

Invest in Sweden
Clinical Trials



The natural location for next-generation clinical trials

Sweden – the fast and reliable route to European drug approval

A leading health care nation

Health system performance

1. Sweden
2. Norway
3. Australia
4. Canada
5. France
6. Germany
7. Spain
8. Finland
9. Italy
10. Denmark

Source: "Measuring the health of nations: analysis of mortality amenable to health care" Ellen Nolte and Martin McKee, London School of Hygiene and Tropical Medicine

"Sweden has the potential to become a leading center of excellence for in silico drug development, clinical trial design and studies in phase I and II - areas which offer considerable efficiency scope for drug developers."

*Anders Grahnén
Head of clinical trials and
clinical development in the
Nordic and Baltic countries
Quintiles*

For many years, leading pharmaceutical companies have turned to Sweden for its ability to deliver valid clinical data, rapidly and cost-effectively. Today, more than 30 of the largest drug companies perform clinical trials in Sweden. The fact that all of the world's best-selling drugs have been tested on Swedish patients during clinical development is a testimony to Sweden's leadership in this field.

Among Sweden's attractions, industry executives typically quote the high quality of clinical data. Part of the credit goes to the Medical Products Agency (MPA), the widely respected regulatory authority. Strong ties exist between the MPA, academia, the health care system and the pharmaceutical industry. These ties facilitate both clinical trials and the drug approval process.

Sweden's unique public health care system is another advantage. National registers are built around individual personal identity numbers, allowing for long-term tracking of patients and lower lost-to-follow-up rates. High patient compliancy rates are the norm.

But there's more to Sweden than scientific credibility and accurate medical records management. There is a strong presence of highly qualified contract research organizations (CROs) and site management organizations (SMOs), capable of delivering most services pharmaceutical companies need in the clinical stages.

This includes multi-center studies across Scandinavia, the Baltic Sea region and Eastern Europe. Similarities between national health care systems, treatment traditions and ability for patient follow-up make Scandinavia, with some 25 million inhabitants, well suited for large-scale clinical trials. Sweden, with the largest population base and pharmaceutical market, is the natural point for managing studies.

Industry requirements on speed, know-how, quality and safety in clinical trials continue to give Sweden a higher global share of studies than its population and the size of its pharmaceutical market would indicate. The need for more efficient drug development processes and an increased focus on health economics make clinical trials in Sweden all the more interesting.

Welcome to find out for yourself.

Blockbuster drugs clinically tested in Sweden

The world's best-selling human pharmaceuticals 2002

Product	Clinical trial in Sweden ¹⁾
1. Lipitor (Pfizer)	Yes
2. Zocor/Lipovas (Merck)	Yes
3. Losec/Prilosec/Omeprazole (AstraZeneca)	Yes
4. Zyprexa (Eli Lilly)	Yes
5. Norvasc/Novasc (Pfizer)	Yes
6. Erypo (Johnson & Johnson)	Yes
7. Ogestro/Prevacid/Takepron (Abbott)	Yes
8. Seroxat/Paxil (GlaxoSmithKline)	Yes
9. Celebrex (Pharmacia)	Yes
10. Zolofit (Pfizer)	Yes

1) Clinical trials were performed in Sweden and several other countries.

Source: IMS World Review 2003, Trial Form Support

“Big Pharma usually strive to register new drugs concurrently in the US, Europe and Japan.

A respected regulatory agency and high quality in clinical trials make Sweden an excellent choice for the European portion.”

*Christopher Round
Managing Director
Merck Sharp & Dohme
(Sweden)*

The Medical Products Agency - an influential regulatory agency

Sweden's regulatory authority, the Medical Products Agency (MPA), is one of the world's most respected bodies. Swedish clinical data is recognized by leading drug regulatory agencies in the US and the EU. The MPA was one of the first agencies to have their clinical data approved by the US Food and Drug Administration (FDA).

The MPA is Europe's most frequently used regulatory authority, under both centralized and mutual recognition procedures. The MPA's share of allocated investigations as a rapporteur or co-rapporteur country under the EU centralized procedure was 30 percent in 2002 (vs. 29 percent in 2001).

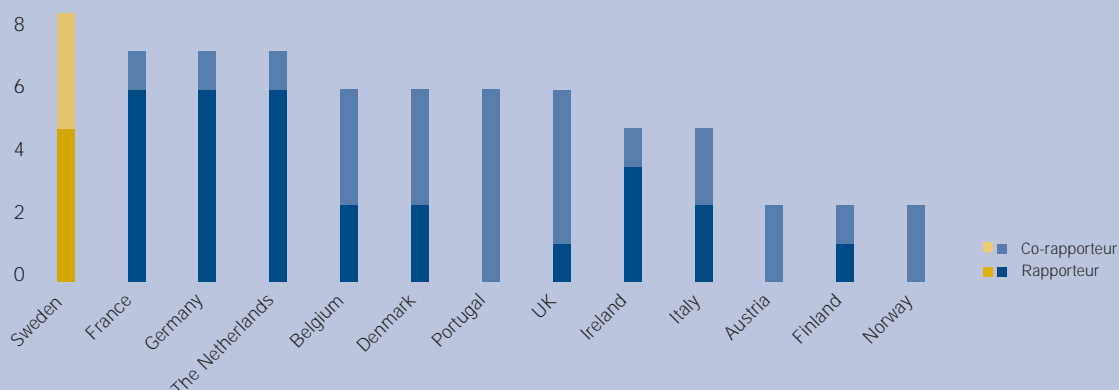
The MPA is also the pharmaceutical industry's preferred investigative authority. In 2002, just five countries (Sweden, Germany,

the Netherlands, UK, Denmark and France) made it to the list of countries that completed NCE (New Chemical Entities) applications under the mutual recognition procedure. Sweden topped the list with 11 completed applications (a share of 27 percent).

The MPA is renowned for the quality of its scientific advice, performed by both in-house and external counsel. External counsel are often local leading clinical research experts. Sweden's international position is no coincidence. The government mandate is for the MPA to carry a strong voice in European regulatory drug affairs.

www.mpa.se

Number of NCE rapporteurships in the centralized procedure, 2002 (medicinal products for human use)



Source: Medical Products Agency, based on data from EMEA, European Agency for Evaluation of Medicinal Products

A natural location for next-generation clinical trials

In academic, ethical, regulatory and quality terms, Sweden is one of the world's leading clinical trials countries. A number of factors point to Sweden's ability to strengthen this position in future years.

A strong foundation Sweden is distinguished by high scientific standards and an outstanding capacity to track patients over time. A homogeneous health care system means processes and routines are harmonized across the country. Research nurses are granted significant responsibilities, making it easier to reach patients and instigate clinical trials.

Sweden introduced personal identity numbers in 1947. All Swedes carry a unique number, composed of the date of birth plus four digits. This number is always used for personal identification in public registers and records.

Excellent patient base Other advantages are patients' willingness to participate and remain in clinical trials. Sweden enjoys high enrolment rates and low drop-out rates - a reflection of high education, trust and confidence in the public health care system as well as an awareness of the potential benefits new treatment may bring. In addition, Swedes are not highly migratory. A hypertension study of 11,000 patients aged 25-66 and involving 536 health care centers in Sweden and Finland resulted after six years in only 27 patients that were lost to follow-up.

Sweden is well placed to manage clinical trials in Scandinavia and the Baltic Sea region. Sweden, Denmark, Finland and Norway has a combined population of some 25 million people. Including other Baltic Sea nations, the population approximates 100 million.

Biobanks and registers Sweden offers major advantages for epidemiological research. Large biobanks have been collected by the public health care system and several population-based, well-characterized biobanks have been established specifically for research use. Sweden also has comprehensive registries with information on morbidity, mortality and genetic relatedness, for instance in the cancer registry, the multi-generation registry and the twin registry. The use of personal identity numbers allows biobanks and registries to be linked with each other.

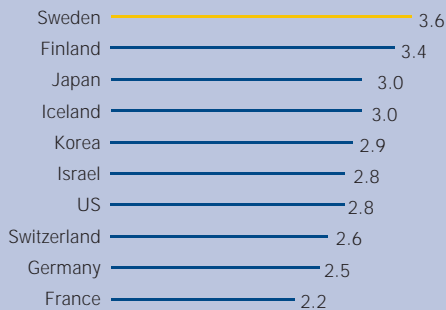
Strengthening industrial drug development know-how at hospitals

Sweden is recognized for high levels of cooperation between industry, universities and hospitals. Numerous university-based site management organizations (SMOs) offer services for phase I-III clinical trials, including protocol design, submissions to the MPA and ethics review committees, conduct, monitoring, analysis and reports. The centers cooperate with the clinical departments in hospitals, most of which have their own clinical research centers.

CRC Karolinska, the new clinical research center at Karolinska University Hospital in Stockholm, has brought together strong industry, regulatory and academic experience and is an example of a knowledge and resource center for phase I-II studies. The large patient volumes mean the center can manage both widespread and rare diseases. The center offers considerable GCP experience.

Total expenditure on R&D

2001, percent of GDP



Sweden ranks top in the world for R&D spending. The nation is also the world leader in investment in knowledge according to the OECD.

Source: IMD, 2003



Sweden is the premier choice for managing studies in Northern and Eastern Europe.

Sangart: Pioneering artificial blood development from Sweden

Ties with Swedish researchers and research institutes led Sangart, a US biotechnology firm, to choose Sweden as a clinical research base. "The ability to move clinical trials 'fast and light' was a decisive factor for Sweden," says Dr Robert Winslow, President.

Sangart is one of several companies that seek a safe alternative to whole blood in blood transfusions. Its artificial blood product, Hemospan, entered phase Ib/II clinical trials at Stockholm's Karolinska Hospital in the spring of 2003, following the first trials on healthy volunteers in 2002.

All pre-clinical and clinical trials have been performed in Sweden. "Our view was that the turnaround time for handling of documents and applications would be faster in Sweden," says Dr Winslow. "Also, for a company with access to limited resources, Sweden's lower costs for clinical trials were attractive."

Dr. Winslow says Sangart's ability to work with respected Swedish clinicians facilitated the identification of suitable investigators. "We've had an excellent experience interacting with Swedish hospitals and research institutions, the Medical Products Agency and contract research organizations."

In 2003, Sangart's efforts bore good fruit. In what is probably a medical first, doctors at the Karolinska Hospital performed clinical trials of artificial blood without apparent side effects or complications for patients. Dr Winslow hails Sweden as a research location and says his company's collaboration with the Swedish Defense Agency and Karolinska Institutet has been crucial to Sangart's achievements.

"The intimacy of Sweden's medical community is a tremendous advantage. Everybody is within easy reach. And the quality of research is really good, not inferior to anything we have encountered."

www.sangart.com

"The ability to move clinical trials 'fast and light' was a decisive factor for Sweden. In addition, the intimacy of Sweden's medical community is a tremendous advantage. Everybody is within easy reach."

*Robert Winslow
President
Sangart*



Pfizer: "Studies performed efficiently and on time"

Pfizer maintains considerable clinical research activities in Sweden. The 100-strong clinical research organization manages some 50 studies in phases II-IV, involving close to 8,000 patients, 700 doctors and clinical centers. "Sweden is recognized for high quality in clinical trials," says Viveka Åberg, Medical Director. "The clinical data is reliable, and studies are performed efficiently and on time."

Sweden's contribution is of particular importance for Lipitor, Pfizer's cholesterol-lowering medicine. Sweden has provided 4,000 patients for Pfizer's Ascot study (Anglo-Scandinavian Cardiac Outcomes Trial), a large endpoint study on high blood pressure and cholesterol lowering conducted in Sweden, Norway, Finland, Denmark and the UK. "Its excellent capacity to track patients makes Sweden particularly well suited for endpoint studies," says Åberg.

Pfizer Sweden has also attracted attention for its Slice study (Swedish Longterm Implications of Compliance Enhancing programs in depressed outpatients), a study that has compared treatment results in patients with or without the support of a compliance tool. The study shows that training and education can affect patient responses to treatment.

The findings are important, since increased patient compliance can greatly reduce health care costs. "Clinical research is entering a new phase," says Åberg. "Studies will no longer only consider safety, efficacy and quality aspects. Health economics, the role of pharmaceuticals in a treatment situation and patient compliance are other factors that must be examined. And Sweden offers tremendous expertise in these areas."

www.pfizer.com

Contract research firms in Sweden

Berzelius Clinical Research Center
www.bcrc.nu

Clinical Data Care
www.clinicaldatacare.com

Covance
www.covance.com

Galenica
www.galenica.se

Medilab
www.medilab.se

NDA Regulatory Service
www.ndareg.com

NMCT
www.nmct.se

North Sweden Clinical Research Institute
www.nscri.com

Omnicare Clinical Research AB
www.omnicarecr.com

Parexel
www.parexel.com

Pharmanet
www.pharmanet.com

PPD Development
www.ppd.com

Quintiles
www.quintiles.com

Scandinavian CRI
www.scandinaviancri.se

Scandinavian Regulatory Services
www.srs.se

SEDOC Pharmaceutical Medicine
www.sedocpm.se

Smerud Medical Research
www.smerud.com

TFS Trial Form Support
www.trialformsupport.com

Site management organizations

Berzelius CRC, Linköping
CRC Clinical Research Center, Lund
CRC Karolinska, Stockholm
Dept. of Clinical Pharmacology, Göteborg

PET expertise A number of leading PET (Positron Emission Tomography) centers provide pharmaceutical companies with imaging solutions to accelerate and facilitate development of novel therapeutics. The PET center in Uppsala, now Uppsala Research Imaging Solutions, is led by professor Bengt Långström, a prominent researcher in this field. Advanced PET services are also available at the PET center at Karolinska University Hospital.

Uniquely positioned for clinical trial design and phase I-II The requirement on drug developers to cut costs will shape clinical trials in the years ahead. Through more efficient design and implementation of phase I and II studies, substances that reach phase III should have a higher potential to become approved product.

Sweden, with its unequaled health care system, excellent control of patients and increasing access to digitized medical records, is particularly well suited for clinical trial design and phase I-II studies. The clinical research expertise is cutting-edge. For instance, Sweden holds the world's only professorship in pharmacometrics, the science of modeling and simulating drug response (Mats Karlsson, Uppsala University).

Gene and cell therapy Sweden offers real advantages in emerging treatment technologies. The quality of research in both genomics and proteomics is high, and will be advanced by large-scale projects such as the Human Proteome Resource program. The scientific advice of the MPA can be drawn upon. The quality and number of biobanks make Sweden all the more attractive for research in these areas.

Health economics / pharmacovigilance Sweden is well positioned for pharmacovigilance of launched products, primarily because of the ability to deliver highly accurate data on efficacy and safety over long periods of time. Sweden also has some of the world's strictest requirements for documentation on health economics impact in clinical trials applications. Examples of leading researchers include Anders Ekbohm at Karolinska Institutet and Bengt Jönsson at the Stockholm School of Economics.

New EU directive reinforces Sweden's position The new and harmonized EU clinical trial directive will be introduced in all member states from May 2004. Under the new system ethics committee approval is required already from phase I (this is already the case in Sweden). The new regulations provide additional advantages for drug developers that choose Sweden for clinical trials. Smooth working procedures between ethics committees and the MPA are already in place here. Sweden also offers regulatory competence and experience of the new working methods that are virtually unmatched. Trials will run faster and with less hassle in Sweden.

“The new European clinical trials directive strengthens Sweden's competitive advantage for clinical trials. The regulatory environment that will be introduced in the EU in 2004 is principally the one Sweden has followed for many years.”

*Daniel Spasic, CEO
TFS Trial Form Support*

10 good reasons to choose Sweden for Clinical Trials

1. Great experience

Sweden's reputation as a location of choice for clinical trials stretch back many years. Over 40 of the world's largest pharmaceuticals companies currently perform clinical trials in Sweden.

2. Sweden has followed new EU clinical trials directive for many years

The new EU clinical trials directive means significant changes for many countries. Not so for Sweden, which has been working along the new EU lines for many years. Sweden is better suited to rapidly adapt to raised quality standards.

3. High scientific credibility

Sweden enjoys a strong reputation in clinical research. The Medical Products Agency is one of the world's most respected regulatory agencies and one of the most frequently consulted authorities in the EU.

4. Homogenous health care system

A health care system with common processes, treatment philosophies and routines for data collection is a major advantage in clinical trials.

5. Excellent tracking of patients

Sweden has an outstanding capacity to track patients, thanks to meticulous record-keeping and a homogenous health care system.

6. High data quality & study compliance

Swedish registers and medical records are very reliable and of high quality. Drop-out and lost to follow-up rates are very low.

7. Easy access to patients

The Swedish system offers rapid access to well-defined patient cohorts. Research nurses are granted significant responsibilities, which facilitates patient contacts.

8. Strong ties between health care system, academia and industry

Sweden is a highly innovative life sciences nation. In many respects, this is due to strong ties and close collaboration between academic research, hospital clinics and the pharmaceuticals industry.

9. Natural starting point for Nordic and Eastern European studies

Of the Nordic countries, Sweden has the largest pharmaceutical market and captures the largest share of clinical trials. Numerous companies lead multi-country studies in Northern and Eastern Europe from Sweden.

10. In the front-line of research

Sweden offers cutting-edge research capabilities in areas of importance to clinical trials. These include in silico drug development, clinical trial design and health economics.

Pharmaceutical companies that perform clinical trials in Sweden

Abbott
Alcon
Allergan
Amgen
AstraZeneca
Aventis
Baxter
Bayer
Boehringer Ingelheim
Bristol-Myers Squibb
Eli Lilly
Fujisawa
GlaxoSmithKline
Janssen-Cilag
Johnson & Johnson
Merck
Novartis
Pfizer
Roche
Sanofi-Synthelabo
Schering-Plough
Serono
Wyeth
Yamanouchi

A leading life sciences nation

Life sciences companies employ more than 45,000 people, making it one of Sweden's major industries.

Sweden has Europe's fourth-largest biotechnology industry, employing some 6,000 people in over 200 companies.

Sweden invests heavily in R&D, and is one of the world's largest producers of life science knowledge, per capita.

AstraZeneca leads global R&D in three of its six therapeutic areas from Swedish research sites.

Companies that have formed strategic research alliances with Swedish biotech firms include Amgen, Bristol-Myers Squibb, GlaxoSmith-Kline, Merck and Wyeth.

The VC investment route Numerous Swedish venture capital firms are specialized in life science, covering all segments and stages of company growth. These include Health Cap, H&B Capital, Innovationskapital, Investor Growth Capital, Karolinska Investment Management, Scandinavian Life Science, SEB Företagsinvest and Swedfund.

ISA – Business facilitator

Invest in Sweden Agency (ISA) is the government agency responsible for informing foreign investors about business opportunities in Sweden. Companies planning to establish or expand business operations in Sweden can, free of charge, obtain information and assistance from ISA and its regional and international network.

With headquarters in Stockholm, ISA has international operations and representation in major European, North-American and Asian cities. The vast majority of ISA staff has a background in the corporate sector and expertise in the investment process. These attributes help ensure professional guidance for successful business launches in Sweden.

Welcome to the ISA web site at www.isa.se

Stockholm, Sweden Invest in Sweden Agency Phone: +46 8 402 78 00 E-mail: isa@isa.se	London, UK Invest in Sweden Agency Phone: +44 20 7723 2000 E-mail: isa.uk@isa.se	New York, US Invest in Sweden Agency Phone: +1 212 702 8780 E-mail: isa@usa.isa.se	Shanghai, China Invest in Sweden Agency Phone: +86 21 5404 0910 E-mail: shanghai@isa.se	Tokyo, Japan Invest in Sweden Agency Phone: +81 3 5562 5014 E-mail: isa@isatokyo.org
---	---	--	--	--