

# Elekta: Growing from the Head Down

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**Summary:** Elekta established its reputation with the Leksell Gamma Knife for neurosurgery. Now, after a turnaround, it is expanding into a comprehensive cancer care company.

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## Elekta: Growing from the Head Down

***Elekta established its reputation with the Leksell Gamma Knife for neurosurgery. Now, after a turnaround, it is expanding into a comprehensive cancer care company.***

By Stephen Levin

- Lars Leksell, a pioneering neurosurgeon, founded Elekta to fulfill his 1930s vision of minimally-invasive neurosurgery: procedures without incisions.
- Through his *Leksell Gamma Knife*, the Swedish company became the global leader in stereotactic neurosurgery.
- Efforts to expand beyond neuro brought hard times, but a patient board and shareholders enabled management to effect a turnaround.
- Laurent Leksell wrapped up his 30-year CEO tenure with a flurry of dealmaking, leaving his successor a broad-based oncology company.

Assume you are the president and CEO of a publicly-traded, technology-driven medical device company. For the first 15 years of the company's existence, it has established itself as the technology leader in its space and built strong positions in several of the world's leading markets, including the US and Japan. But after a record-setting year of profits, the combination of an economic crisis in the geographic market that's responsible for one-third of the company's revenue and a harder-than-expected acquisition integration causes the bottom to fall out of your business. Your market cap drops by nearly 90%, as does your stock price, and you are forced to layoff roughly one-third of your employees. Hardly a scenario that inspires confidence in terms of your job security, particularly in today's business climate.

What did the board do in that case? Nothing. That is to say, the board did not respond with a knee-jerk "Dump the management" solution, as so often occurs. Rather, they supported the management team that was in place and their ultimately successful efforts to get the company back on track.

That is the story of Stockholm, Sweden-based **Elekta AB**, which today is reaping the dividends of the patience exercised by its board of directors, and the success of its longstanding management team in overcoming what turned out to be a four-year downturn. Indeed, in the four years since the 1997-2001 drop-off, Elekta has reported the best financial results in the company's 34-year history. That enabled Laurent ("Larry") Leksell, who headed the company during that period of decline, to conclude his 30-years as president and CEO in 2005 (the longest CEO tenure in any Swedish public company) on an up note. No doubt his late father, Lars Leksell, MD, who founded Elekta, would be very pleased at his son's and the company's success, especially since neither one of them was initially interested in getting involved in the business. And it leaves his successor, Tomas Puusepp, the company's former VP of sales and marketing, in a strong position as he looks to continue to grow Elekta from a company once associated with a single product to one known for providing comprehensive cancer care solutions.

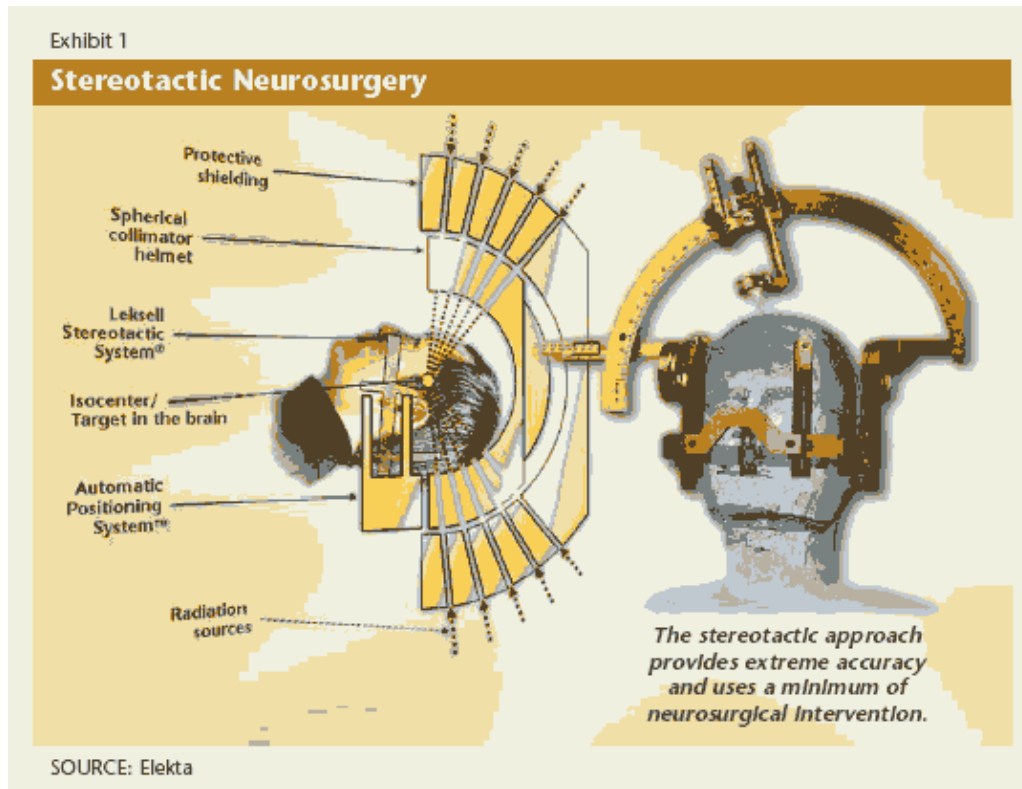
## Birth of the *Gamma Knife*

When Lars Leksell was attending medical school in the 1930s studying to be a neurosurgeon, the mortality rate for patients undergoing brain surgery was around 60%, meaning you had a better chance of dying than surviving those procedures. Early in his career, Leksell had the notion that the mortality rate could be reduced by minimizing the surgical access into the skull. That marked the beginning of his lifelong interest in developing minimally invasive procedures and devices for neurosurgery.

Leksell became chief of neurosurgery at the Karolinska Institute, one of Stockholm's leading medical centers and teaching hospitals. There in the late 1940s, he invented the stereotactic (guiding) frame (a rigid metal frame externally affixed to the skull to help physicians locate and reach structures within the brain), and in 1949, he introduced the *Leksell Stereotactic System*, which enabled neurosurgical instruments to be positioned more precisely in the brain.

This early research was the classic case of a technology in search of an application. Since physicians then didn't have the benefit of modern imaging technology, they had to rely on brain atlases to determine the locations of critical structures. In order for surgeons to precisely target these structures, there had to be both a frame of reference and a means by which the patient's head would remain rigid during a procedure. Those were the goals of the stereotactic frame. As to its potential applications, Leksell theorized that the system could be used in the treatment of Parkinson's disease to hold the patient's head still so that the physician could locate the thalamus and administer a therapeutic radiation dose with a non-invasive radiation beam, thereby providing the added benefit of avoiding open surgery.

The concept of stereotaxy proved to be an important advance in neurosurgery. In 1951, neurosurgeons used Leksell's stereotactic frame for the first time to direct X-ray beams into the brain to treat tumors and other brain disorders. This led Leksell to begin working with Borje Larsson, a radiation biologist with the Gustaf Werner Institute of Uppsala University, in an effort to combine radiation beams with stereotactic devices to enable surgeons to precisely target structures within the brain. The result was the construction, in 1968, of the first *Leksell Gamma Knife*, with funding from the Swedish government (prior to Elekta being formed), and the birth of what Lars Leksell termed stereotactic radiosurgery. (See *Exhibit 1*.)



Leksell's and Larsson's idea was to design and build a device to deliver an intense, precise radiation beam capable of destroying certain tissue while inflicting only minimal damage on surrounding structures. Leksell's theory about the potential application of this technology to treat Parkinson's disease proved correct, and he successfully treated patients through the early 1970s with this system. His timing was off, however: around that same time, the drug dopamine became available as a treatment for Parkinson's, largely obviating the need for surgery of any kind. (Ironically, Leksell's stereotactic frame has re-emerged as an important tool in newer Parkinson's treatments such as neurologic implants that must be placed precisely within the brain.)

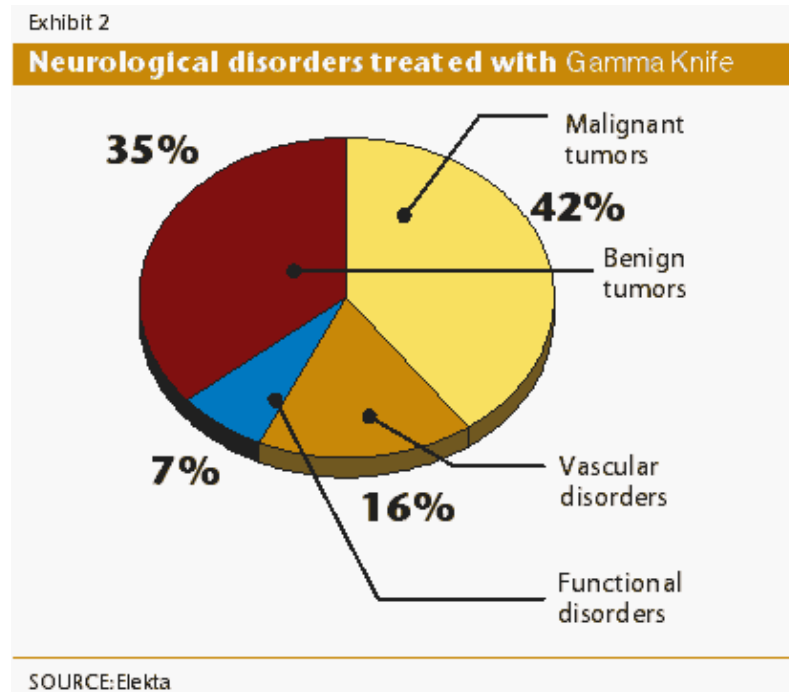
But the primary obstacle to increased early adoption of the *Leksell Gamma Knife* was the lack of advanced diagnostic imaging technologies in the late 1960s and early 1970s. Indeed, advances in radiation treatment generally can be tied directly to improvements in both imaging and computer technology.

## **Gamma Knife Goes Commercial**

The first major advance in imaging was the introduction of the computed tomography (CT) scanner in 1972, the same year that Lars Leksell founded Elekta. This enabled surgeons and radiation oncologists to begin more clearly defining the exact location, shape, and volume of a tumor. And this process has continued to improve with the development of subsequent advances in imaging technology such as magnetic resonance imaging (MRI), positron emission tomography (PET), magnetoencephalography (MEG), and cerebral angiography.

Most radiosurgery procedures are performed on an outpatient basis with only local anesthesia used during placement of the stereotactic frame on the head and then a light sedative. (Pediatric cases are performed under general anesthesia.) The patient lies down and the location of the target is identified in the brain using any of the diagnostic imaging tools identified above. The frame is used to position the patient's head inside a large, helmet-like device with small openings called collimator ports, through which radiation beams are directed at the targeted structure. More than 350,000 patients have been treated to date with the *Leksell Gamma Knife* for a variety of neurological disorders, including malignant and benign tumors and both vascular and functional

disorders. (See Exhibit 2.)



Larry Leksell notes that his father was never interested in the commercial development of the *Leksell Gamma Knife* or any of his innovations; he was simply looking for additional funding for his research efforts. Indeed, the only reason that Lars Leksell founded Elekta was to protect a larger share of incoming product royalties from the onerous Swedish tax code. Initially, the company was basically a research entity and had no employees. Larry Leksell served first as an informal administrator, and several years later was given the title of president and CEO, although he continued to work only on a part-time basis.

But Larry didn't have a commercial bent either; his interest was in academia. He received an MBA from Harvard and a PhD from the Stockholm School of Economics, where he became a faculty member. He then launched a successful management consulting firm, all the while continuing to manage the limited operations of fledgling Elekta.

Larry Leksell acknowledges that for all of his father's talents as a surgeon and inventor, he had no interest in business, although he was a good enough salesman to convince his son to remain involved with the company. Larry Leksell's business acumen proved useful when Elekta's R&D demands led to a financial crisis in 1979.

"My father stepped up his own research and development in stereotactic surgery in order to try to accommodate digital imaging, particularly CT scanning, which had just emerged in the 1970s," Larry Leksell recalls. Lars Leksell's idea was to bring the CT scanning technology into the OR so that the surgeon could apply pre-operative imaging in real time during the procedure to provide a visualization component to radiosurgery. This marked some of the early efforts to develop image-guided surgery systems.

The merging of digital imaging with radiosurgery was a significant step forward because it provided surgeons with the visualization technology they needed to improve stereotactic procedures, but it was also quite expensive for Elekta. The company incurred losses of around \$150,000 at a time when its revenue only amounted to roughly \$15,000 annually. Larry Leksell thought that the best way to fund this R&D would be to sell these innovations to large device companies, but none were interested. Instead he was able to obtain local bank funding that helped Elekta develop its image-guided surgery system.

The company remained primarily a vehicle to help finance Lars Leksell's stereotactic research. In 1982, ten years after its founding, Elekta only had three employees (not including Larry Leksell, who never took a salary for running the company). In 1983, Elekta's US distributor of the stereotactic frames ran into trouble, and the company made the decision to begin selling direct in its largest market, opening its first foreign subsidiary in Atlanta. This decision to establish a US presence and sell direct reflects Lars Leksell's philosophy that the company should build strong relationships with its physician customers, a belief that Larry Leksell says comes directly from his father's close relationships with his patients as a surgeon. Being close to their customers continues to be an important part of Elekta's mission, and one that company officials believe is responsible for their excellent reputation among physicians.

By 1985, Elekta was generating nearly \$1 million in annual revenue, primarily from stereotactic frames that surgeons were using to guide placement of instruments during deep brain surgery. The only *Leksell Gamma Knife* in existence was the prototype. "Elekta was far too small to develop the *Leksell Gamma Knife* technology because the machine was much more expensive to build than its limited market could support, so it was used primarily for scientific research," Larry Leksell recalls.

But in the mid-1980s, with the advances in diagnostic digital imaging that had taken place, interest in the *Leksell Gamma Knife* began to pick up. By that point, a small group of neurosurgeons from a number of different countries had trained with Lars Leksell on this device in Stockholm, and the company was receiving inquiries about whether they could provide a commercial version of the *Leksell Gamma Knife*. One of the first such inquiries came from L. Dade Lunsford, MD, a neurosurgeon at the **University of Pittsburgh Medical Center** (UPMC), who had trained with Lars Leksell and maintained a similar interest in minimally-invasive neurosurgery. (Today Lunsford is the Lars Leksell professor of neurological surgery and radiology oncology and chairman of the department of neurological surgery at UPMC, and a consultant to and shareholder in Elekta.)

"When my father came to me and asked if we could build a *Leksell Gamma Knife*, I thought at first he was joking," says Larry Leksell. "The expense of updating the prototype, gaining regulatory clearance, and then commercially launching the system was way beyond Elekta's financial resources; it would have required a \$3-to-\$5 million investment by the company." Larry Leksell then asked his father how big was the market for this device, which he estimated at three units.

But in re-thinking his father's proposal, Larry Leksell says he had great respect for the surgeons like Lunsford who were making these requests and decided that commercializing the *Leksell Gamma Knife* was worth trying. "I told Dade Lunsford that we'd have to have receive their payment up front because otherwise we couldn't afford to build the system, and to my surprise, the hospital CEO agreed," Larry Leksell notes. The result: the first commercial *Leksell Gamma Knife* was delivered to UPMC in 1986, the same year that Lars Leksell died of a sudden heart attack at age 76.

Larry Leksell notes that while his father had little interest in the operations of the business, he did convey to the company certain underlying principles that remain at the core of Elekta's mission. First was that the company remain close to its customers, and equally important, Lars Leksell believed that patient needs should dictate product development and that the company should be able to demonstrate with clinical evidence the improved outcomes that result from its devices. (The Leksell family remains well represented at Elekta. In addition to Larry's role, his brother, Dan, a physician, heads the company's clinical research department.)

## Elekta Goes Commercial

With Lars Leksell's death in 1986, Elekta was at a crossroads. The company had five employees and was generating nearly \$20 million in annual revenue, having just begun commercializing the *Leksell Gamma Knife*. "I had to make a decision about whether to continue running Elekta or whether to sell it to a company

that could grow the technology," Larry Leksell recalls. He shopped the company around to some obvious potential buyers, including large radiation therapy companies like **Varian Medical Systems Inc.** and **Siemens AG**. But no one was interested.

Around the same time, the small group of young neurosurgeons who had trained with Lars Leksell at Karolinska, like Dade Lunsford, were beginning to explore expanding the use of the *Leksell Gamma Knife* from just functional neurosurgery (treating conditions like Parkinson's) into vascular surgery and tumor management. Tomas Puusepp points out that Lars Leksell first used the *Leksell Gamma Knife* for treating functional disorders but was hampered by the lack of diagnostic tools, so he then focused on vascular malformations, which could be identified using cerebral angiography. "Vascular malformations were the first successful applications of the *Leksell Gamma Knife*, not tumors, which is what we're currently most widely known for," he says. Puusepp also notes that the company is once again exploring using the *Leksell Gamma Knife* to treat functional disorders since new imaging technologies such as PET, MEG and SPECT can now identify the locations in the brain that require treatment.

The surgeons who had studied with Leksell found that they were able to achieve better clinical results using the Elekta device than they could through traditional surgical approaches. The emerging interest of these surgeons in expanding the *Leksell Gamma Knife*'s applications helped convince Larry Leksell of the company's potential. In 1986, he decided that he should not only continue running the company, but that he should sell his consulting firm and make Elekta his full-time job. That marked the beginning of Elekta's transition from a research-focused organization to a commercial venture. An important part of that transition was Leksell's decision to hire his eventual successor, Tomas Puusepp, an experienced medical device executive, in 1988 to run Elekta's sales and marketing efforts.

The company's commercial growth was made possible by the advent of advanced imaging modalities, which were the enabling technologies that Elekta needed to demonstrate the real value of the *Leksell Gamma Knife*. The two technologies were truly complementary and together marked the birth of stereotactic (frame-based) radiosurgery.

"We developed imaging tools like CT and MRI scans to recognize problems, but we didn't have surgical tools to treat them," Dade Lunsford explains. "Stereotactic techniques became the interface between the imaging definition of a problem and the ability to actually treat it effectively with low risk without the need to make invasive corridors to reach something deep within the brain and risk destroying functioning brain tissue."

The *Leksell Gamma Knife* was, according to Lunsford, "the most creative and dramatic tool because it was 'no incision surgery.'" It used the biological benefit of tiny focused beams of radiation coming from all around the head to inactivate a target in the depths of the brain without the need for any kind of incision. But the key to successful radiosurgery was precise targeting. "The surgeon not only had to see the target, but had to be able to deliver the destructive energy force to a very small area with a precision of less than a millimeter, and that's what these new imaging technologies allowed," he explains.

Radiosurgery (whether performed using the *Leksell Gamma Knife* or using a conventional linear accelerator or "linac" as the radiation source) is a significant departure from traditional radiation therapy (radiotherapy). Radiosurgery uses an intense dose of high energy radiation to destroy a brain tumor in a single treatment generally, whereas radiotherapy employs lower levels of radiation administered in multiple or so-called fractionated treatments. The high radiation dosage delivered during radiosurgery creates the need for precise delivery in order to minimize potentially severe damage to surrounding tissue and organs. Targeting accuracy in radiosurgery must be on the order of one-to-two millimeters, whereas conventional radiation therapy has targeting accuracies that are typically on the order of one centimeter or more.

The stereotactic frame became an important tool for achieving the level of accuracy needed to target a tumor in radiosurgery. Since traditional radiosurgery instruments do not employ image guidance technology,

surgeons use the frame to provide a reference point during CT imaging and to immobilize the patient's head during treatment to ensure precise delivery of the radiation.

Competitors claim that many patients are unwilling to undergo *Leksell Gamma Knife* treatments because of the frame requirements. Indeed, other companies, such as **Accuray Inc.**, have developed frameless radiosurgery systems. (See "*Accuray: Tightly Targeting Tumors*," IN VIVO, April 2001 [A#2001800090].) Dade Lunsford, who headed Accuray's medical advisory board for several years, strongly disagrees. "The reality is that it's all about accuracy and precision," he says. "Stereotactic guiding devices attached to the head provide a degree of accuracy, precision, reliability, and reproducibility that cannot be matched by any other technique."

Lunsford points out that patients generally appreciate the fact that stereotactic radiosurgery can be performed in one four-to-six hour session, instead of having to undergo as many as 30 daily sessions of radiotherapy. He notes, "We have treated almost 8,000 patients with the *Leksell Gamma Knife* at our center since 1987 and I have never had a patient who has had any concern related to the usage of the rigidly-affixed guiding device—it's a non-issue."

Early on, the *Leksell Gamma Knife* was not widely embraced by neurosurgeons. "Initially, most neurosurgeons thought radiosurgery was a fad and had no interest in it whatsoever," Larry Leksell recalls. Indeed, the initial adopters of the system were a small group of surgeons, most of whom trained with Lars Leksell.

Nevertheless, the interest from the small group of early adopters was sufficient to provide the company with prospective customers because these surgeons were urging their hospitals to acquire a *Leksell Gamma Knife*. This meant that Elekta could no longer rely on cash in advance to finance the building of these machines, as was the case with the first unit that UPMC bought—the company needed to raise additional financing.

## Looking Beyond the Head

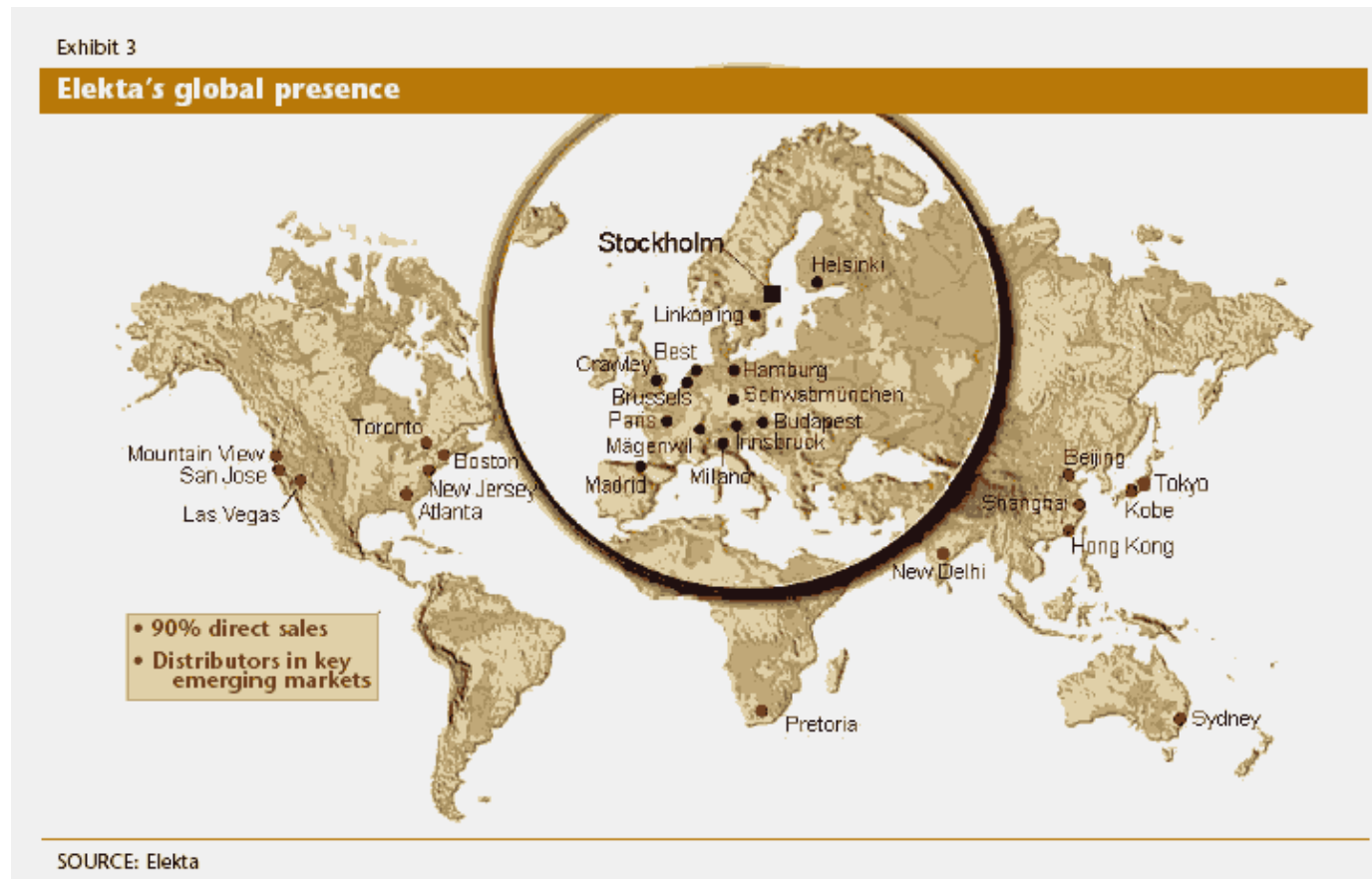
In 1989 and 1992, Elekta did two private financing rounds. The first round came primarily from Scandinavian investors, and the second round included US and UK institutional funding. This additional capital enabled the company to expand its presence in the US and begin establishing itself in Asia, both of which have been Elekta's two largest markets. The company has never derived significant revenue from the European market, which Larry Leksell attributes to Europe's general skepticism concerning the use of radiation and the financial constraints that limit health care spending in Europe, a trend that is particularly significant for capital equipment purchases like a \$3–\$4 million *Leksell Gamma Knife*. "There are more [*Leksell Gamma Knife*] units in Miami than in all of Scandinavia, and more in Seoul, South Korea, than in all of the UK," he says.

Also, the reimbursement environment for *Leksell Gamma Knife* surgery is better in the US and Japan than it is in Europe. Elekta has done a lot of work to improve US reimbursement, which was increased 28% effective in January 2006 to a level that the company claims is 32% higher than that for linac-based stereotactic radiosurgery. "We were successful at benchmarking the *Leksell Gamma Knife* against traditional neurosurgery, which is a complex procedure that is well reimbursed," Tomas Puusepp explains.

Elekta's continued growth and need for capital resulted in the company going public in March 1994 on the Stockholm Stock Exchange—the company's share price increased 40% on the first day of trading. "We were growing nicely with good profitability but we knew we had to expand our product lines, which was likely to involve acquisitions, and to do so would require additional resources so it made sense to go public at that time," Puusepp says.

The company was looking to finance growth in a number of areas. First, it was expanding the markets for the

*Leksell Gamma Knife*. Indeed, in 1996 it opened its second foreign subsidiary by establishing a presence in Japan. In the mid-1990s, Elekta was generating \$40 million in annual revenue, with 50% of that coming from the US, 45% from Asia, and 5% from Europe. (The company's home market, Sweden, has seldom generated more than one percent of Elekta's revenue.)



Elekta company officials also recognized that while the *Leksell Gamma Knife* offered opportunities for growth potential, the system has its inherent limitations. Because of the need for a stereotactic frame, the device can only be used to treat the head. It's not practicable to attach frames elsewhere on the body. Since 90% of all solid tumors occur outside of the head and neck, that means only a relatively small group of cancer patients can be treated with the *Leksell Gamma Knife*. The company knew that the opportunities for significant growth would require moving into more broad-based radiation therapy approaches, which meant expanding Elekta's capabilities to provide linac-powered radiotherapy and radiosurgery systems.

"We recognized that it was time for us to take what we'd learned in the brain and apply that to the rest of the body," Tomas Puusepp says. Not long after its IPO, Elekta commercialized a whole-body stereotactic frame and began conducting clinical research at the Karolinska Institute into stereotactic radiotherapy using the hospital's linac as the radiation source. These trials produced positive results, which encouraged the company to get into the radiotherapy business. But Elekta lacked one important piece of technology: it didn't have a radiation source, so the company set out in search of a linac.

Larry Leksell realized that it would be too costly and take too long for Elekta to duplicate its experience with the *Leksell Gamma Knife* in terms of internally developing the technology it would require to build its radiotherapy business, including a linear accelerator. The result was Elekta's first foray into M&A with three acquisitions in the space of three months.

## Acquisition Spree

The company sought to achieve several goals through this series of acquisitions. One was to expand its neurosurgery product line to provide its reps and distributors with more reasons to get in front of their physician customers. Elekta sought to address that need with the acquisition of the **Johnson & Johnson's** Cordis Neuroscience division in December 1996. [W#199610259]

The company was also interested in developing image-guided surgery (IGS) technology that it believed could prove useful both in neurosurgery and radiosurgery. In the same month as the Cordis deal, Elekta acquired DeeMed, an IGS start-up.

But Elekta's primary goal, to acquire its own linac technology, remained unmet. Leksell and Puusepp scoured the market but didn't find a property that would meet the company's radiation-producing needs. Finally, in 1997, one of Elekta's competitors, **Philips Medical Systems International BV**, decided to get out of the radiotherapy business. In February 1997, Elekta acquired that business from Philips for approximately \$60 million. [W#199610258]

As is often the case with acquisitions, the deal was the easy part; the real challenge was integrating these new businesses into the existing operations, and Philips was the most difficult. Philips's radiotherapy business did not exist as one entity in a single location; rather, it was spread across a number of different facilities throughout the world. So Elekta was faced with having to decide how to consolidate these newly-acquired people and facilities with its existing resources. Indeed, Elekta continues to maintain its radiotherapy manufacturing facilities in Crawley, UK, the site of a former Philips plant.

Puusepp also points out that the acquired entity was twice the size of Elekta and that there weren't significant synergies, which made integration more difficult and expensive. That added to the debt Elekta incurred in making the acquisition. "The two companies really had complementary products, so there wasn't much overlap and not a lot of cost synergies," he explains. Each company was also selling to a different physician customer—Elekta at the time was working primarily with neurosurgeons and Philips was largely selling to radiation oncologists, reflecting the differences between radiosurgery and radiotherapy.

Another problem that Elekta encountered was Philips's sub-standard levels of quality and customer service, especially relative to Elekta which has always prided itself on being a technology leader and maintaining good customer relations. "Once we made the acquisition, it became clear to us that Philips had not really focused on its radiotherapy business, and as a result they had serious problems," Puusepp explains. "You could see that in their product development and in how they approached the market, so as a result, they did not have the best reputation in the marketplace at that time." Elekta was forced to invest substantially more money than they'd planned in order to improve the overall quality of the former Philips operations.

Elekta was pleased with the design of the radiotherapy system. Tomas Puusepp points out that the Philips linac system remains the only fully digital system in the market. "We believed that would fit in well with what we saw as the future of cancer care, which will involve remote diagnostics, sophisticated computer workflow systems, and other advanced technology," he says.

## A Crisis in the East

At the same time that Elekta made the initial investment to acquire the Philips operations and the subsequent investment to improve the overall quality, the company was also in the middle of a significant internal R&D effort that, together with the Philips deal, would greatly enhance its radiotherapy capabilities. The internal effort was focused on developing a system capable of delivering what was emerging in the mid-1990s as the new standard of care for radiotherapy: intensity modulated radiation therapy (IMRT).

Just as advances in imaging technology enabled the growth of radiosurgery, so too did these advances make possible improvements in radiotherapy by enabling physicians to better define the exact location, shape, and volume of a tumor, and to target them from a number of different angles to make therapy more precise and limit collateral damage. Radiation therapy has also benefited from advances in ancillary technology such as simulators to help better position patients and sophisticated software, which improved pre-treatment planning and helped link imaging scanners to radiation therapy systems.

These advances made possible what was called integrated conformal therapy (ICT) in the early 1980s, which better conformed the radiation to the shape of the tumor, and integrated a variety of imaging and treatment planning tools into the therapy to improve accuracy. IMRT further improves the ability to conform the radiation to the shape of the tumor through the use of computerized beam-shaping devices known as multi-leaf collimators. Recent advances include the addition of image-guided surgery technology to further improve the accuracy and precision of IMRT therapy. While a small company called Nomos Corp., (now **Nomos Radiation Oncology**), a division of **North American Scientific Inc.**, was the first to develop an IMRT system, all of the large radiotherapy companies quickly got into the market. So Elekta, in developing its *Synergy* image-guided radiation therapy system, is looking to compete with major players like Varian and Siemens, who are numbers one and two in this space, respectively, and it aimed to be the technology leader. (Puusepp acknowledges that Elekta is currently third in this market, but claims the company is now taking market share from Siemens.)

While Elekta was dealing with the challenges of integrating the Philips acquisition and developing its IMRT system, the Asian economic crisis hit. For the company that meant that the bottom fell out of its second largest product market. During a six-month period in 1997, the markets responsible for 45% of Elekta's revenue basically disappeared, and its market cap and share price followed suit, with each declining by roughly 90%. And these markets, along with Elekta's business, remained depressed for nearly four years. Indeed, the company was forced to lay-off one-third of its 1,200 employees.

The company's board exhibited tremendous patience with the management team, keeping everyone in place and allowing them to manage Elekta out of this crisis. "We recognized that we could not sustain our efforts at building a broad-based neurology company with products in many small market segments," Larry Leksell explains.

With the Philips deal giving Elekta access to linac technology, that gave the company a presence in radiotherapy and radiosurgery, two significant potential opportunities in neurology and oncology. To focus on those larger markets, Elekta decided to divest several of its smaller, non-core neuro products, many of which it had only recently acquired. Elekta wound up selling several of those products, including the image-guided surgery business, to **Medtronic Inc.**, where today they form the basis of that company's **Surgical Navigation Technologies Inc.** (SNT) division. [W#199910250]

## Back to Basics

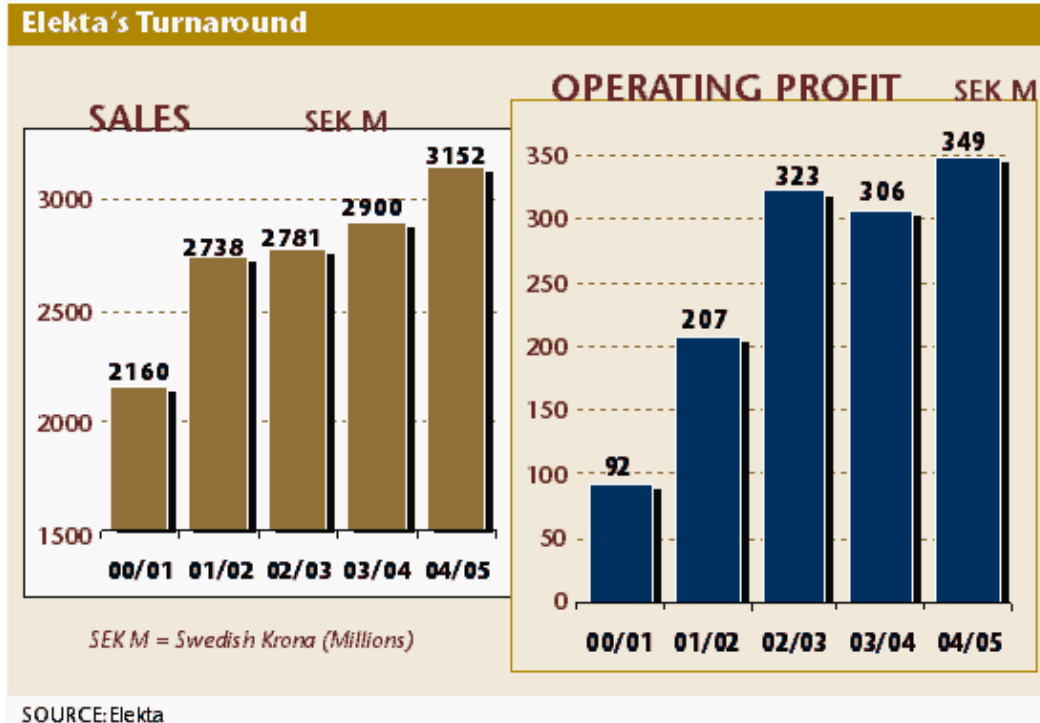
The Asian economic crisis triggered a major restructuring at Elekta as it narrowed its focus. The company reorganized into two product areas: neurosurgery, which includes *Leksell Gamma Knife* and stereotactic surgery, and oncology, which is largely centered around radiotherapy, although the two obviously overlap. "We needed to do significant downsizing and restructuring because we had problems in all areas," Leksell explains. "This wasn't a case of restructuring to improve profitability when your balance sheet is still solid. Our P&L was awful, cash-flow was highly negative, and the balance sheet was weak."

Tomas Puusepp explains that the businesses that Elekta divested weren't unprofitable. Rather, they didn't have critical mass in their space so they diluted the company's focus. "It was very difficult to combine small items with our big ticket items, so we decided to focus on the big areas, which are radiotherapy and

minimally-invasive and non-invasive surgery," he says.

By 2000-2001, Elekta was beginning to emerge from this down cycle, but according to Puusepp, one area of the company still needed improvement and that was its US operations. In 2000, he moved to Atlanta for three years and reorganized Elekta's US organization. By 2001, the company's overall profitability was improving dramatically. Indeed, in 2002, Elekta had its best year in terms of sales, and has exceeded the previous year's standard in each succeeding year to date. Total sales in 2005 represented a 76% increase since 1998.

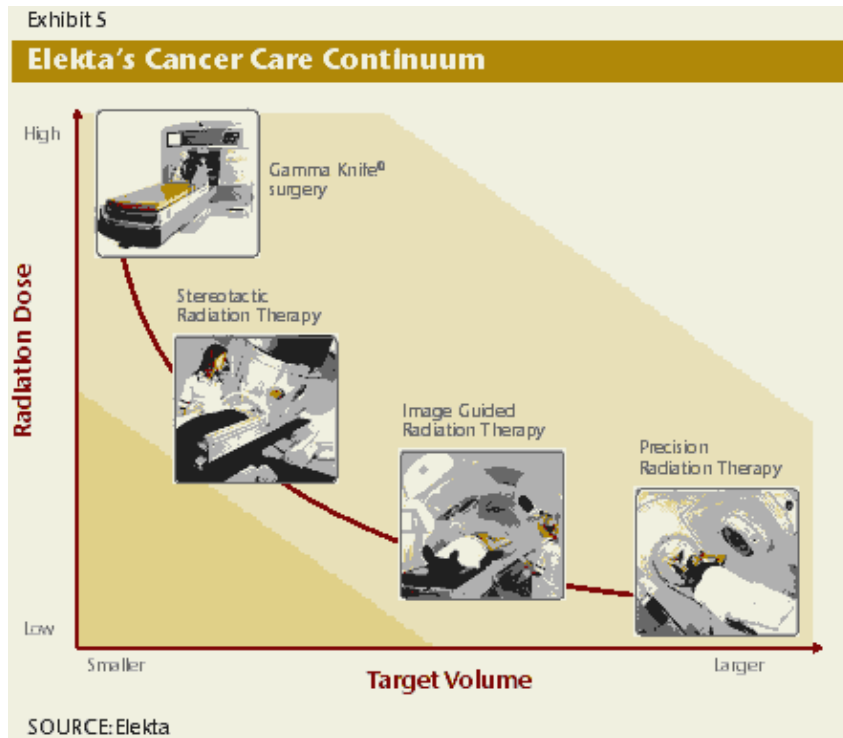
Exhibit 4



Fueling this recent growth have been the advances the company has made in radiotherapy, particularly the roll-out of its *Synergy* image-guided radiation therapy system, as well as the company's stereotactic radiotherapy products. The major challenges in radiation therapy are proper patient positioning and allowing for the movement of internal organs, both of which create the need for precise visualization of the target at the time of treatment.

While current radiation therapy techniques allow for tight conforming of the radiation to the target, Tomas Puusepp points out that the challenge then becomes determining if the target is in the right place because people and internal organs move. The result can be the administering of what's thought to be a conforming dose to the wrong shape or volume target. By integrating the ability to deliver three-dimensional images of organs and tumor tissue with radiation administration, Puusepp says the *Synergy* system enables physicians to adjust radiation delivery precisely at the time of treatment.

By being able to provide both radiosurgery and radiotherapy systems, Elekta has been able to begin realizing its goal of providing comprehensive cancer care. The company is helping to create approximately a dozen hospital-based "Stereotactic Centers of Excellence" in the US that offer a broad range of cancer therapies and house both the *Leksell Gamma Knife* and the *Synergy* image-guided radiotherapy system. These centers can offer intra-cranial stereotactic radiosurgery, and hypo-fractionated stereotactic radiosurgery and stereotactic radiotherapy to treat tumors in the spine, liver, and lungs. Tomas Puusepp estimates that these centers are capable of providing more than 70% of all types of radiotherapy treatments, including IMRT.



Elekta also believes there continues to be room for significant growth in *Leksell Gamma Knife* sales. Puusepp points out that, with a current installed base of 259 units (100 in the US), that product has penetrated only an estimated one-third of its available market.

The company's turnaround has also enabled them to once again become active on the acquisition front. Having Puusepp reorganize Elekta's US operations was only part of the solution to bolstering sales in the company's largest market. "It was clear that we didn't have the necessary IT solutions in our product portfolio to be able to provide integrated oncology management support to our customers," Larry Leksell notes.

To address that gap, Elekta began working with Mountain View, CA-based Impac Medical Systems, which provides IT capabilities for streamlining clinical and business operations across the spectrum of cancer care, e.g., managing the entire workflow from pathology to imaging to practice management.

Tomas Puusepp points out that working with Impac enabled Elekta to fill in a key missing piece in its strategy to become a comprehensive cancer care company: relationships with radiation therapy providers. After working with Impac for more than two years, Elekta acquired that company in April 2005 for \$190 million. "This was particularly important to help us gain new business in the US because the Impac acquisition gives us immediate new relationships with more than 1,000 radiation therapy clinics in the US, most of which currently use Varian equipment," he points out.

Elekta also did a second acquisition last year, buying **Medical Intelligence**, a small German start-up, that is developing innovative patient positioning systems for radiation oncology. That deal was valued at around \$20 million. "The reason for the Medical Intelligence deal is the need for additional precision," Puusepp explains. "The development of IMRT and image-guided radiotherapy places greater emphasis on precise patient positioning, and we felt that was a missing link in our product portfolio."

## Not Just "The Gamma Knife Company"

Although he had been with the company for 17 years prior to assuming the positions of president and CEO of

Elekta, Tomas Puusepp is still a relative newcomer compared to the tenure of his predecessor. Adding to the potential pressure Puusepp faces in his new position is not only the fact that Larry Leksell had been in that job for 30 years, but also that he is the son of the company's founder and its largest shareholder.

Puusepp admits that, "According to the textbooks, I should never have taken the job, but Larry and our board can be very persuasive." He and Leksell discussed his ascension to this position for three years prior to Larry Leksell stepping down. Leksell's current role is to focus on overall corporate strategy and key customer accounts. "It was a very smooth transition, and the company has much more management depth today as a consequence of our planning this process than ever before in its history," Leksell says.

Elekta appears to have emerged from its crisis not only leaner but more focused on opportunities in major markets. While the company is still seen by many as the *Leksell Gamma Knife* company, that product accounts for only 25% of Elekta's current revenue. By restructuring itself as a broad-based oncology company, Elekta is looking to avoid being pigeon-holed as it was in its early days as a one-trick pony.

Indeed, the company has launched a major effort to reorganize itself along both vertical and horizontal lines in order to build what many oncology companies are aspiring for: a comprehensive cancer care company. Oncology has not yet undergone the kind of consolidation that has taken place in other device segments, particularly cardiovascular and orthopedics. By adding Philips's radiotherapy business to its existing radiosurgery capabilities, Elekta now has the therapeutic tools to provide a broad range of cancer treatment. And by acquiring Impac's IT capabilities, the company now has the work-flow and management tools to participate in the entire continuum of cancer treatment from billing to therapy to patient follow-up. With cancer having recently passed heart disease as the leading cause of death, Elekta is well-positioned to become a major player in many segments of this huge worldwide market by consolidating what has been one of the last major fragmented therapeutic device areas.