18,42

Source: LBBW

Applying equal weights to both valuation approaches gives a fair value of € 19.13.

Recommendation

CZM's markets, like all medical technology markets, are benefiting from demographic factors. In addition, better education is increasing the demand for products in CZM's markets. Increasing literacy means that more people suffer from deteriorating eyesight.

The 10 percent rate of growth in the equipment market makes that market very attractive. Moreover, the acquisition of IOL Tech has positioned CZM in a market with growth rates in excess of 10 percent p.a.

The company's profit margins are steadily increasing and it continues to be on path to achieve its targets of doubling sales by 2008 and attaining a 15 percent EBIT margin.

Although our valuation model shows a fair value of € 19.13 per share, this figure appears to be somewhat high for the target price.

On the one hand, the medium term objective to be included in the TecDAX and the concomitant improvement in attractiveness to investors is still far off: Ranking 44th in terms of exchange turnover means that the company is not likely to be included in the TecDAX anytime soon. On the other hand, the current shareholding structure is hindering an increased free float. The Carl Zeiss Group continues to hold 69 percent of the company's shares. Although it was planned to restructure its shareholding prior to the merger between Carl Zeiss Ophthalmic and Asclepion Meditec, this has not yet been accomplished. With regard to the growth potential that we see in the value of CZM shares, a restructuring of the shareholding structure appears unlikely at present.

We maintain our 'buy' recommendation for CZM shares with a target price of € 19.00.

Profit and Loss Account € mn	2002/03	2003/04	2004/05e	2005/06e	2006/07e
Revenues	**235,7**	**234,9**	**318,1**	**377,4**	**412,3**
Cost of Sales	-133,2	-125,9	-160,0	-187,9	-205,3
Gross Profit	102,5	109,0	158,1	189,4	207,0
Margin	*43,5 %*	*46,4 %*	*49,7 %*	*50,2 %*	*50,2 %*
R&D Expenses	-25,7	-25,9	-31,0	-35,7	-37,4
Marketing and Sales	-42,6	-47,1	-71,0	-79,5	-85,9
G&A Expenses	-11,1	-11,7	-15,9	-17,3	-18,2
Other Income	0,5	0,3	-1,5	-1,7	-1,8
EBITDA	**30,5**	**31,8**	**48,4**	**65,2**	**72,7**
Margin	*12,9 %*	*13,5 %*	*15,2 %*	*17,3 %*	*17,6 %*
Depreciation and Amortisation	-5,8	-5,4	-7,8	-8,4	-9,0
EBIT	**24,7**	**26,3**	**40,6**	**56,8**	**63,7**
Margin	*10,5 %*	*11,2 %*	*12,8 %*	*15,0 %*	*15,4 %*
Net Financial Income/Expense	-2,1	-1,2	-1,5	-1,4	-0,7
EBT	**22,6**	**25,1**	**39,1**	**55,4**	**63,0**
Margin	*9,6 %*	*10,7 %*	*12,3 %*	*14,7 %*	*15,3 %*
Income Taxes	-9,0	-9,8	-15,2	-21,0	-23,9
EAT	**13,6**	**15,3**	**24,0**	**34,3**	**39,0**
Margin	*5,8 %*	*6,5 %*	*7,5 %*	*9,1 %*	*9,5 %*
Minorities	2,9	2,7	4,1	4,7	5,4
Net Profit	**10,8**	**12,6**	**19,9**	**29,6**	**33,6**
Margin	*4,6 %*	*5,4 %*	*6,2 %*	*7,9 %*	*8,2 %*
Earnings per Share	**0,41**	**0,44**	**0,68**	**1,00**	**1,13**

Source: LBBW

Balance Sheet € mn	2002/03	2003/04	2004/05e	2005/06e	2006/07e
Assets	**205,8**	**215,4**	**272,3**	**320,2**	**362,5**
Goodwill	11,1	16,1	44,0	44,0	44,0
Other intangible assets	5,1	5,4	16,5	18,2	20,0
Tangible assets	26,0	24,1	58,0	63,8	70,2
Financial assets	2,8	2,9	2,8	2,8	2,8
Other fixed assets	11,3	10,1	8,1	6,4	5,2
Fixed assets	56,3	58,5	129,4	135,2	142,1
Inventories	38,6	34,1	44,5	46,7	48,6
Trade receivables	31,1	26,6	53,8	59,2	65,1
Other receivables and assets	34,9	46,4	31,3	32,9	34,7
Cash and cash equivalents	45,0	49,7	13,4	46,2	72,0
Current assets	149,6	156,9	143,0	185,0	220,4
Liabilities	**205,8**	**215,4**	**272,3**	**320,2**	**362,5**
Equity	121,4	131,6	169,4	203,7	242,8
Minority interests	3,1	5,6	6,1	4,1	4,3
Pension provisions	0,0	0,0	0,0	0,0	0,0
Other provisions	27,2	26,2	27,9	29,4	31,0
Financial liabilities	30,1	28,3	29,4	39,5	36,7
Trade payables	10,6	10,6	18,0	19,8	21,6
Other liabilities	13,3	13,2	21,6	23,7	26,1

Source: LBBW

Drägerwerk

Drägerwerk is represented in the medical technology and safety technology services markets by its two subsidiaries, Dräger Medical and Dräger Safety. Dräger Medical is a joint venture of Drägerwerk and Siemens, in which Drägerwerk holds 65 percent and Siemens 35 percent.

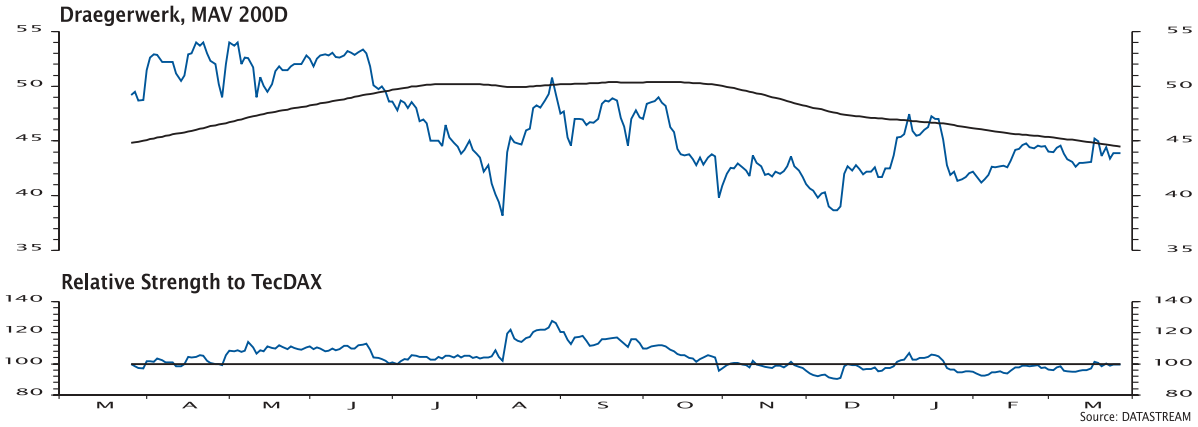
Price:	**44.12 €**
Target Price:	**60.00 €**
Rating:	**Buy**

Share Data	EPS current €	EPS previous €	PSR	EV/EBITDA	PER
2003	2,12	2,12	0,4	9,3	20,8
2004e	2,02	1,81	0,4	7,0	21,8
2005e	1,93	2,98	0,4	6,5	22,9
2006e	2,49	3,73	0,3	5,3	17,7

Source: Drägerwerk AG, LBBW

Company Data	Revenues € m	EBITDA € m	EBIT € m	EBIT-Margin	Net Profit € m
2003	1 413,5	105,8	61,0	4,3 %	6,7
2004e	1 526,0	139,9	94,9	6,2 %	16,3
2005e	1 595,0	151,7	103,7	6,5 %	24,5
2006e	1 676,0	184,4	134,0	8,0 %	31,6

Source: Drägerwerk AG, LBBW



Source: DATASTREAM

Markets and position.

In our opinion, when analysing the Drägerwerk group, it makes sense to individually analyse each subsidiary's respective market.

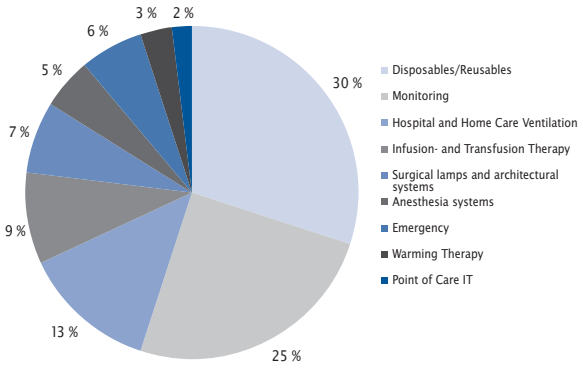
Dräger Medical is a specialist in the so-called „acute point of care" (APOC) segment, which primarily concentrates on ventilation and anaesthesia systems as well as the relevant monitoring systems for emergency physicians and operating theatres, intensive care units and home care ventilation devices. Dräger Medical has a strong foothold in the neonatology segment in hospitals where it provides incubators, thermotherapy and the necessary devices for monitoring premature infants.

Dräger Medical has been in a joint venture with Siemens since July 2003. Drägerwerk holds 65 percent and Siemens 35 percent in the joint venture which complements the product portfolio of the new company, it thus can cover the entire APOC chain as system provider for emergency physicians (pre-hospital) and operating theatres as well as intensive care units (hospital) and post-hospital treatment at home.

In our opinion, the sharing of distribution channels is as important as rounding off the range of products offered. The joint venture also gives Dräger Medical the opportunity to structure and expand its product lines in such a way that they can be easily integrated into hospitals' existing or new IT infrastructures. Siemens, which is in a strong market position here, is one of the major assets of the collaboration between Dräger Medical and Siemens in our opinion.

The estimated size of the global APOC and HRC market last year was roughly € 16bn.

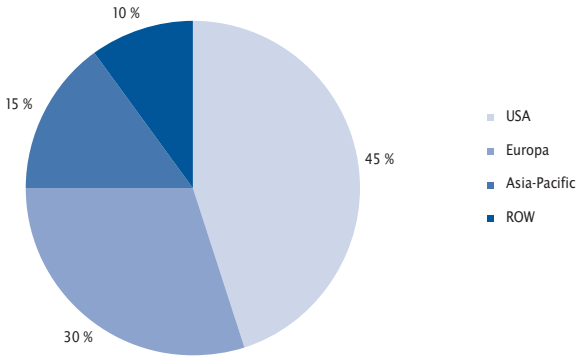
Worldwide market APOC and HRC (est. €bn 16)



Source: Drägerwerk, LBBW

The apparent decline in market volume compared to earlier estimates of world market volumes was caused by currency fluctuations. The USA continues to be the most important market for medical technology, a fact which we already dealt with in the general part of this analysis. The impact of the sharp drop in the US dollar versus the euro throughout last year exceeded the effects of volume and price increases. As a consequence, overall world market volume actually decreased in euro terms.

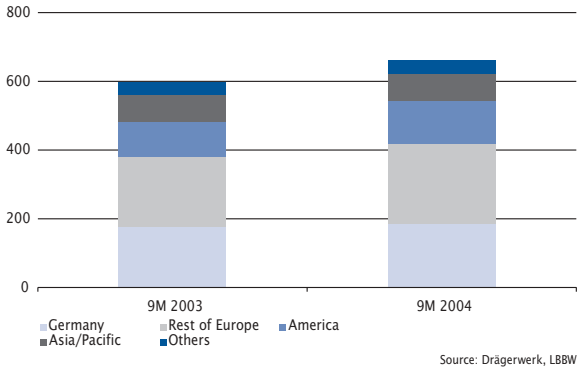
APOC/HRC-markets by region



Source: Drägerwerk, LBBW

A comparison of the allocation of global sales territories and the allocation of sales of Dräger Medical clearly shows the company's prevailing concentration on the German domestic market and neighbouring markets in Europe whilst America is still significantly under-represented.

Revenues by region Draeger Medical (€ mn)



Source: Drägerwerk, LBBW

Dräger Medical is currently increasing its efforts to expand its position and establish itself in the US market. The implementation of these plans turned out to be slower than expected last year, so that Dräger Medical will be forced to report the cost of the increased US sales force (from 125 to 250) in this year's income statement.

Dräger Safety operates the safety technology segment, providing gas measuring technology, personal protection and system technologies (safety solutions). Around 40 subsidiaries and 6 production locations offer their products and services in over 100 countries throughout the world.

Dräger Safety's customer structure is diverse and includes fire-fighters and emergency rescue workers, mining companies and utilities, state facilities such as the police and military as well as the producing sector.

It supplies fire-fighters with breathing protection masks, protective helmets and clothing as well as gas detection equipment for mobile use. It also supplies gas measuring technology and breathing equipment for mobile use in mining as well as masks, filters and long-term rescue systems.

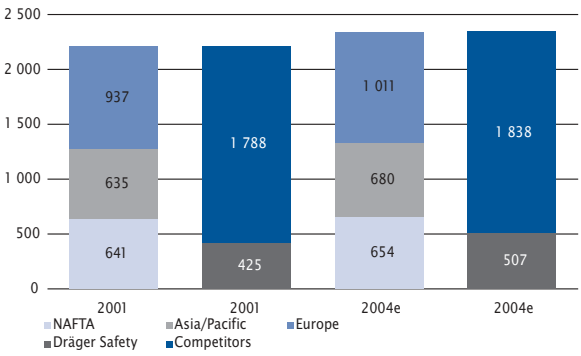
Dräger supplies state facilities with stationary and portable gas measuring systems as well as alcohol and drug testing equipment. The breathalyser equipment for testing drivers suspected of being over the limit is well known. But the police force is already testing a portable Dräger device which will allow a series of other drugs, even designer drugs, to be detected in the near future.

Armed forces also procure equipment from Dräger Safety, which is the world market leader in the supply of military diving equipment.

The industry also requires stationary and portable gas measuring systems and Dräger Safety supplies filters, masks and protective helmets and clothing for personal protection.

Drägerwerk „Safety Solutions" entail the bundling of different products, where necessary procured from outside the group, to one safety concept. Gas measuring equipment is, for instance, combined with fire detection systems for use in the petrochemical industry. Dräger Safety equipped the Reichstag in Berlin with devices that detect chemical warfare agents and planned and implemented a suitable evacuation system.

World market Safety (Draeger portfolio; €mn)



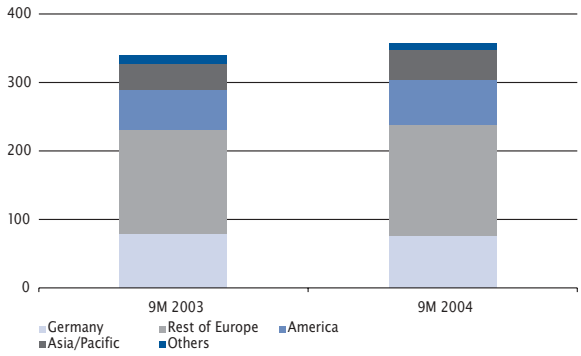
Source: Drägerwerk, LBBW

A look at the issued market figures reveals a rather low annual market growth rate of around 2 percent. Individual years such as 2002 posted higher growth rates. This is due to special effects such as a worldwide increase in the demand for safety products and services against the backdrop of September 9, 2001. Disregarding such effects reveals a market that is mature, albeit with a low growth.

A geographical analysis shows that Dräger Safety's operations are world-wide, which is clearly demonstrated by the most recent sales figures (9M 2004).

The breakdown of sales by region, however, does not reflect the geographic distribution of the world market. This is shown by the preponderance of the German domestic market combined with neighbouring countries which are classified as „Other Europe“. We believe that any future market and expansion strategies of Dräger Safety have potential for further growth in particular in the up-and-coming Asia/Pacific region.

Revenues by regions Draeger Safety (€mn)



Source: Drägerwerk, LBBW

Valuation.

Multiples-based model

Care should be taken when using a multiples-based model to value Drägerwerk. This is because no company is, in fact, comparable with Drägerwerk as a group. Many competitors are only active in the medical technologies market and then often only in selected segments. The same is true for safety technologies The same problem would also emerge when making a sum-of-the-parts valuation of the company. In addition, Drägerwerk does not use the standard definitions of EBIT and EBITDA (before interest expense but after interest income). This means that direct comparisons with competitors can only be made at group level, since it is only the consolidated figures that are sufficiently detailed to make the necessary adjustments for comparison with normally defined sector EBIT and EBITDA.

Company	Currency	Price	EV	EPS			EBITDA			PER			EV/EBITDA		
				04e	05e	06e	04e	05e	06e	04e	05e	06e	04e	05e	06e
Getinge	SEK	105,50	24 627,9	4,53	5,90	6,74	2 006,4	2 212,4	2 421,1	23,3	17,9	15,7	12,3	11,1	10,2
Respironics	USD	58,62	1 948,4	2,23	2,64	n.v.	175,2	200,3	n.v.	26,3	22,2	18,7	11,1	9,7	-
3M	USD	85,17	66 104,2	3,75	4,23	4,70	5 577,0	6 168,4	6 765,4	22,7	20,1	18,1	11,9	10,7	9,8
Mittelwert											20,1	17,5		10,5	10,0
Median											19,0	16,9		10,2	9,8
Draeger	€	44,12	984,4	2,02	1,93	2,49	139,9	151,7	184,4	21,8	22,9	17,7	7,0	6,5	5,3

Source: Bloomberg; LBBW

Although the relative undervaluation of the company shown by comparisons could mean that the share is undervalued, peer group comparisons are inaccurate in our opinion.

Discounted Cash Flow Method

The assumptions of our DCF model are:

Calculation data

Equity ratio	70,0 %	Revenue growth	5,0 %
Debt ratio	30,0 %	EBIT margin	12,0 %
Risk free interest rate	3,7 %	Tax rate	40,0 %
Market premium	6,0 %	Provision ratio	19,0 %
Company specific premium	2,5 %	Depreciation ratio	4,0 %
Beta	1,5	Investment ratio	4,0 %
WACC	10,0 %	Working capital ratio	33,0 %
		Sustainable growth	1,0 %

Source: LBBW

Based on a five-year analysis and increasing growth rates as shown in five-year projections the DCF was calculated as shown in the following table:

€ mn	2005e	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	**1 595,0**	**1 676,0**	**1 764,3**	**1 860,8**	**1 963,0**	**2 061,2**	**2 164,3**	**2 272,5**	**2 386,1**	**2 505,4**
Growth (yoy)	*4,5%*	*5,1%*	*5,3%*	*5,5%*	*5,5%*	*5,0%*	*5,0%*	*5,0%*	*5,0%*	*5,0%*
EBIT	103,7	134,0	167,6	209,6	221,4	247,3	259,7	272,7	286,3	300,6
EBIT margin	*6,5%*	*8,0%*	*9,5%*	*11,3%*	*11,3%*	*12,0%*	*12,0%*	*12,0%*	*12,0%*	*12,0%*
Taxes	- 37,0	- 51,1	- 61,9	- 79,3	- 84,7	- 98,9	- 103,9	- 109,1	- 114,5	- 120,3
Tax rate	*-39,7%*	*-42,5%*	*-40,0%*	*-40,0%*	*-40,0%*	*-40,0%*	*-40,0%*	*-40,0%*	*-40,0%*	*-40,0%*
Depreciation/Amortisation	- 48,0	- 50,4	- 52,9	- 55,6	- 58,3	- 82,4	- 86,6	- 90,9	- 95,4	- 100,2
to revenues	*-3,0%*	*-3,0%*	*-3,0%*	*-3,0%*	*-3,0%*	*-4,0%*	*-4,0%*	*-4,0%*	*-4,0%*	*-4,0%*
Provisions	326,8	342,3	358,6	376,0	394,4	391,6	411,2	431,8	453,4	476,0
to revenues	*20,5%*	*20,4%*	*20,3%*	*20,2%*	*20,1%*	*19,0%*	*19,0%*	*19,0%*	*19,0%*	*19,0%*
Change	14,6	15,4	16,4	17,4	18,4	-2,8	19,6	20,6	21,6	22,7
Cashflow from operating activities	**129,3**	**148,6**	**175,0**	**203,2**	**213,5**	**228,1**	**262,0**	**275,1**	**288,8**	**303,3**
Investments	61,7	67,8	74,6	82,1	90,3	82,4	86,6	90,9	95,4	100,2
to revenues	*3,9%*	*4,0%*	*4,2%*	*4,4%*	*4,6%*	*4,0%*	*4,0%*	*4,0%*	*4,0%*	*4,0%*
Working Capital	570,2	579,0	587,5	595,9	604,0	680,2	714,2	749,9	787,4	826,8
to revenues	*35,7%*	*34,5%*	*33,3%*	*32,0%*	*30,8%*	*33,0%*	*33,0%*	*33,0%*	*33,0%*	*33,0%*
Change	8,9	8,8	8,6	8,4	8,1	76,2	34,0	35,7	37,5	39,4
Free Cashflow	**58,7**	**72,1**	**91,8**	**112,7**	**115,1**	**69,5**	**141,4**	**148,5**	**155,9**	**163,7**

Source: LBBW

These projections and an assumed final growth rate of 1.0 percent return an enterprise value of € 1 040mn or € 81.90 per share. We ran a sensitivity analysis on this amount which returned the following results:

Sensitivity analysis

Value of equity (€ mn)

	Discounting rate		
Growth	9,0 %	10,0 %	11,0 %
0,0 %	1 073	965	874
1,0 %	1 166	1 040	935
2,0 %	1 286	1 133	1 010

Source: LBBW

Value of equity per share (€)

	Discounting rate		
Growth	9,0 %	10,0 %	11,0 %
0,0 %	84,46	76,02	68,82
1,0 %	91,81	81,90	73,63
2,0 %	101,25	89,24	79,51

Source: LBBW

Recommendation.

Our DCF projections show fair value to be € 81.90 per share and peer group comparisons, despite all the limitations caused by a lack of comparability between Drägerwerk and other companies, also suggest that the share price has an upside potential. As mentioned above, peer group comparisons cannot be used with precision to calculate a target price.

Due to the fact that Drägerwerk has so far been unable to meet the expectations for this year that were created by it last year, especially on the US market and due to estimated rising minorities, a 25 percent discount to the calculated fair value appears justifiable. We raise our rating to buy and set a price target of € 60.00.

Profit & Loss Account €m	2002	2003	2004e	2005e	2006e
Revenues	**1 333,0**	**1 413,5**	**1 526,0**	**1 595,0**	**1 676,0**
Changes in stocks and capitalised expenditure	7,2	-10,1	40,0	0,0	0,0
Total output	**1 340,2**	**1 403,4**	**1 566,0**	**1 595,0**	**1 676,0**
Other income/expenses	-233,0	-257,4	-293,8	-308,0	-318,4
Cost of materials	-469,7	-473,6	-549,4	-550,3	-569,8
Personnel cost	-528,8	-566,5	-582,9	-585,0	-603,4
EBITDA	**108,7**	**105,8**	**139,9**	**151,7**	**184,4**
Margin	*8,0%*	*7,5%*	*9,2%*	*9,5%*	*11,0%*
Depreciation and amortisation	-45,5	-44,8	-45,0	-48,0	-50,4
EBIT	**63,2**	**61,0**	**94,9**	**103,7**	**134,0**
Margin	*4,5%*	*4,3%*	*6,2%*	*6,5%*	*8,0%*
Net financial income/expense	-12,0	-10,6	-9,7	-10,5	-13,6
EBT	**51,1**	**50,4**	**85,2**	**93,2**	**120,3**
Margin	*3,5%*	*3,6%*	*5,6%*	*5,8%*	*7,2%*
Income taxes	-26,5	-27,1	-41,3	-37,0	-51,1
EAT	**24,7**	**23,3**	**43,9**	**56,2**	**69,2**
Margin	*1,8%*	*1,6%*	*2,9%*	*3,5%*	*4,1%*
Minorities	-2,3	-10,9	-21,6	-24,5	-29,4
Payout for profit certificates	-4,9	-5,7	-6,0	-7,3	-8,2
Net profit before extraordinaires	**17,4**	**6,7**	**16,3**	**24,5**	**31,6**
Margin	*1,1%*	*0,5%*	*1,1%*	*1,5%*	*1,9%*
Net profit	**17,4**	**26,9**	**25,7**	**24,5**	**31,6**
Margin	*1,3%*	*1,9%*	*1,7%*	*1,5%*	*1,9%*
Earnings per share before extraordinaries (€)	**1,37**	**0,53**	**1,28**	**1,93**	**2,49**
Earnings per share (€)	**1,37**	**2,12**	**2,02**	**1,93**	**2,49**

Source: LBBW

Balance sheet €m	2002	2003	2004e	2005e	2006e
Assets	**845,5**	**1 196,5**	**1 296,4**	**1 401,6**	**1 523,7**
Goodwill	0,0	0,0	0,0	0,0	0,0
Other intangible assets	23,2	159,1	183,0	210,5	242,0
Tangible assets	166,7	169,5	176,0	184,8	194,0
Financial assets	11,1	8,2	7,8	7,4	7,0
Other fixed assets	0,0	0,0	0,0	0,0	0,0
Fixed assets	**201,0**	**336,9**	**366,8**	**402,7**	**443,1**
Inventories	213,0	203,0	272,4	278,7	285,0
Trade receivables	342,7	418,6	380,0	389,5	399,2
Other receivables and assets	46,3	51,8	101,6	105,0	108,9
Cash and cash equivalents	42,4	186,2	175,6	225,7	287,4
Current assets	**644,5**	**859,6**	**929,6**	**998,9**	**1 080,6**
Liabilities	**845,5**	**1 196,5**	**1 296,4**	**1 401,6**	**1 523,7**
Equity	164,1	277,2	296,5	321,0	352,6
Minority interests	6,0	222,0	235,0	259,5	288,9
Pension provisions	129,0	134,4	135,0	145,1	156,0
Other provisions	154,1	173,0	177,3	181,7	186,3
Financial liabilities	231,7	223,0	300,0	330,0	363,0
Trade payables	81,5	84,8	91,1	98,0	105,3
Other liabilities	79,0	82,2	61,5	66,3	71,7

Source: LBBW

Eckert & Ziegler

Eckert & Ziegler (EZAG) is an isotope producer based in Berlin whose products are used in industrial and medical applications. Gas detectors or radiation source material for permanent implants for the treatment of cancer are just two examples of the company's range of products.

Price:	**11.64 €**
Target Price:	**19.00 €**
Rating:	**Buy**

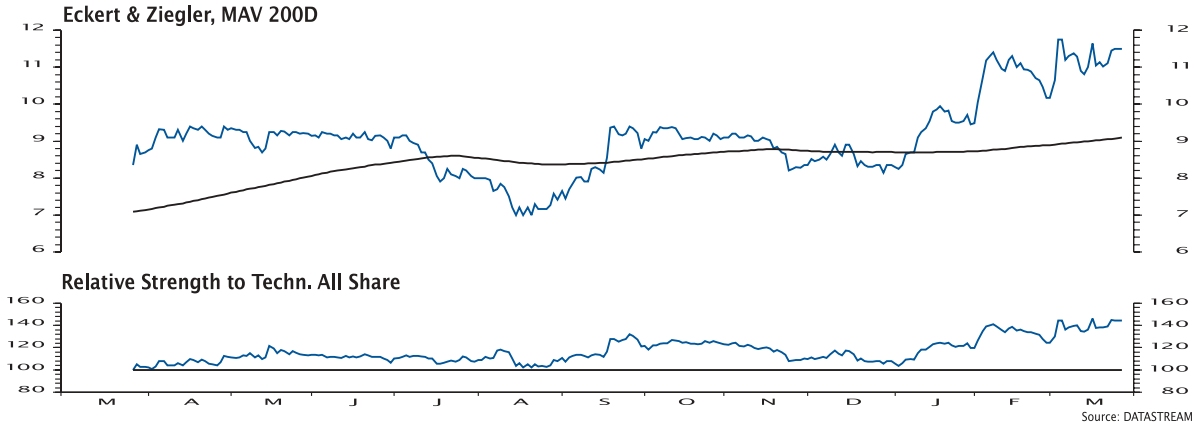
Share Data	EPS current €	EPS previous €	PSR	EV/EBITDA	PER
2003*	0,25	0,25	1,0	4,8	35,1
2004*	0,74	0,66	0,9	4,1	13,2
2005e	0,55	0,54	0,8	3,6	17,6
2006e	0,72	0,71	0,7	3,1	13,6

Source: Eckert & Ziegler, LBBW

Company Data	Revenues € m	EBITDA € m	EBIT € m	EBIT-Margin	Net Profit € m
2003*	29,2	5,9	2,2	7,5 %	0,8
2004*	34,5	6,8	3,2	9,2 %	2,0
2005e	40,7	7,9	4,1	10,0 %	1,8
2006e	47,0	8,9	4,9	10,5 %	2,3

*without one time exceptionals from SFAS 143 and changes of accounting principles

Source: Eckert & Ziegler, LBBW

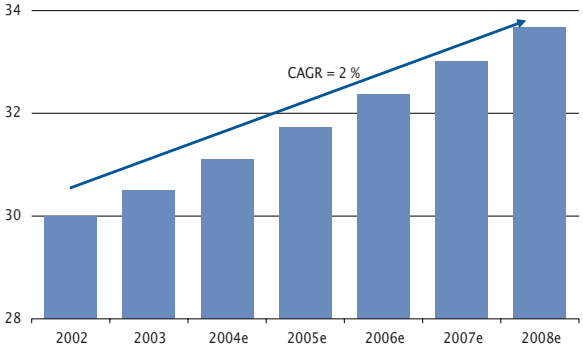


Source: DATASTREAM

Markets and position.

EZAG operates in a number of different markets. In the industrial applications segment, the company produces components for measurement and testing devices for equipment manufacturers. With total sales of about € 31 m, this market is fairly small and the low growth rate of 2 percent p.a. is a demonstration of its maturity. The market is, to a certain extent, stable as the result of replacement investments since radiation sources deteriorate over time and normally need to be replaced once or twice a year. EZAG reports that its market share in this segment is about one third.

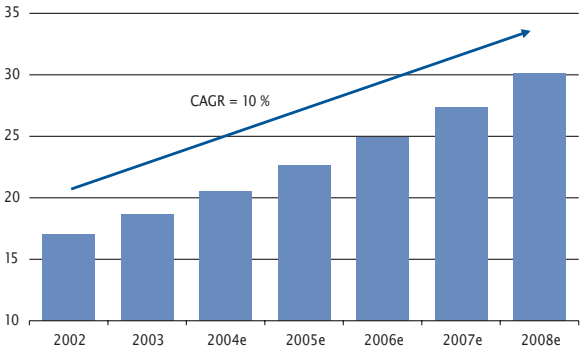
Worldwide market for industrial radiation sources (€ mn)



Source: LBBW

In the medical diagnostic applications segment, EZAG produces calibrator and reference radiators for gamma cameras and positron emission tomography (PET), which we analysed in the general part of this industry report. This market also benefits from replacement investments. As a driver of innovation, PET makes for higher market growth rates than the industrial applications segment. We expect the size of the market to reach about € 21 m with an annual rate of growth of 10 percent. EZAG reports that its market share is approximately 60 percent.

Worldwide market Nuclear Imaging radiation sources (€ mn)

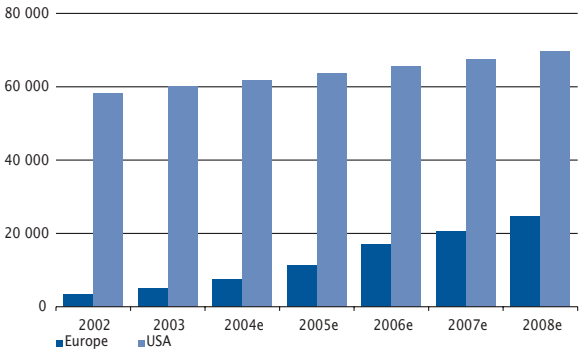


Source: LBBW

In the area of therapeutic applications, EZAG offers, on the one hand, permanent implants for the treatment of early-stage prostate cancer. On the other hand, its strategy of targeted acquisitions has resulted in the addition of afterloaders to its product range. Afterloaders are applicators for radiation sources that can, for example, be used in the treatment of cancer of the throat and breast and cervical cancers.

Growth in this segment is, in our opinion, mainly driven by the treatment of early-stage prostate cancer with permanent implants. We analysed this factor in the general part of this industry report. Although the technique is widely used in the United States, where it is well established, there is still significant potential in Europe.

Number of treatments with seed implantation



Source: Eckert & Ziegler, LBBW

Valuation.

Multiplier model
In our opinion, there is no point in valuing EZAG with multiples. Comparable competitors like IBT or Theragenics are either unprofitable or the detailed data required to make direct comparisons (forecasts) is not available. We will, therefore, not perform a multiples based valuation.

Discounted Cash Flow Method
The assumptions of our DCF model are:

Calculation data

		Growth drivers (Phase II; to revenues)	
Equity ratio	60,0 %	Revenue growth	7,0 %
Debt ratio	40,0 %	EBIT margin	10,0 %
Risk free interest rate	3,7 %	Tax rate	40,0 %
Market premium	6,0 %	Provision ratio	11,0 %
Beta	1,6	Depreciation ratio	7,0 %
Company specific premium	2,5 %	Investment ratio	7,0 %
WACC	9,5 %	Working capital ratio	25,0 %
		Sustainable growth	1,0 %

Source: LBBW

Based on a five-year analysis and increasing growth rates as shown in five-year projections the DCF was calculated as shown in the following table:

DCF Model € mn	2005e	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	**40,7**	**47,0**	**51,7**	**55,3**	**59,2**	**63,3**	**67,8**	**72,5**	**77,6**	**83,0**
Growth (yoy)	*18,1 %*	*15,5 %*	*10,0 %*	*7,0 %*	*7,0 %*	*7,0 %*	*7,0 %*	*7,0 %*	*7,0 %*	*7,0 %*
EBIT	**4,1**	**4,9**	**5,4**	**5,8**	**6,2**	**6,3**	**6,8**	**7,3**	**7,8**	**8,3**
EBIT margin	*10,0 %*	*10,5 %*	*10,5 %*	*10,5 %*	*10,5 %*	*10,0 %*	*10,0 %*	*10,0 %*	*10,0 %*	*10,0 %*
Taxes	1,9	2,2	2,4	2,4	2,6	2,5	2,7	2,9	3,1	3,3
Tax rate	*-50,0 %*	*-48,0 %*	*-46,0 %*	*-43,0 %*	*-43,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*
Depreciation/ Amortisation	-3,8	-4,0	-4,2	-4,4	-4,6	-4,4	-4,7	-5,1	-5,4	-5,8
to revenues	*-9,3 %*	*-8,4 %*	*-8,1 %*	*-7,9 %*	*-7,8 %*	*-7,0 %*	*-7,0 %*	*-7,0 %*	*-7,0 %*	*-7,0 %*
Provisions	4,7	5,2	5,7	6,3	6,9	7,0	7,5	8,0	8,5	9,1
to revenues	*11,6 %*	*11,1 %*	*11,1 %*	*11,4 %*	*11,7 %*	*11,0 %*	*11,0 %*	*11,0 %*	*11,0 %*	*11,0 %*
Change	0,4	0,5	0,5	0,6	0,6	0,0	0,5	0,5	0,6	0,6
Cashflow from operating activities	**6,4**	**7,1**	**7,7**	**8,4**	**8,9**	**8,3**	**9,3**	**10,0**	**10,6**	**11,4**
Investments	2,9	3,3	3,6	4,0	4,4	4,4	4,7	5,1	5,4	5,8
to revenues	*7,1 %*	*7,0 %*	*7,0 %*	*7,2 %*	*7,4 %*	*7,0 %*	*7,0 %*	*7,0 %*	*7,0 %*	*7,0 %*
Working Capital	10,9	11,7	12,5	13,6	14,7	15,8	16,9	18,1	19,4	20,8
to revenues	*26,9 %*	*24,8 %*	*24,1 %*	*24,5 %*	*24,9 %*	*25,0 %*	*25,0 %*	*25,0 %*	*25,0 %*	*25,0 %*
Change	0,9	0,8	0,8	1,1	1,2	1,1	1,1	1,2	1,3	1,4
Free Cashflow	**2,6**	**3,1**	**3,3**	**3,3**	**3,3**	**2,7**	**3,4**	**3,7**	**3,9**	**4,2**

Source: LBBW

These projections and an assumed final growth rate of 1.0 percent give an enterprise value of € 76.0m or € 25.46 per share. We ran a sensitivity analysis on this amount which returned the following results

Sensitivity analysis

Value of equity (€ m)

	Discounting rate		
Growth	8,5 %	9,5 %	10,5 %
0,0 %	76,8	71,0	66,3
1,0 %	83,0	76,0	70,3
2,0 %	91,2	82,2	75,2

Source: LBBW

Value of equity per share (€)

	Discounting rate		
Growth	8,5 %	9,5 %	10,5 %
0,0 %	25,73	23,82	22,23
1,0 %	27,83	25,46	23,56
2,0 %	30,56	27,56	25,21

Source: LBBW

Recommendation:

With its two core businesses, industrial and medical diagnostic applications, EZAG is well positioned in small markets with low to medium growth rates.

The therapeutic applications sector is still young and, especially for brachytherapy in Europe, the market is still very immature. There is, however, in our opinion, a very good likelihood of above average market development. The reasons are discussed in the general part of our industry report.

We are not convinced that the calculated fair value of € 25.46 can be achieved during our forecast period.

The wide range of the company's forecast earnings (€ 0.50 - € 0.80 per share) means uncertainty for investors, who as a consequence require a risk premium. Moreover, even at the fair value we calculated, EZAG is too small for many institutional investors while for other investors, the market is simply too narrow.

As a result, we believe that discounting the fair value by at least 25 percent is appropriate in calculating the price target which we raise to € 19.00 together with our 'buy' rating.

Profit and Loss Account € mn	2002	2003	2004e	2005e	2006e
Revenues	**31,2**	**29,2**	**34,5**	**40,7**	**47,0**
Cost of Sales	-16,0	-15,7	-18,1	-21,6	-25,4
Gross Profit	**15,3**	**13,5**	**16,4**	**19,1**	**21,6**
Margin	*48,9%*	*46,1%*	*47,5%*	*47,0%*	*46,0%*
R&D Expenses	-3,4	-2,2	-0,8	-1,4	-1,6
G&A Expenses	-11,3	-9,3	-12,5	-13,6	-15,0
Other Income	1,4	0,2	0,1	0,0	0,0
EBITDA	**6,3**	**5,9**	**6,8**	**7,9**	**8,9**
Margin	*20,0%*	*20,1%*	*19,7%*	*19,3%*	*18,9%*
Depreciation and Amortisation	-4,3	-3,7	-3,6	-3,8	-4,0
EBIT	**2,0**	**2,2**	**3,2**	**4,1**	**4,9**
Margin	*6,4%*	*7,5%*	*9,2%*	*10,0%*	*10,5%*
Net Financial Income/Expense	-1,1	-0,3	-0,2	-0,3	-0,3
EBT	**0,9**	**1,9**	**3,0**	**3,8**	**4,7**
Margin	*2,9%*	*6,4%*	*8,8%*	*9,3%*	*9,9%*
Income Taxes	-0,6	-1,0	-0,9	-1,9	-2,2
EAT	**0,3**	**0,8**	**2,1**	**1,9**	**2,4**
Margin	*1,1%*	*2,8%*	*6,2%*	*4,6%*	*5,2%*
Extraordinaries	0,0	-2,0	1,2	0,0	0,0
Minorities	0,0	-0,1	-0,1	-0,1	-0,1
Net Profit	**0,3**	**-1,3**	**3,2**	**1,8**	**2,3**
Margin	*1,1%*	*neg.*	*9,3%*	*4,3%*	*4,9%*
Earnings per share before extraordinaries (€)	**0,11**	**0,25**	**0,66**	**0,54**	**0,71**
Earnings per share before minorities(€)	**0,11**	**-0,39**	**1,09**	**0,58**	**0,75**
Earnings per share before extraordinaries and minorities (€)	**0,11**	**0,28**	**0,70**	**0,58**	**0,75**
Earnings per share (€)	**0,11**	**-0,42**	**1,05**	**0,54**	**0,71**

Source: LBBW

Balance sheet € mn	2002	2003	2004e	2005e	2006e
Assets	**49,7**	**45,7**	**55,3**	**58,4**	**62,1**
Goodwill	0,4	6,0	7,8	7,8	7,8
Other intangible assets	4,8	3,7	5,0	3,6	3,2
Tangible assets	17,7	14,9	13,8	15,6	15,6
Financial assets	7,7	0,5	0,1	0,1	0,1
Other fixed assets	1,6	2,2	1,9	1,3	1,4
Fixed assets	**32,1**	**27,3**	**28,6**	**28,4**	**28,2**
Inventories	3,6	3,0	6,0	5,0	5,5
Trade receivables	4,1	3,7	6,7	9,2	9,9
Other receivables and assets	1,4	2,0	3,0	4,2	6,0
Cash and cash equivalents	8,5	9,8	11,0	11,6	12,5
Current assets	**17,6**	**18,4**	**26,7**	**30,0**	**33,9**
Liabilities	**49,7**	**45,7**	**55,3**	**58,4**	**62,1**
Equity	32,9	28,8	32,2	34,6	37,1
Minority interests	0,0	0,2	0,2	0,2	0,2
Pension provisions	0,1	0,1	0,2	0,2	0,2
Other provisions	1,7	1,8	4,3	4,7	5,2
Financial liabilities	4,0	4,3	4,5	4,5	4,6
Trade payables	1,2	0,7	2,7	3,2	3,7
Other liabilities	9,7	9,8	11,4	10,9	11,2

Source: LBBW

Fresenius Medical Care

Fresenius Medical Care (FME) is an international specialist in dialysis. The company produces and distributes products for haemodialysis or peritoneal dialysis. The different kinds of dialysis are described in the general part of this industry report. In addition to supplying products, FME also manages its own dialysis centres (1,610 clinics throughout the world at year-end 2004), in which 124,400 patients received 18.8 million treatments.

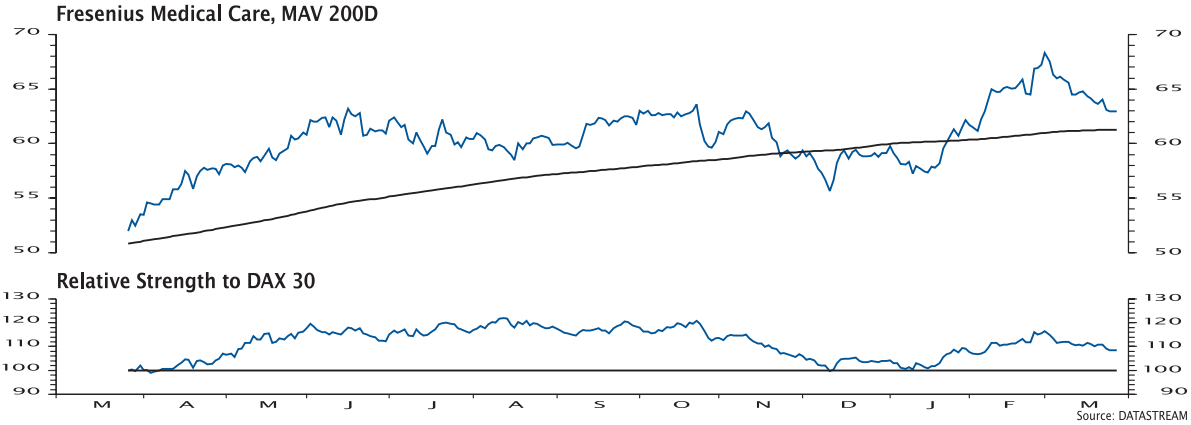
Price:	**62.87 €**
Target Price:	**69.00 €**
Rating:	**Hold**

Share data	EPS current USD	EPS previous USD	PSR	EV/EBITDA	PER
2003	3,42	-	0,8	9,8	23,8
2004e	4,16	4,10	1,0	8,8	19,5
2005e	4,57	4,56	0,9	8,2	17,8
2006e	4,95	4,95	0,9	7,7	16,4

Source: FME AG, LBBW

Company data	Revenues USD m	EBITDA USD m	EBIT USD m	EBIT-Margin	Net profit USD m
2003	5 527,5	973,4	757,4	13,7 %	331,2
2004e	6 228,0	1 084,9	852,3	13,7 %	402,0
2005e	6 636,2	1 166,3	922,1	13,9 %	439,9
2006e	6 986,7	1 240,6	989,0	14,2 %	476,5

Source: FME AG, LBBW

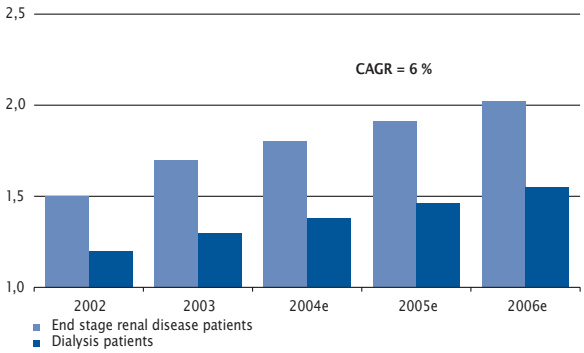


Source: DATASTREAM

Market and position.

For many years now, the dialysis market has been characterised by a steady rise in the number of patients. At the end of 2002, the number of patients being treated world-wide for terminal renal insufficiency was 1.5 million; by the end of 2003, this number had already risen to 1.7 million. Of these patients 1.2 million received dialysis treatment in 2002 and 1.3 million in 2003. Forecasts for further growth in patient numbers fluctuate between 5 and 7 percent. There is a conflict here between greater health consciousness in many industrialised countries on the one hand and the adoption of bad eating habits in emerging countries on the other. Realistically, however, we are predicting annual growth of 6 percent.

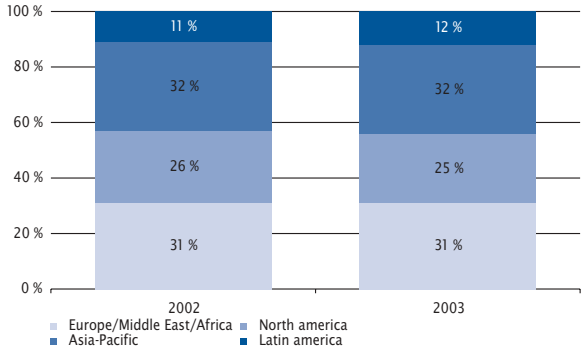
ESRD and dialysis patients (mn)



Source: Fresenius Medical Care, LBBW

Looking at the regional distribution of dialysis patients, we can see an obvious concentration in the industrialised countries.

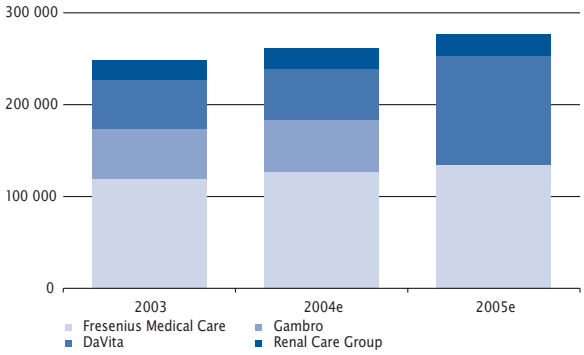
Dialysis patientes by region



Source: Fresenius Medical Care, LBBW

However, a significant increase in the number of patients is particularly evident in emerging countries. The number of patients in South Korea, for example, is increasing at an average rate of 12 percent per annum. Until now, there were four major players in the dialysis services sector and the market situation was as follows:

Dialysis patients

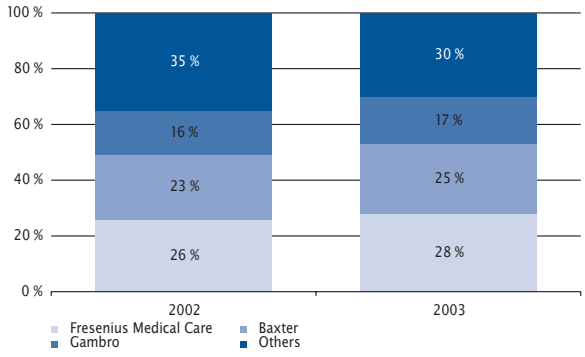


Source: Company data, LBBW

At the end of 2004, Gambro and DaVita announced the acquisition of Gambro's dialysis division by DaVita. Although this has no impact on Fresenius Medical Care's leading global position, it relegates the company to second place in North America.

In terms of the market for dialysis products, on the other hand, DaVita does not play a significant role.

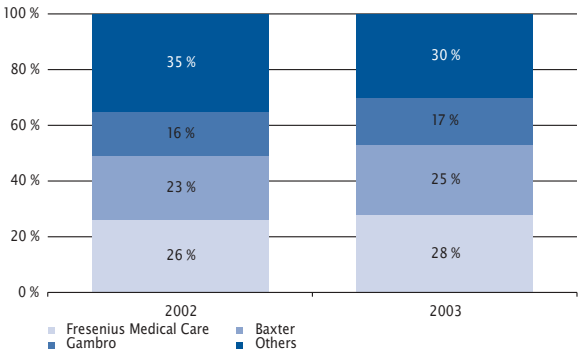
Market shares dialysis products



Source: Company data, LBBW

The increasing market consolidation is also becoming evident with regard to dialysis products: the market shares of the major players are growing, while those of smaller companies are shrinking. This effect is not quite as obvious looking at the market by individual types of dialysis.

Market shares dialysis products



Source: Company data, LBBW

On the whole, however, the dialysis market is and shall remain an interesting area of activity, at least for the major players. We cannot currently perceive any serious short-term or medium-term competition for dialysis, such as from the field of biotechnology. In the long term, i.e. within a timeframe of at least 15 years, alternative therapies may possibly emerge in the form of xenogenic transplants. However, the results so far have not been impressive enough to raise hopes among patients for the short term or cause the suppliers of dialysis products and services to lose any sleep. It nevertheless is always a good idea to keep an eye on new developments and this is what the major players do.

Companies could be faced somewhat sooner with indirect competition from better methods to prevent or treat primary diseases. For example, better preventive measures against or better treatment of diabetes could at least potentially put a damper on growth in patient numbers.

However, it must also be remembered that countries such as India and China are assuming the bad eating habits of many people in industrialised countries, due to increasing westernisation: this results in higher incidences of diseases such as diabetes, which means that the related secondary conditions that can occur - terminal renal failure, for example - are also on the increase. In the short to medium term, we therefore do not expect the growth in the number of patients requiring dialysis to slow down significantly; it is more likely to remain at an annual level of around 6 percent.

Valuation.

Multiples-based model

Based on peer group comparisons, we see no more potential in the FME share price.

Company	Currency	Price	EPS			PER			EV	EBITDA			EV/EBITDA		
			04e	05e	06e	04e	05e	06e		04e	05e	06e	04e	05e	06e
Baxter	USD	33,79	1,69	1,86	2,07	20,0	18,2	16,32	24 124,8	2 144,7	2 351,3	2 634,0	11,2	10,3	9,16
Capio	SEK	107,50	8,57	5,87	7,43	12,5	18,3	14,47	11 538,8	1 148,4	1 595,6	1 707,7	10,0	7,2	6,76
DaVita	USD	41,35	2,11	2,29	2,64	19,6	18,1	15,66	5 270,7	510,5	562,5	676,4	10,3	9,4	7,79
Renal Care Group	USD	37,73	1,70	1,99	2,29	22,2	19,0	16,48	3090,3	312,2	355,2	395,0	9,9	8,7	7,82
Average							18,4	15,7						8,9	7,9
Median							18,2	16,0						9,0	7,8
Fresenius Medical Care	EUR	62,87	4,16	4,57	4,95	19,5	17,8	16,4	7 383,3	1 084,9	1 166,3	1 240,6	8,8	8,2	7,7

*Accounting in USD; USD/€ =

Source: Bloomberg, LBBW

Applying multiples, we calculate a fair value per share of € 63.20.

Discounted Cash Flow Method

The assumptions of our DCF model are:

Calculation data

Equity ratio	50,0 %	Revenue growth	4,0 %
Debt ratio	50,0 %	EBIT margin	14,0 %
Risk free interest rate	3,7 %	Tax rate	39,0 %
Market premium	6,0 %	Provision ratio	10,0 %
Company specific premium	2,0 %	Depreciation ratio	4,0 %
Beta	1,0	Investment ratio	4,0 %
WACC	6,6 %	Working capital ratio	26,0 %
USD/€	1,294	Sustainable growth	0,5 %

Source: LBBW

Based on a five-year analysis and increasing growth rates as shown in five-year projections, the DCF was calculated as shown in the following table:

DCFModel (USD mn)	2005e	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	6 636,2	6 986,7	7 291,2	7 609,0	7 940,7	8 258,4	8 588,7	8 932,2	9 289,5	9 661,1
Growth	*6,6 %*	*5,3 %*	*4,4 %*	*4,4 %*	*4,4 %*	*4,0 %*	*4,0 %*	*4,0 %*	*4,0 %*	*4,0 %*
EBIT	922,1	989,0	1 054,8	1 100,6	1 139,3	1 156,2	1 202,4	1 250,5	1 300,5	1 352,6
EBIT margin	*13,9 %*	*14,2 %*	*14,5 %*	*14,5 %*	*14,3 %*	*14,0 %*	*14,0 %*	*14,0 %*	*14,0 %*	*14,0 %*
Taxes	- 288,0	- 308,7	- 330,1	- 343,0	- 353,8	- 450,9	- 468,9	- 487,7	- 507,2	- 527,5
Tax rate	*-39,5 %*	*-39,3 %*	*-39,2 %*	*-39,1 %*	*-39,1 %*	*-39,0 %*	*-39,0 %*	*-39,0 %*	*-39,0 %*	*-39,0 %*
Depreciation/Amortisation	- 244,2	- 251,5	- 259,1	- 266,9	- 274,9	- 330,3	- 343,5	- 357,3	- 371,6	- 386,4
to revenues	*-3,7 %*	*-3,6 %*	*-3,6 %*	*-3,5 %*	*-3,5 %*	*-4,0 %*	*-4,0 %*	*-4,0 %*	*-4,0 %*	*-4,0 %*
Provisions	541,2	608,1	686,7	779,3	888,4	825,8	858,9	893,2	929,0	966,1
to revenues	*8,2 %*	*8,7 %*	*9,4 %*	*10,2 %*	*11,2 %*	*10,0 %*	*10,0 %*	*10,0 %*	*10,0 %*	*10,0 %*
Annual change	57,2	66,9	78,6	92,5	109,1	- 62,5	33,0	34,4	35,7	37,2
Cashflow from operating activities	**935,5**	**998,8**	**1 062,4**	**1 117,0**	**1 169,5**	**973,1**	**1 110,1**	**1 154,5**	**1 200,6**	**1 248,7**
Investments	300,5	309,5	318,8	328,4	338,2	330,3	343,5	357,3	371,6	386,4
to revenues	*4,5 %*	*4,4 %*	*4,4 %*	*4,3 %*	*4,3 %*	*4,0 %*	*4,0 %*	*4,0 %*	*4,0 %*	*4,0 %*
Working Capital	1 576,4	1 694,0	1 812,2	1 907,4	2 008,0	2 147,2	2 233,1	2 322,4	2 415,3	2 511,9
to revenues	*23,8 %*	*24,2 %*	*24,9 %*	*25,1 %*	*25,3 %*	*26,0 %*	*26,0 %*	*26,0 %*	*26,0 %*	*26,0 %*
Annual change	104,0	117,6	118,3	95,1	100,7	139,1	85,9	89,3	92,9	96,6
Free Cashflow	**531,0**	**571,7**	**625,3**	**693,5**	**730,6**	**503,6**	**680,6**	**707,8**	**736,2**	**765,6**

Source: LBBW

These projections and an assumed final growth rate of 0.5 percent return an enterprise value of € 7.1bn or € 74.08 per share.

Sensitivity analysis

Value of equity (€ mn)

	Discounting ratio		
Growth	5,6%	6,6%	7,6%
0,0%	8143,2	6600,9	5465,2
0,5%	8750,5	6995,3	5735,1
1,0%	9490,9	7460,7	6046,2

Source: LBBW

Value of equity per share (€)

	Discounting ratio		
Growth	5,6%	6,6%	7,6%
0,0%	84,67	68,63	56,82
0,5%	90,98	72,73	59,63
1,0%	98,68	77,57	62,87

Source: LBBW

Recommendation.

In our opinion, the risk that the share could be excluded from the DAX is likely to be offset by the prospect of continued positive development in operations. We believe that if FME were to leave the DAX, there would be a short-term increase in sales by index-linked funds, which, however, would not be for long as the company's operational performance continues to be strong.

The purchase of Gambro's dialysis division by DaVita has put FME in a good position where acquisitions are concerned: against the backdrop of a new market structure, the Federal Trade Commission (FTC) is only likely to approve further acquisitions by DaVita in exceptional circumstances. Furthermore, the conditions attached to the approval of the purchase of Gambro's dialysis division still remain to be seen. Most US companies looking for buyers will therefore have to approach FME directly or possibly the much smaller Renal Care Group. The lack of other potential buyers would facilitate price negotiations for FME.

Our valuations show only a very limited upside potential for FME. Applying equal weights to the valuation methods using multiples and the discounted cash flow returns a fair value of € 68.64.

We maintain our hold recommendation for FME and increase our target price from € 68.00 to € 69.00.

Profit and Loss Account USD mn	2002	2003	2004e	2005e	2006e
Revenues	**5 084,1**	**5 527,5**	**6 228,0**	**6 636,2**	**6 986,7**
Cost of Sales	-3 428,1	-3 698,6	-4 142,1	-4 413,1	-4 626,9
Gross Profit	**1 656,0**	**1 828,9**	**2 085,9**	**2 223,1**	**2 359,8**
Margin	*32,6 %*	*33,1 %*	*33,5 %*	*33,5 %*	*33,8 %*
Sales and Administration	- 913,6	-1 021,8	-1 182,2	-1 241,3	-1 300,9
Research and development	- 47,4	- 49,7	- 51,4	- 59,7	- 69,9
EBITDA	**893,7**	**973,4**	**1 084,9**	**1 166,3**	**1 240,6**
Margin	*17,6 %*	*17,6 %*	*17,4 %*	*17,6 %*	*17,8 %*
Depreciation and Amortization	- 210,6	- 216,0	- 232,6	- 244,2	- 251,5
EBIT	**683,2**	**757,4**	**852,3**	**922,1**	**989,0**
Margin	*13,4 %*	*13,7 %*	*13,7 %*	*13,9 %*	*14,2 %*
Net Financial Income/Expense	- 207,0	- 211,8	- 183,7	- 192,9	- 202,6
EBT	**476,2**	**545,7**	**668,6**	**729,2**	**786,4**
Margin	*9,4 %*	*9,9 %*	*10,7 %*	*11,0 %*	*11,3 %*
Income Taxes	- 182,8	- 212,7	- 265,4	- 288,0	- 308,7
EAT	**293,4**	**333,0**	**403,2**	**441,2**	**477,8**
Margin	*5,8 %*	*6,0 %*	*6,5 %*	*6,6 %*	*6,8 %*
Minorities	3,6	1,8	1,2	1,2	1,3
Net Profit	**289,8**	**331,2**	**402,0**	**439,9**	**476,5**
Margin	*5,7 %*	*6,0 %*	*6,5 %*	*6,6 %*	*6,8 %*
Earnings per share (USD)	**3,01**	**3,42**	**4,16**	**4,57**	**4,95**

Source: LBBW

Balance sheet USD mn	2002	2003	2004e	2005e	2006e
Assets	**6 779,9**	**7 503,3**	**7 962,0**	**8 467,2**	**9 037,6**
Goodwill	550,3	582,1	617,0	654,0	654,0
Intangible assets	3 192,7	3 288,3	3 430,0	3 554,9	3 723,2
Tangible assets	917,9	1 089,1	1 198,1	1 317,9	1 449,7
Financial assets	0,0	0,0	0,0	0,0	0,0
Other fixed assets	297,4	337,6	307,0	337,7	371,5
Fixed assets	**4 958,2**	**5 297,2**	**5 552,1**	**5 864,4**	**6 198,4**
Inventories	372,2	444,7	507,0	547,6	596,8
Trade receivables	955,6	1 280,0	1 365,4	1 440,1	1 519,9
Other receivables and assets	429,1	433,0	476,3	523,9	576,3
Cash and cash equivalents	64,8	48,4	61,2	91,2	146,1
Current assets	**1 821,7**	**2 206,1**	**2 409,9**	**2 602,8**	**2 839,2**
Liabilities	**6 779,9**	**7 503,3**	**7 962,0**	**8 467,2**	**9 037,6**
Equity	2 807,2	3 243,7	3 635,4	4 075,3	4 551,7
Minority interests	22,5	14,1	20,0	20,0	20,0
Pension provisions	96,2	100,1	102,1	104,1	106,2
Other provisions	369,8	316,3	382,0	437,1	502,0
Financial liabilities	1 242,6	1 321,4	919,0	912,3	921,1
Trade payables	284,9	306,5	400,0	411,3	422,8
Other liabilities	1 956,8	2 201,3	2 503,6	2 507,2	2 513,8

Source: LBBW

Fresenius

Fresenius operates internationally in the healthcare sector with its subsidiaries Fresenius Medical Care, Fresenius Kabi, Fresenius ProServe and Fresenius Biotech.

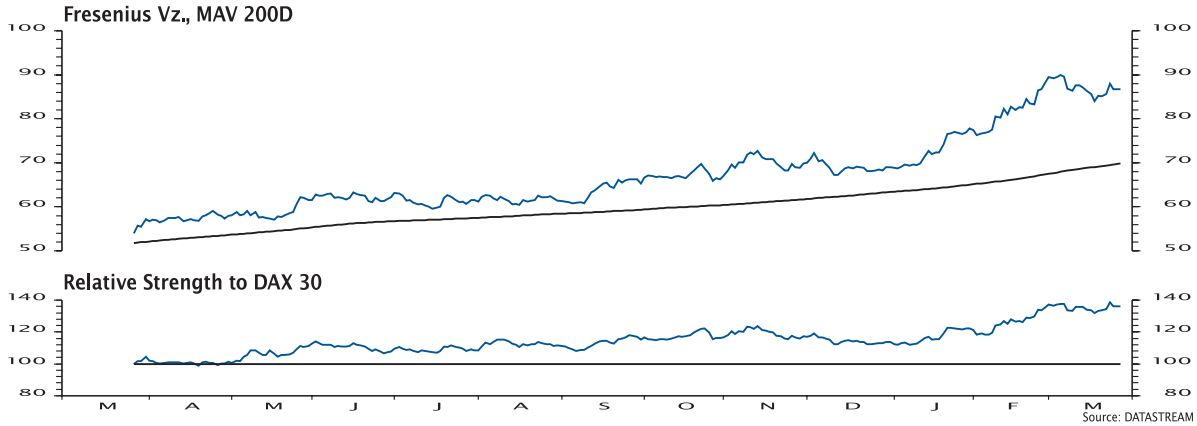
Price:	**86.51 €**
Target Price:	**95.00 €**
Rating:	**Hold**

Share Data	EPS current €	EPS previous €	PSR	EV/EBITDA	PER
2003	2,82	-	0,5	7,4	30,7
2004e	4,10	3,93	0,5	7,0	21,1
2005e	4,32	4,76	0,5	6,6	20,0
2006e	4,94	-	0,4	6,3	17,5

Source: Fresenius AG, LBBW

Company data	Revenues € m	EBITDA € m	EBIT € m	EBIT-Margin	Net profit € m
2003	7 064,0	1 106,0	781,0	11,1 %	115,0
2004e	7 271,0	1 160,0	845,0	11,6 %	168,0
2005e	7 698,9	1 225,7	886,9	11,5 %	176,9
2006e	8 083,9	1 295,1	939,4	11,6 %	202,3

Source: Fresenius AG, LBBW



Market and position.

Fresenius Medical Care is an international specialist in dialysis. A detailed description of this company is given in the relevant analysis of this industry report.

Fresenius Kabi is a provider of infusion and transfusion therapy as well as clinical nutrition, i.e. enteral (using the digestive tract) and parental (bypassing the digestive tract) nutrition. Following acquisitions such as the purchase of the Spanish company Labesfal, it is intended to obtain approvals for their portfolio of IV drugs which will be distributed throughout Europe. In addition, Kabi is planning further acquisitions. Although it is particularly interested in the Far East, acquisitions in Europe and North America are also possible as and when opportunities arise.

Although management likes to describe Fresenius ProServe as the group's next turn-around story, we believe that the company will remain the group's problem child. The hospital business is to a great extent controlled by government regulations and we see the Wittgenstein Kliniken AG as being too small to generate significant synergies (as, for instance, Rhön-Klinikum, Helios or Asklepios are trying). In addition, ProServe's project business is also suffering from the slowdown of investments in the pharmaceutical industry. Since, according to management, Fresenius ProServe will hardly be able to achieve an EBIT margin of more than 7 percent in the long term, it is likely that the call for divestment in this sector will become louder in future despite the fact that the board has up until now continued to deny that it has plans for divestments.

The group's hopes are on Fresenius Biotech, whose main business is the development of drugs for the treatment of cancer and autoimmune diseases based on antibody and gene therapies. There are currently no separate segment reports for Fresenius Biotech since the company's projects are still in their early stages.

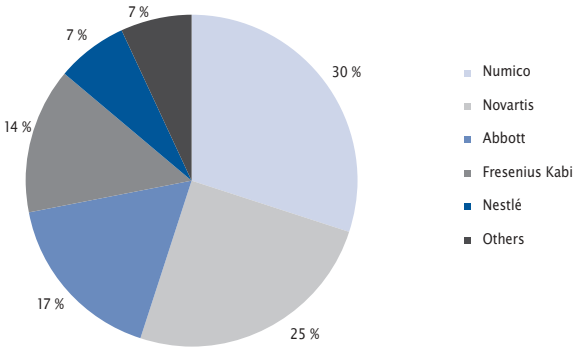
The reader is once again referred to the separate analysis of exchange-listed Fresenius Medical Care included in this industry report.

In our opinion, it seems too soon to prepare a separate market analysis for Fresenius Biotech. The division generates no sales except with its immunosuppressive agent (ATG) used in connection with organ transplantation. On top of this, the agent has not yet been approved by the FDA so that it currently has no access to the US market.

Market analyses for Fresenius ProServe are just as problematic since the hospital segment, especially in Germany, is not a free market but highly dependent on government regulations which are continually changing. As a result, for instance, the Diagnosis Related Groups (DRGs) system, which is currently being introduced in German hospitals for the reimbursement of costs on a case fee basis, is still in need of revision. However, a very interesting market study can be drawn up for Fresenius Kabi. The first fact to note is that Fesenius Kabi still has next to no presence on the US market.

Its core business, clinical nutrition, is subdivided into two segments: enteral and parenteral nutrition. Kabi reported that the size of the enteral market had reached € 1.4bn in 2003.

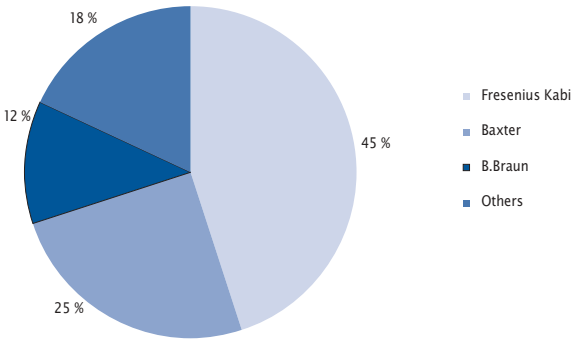
Enteral nutrition (2003: € 1,4 bn)



Source: Fresenius, LBBW

At € 0.5bn the market for parenteral nutrition is considerably smaller, although Fresenius has a much stronger presence in that segment.

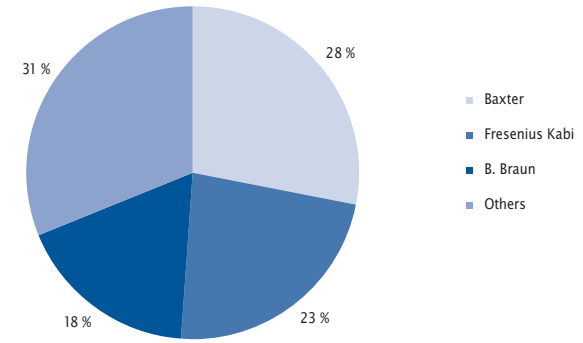
Parenteral nutrition (2003: € 0,5 bn)



Source: Fresenius, LBBW

Kabi classifies its infusion solutions into basic solutions and colloids (blood volume replacement substances). Kabi comes in second on the basic solutions market with sales of € 0.9bn.

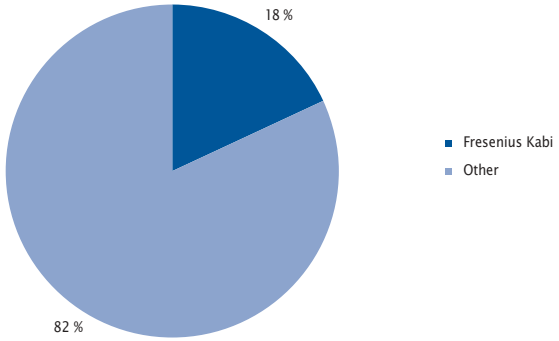
Basic solutions (2003: € 0,9 bn)



Source: Fresenius, LBBW

Despite the success of Kabi's Voluven(, a blood volume replacement substance, Albumin's dominant position has not yet been shaken. This is the reason why Kabi only has an 18 percent market share.

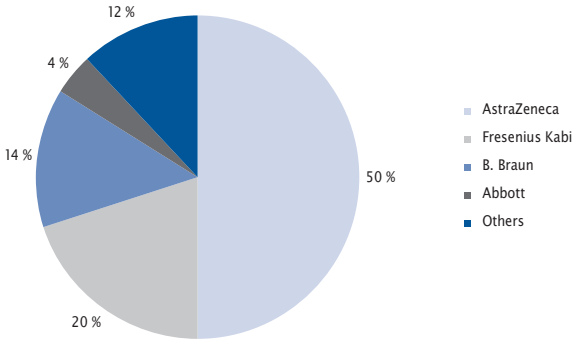
Colloids (2003: € 0,4 bn)



Source: Fresenius, LBBW

And finally, the intravenous anaesthesia market operated on by Kabi is fairly small at about € 0.2bn and, in addition, is dominated by AstraZeneca.

IV anaesthesia (2003: € 0,2 bn)



Source: Fresenius, LBBW

Market growth in established markets like Europe or Canada ranges between 2 and 5 percent. As mentioned elsewhere in this study, demographics also play a role due to the increasing number of individuals requiring healthcare services and products, leading to an increase in demand. The growth in volumes is faced with continuing price pressures, which has partly been caused by government (public health care) so that annual market growth rates have been between 0 and 3 percent.

Valuation.

Multiples-based model

Based on peer group comparisons, we see little upside potential in Fresenius' share price. The share has made significant gains in recent months and, in our opinion, its multiples demonstrate that it has reached its fair value. We have mainly based our opinions on the company's P/E ratio since we do not believe that EV/EBITDA is a meaningful ratio for Fesenius due to the fact that the company's minorities make up considerably more than 50 percent of its after-tax profits, or around 3 percent of sales. Although the increasing contribution to results by Kabi and ProServe means that this percentage will continue to decrease given that the minorities are mainly in connection with Fesenius Medical Care, we still expect that in coming years payouts to minorities will remain at high levels in absolute terms.

Company	Currency	Price	EPS			PER			EV	EBITDA			EV/EBITDA		
			04	05e	06e	04	05e	06e		04	05e	06e	04	05e	06e
Abbott	USD	45,18	2,27	2,49	2,74	19,9	18,1	16,5	75 154,6	5 466,0	5 764,0	6306,0	13,7	13,0	11,9
Baxter	USD	33,79	1,69	1,86	2,07	20,0	18,2	16,3	24 124,8	2 144,7	2 351,3	2634,0	11,2	10,3	9,2
Capio	SEK	107,50	8,57	5,87	7,43	12,5	18,3	14,5	11 538,8	1 148,4	1 595,6	1707,7	10,0	7,2	6,8
DaVita	USD	41,35	2,11	2,29	2,64	19,6	18,1	15,7	5 270,7	510,5	562,5	676,4	10,3	9,4	7,8
Gambro	SEK	98,00	-3,47	3,71	4,10	-28,2	26,4	23,9	39 230,5	4 815,0	2 991,3	3179,4	8,1	13,1	12,3
Renal Care Group	USD	37,73	1,70	1,99	2,29	22,2	19,0	16,5	3 090,3	312,2	355,2	395,0	9,9	8,7	7,8
Average							19,7	17,2						10,3	9,3
Median							18,2	16,4						9,8	8,5
Fresenius	EUR	86,51	4,10	4,32	4,94	21,1	20,0	17,5	8 147,7	1 160,0	1 225,7	1 295,1	7,0	6,6	6,3

Source: Bloomberg, LBBW

Applying multiples, we calculate a fair value per share of € 85.51.

Discounted Cash Flow Method

The assumptions of our DCF model are:

Calculation data

Equity ratio	60,0 %	Revenue growth	4,0 %
Debt ratio	40,0 %	EBIT margin	12,0 %
Risk free interest rate	3,7 %	Tax rate	40,0 %
Market premium	6,0 %	Provision ratio	18,0 %
Company specific premium	2,0 %	Depreciation ratio	4,5 %
Beta	1,0	Investment ratio	5,0 %
WACC	7,2 %	Working capital ratio	30,0 %
		Sustainable growth	0,0 %

Source: LBBW

Based on a five-year analysis and increasing growth rates as shown in five-year projections, the DCF was calculated as shown in the following table:

€ mn	2005e	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	**7 698,9**	**8 083,9**	**8 488,1**	**8 912,5**	**9 269,0**	**9 639,7**	**10 025,3**	**10 426,3**	**10 843,4**	**11 277,1**
Growth (yoy)	*5,9 %*	*5,0 %*	*5,0 %*	*5,0 %*	*4,0 %*	*4,0 %*	*4,0 %*	*4,0 %*	*4,0 %*	*4,0 %*
EBIT	**886,9**	**939,4**	**1 011,8**	**1 106,6**	**1 178,3**	**1 253,2**	**1 303,3**	**1 355,4**	**1 409,6**	**1 466,0**
EBIT margin	*11,5 %*	*11,6 %*	*11,9 %*	*12,4 %*	*12,7 %*	*13,0 %*	*13,0 %*	*13,0 %*	*13,0 %*	*13,0 %*
Taxes	- 266,8	- 285,7	- 312,7	- 348,6	- 377,3	- 501,3	- 521,3	- 542,2	- 563,9	- 586,4
Tax rate	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*
Depreciation/ Amortisation	- 338,8	- 355,7	- 369,2	- 387,7	- 403,2	- 433,8	- 451,1	- 469,2	- 488,0	- 507,5
to revenues	*-4,4 %*	*-4,4 %*	*-4,4 %*	*-4,4 %*	*-4,4 %*	*-4,5 %*	*-4,5 %*	*-4,5 %*	*-4,5 %*	*-4,5 %*
Provisions	1 467,5	1 540,9	1 618,0	1 698,9	1 783,8	1 831,5	1 904,8	1 981,0	2 060,2	2 142,6
to revenues	*19,1 %*	*17,3 %*	*16,5 %*	*19,1 %*	*19,2 %*	*19,0 %*	*19,0 %*	*19,0 %*	*19,0 %*	*19,0 %*
Change	104,2	109,9	116,0	122,5	129,4	47,8	73,3	76,2	79,2	82,4
Cashflow from operating activities	1 063,1	1 119,2	1 184,3	1 268,1	1 333,5	1 233,4	1 306,4	1 358,6	1 413,0	1 469,5
Investments	361,5	379,6	398,6	418,5	439,4	482,0	501,3	521,3	542,2	563,9
to revenues	*4,7 %*	*4,7 %*	*4,7 %*	*4,7 %*	*4,7 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*
Working Capital	1 997,9	2 130,0	2 271,0	2 421,4	2 581,9	2 699,1	2 807,1	2 919,4	3 036,1	3 157,6
to revenues	*26,0 %*	*26,3 %*	*26,8 %*	*27,2 %*	*27,9 %*	*28,0 %*	*28,0 %*	*28,0 %*	*28,0 %*	*28,0 %*
Change	123,8	132,1	140,9	150,4	160,5	117,3	108,0	112,3	116,8	121,4
Free Cashflow	**577,8**	**607,5**	**644,8**	**699,2**	**733,6**	**634,2**	**697,1**	**725,0**	**754,0**	**784,2**

Source: LBBW

These projections and an assumed horizon growth rate of 0.0 percent return an enterprise value of € 4.5bn or € 109.57 per share. We ran a sensitivity analysis on this amount which returned the following results:

Sensitivity analysis

Value of equity (€ mn)

	Discounting rate		
Growth	6,2 %	7,2 %	8,2 %
0,0 %	4 498,7	3 901,4	3 355,1
1,0 %	5 142,0	4 488,9	3 892,2
2,0 %	5 993,2	5 266,4	4 602,9

Source: LBBW

Value of equity per share (€)

	Discounting rate		
Growth	6,2 %	7,2 %	8,2 %
0,0 %	109,81	95,23	81,89
1,0 %	125,51	109,57	95,00
2,0 %	146,28	128,54	112,35

Source: LBBW

If equal weights are applied to the multiples-based model and DCF valuations, the fair value per share for Fresenius amounts to € 97.54 in our opinion.

Recommendation.

The group's core businesses, represented by Fresenius Medical Care and Fresenius Kabi, are profitable and will continue to make steady contributions to consolidated results. In addition, Fesenius Biotech provides the group with a significant upside potential with limited risk. This upside, however, is unlikely to be realised prior to 2007 when ATG is approved for sale on the US market.

In our opinion, the performance of Fesenius ProServe has caused dissatisfaction among investors. Although Fresenius management continues to deny that there are plans to divest Fesenius ProServe, in the same breath they confirm that the EBIT margins that can be achieved in this segment are only half those of Fresenius Medical Care or Fesenius Kabi. Hence we are doubtful as to whether ProServe has a long-term future with the group.

This uncertainty, in our opinion, is likely to somewhat curb investors' imagination with respect to Fresenius. We are therefore not convinced that the calculated fair value can be achieved during our forecast period. We maintain our hold recommendation for Fresenius with a target price of € 95.

Profit and Loss Account € mn	2002	2003	2004e	2005e	2006e
Revenues	**7 507,0**	**7 064,0**	**7 271,0**	**7 698,9**	**8 083,9**
Cost of Sales	-5 071,0	-4 788,0	-4 895,0	-5 196,8	-5 448,5
Gross Profit	**2 436,0**	**2 276,0**	**2 376,0**	**2 502,1**	**2 635,3**
Margin	*32,4%*	*32,2%*	*32,7%*	*32,5%*	*32,6%*
Sales and Administration	-1 599,0	-1 495,0	-1 531,0	-1 615,2	-1 696,0
EBITDA	**1 178,0**	**1 106,0**	**1 160,0**	**1 225,7**	**1 295,1**
Margin	*15,7%*	*15,7%*	*16,0%*	*15,9%*	*16,0%*
Depreciation and Amortization	- 341,0	- 325,0	- 315,0	- 338,8	- 355,7
EBIT	**837,0**	**781,0**	**845,0**	**886,9**	**939,4**
Margin	*11,1%*	*11,1%*	*11,6%*	*11,5%*	*11,6%*
Net Financial Income/Expense	- 270,0	- 249,0	- 209,0	- 220,0	- 225,0
EBT	**567,0**	**532,0**	**636,0**	**666,9**	**714,4**
Margin	*7,6%*	*7,5%*	*8,7%*	*8,7%*	*8,8%*
Income Taxes	- 210,0	- 223,0	- 253,0	- 266,8	- 285,7
EAT	**352,0**	**309,0**	**383,0**	**400,2**	**428,6**
Margin	*4,7%*	*4,4%*	*5,3%*	*5,2%*	*5,3%*
Minorities	- 218,0	- 194,0	- 215,0	- 223,3	- 226,3
Net Profit	**134,0**	**115,0**	**168,0**	**176,9**	**202,3**
Margin	*1,8%*	*1,6%*	*2,3%*	*2,3%*	*2,5%*
Earnings per share (€)	**3,27**	**2,82**	**4,10**	**4,32**	**4,94**

Source: LBBW

Balance sheet € mn	2002	2003	2004e	2005e	2006e
Assets	**8 915,0**	**8 347,0**	**8 187,9**	**8 289,5**	**8 415,4**
Goodwill	3 409,0	2 977,0	2 891,0	2 746,5	2 609,1
Other intangible assets	577,0	504,0	493,9	484,0	474,4
Tangible assets	1 797,0	1 721,0	1 631,0	1 663,6	1 696,9
Financial assets	0,0	0,0	0,0	0,0	0,0
Other fixed assets	389,0	401,0	416,9	433,8	452,0
Fixed assets	**6 172,0**	**5 603,0**	**5 432,8**	**5 327,9**	**5 232,4**
Inventories	659,0	642,0	619,0	650,0	682,4
Trade receivables	1 315,0	1 438,0	1 528,2	1 634,6	1 748,6
Other receivables and assets	606,0	539,0	468,0	470,0	450,0
Cash and cash equivalents	163,0	125,0	140,0	207,0	302,0
Current assets	**2 743,0**	**2 744,0**	**2 755,2**	**2 961,6**	**3 183,0**
Liabilities	**8 915,0**	**8 347,0**	**8 187,9**	**8 289,5**	**8 415,4**
Equity	1 607,0	1 536,0	1 603,0	1 636,6	1 672,0
Minority interests	1 762,0	1 678,0	1 744,0	1 744,0	1 744,0
Pension provisions	220,0	216,0	226,8	238,1	250,0
Other provisions	1 297,0	1 184,0	1 170,9	1 229,4	1 290,9
Financial liabilities	3 284,0	3 023,0	2 708,3	2 674,2	2 652,4
Trade payables	304,0	266,0	273,0	286,7	301,0
Other liabilities	441,0	444,0	462,1	480,9	500,6

Source: LBBW

UMS United Medical Systems

UMS Medical Systems describes itself as a „solution provider for medical full service concepts". The company offers mobile state-of-the-art comprehensive diagnostics and therapeutic services in selected areas of business.

In addition to supplying the physical equipment needed for diagnosis or treatment, USM also provides the skilled personnel that uses and maintains the equipment and as such presents itself as a full service provider to the market.

Price:	**2.74 €**
Target Price:	**2.00 €**
Rating:	**Sell**

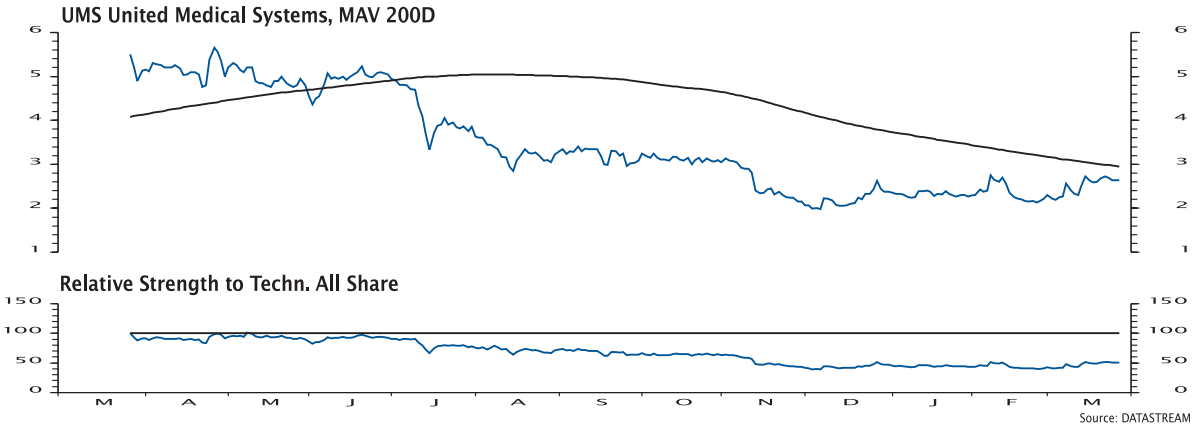
Share data	**EPS current €**	**previous €**	**PSR**	**EV/EBITDA**	**PER***
2003	0,29	0,29	0,3	5,4	9,61
2004e	-0,05	0,26	0,3	4,8	-60,8
2005e	0,17	0,32	0,3	3,4	16,0
2006e	0,18	-	0,2	3,2	15,0

*bezogen auf EBG

Source: UMS AG, LBBW

Company data	**Revenues € m**	**EBITDA € m**	**EBIT € m**	**EBIT margin**	**Net profit € m**
2003	62,7	10,7	0,4	0,6 %	- 2,5
2004e	58,5	12,0	2,6	4,4 %	- 2,1
2005e	62,9	17,0	7,1	11,3 %	1,0
2006e	66,3	17,9	7,5	11,4 %	1,1

Source: UMS AG, LBBW



Source: DATASTREAM

Please note the disclaimer on the last page of this study.

Markets and position.

An analysis of UMS's product markets entails breaking them down into their reporting segments.

In the gynaecology segment, UMS provides stereotactic breast biopsies, which is a minimally invasive procedure for the removal of suspicious lesions from the female breast to be examined for breast cancer. Despite the clear advantage of this type of minimally invasive incision compared to normal surgery, the use of this procedure for diagnosis is not covered by national health insurance programmes in important markets, such as Germany. This means that the company focuses on those markets with general case-based lump-sum reimbursements of all clinical expenses (USA) or on private patients.

UMS's radiology segment primarily consists of the provision of mobile CT and MRT. The company has a solid customer base in this segment. In 2004, it was able to agree coverage by the largest Irish health insurer and was granted several Certificates of Need by the state of Michigan. These certificates, which are issued by individual states, effectively provide protection from competition by other potential providers for a limited period of time.

In the urology segment, the company offers mobile equipment for extracorporeal shock wave therapy (ESWT), mobile lithotripters for the destruction of kidney stones, which, however, is being increasingly replaced with other minimally invasive methods such as laser supported procedures (through the urethra).

The oncology segment holds the most promise for UMS, which supplies mobile PET equipment and related services. By now, the company already launched two hybrid PET and CT devices. The reimbursement of costs, however, is just as problematic in this segment as in gynaecology. Important markets such as Germany do not normally cover the cost of PET metastasis diagnoses. At the same time, full reimbursement of this type of procedure has been approved in the United States and in 2004 coverage was even extended to include its use for the diagnosis of Alzheimer's disease.

At first glance, the easing of regulations relating to cost reimbursements would appear to benefit UMS. It should, however, be noted that extending cover could now enable medium-sized hospitals to purchase their own PET scanners. These hospitals would not have been able to utilise full capacity by metastasis diagnosis alone. UMS could lose these hospitals as customers. On the other hand, it could be argued that small hospitals are now finding contracts with UMS attractive. This phenomenon may be short-lived, however, since there is also a trend towards hospital consolidation in the United States meaning that small hospitals are likely to disappear from UMS's customer base in the medium term.

Valuation.

Multiples-based model
When using a multiples-based model to value UMS, a number of factors must be kept in mind.

Company	Currency	Price	EV	EPS			PER			EBITDA			EV/EBITDA		
				04e	05e	06e	04e	05e	06e	04e	05e	06e	04e	05e	06e
Alliance Imaging	USD	9,17	964,7	0,49	0,52	0,70	107,1	168,0	n.a.	18,7	17,6	13,1	9,0	5,7	n.a.
Healthtronics	USD	10,99	422,2	0,36	0,53	0,73	41,9	48,7	61,6	30,5	20,7	15,1	10,1	8,7	6,9
Average											19,2	14,1		7,2	6,9
UMS*	€	2,74	57,5	-0,05	0,17	0,18	12,0	17,0	17,9	neg.	16,0	15,0	4,8	3,4	3,2

* EBG

Source: Bloomberg, LBBW

The first is that UMS's peer group has become very small following the Prime Medical Services' takeover of Healthtronics. Secondly, there is a distinct difference in size between UMS and the other two companies in its peer group. Third, UMS benefits greatly from the adjustments between IFRS and US GAAP regarding the treatment of goodwill. If UMS had continued to amortise goodwill as it had in the past, we estimate that earnings per share would be reduced by € 0.30 in both 2005 and 2006. And fourth, UMS in the past repeatedly disappointed investors with significant minority interests (for US joint ventures with local physicians), which exceeded consolidated profits. As a result of the high level of minority interests, we are also of the opinion that EV/EBITDA is not meaningful so that we will limit ourselves to comparisons of P/E ratios. Consequently, we estimate the multiples-based fair value to be € 2.93.

Discounted Cash Flow Method
The assumptions of our DCF model are:

Calculation data

Equity ratio	40,0 %	Revenue growth	5,0 %
Debt ratio	60,0 %	EBIT margin	12,0 %
Risk free interest rate	3,7 %	Tax rate	40,0 %
Market premium	6,0 %	Provision ratio	4,5 %
Company specific premium	2,5 %	Depreciation ratio	14,0 %
Beta	1,8	Investment ratio	14,0 %
WACC	8,0 %	Working capital ratio	14,0 %
		Sustainable growth	1,0 %

Source: LBBW

Based on a five-year analysis and increasing growth rates as shown in five-year projections, the DCF was calculated as shown in the following table:

	2005e	2006e	2007e	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	**62,9**	**66,3**	**70,4**	**74,1**	**78,1**	**82,0**	**86,1**	**90,4**	**94,9**	**99,7**
Growth	*7,6 %*	*5,4 %*	*6,2 %*	*5,3 %*	*5,4 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*
EBIT	**7,1**	**7,5**	**8,1**	**8,7**	**9,1**	**9,8**	**10,3**	**10,9**	**11,4**	**12,0**
EBIT margin	*11,3 %*	*11,4 %*	*11,6 %*	*11,7 %*	*11,6 %*	*12,0 %*	*12,0 %*	*12,0 %*	*12,0 %*	*12,0 %*
Taxes	- 0,5	- 0,6	- 1,3	- 2,5	- 3,1	- 3,9	- 4,1	- 4,3	- 4,6	- 4,8
Tax rate	*-17,5 %*	*-20,0 %*	*-30,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*	*-40,0 %*
Amortisation/Depreciation	- 9,9	- 10,4	- 10,9	- 11,4	- 12,0	- 11,5	- 12,1	- 12,7	- 13,3	- 14,0
to revenues	*-15,7 %*	*-15,7 %*	*-15,5 %*	*-15,4 %*	*-15,4 %*	*-14,0 %*	*-14,0 %*	*-14,0 %*	*-14,0 %*	*-14,0 %*
Provisions	2,5	2,7	3,0	3,3	3,6	3,7	3,9	4,1	4,3	4,5
to revenues	*3,9 %*	*4,1 %*	*4,3 %*	*4,4 %*	*4,6 %*	*4,5 %*	*4,5 %*	*4,5 %*	*4,5 %*	*4,5 %*
Change	0,2	0,2	0,3	0,3	0,3	0,1	0,2	0,2	0,2	0,2
Cashflow from operating activities	**16,8**	**17,5**	**18,0**	**17,9**	**18,3**	**17,5**	**18,4**	**19,4**	**20,3**	**21,3**
Investments	12,9	12,3	11,7	11,1	10,5	11,5	12,1	12,7	13,3	14,0
to revenues	*20,6 %*	*18,6 %*	*16,6 %*	*15,0 %*	*13,5 %*	*14,0 %*	*14,0 %*	*14,0 %*	*14,0 %*	*14,0 %*
Working Capital	9,3	9,9	10,3	10,6	10,8	11,5	12,1	12,7	13,3	14,0
to revenues	*14,8 %*	*14,9 %*	*14,7 %*	*14,3 %*	*13,8 %*	*14,0 %*	*14,0 %*	*14,0 %*	*14,0 %*	*14,0 %*
Change	0,8	0,6	0,4	0,3	0,2	0,7	0,6	0,6	0,6	0,7
Free Cashflow	**3,0**	**4,7**	**5,9**	**6,6**	**7,5**	**5,3**	**5,8**	**6,1**	**6,4**	**6,7**

Source: LBBW

These projections and an assumed final growth rate of 1.0 percent return an enterprise value of € 9.3mn or € 1.54 per share. We ran a sensitivity analysis on this amount which returned the following results:

Sensitivity analysis

Value of equity (€ mn)

	Discounting rate		
Growth	7,0 %	8,0 %	9,0 %
0,0 %	9,4	3,9	-1,0
1,0 %	15,2	9,3	3,9
2,0 %	23,0	16,4	10,4

Source: LBBW

Value of equity per share (€)

	Discounting rate		
Growth	7,0 %	8,0 %	9,0 %
0,0 %	1,55	0,66	-0,17
1,0 %	2,53	1,54	0,64
2,0 %	3,82	2,73	1,73

Source: LBBW

If equal weights are applied to the multiples-based model and DCF valuations, the fair value per share for UMS amounts to € 2.24 in our opinion.

Recommendation.

UMS has a very attractive business model that combines high value, state-of-the-art medical technology with services.

Despite this excellent concept, the extension of insurance cover, which at first glance appears to be beneficial to UMS, could in fact lead to the loss of customers to the extent that hospitals can cover the cost of outright equipment purchases.

In addition, minority interests continue to be problematic. In that context, UMS must increase income on which minorities have no claim so that not all net profits (or even more) are paid to minorities. Alternatively, the agreements with minorities should be amended either by renegotiating existing agreements or even by buying out the minority interests.

We maintain our sell recommendation for UMS and set our target price to € 2.00.

Profit and Loss Account € mn	2002	2003	2004e	2005e	2006e
Revenues	**56,0**	**62,7**	**58,5**	**62,9**	**66,3**
Cost of sales	-45,0	-46,8	-42,7	-44,0	-46,4
Gross profit	**11,0**	**15,9**	**15,8**	**18,9**	**19,9**
Distribution costs	-8,8	-6,1	-5,0	-5,2	-5,4
General administrative expenses	-8,4	-7,6	-7,0	-7,2	-7,6
Other operating income/charges	-2,3	2,3	0,6	0,7	0,7
Goodwill amortisation	-2,6	-4,3	-1,8	0,0	0,0
EBITDA	**1,6**	**10,7**	**12,0**	**17,0**	**17,9**
Margin	2,9 %	17,1 %	20,5 %	27,1 %	27,0 %
Depreciation	-10,0	-6,1	-7,6	-9,9	-10,4
EBIT	**-11,0**	**0,4**	**2,6**	**7,1**	**7,5**
Margin	neg.	0,6 %	4,4 %	11,3 %	11,4 %
Financial result	-2,0	-2,6	-2,9	-2,7	-2,6
EBT	**-13,0**	**-2,2**	**-0,3**	**4,5**	**4,9**
Margin	neg.	neg.	neg.	7,1 %	7,4 %
Tax on profit	-2,4	0,1	-0,3	-1,1	-1,3
EAT	**-15,4**	**-2,2**	**-0,6**	**3,4**	**3,6**
Margin	neg.	neg.	neg.	5,4 %	5,4 %
Minorities	-1,3	-0,4	-1,5	-2,4	-2,5
Net profit	**-16,7**	**-2,5**	**-2,1**	**1,0**	**1,1**
Margin	neg.	neg.	neg.	1,6 %	1,7 %
Net profit before goodwill amortisation	**-14,1**	**1,7**	**-0,3**	**1,0**	**1,1**
Margin	neg.	2,7 %	neg.	1,6 %	1,7 %
EPS before minorities (€)	**-2,55**	**-0,36**	**-0,09**	**0,56**	**0,60**
EPS before goodwill (€)	**-2,34**	**0,29**	**-0,05**	**0,17**	**0,18**
EPS (€)	**-2,77**	**-0,42**	**-0,34**	**0,17**	**0,18**

Source: LBBW

Balance sheet € mn	2002	2003	2004e	2005e	2006e
Assets	**91,8**	**78,7**	**79,0**	**82,0**	**85,4**
Goodwill	16,6	12,4	11,2	10,0	9,0
Other intangible assets	12,0	9,4	9,1	8,9	8,7
Tangible assets	28,5	29,5	28,8	28,1	27,4
Financial assets	0,1	0,1	0,1	0,1	0,1
Other fixed assets	3,7	2,5	2,5	1,7	0,7
Fixed assets	**60,9**	**53,9**	**51,7**	**48,8**	**45,9**
Inventories	1,7	1,7	1,6	1,7	1,8
Trade receivables	14,3	12,9	13,5	14,9	16,1
Other receivables and assets	6,3	5,9	6,5	7,2	7,9
Cash and cash equivalents	8,5	4,4	5,7	9,5	13,7
Current assets	**30,8**	**24,9**	**27,3**	**33,2**	**39,5**
Liabilities	**91,8**	**78,7**	**79,0**	**82,0**	**85,4**
Equity	27,1	22,2	20,0	20,8	21,6
Minority interests	1,3	0,8	1,4	1,5	1,5
Pension provisions	0,0	0,0	0,0	0,0	0,0
Other provisions	5,9	2,0	2,2	2,5	2,7
Financial liabilities	46,9	44,5	45,8	47,3	48,8
Trade payables	7,6	6,0	6,6	7,3	8,0
Other liabilities	3,0	3,1	3,0	2,8	2,7

Source: LBBW

Wavelight Laser Technologie

Wavelight Laser Technologie (WLT) of Erlangen is specialised in medical and industrial lasers for lifestyle and healthcare applications predominantly for use in the ophthalmologic sector.

Price:	**14.60 €**
Target Price:	**18.00 €**
Rating:	**Buy**

Share Data	EPS current €	EPS previous €	PSR	EV/EBITDA	PER
2003/04	0,53	0,53	0,9	13,5	27,4
2004/05e	0,55	0,55	1,2	10,4	26,6
2005/06e	0,74	0,75	1,0	8,6	19,6
2006/07e	0,99	-	1,0	7,0	14,7

Source: Wavelight Laser Technologie, LBBW

Company Data	Revenues € m	EBITDA € m	EBIT € m	EBIT-Margin	Net Profit € m
2003/04e	62,0	8,7	6,2	10,0 %	2,2
2004/05e	77,1	11,2	8,3	10,8 %	3,5
2005/06e	93,7	13,7	10,5	11,2 %	4,7
2006/07e	112,5	16,6	13,2	11,7 %	6,3

Source: Wavelight Laser Technologie, LBBW

Source: DATASTREAM

Markets and position.

WLT operates in four different markets. The company manufactures refractive laser systems in its Ophthalmology division. In the Aesthetics division, the company supplies lasers for the treatment of skin pigmentation and the removal of tattoos as well as for other cosmetic procedures. In Urology, WLT is the OEM manufacturer of products for Dornier. And finally, it develops inscription lasers in its Industrial Lasers division.

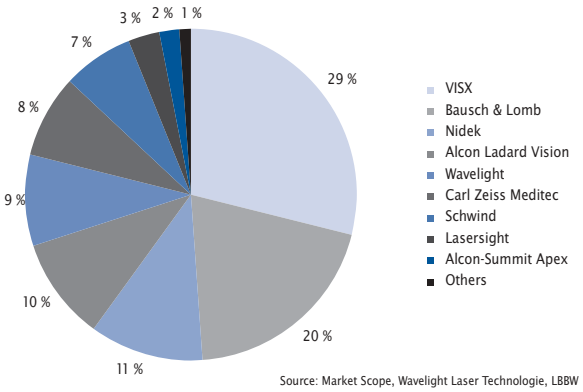
According to management, the Industrial Lasers division has been up for sale for some time. This is why we have not analysed this segment.

We also excluded the Urology division since, as reported in the most recent quarterly statements, only 3.7 percent of Wavelight's consolidated sales were generated in that segment, where the company is „only" engaged in OEM manufacturing.

WLT's core business is and will continue to be ophthalmology. The company's refractive lasers are among the most technologically advanced systems in the world and time-wise Wavelight clearly has the edge over Carl Zeiss Meditec on the US market: while WLT already has FDA approval for its Allegretto Wave refractive laser, Carl Zeiss Meditec is still working on the applications for its own devices.

Wavelight is situated in the middle of its peer group with respect to the number of refractive laser systems that it has installed.

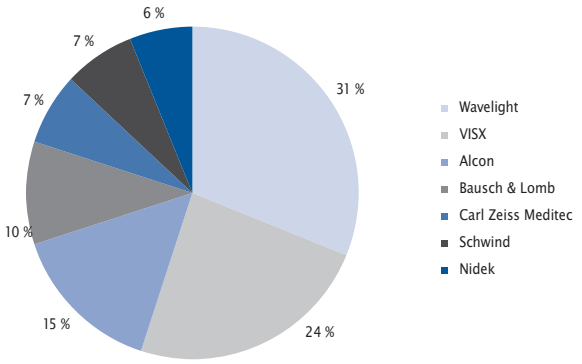
Installed base refractive lasers 2004e



Source: Market Scope, Wavelight Laser Technologie, LBBW

Wavelight's advantage over its competitors in terms of technology and the status of its approvals can be clearly seen in its new equipment sales.

Refractive lasers sold (2003)

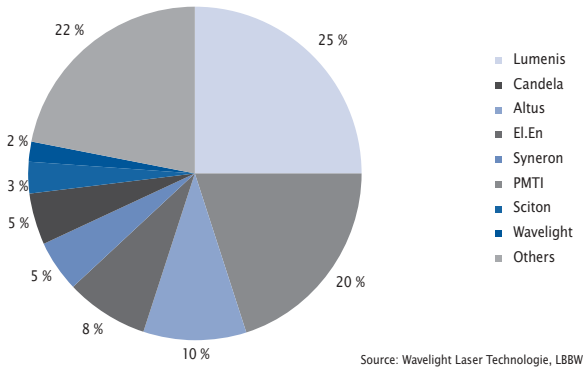


Source: Medical Laser Insight, LBBW

In Aesthetics, which represented 12.9 percent of the total consolidated sales reported in the most recent quarterly statements, Wavelight's position is not quite as strong as in Ophthalmology. Although this division is also in possession of various European and FDA approvals, Wavelight only launched its products on the US market, by far the most important in the world, at the end of February at the American Academy of Dermatology which is the most important trade fair for the sector.

Wavelight is confident that its current 2 percent share of the USD 540mn global aesthetics market, which is growing at 10 percent p.a., will be expanded following the launch of its products on the US market.

Market shares aesthetics



Source: Wavelight Laser Technologie, LBBW

Valuation.

Multiples-based model

The attractiveness of WLT's valuation continues to be obvious when compared to its peer group. It should, however, be noted that competitor VISX, which is the global leader as regards the number of installed refractive lasers, is in the process of being taken over by Advanced Medical Optics (AMO). When new estimates become available following completion of the takeover, VISX will be replaced by AMO in the peer group.

Company	Currency	Price	EV	EPS			PER			EBITDA			EV/EBITDA		
				04e	05e	06e	04e	05e	06e	04e	05e	06e	04e	05e	06e
Alcon	USD	87,35	2,62	3,14	3,68	33,3	27,8	23,7426	705,5	1 327,0	1 474,0	1635,00	20,1	18,1	16,33
Bausch & Lomb	USD	73,99	2,93	3,41	3,95	25,3	21,7	18,73	4 127,0	404,8	442,2	488,30	10,2	9,3	8,45
Laserscope	USD	32,00	0,66	0,80	1,06	48,5	40,0	30,19	672,8	16,8	30,9	n.v.	40,0	21,8	-
VISX	USD	23,49	0,82	0,96	1,13	28,6	24,5	20,79	1 037,2	72,5	87,6	99,80	14,3	11,8	10,39
Carl Zeiss Meditec*	€	15,70	0,50	0,76	1,03	31,4	20,7	15,24	440,2	35,9	52,6	67,00	12,3	8,4	6,57
Average						33,4	26,9						19,4	13,9	
Median						31,4	24,5						14,3	11,8	
Wavelight Laser*	€	14,60	0,54	0,63	0,85	27,1	23,2	17,2	117,1	10,2	12,7	15,4	11,5	9,3	7,6

*adapted to calendar years

Source: Bloomberg, LBBW

On the basis of the median values of the 2005 and 2006 P/E ratios, we calculated a fair value of € 19.95 for Wavelight.

Discounted Cash Flow Method

The assumptions of our DCF model are:

Calculation data

Equity ratio	60,0 %	Revenue growth	15,0 %
Debt ratio	40,0 %	EBIT margin	13,0 %
Risk free interest rate	3,7 %	Tax rate	40,0 %
Market premium	6,0 %	Provision ratio	5,0 %
Company specific premium	2,5 %	Depreciation ratio	3,0 %
Beta	1,5	Investment ratio	3,0 %
WACC	9,1 %	Working capital ratio	33,0 %
		Sustainable growth	1,0 %

Source: LBBW

Based on a five-year analysis and increasing growth rates as shown in five-year projections, the DCF was calculated as shown in the following table:

DCF Model (€ mn)	04/05e	05/06e	06/07e	07/08e	08/09e	09/10e	10/11e	11/12e	12/13e	13/14e
Revenues	**77,1**	**93,7**	**112,5**	**132,7**	**152,6**	**175,5**	**201,9**	**232,1**	**267,0**	**307,0**
Growth	*24,3 %*	*21,5 %*	*20,0 %*	*18,0 %*	*15,0 %*	*15,0 %*	*15,0 %*	*15,0 %*	*15,0 %*	*15,0 %*
EBIT	**8,3**	**10,5**	**13,2**	**16,8**	**20,8**	**22,8**	**26,2**	**30,2**	**34,7**	**39,9**
EBIT margin	*10,8 %*	*11,2 %*	*11,7 %*	*12,7 %*	*13,6 %*	*13,0 %*	*13,0 %*	*13,0 %*	*13,0 %*	*13,0 %*
Taxes	- 3,4	- 4,2	- 5,2	- 6,5	- 8,1	- 9,1	- 10,5	- 12,1	- 13,9	- 16,0
Tax ratio	*48,0 %*	*46,0 %*	*44,0 %*	*42,0 %*	*42,0 %*	*40,0 %*	*40,0 %*	*40,0 %*	*40,0 %*	*40,0 %*
Depreciation/Amortisation	- 2,9	- 3,1	- 3,5	- 3,8	- 4,2	- 5,3	- 6,1	- 7,0	- 8,0	- 9,2
to revenues	*-3,7 %*	*-3,4 %*	*-3,1 %*	*-2,9 %*	*-2,7 %*	*-3,0 %*	*-3,0 %*	*-3,0 %*	*-3,0 %*	*-3,0 %*
Provisions	5,2	5,7	6,3	6,9	7,6	8,8	10,1	11,6	13,3	15,3
to revenues	*6,7 %*	*6,1 %*	*5,6 %*	*5,2 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*	*5,0 %*
Annual change	0,5	0,5	0,6	0,6	0,7	1,2	1,3	1,5	1,7	2,0
Cashflow from operating activities	**8,3**	**10,0**	**12,0**	**14,8**	**17,5**	**20,1**	**23,1**	**26,6**	**30,6**	**35,2**
Investments	4,8	4,6	4,5	4,5	4,5	5,3	6,1	7,0	8,0	9,2
to revenues	*6,2 %*	*4,9 %*	*4,0 %*	*3,4 %*	*2,9 %*	*3,0 %*	*3,0 %*	*3,0 %*	*3,0 %*	*3,0 %*
Working Capital	34,2	36,3	39,1	42,8	47,1	57,9	66,6	76,6	88,1	101,3
to revenues	*44,3 %*	*38,7 %*	*34,8 %*	*32,3 %*	*30,8 %*	*33,0 %*	*33,0 %*	*33,0 %*	*33,0 %*	*33,0 %*
Annual change	1,3	2,1	2,8	3,7	4,2	10,9	8,7	10,0	11,5	13,2
Free Cashflow	**2,1**	**3,2**	**4,7**	**6,6**	**8,8**	**4,0**	**8,4**	**9,6**	**11,1**	**12,7**

Source: LBBW

These projections and an assumed final growth rate of 1.0 percent return an enterprise value of € 117mn or € 18.39 per share. We ran a sensitivity analysis on this amount which returned the following results:

Sensitivity analysis

Value of equity (€ mn)

	Discounting rate		
Growth	8,1%	9,1%	10,1%
0,0%	119	109	100
1,0%	129	117	106
2,0%	143	127	114

Source: LBBW

Value of equity per share (€)

	Discounting rate		
Growth	8,1%	9,1%	10,1%
0,0%	18,76	17,11	15,74
1,0%	20,40	18,39	16,77
2,0%	22,58	20,03	18,05

Source: LBBW

Applying equal weights to these valuations returns a fair value of € 19.17 per share.

Recommendation.

We are still waiting for the sale of the Industrial Lasers division which should generate exceptional earnings of single-digit millions.

The group's main growth business in the foreseeable future will continue to be the Ophthalmology division. Wavelight is well positioned in that market and most importantly has a significant advantage over Carl Zeiss Meditec due to the head start in its approvals in the US. However, Wavelight will need this advantage if Carl Zeiss manages to launch its MEL80 on the US market in 12-18 months' time. This is because the name „Zeiss" is so well-known that it will certainly be attractive to refractive laser systems customers.

We are forecasting strong growth in the Aesthetics division now that the division has started marketing different lasers in the United States. The second half-year will show the extent to which Wavelight has been able to turn the advantage of the timing of its approvals into concrete results.

We calculated Wavelight's fair value per share to be € 19.17. Given the share's occasional illiquidity, it will be difficult for it to reach this level. We believe a realistic target is more likely to be discount to the calculated fair value and maintain our buy recommendation for Wavelight Laser at a target price at € 18.00.

Profit and Loss Account € mn	2002/03	2003/04	2004/05e	2005/06e	2006/07e
Revenues	**47,8**	**62,0**	**77,1**	**93,7**	**112,5**
Cost of Sales	-27,7	-30,7	-38,4	-46,9	-56,2
Gross Profit	**20,1**	**31,3**	**38,8**	**46,9**	**56,2**
Margin	*42,1 %*	*50,5 %*	*50,3 %*	*50,0 %*	*50,0 %*
R&D Expenses	-4,2	-6,3	-6,9	-8,4	-9,8
SG&A Expenses	-10,8	-19,8	-24,4	-28,5	-33,5
Other Income	-0,7	1,1	0,9	0,6	0,3
EBITDA	5,9	8,7	11,2	13,7	16,6
Margin	*12,4 %*	*14,0 %*	*14,5 %*	*14,6 %*	*14,8 %*
Depreciation and Amortisation	-1,5	-2,5	-2,9	-3,1	-3,5
EBIT	**4,4**	**6,2**	**8,3**	**10,5**	**13,2**
Margin	*9,2 %*	*10,0 %*	*10,8 %*	*11,2 %*	*11,7 %*
Net Financial Income/Expense	-0,7	-1,3	-1,3	-1,3	-1,4
EBT	**3,7**	**4,9**	**7,1**	**9,2**	**11,8**
Margin	*7,8 %*	*7,9 %*	*9,2 %*	*9,8 %*	*10,5 %*
Income Taxes	-2,5	-2,6	-3,4	-4,2	-5,2
EAT	**1,2**	**2,3**	**3,7**	**5,0**	**6,6**
Margin	*2,5 %*	*3,8 %*	*4,8 %*	*5,3 %*	*5,9 %*
Minorities	0,1	-0,1	-0,2	-0,3	-0,3
Net Profit	**1,3**	**2,2**	**3,5**	**4,7**	**6,3**
Margin	*2,5 %*	*3,8 %*	*4,8 %*	*5,3 %*	*5,9 %*
Earnings per Share	**0,37**	**0,53**	**0,55**	**0,74**	**0,99**

Source: LBBW

Balance sheet € mn	2002/03	2003/04	2004/05e	2005/06e	2006/07e
Assets	**48,3**	**68,8**	**93,7**	**96,6**	**99,9**
Goodwill	6,8	7,1	7,1	7,1	7,1
Other intangible assets	3,9	7,2	7,9	8,7	9,6
Tangible assets	3,7	6,7	7,4	8,2	9,0
Financial assets	0,8	0,7	0,8	0,9	1,0
Other fixed assets	0,1	0,1	0,1	0,1	0,1
Fixed assets	**15,2**	**21,9**	**23,3**	**25,0**	**26,7**
Inventories	12,8	20,9	19,9	18,9	18,0
Trade receivables	13,0	17,8	21,4	25,7	30,6
Other receivables and assets	4,7	4,6	4,9	5,3	5,8
Cash and cash equivalents	2,7	3,5	24,1	21,7	18,8
Current assets	**33,1**	**46,9**	**70,3**	**71,6**	**73,1**
Liabilities	**48,3**	**68,8**	**93,7**	**96,6**	**99,9**
Equity	22,9	30,2	51,6	52,7	54,1
Minority interests	- 0,7	0,1	0,1	0,1	0,1
Pension provisions	0,0	0,0	0,0	0,0	0,0
Other provisions	2,3	4,7	5,2	5,7	6,3
Financial liabilities	14,9	24,1	23,3	22,9	22,5
Trade payables	6,5	7,8	9,2	10,6	11,9
Other liabilities	2,5	2,5	2,5	2,5	2,5

Source: LBBW

5 Glossary.

Anaemia	Deficiency of red blood cells
Angiodysplasia	Congenital vascular malformation
Antireflux	Heartburn
Arteriosclerosis	Hardening of the arteries
Balloon catheter	Special catheter that has a balloon at its tip which expands when filled with fluid.
Bio-chips	Small chips made of carrier material that contain DNA information
Cardiovascular	Relating to the heart and vessels
Cascade	Process that unfolds gradually
Catheter angiography	A type of X-ray used to image vessels by passing a catheter through the vessels to be examined (e.g. neck or brain arteries). It is possible to show even the slightest changes with utmost precision.
Cervical cancer	Cancer of the neck of the uterus
Cognitive	Relating to perception
Colon	Main section of the large intestine
Convection	Transport of material or energy in a moving medium, e.g. of heat with flowing blood
Cornea	Fibrous coat covering the eye
Coronary arteries	Arteries that supply blood to the heart tissue
Degenerative disease	Disease of the fundus of the eye
Dialysis	Procedure for cleaning the blood
Diffusion	Any displacement of molecules caused by thermal molecular motion.
Dilation	Expansion of the stenosis using a balloon catheter
Diverticulum	Protrusions of the intestinal wall
Dyspepsia	Diarrhoea and vomiting
Embolism	Sudden closure, usually of a vessel, by an embolus
Erythrocytes	Red blood cells
FAP	Abbreviation of Familial Adenomatous Polyposis. Hereditary disease - hundreds to thousands of intestinal polyps develop at an early age that can later turn malignant.
Haemorrhagic	Bleeding from vessels
Hidden bleeding	Bleeding that cannot be seen by the naked eye
Hybrid scanner	Combination scanner
Hypoalbuminaemia	Protein metabolism disorder
Ischaemic	Bloodless
Lesions of the small intestine	Damage to the small intestine
Macrophages	Adherent or accessory cells
Magnetic resonance therapy	Physical procedure in which low-frequency electromagnetic pulses of a certain frequency, strength and structure are passed through the entire body or individual parts of the body. The aim is to improve circulation, strengthen and harmonise the immune system and alleviate pain.
Magnetic resonance imaging	A method of diagnosis used to show the internal organs and tissue using magnetic fields and radio waves.
Metabolisation	Effect of a drug in the body and excretion
Minimally invasive	With the least surgical invasion possible
Monoclonal	stemming from a single cell clone
Morphological	Relating to the shape and structure of a body or an organ

Necrotic	Dead
Nephrology	The area of medicine dealing with diseases of the kidney and urinary tract
Non-steroidal anti-inflammatory drugs	Strong anti-inflammatory and pain-relieving drugs
Nuclear magnetic resonance imaging	See magnetic resonance imaging
Obese	Suffering from obesity
Occlusion	Closure, e.g. of a vessel wall
OECD	Abbreviation of Organisation for Economic Co-operation and Development
Osmosis	Movement of water molecules through a membrane that separates two different solutions until there is an equal concentration on both sides.
Peutz-Jeghers syndrome	Pigment spot polyposis with pigmentation of the lips and face
Piezoelectric receiver	Crystals are electrically charged through mechanical pressure. The crystal atom is polarised when the atomic shell is pushed against the atomic core. Electric fields, in turn, can regenerate mechanical oscillation in the crystal.
Polyp	Protrusion of the mucous lining
Positron emission tomography	Imaging of pathological change based on changes in glucose metabolism in these regions. A radioactive substance is attached to a glucose solution and injected into the bloodstream and thus diffused throughout the body. The solution accumulates a higher concentration where pathological changes are present. The doctor then sees this accumulation as a „hot spot“ or site of activity during measurement.
Predisposition	Hereditary susceptibility to diseases
Radiation carcinoma	A form of skin cancer that develops in skin damaged by X-rays.
Radionuclide	Element with an unstable atomic nucleus
Restenosis	Recurrence of stenosis after stent implantation in the treated area
Stenoses	Constriction of a vessel
Test kit	Rapid test
Ulceration	Formation of ulcers
Vagus nerve	Cranial nerve
Varices	Varicose veins
X-ray dermatitis	Skin reaction after radiotherapy

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