Heart Center Varde

Heart Center Varde is a privately owned heart hospital that offers diagnostic examinations, medical treatment and heart surgery to patients with heart disease. Heart Center Varde is growing, and faces interesting challenges both internally and externally.

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For details on the treatments and examinations, see appendix 1. There is a latent demand for ablation and a general trend is towards more ablation treatments.

Heart Center Varde

Heart Center Varde is a privately owned heart hospital that offers diagnostic examinations, medical treatment and heart surgery to patients with heart disease. The Centre cooperates with the Danish public health service in treating heart patients, but also treats private patients and insurance-referred patient. Professionally, Heart Center Varde (HCV) cooperates with cardiac departments and researchers at university hospitals both in Denmark and abroad.

" At Heart Centre Varde we concentrate on just one thing – namely hearts. This means that we can offer the optimal treatment with highly specialised heart doctors. We have gathered some of the top specialists in the field of cardiology. We believe this enables us to give our heart patients the best and most flexible treatment."

The number of patients referred to the Varde Heart Centre is growing fast. In 2006 the Varde Heart Centre treated 2192 heart patients (operations and diagnosis), and today, in 2008, the centre treats more patients for heart rhythm abnormalities than any other centre in Scandinavia. Heart Center Varde has some of the newest and most specialised technology for treating patients and monitoring their condition. 80% of the Varde Heart Centre's patients are referred to HCV by the Danish National Health Service.

Treatments, trends and comparisons

HCV has three main groups of treatments. PCI is a invasive proceduwre in the heart, where coronary arteries are widened by using a catheter with a expandable balloon, entering the hearth through the blood vessels. This is normally complemented with the placing of reinforcement in the artery; a so called stent. Ablation is a treatment for arrhythmia, where a catheter enters the heart through the blood vessels, and treats the problem by pinpoint heat treatment of small parts of the heart using radio-waves. Surgery is normally bypass operations, heart valve operations or aorta operations.

History

Heart Center Varde was started in 1997 by anaesthesiologist Ricardo Sanchez. Ricardo comes from Spain, but lives in Denmark since many years. HCV was stared in Varde since there was little available special care on hearth surgery in that particular region on Denmark, and there was available space in a local hospital. Varde is located in the south of Jylland, a pretty part of Denmark, but far from Copenhagen. Since Denmark is a small country it is still not more than 4 hours by car from Copenhagen, and it has an international airport less than 60 minutes away.

Ricardo wanted HCV to become a state of the art centre for heart treatment, and was early to adopt new treatments for arrhythmia and angioplasty. The heart center was run mainly with consulting doctors, but in 2007 two full time doctors was brought in as partners in the company, Peter Steen Hansen and Anders Kirsten Pedersen. At the same time the idea of building a new hospital building was raised. In 2008 these plans took form, and in 2009 the building project has taken off. The number of employees has grown steadily, and in 2008 it reached 57. When the new hospital is in place, this will be big enough for twice as many treatments as today.

1 For more information, also see http://www.hjertecentervarde.dk

Figures

Treatments performed per year

	2008	2007	2006
Surgery	462	276	189
CAG	411	398	232
Ablationer	966	646	388
PCI	357	479	298
Health Examinations	208	403	479
Scanning	217	19	-
Total number	2621	2221	1586

Surgery – Coronary Artery Bypass Grafting and valve suurgery
CAG – Coronary angiography examination
Ablations – Radiofrequency Ablations
PCI - Percutaneous Coronary Intervention, or Balloon Angioplasty
Health Examin – Health examination, see appendix 1
Scanning – CT scanning

Key figures

	2008	2007	2006
Turnover	148 810	110 121	68 748
Result	10 118	11 963	3 029
Employees	57	49	35
Consultants and guests	16	14	12

HCV position in the health care system

HCV is a small specialised player in a large, complex and politically governed health care system. Since HCV is privately owned and run, it differs from the majority of other hospitals, which may cause problems or resistance in the system. As we see in appendix 2, activities in the political system can have huge effects on small units such as HCV. The temporary removal of the treatment guarantee has caused a severe drop in referrals. Since HCV is to 80% dependent on these referrals, this has lead to a sharp decrease in treatments, and a necessity to reduce working hours.

The ideological resistance towards privately owned care units in Denmark is a problem for the private hospitals. Even though there may exist a government decision to allow private units, the region s still may have other intentions. There are persons in central roles with the opinion that private units "drains the public system of resources, they only pick the easy and profitable cases, and leaves the difficult cases to the public system". The counter argument is that this is not actually happening, "private units produce care to a lower cost, they use resources in a more efficient way, and they actually accept all referred cases" HCV in particular has never denied access to a patient that has been referred to them.

Another argument used against concentrating elective specialist care to small private hospital is that they do not contribute to the training and education of specialists and new doctors. This has been taken seriously by HCV, and as well as taking in fellows, young doctors in training, HCV allows interested specialist to come for up to 2 weeks to learn how to perform procedures and how to use the advanced equipment. This is seen as beneficiary both for their own internal development and for the long term cooperation with other hospitals.

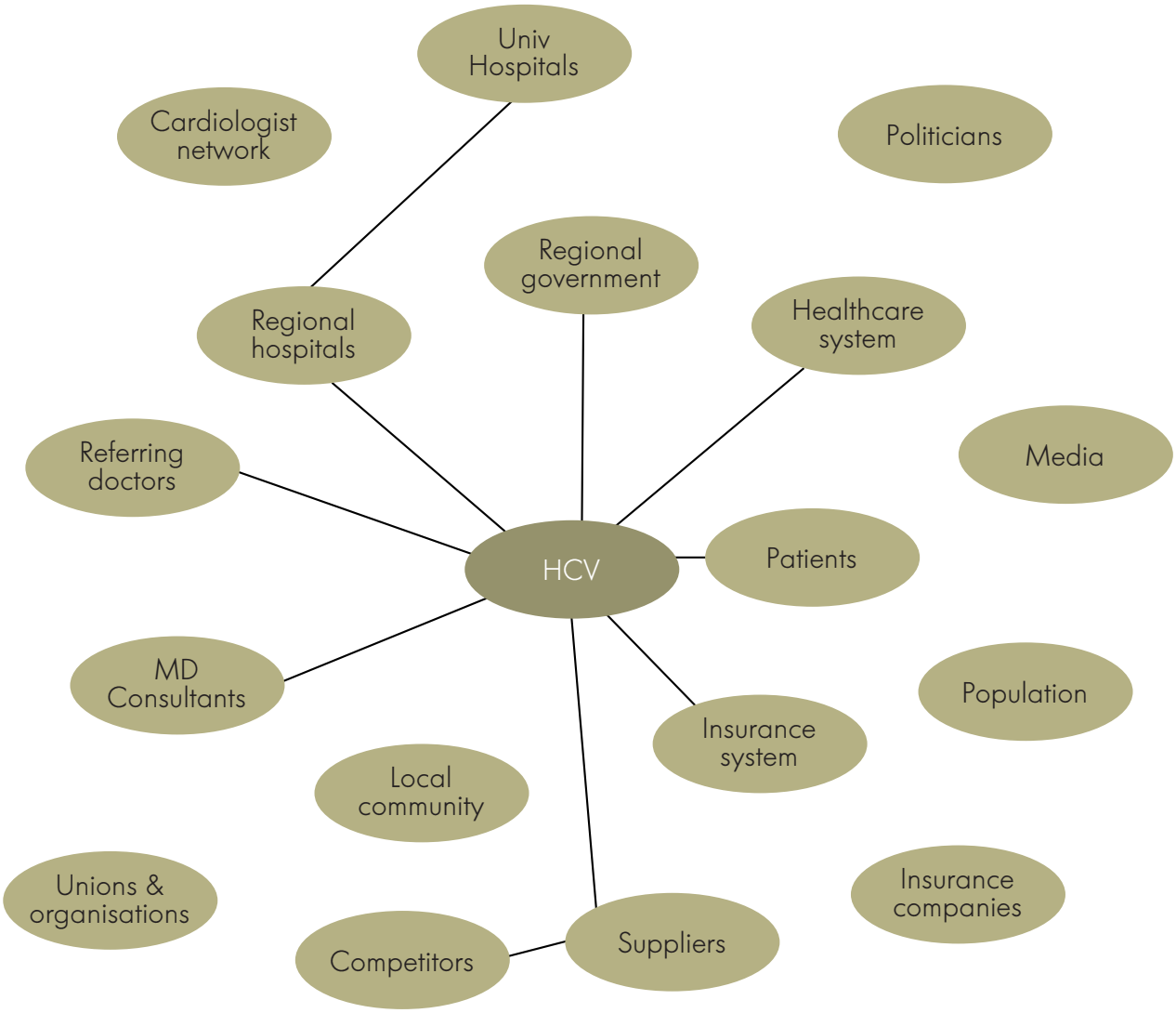

Figure 2: HCV and related actors

Customer requirements

As we see in the network illustration in figure 1 there are many actors and many customers. Each of these customer groups have different demands and different agendas. Some of the most important customers are the patients, the regions (with the money) and the large hospitals (sending patients).

Patients

Some of the most important aspects for patients are the quality of the treatment, the waiting time to treatment, no cancellations, having enough information on what is going to happen, to see a doctor daily, and to trust the involved personnel. HCV are performing well on all these aspects, according to themselves. Other aspects are personal attentions, quality of the rooms and the facilities, to have one dedicated doctor and one dedicated nurse, and quick procedures. Overall there seems to be no major disadvantages in choosing HCV compared to other alternatives, from a patient perspective.

Regions and central government

For the regions and the government there are other factors that influences their decisions. First there are the regulatory factors, laws, standards and quality. These are no problems for HCV. Next there is the availability of service, time to treatment and the ability to keep scheduled appointments. These are also strengths of HCV, since the cutting of queues is part of the business model. HCV can act as a buffer in the system, and help the regions to uphold the treatment guarantee (see appendix 2). A factor that sometimes comes into the game is the issue of ideology, whether private care is good or not. This may apply both on a national level, and on a local regional or even more local level, with influential managers opposing private solutions. Another factor is that HCV is competing for resources with regional hospitals, and thus are taking business from these. The treatments cost less at HCV, but the short term effect is that regional hospitals sometimes will make less money. For the good of the patient, referring them to HCV means quicker treatments and less waiting. On the other hand, referring to a private hospital is to some doctors an unfamiliar way of acting.

Private

Today the private customers are a small group, less than 20 % of the total number of patients. These are either paying themselves, or are being paid for by an insurance company. This group has demands similar to those listed under patient above, but may have even higher demands on service level, setting their own dates, and having nice and well designed facilities.

Today's situation with a majority of patients referred from the national health care system may change in the future, and this will also have an influence on the way the service and the treatment is delivered. The way of working and organising work is influencing both on the internal efficiency and the customer experience. Thus we will now look at how daily work is organised at HCV.

Organising daily work at HCV

Heart Center Varde(HCV) is a small organisation, with an informal and relaxed atmosphere. There is a positive feeling and an entrepreneurial spirit; things are going well, and any problem is fixed directly and without bureaucracy or red tape. People step wherever it is needed, and works hard to make things flow smoothly. The management team is very visible, and takes part in daily work. The three owners who are doctors are also main production resources in daily operations.

The management team stresses the will to keep a flat organisation. They do not want to create layers, especially not for the doctors, but want simple ways of organising and working. There is a awareness that the company is reaching a size where more structure is needed, but also a fear that this will lead to a loss of the easy and informal way of functioning today.

Box 1: A story from daily life at Varde

A patient (let us call him Paul) has come to Varde Heart Center for a bypass operation. Paul is not well, and has waited a long time for his operation. Before coming to VHC he has been examined at a large regional hospital in Denmark, and was then referred to VHC for an operation. The examination data is to be used as guidance during the operation, and should accompany Paul from the regional hospital. There is a problem when Paul is up for operation. Something has obviously not worked as it should, because a DVD with important medical data about Pauls condition is missing. The DVD, which should have arrived a week before Paul, has not arrived. There seems to be a mixup on the way has caused the data to still be in the mail, and the DVD will not arrive in time for the operation.

In many other hospitals this situation would be handled by sending the patient home, reschedule the operation for later, and wait for the data to arrive. In this scenario the operating room would be left empty, the doctors would have to find other activities, and Paul would have to wait. At VHC the problem was handled in another way. The medical data needed for the operation can be gathered using equipment available at VHC. The examination is performed with the same equipment as used for radio ablation, another major treatment. Since Paul is already prepared for operation, he is slotted into the quite tight schedule at the radio ablation theatre, where a doctor does a new examination, compiling the necessary data for the operation. This emergency procedure is stretching the schedule a bit for existing patients, but not by more than 15 minutes. Thanks to this, Paul may be operated in the afternoon, and no cancellation is necessary.

The extra work doing the examination is small compared to the potential extra work involved with rescheduling, new preparation time, and having a doctor and a operation ready for use but not utilised.

This informal and family-like way of organising daily tasks is working well today, but there is a cloud in the horizon. Some of the co-workers feel that this way of working may change when the company grows, and could be difficult to maintain in the future.

Upper Management

Upper management consists of the three active owners of HCV, Ricardo, Peter and Anders. All three are both specialists in their respective field, and making up the entire management team. The fourth owner takes part of board meetings but not in daily operations. The founder of the company, Ricardo, manages many of the large projects, such as the building of the new hospital, in addition to his role as an anaesthesiologist and general manager for HCV.

The management team has daily contact with each other, but few regular formal meetings. Decisions are made between them, and the small team and close contact makes it possible to make quick decisions even if the impact or cost may be high.

A consensus in the management team is that they do not want bureaucratic or elaborate systems to manage their company. "Things should be kept simple and transparent, and not too formal". There should be a focus on the main task, treating patients, and not too much besides that. The managers see it as important to be visible and part of daily work.

Box 2: Vision of Leadership at VHC

The ideas on what VHC is and what it is not is quite strong. An important way of stating this is to define what they are not! VHC is not a large hospital, and is not state governed. This is translated by the management to statements about what they are.

- No hierarchies
- No managers
- No bureaucracy
- Everybody should se the whole picture ant take their responsibility
- Everybody have full control of their own way of working

There is a strive to avoid specialisation as far as possible, to avoid things to become "someone elses problem". This also means that set roles should be avoided, and that tasks should be shifted between persons. Fixed roles and fixed structures is seen as a sign of bureaucracy and hierarchies and is to be avoided.

Everybody should know that they make a difference in doing their job, and take responsibility for this. The focus should be on the patients, which are the guests at VHC. Everybody should put the flow of the patients first.

As shown in box 2, the values of HCV is different from that of a large public hospital. A common problem in large hospitals is the lack of cooperation between clinics and between specialisations. Turf wars and bureaucratic routines may hinder cooperation, delay the process and increase overall costs. The strive at HCV is to avoid this, with direct interaction, a focus on the patient, and a small organisation with little hierarchy and a low degree of formalisation.

Some employees note that management may not have time to take care of everything that is out of the ordinary, as they do today, and at the same time threat patients, when HCV is growing. The task of managing daily operations is taking more time as the company grows. In addition to that comes the plans of building a new hospital, which takes up a lot of time.

Roles and functions

The organisation structure is completely without mid levels, there are no middle managers. There are also no specialist support functions, all responsibilities are distributed among employess, or delegated to the teams, where team members are each given extra areas of responsibility. A team typically consists of a specialist (surgeon or cardiologist), a anaesthesiologist, one or two nurses and a secretary. As discussed above, there is a strive to not create any new levels or additional functions at HCV.

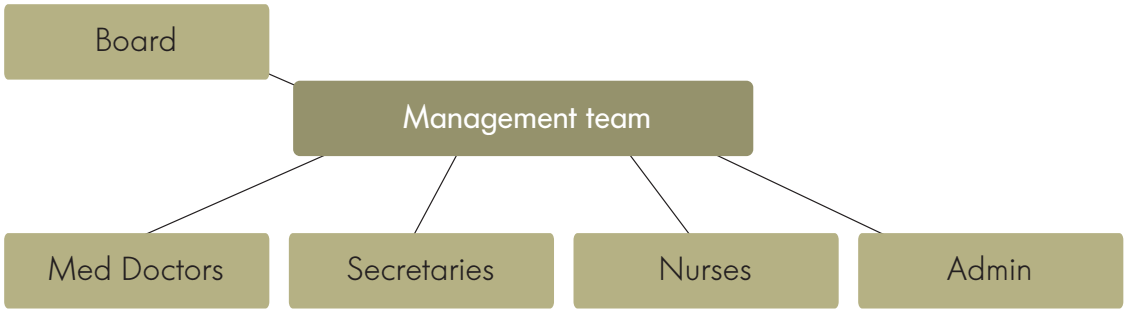

Figure 2: organisation chart

Medical Doctors

Today there are 7 doctors employed full time, and 16 doctors involved on a consultancy basis. The consultants equal 6-8 full time doctors, which gives a total of approximately 14 full time doctors. The number of doctors in ablation and PCI are approximately equal, while the surgeon group is smaller, with roughly half the number of the other groups. The availability of good doctors is a critical sector. There are too few cardiologists available in Denmark, and the good ones are hard to find and attract.

HCV is leading in the Nordic countries in Arrhythmia treatments, and a large player in PCI. A goal is to be leading in all three areas. HCV strives to use the latest methods and equipment, and to attract the best available doctors in each area. The use of consultants makes it possible to have a large network of specialists, and to involve leading expertise from other hospitals, and in this way learning as well as spreading their own knowledge.

Consultants are surgeons or cardiologists that work primarily in another hospital, but takes time off to come to Varde and perform treatments. Consultants are normally paid per procedure, which helps to keep the focus on efficient processes and as many procedures as possible in a limited time.

There are differences in the way of working between the three units. Surgeons cooperate with a cardiologist which does preparatory investigations, and an anaesthesiologist which prepares and manages the patients during procedures. There is a division of tasks that requires more coordination. On the PCI and ablation side, some doctors actually transport their own patient, both to save time, and using the short transport to talk to the patient and explain the procedure.

Medical Secretaries

The doctors has a total of 4 secretaries that answers the phone, manages time schedules for patients and operations, patient journals and handles new enquiries from potential patients and external medical enquiries. One of the secretaries states that it takes a couple of years to get good at this. There are few written procedures, it is all learned by doing, or as the secretary say "it's in my spine". Any change in the way of doing things is discussed and implemented directly, and spread by word of mouth. Each secretary talks to the doctors several times a day, between treatments. There are no appointed times for this, all is very informal. One secretary works with one or two permanent doctors and a few consulting doctors.

The schedule, managed by the secretaries, is similar to a production plan, where treatments are planned and resources are booked. Patients are brought in in the morning, and are told that they may have to wait until the afternoon for treatment. Since this is a once in a lifetime treatment, this is unlikely to be a big problem for the patient. The production environment is very stable, doctors are seldom ill, and patients are almost always on time as planned. Any changes in the schedule is handled between the secretary and the doctor directly. For an example of this, see box 1.

Nurses

There are 36 nurses at HCV today. They are all experienced, and several are specialist nurses. Most of them work full time, alternatively 32 hours a week. Turnover is low "people who starts at HCV normally stay on". Salaries are slightly higher, but the main attraction is the small unit, a good working climate, a predictable working situation, and the possibility to really specialise in the heart care area. No nurse is employed directly from school, but all has previous experience, and several has additional specialist training.

There are 7 specialist nurse work with PCI, 7 with ablation, 4 with operations, 2 with anaesthesia and 6 with health checks. There is a general goal that nurses should have two specialities, but this is not fulfilled. There are some nurses that are working on their specialisation, and a group of nurses that works with in the care units, and does not have any specialisation.

Many nurses have an extra area of responsibility in addition to her regular tasks. This can be taking responsibility for availability and purchasing of certain material, or overseeing parts of the lab. These tasks are sometimes rotated, to increase the overall competence level and flexibility among the nurses.

The planning of the schedule for nurses is done by a senior nurse. HCV has chosen not to have a manager of the nurse team; this function is seen as a administrative task, not a managerial role. The doctors plan their activities together with their secretaries, but the senior nurse is involved in this. The formal system is a bit unclear, and routines vary between specialisations and doctors. The overall production planning is not formally coordinated.

Administration / economy

The economy of the centre is managed by one person, the book-keeper. There is no finance function, and no formal controller, this is all handled by the management / owners. The book-keeper manages all invoices, payments and salaries. Invoices are originated by the doctors treatments, which the secretaries summarises to a total amount for each patient. This is then aggregated to invoices and sent out by the book-keeper. All bills are handled by the book-keeper, but large bills are signed off by someone in the management team. Contracts and prices are negotiated by the management. Prices for treatment are set centrally by the government, and are not negotiable.

The economy system is a standard off-the shelf solution, with a built in e-invoice function. The details in the payroll management is handled in an excel system, and manually entered into the economy system. This is a flexible and easy solution according to the book-keeper, which also allows for a final manual control of the numbers.

The purchasing function is not formalised, but handled by someone using the needed articles, normally a nurse or someone in administration. There are no formal meetings with the management team regarding the economic situation. This is handled on a day-to-day basis, and informally, since the office is small, and all involved see each other almost every day.

Daily work

The patient process at Varde is to a large extent predictable, since 95% of main activity is planned operations. Patients are scheduled well in advance, and exceptions or emergencies are not common. Since this is the case, it is possible to keep a tight schedule, and manage high volumes with limited resources. The process of a typical patient is described below.

- *Patient is referred to HCV*
- *Patient and HCV administration decides on a time for treatment*
- *Patient visits HCV for examination and information*
  - patient data arrives at HCV *- 1 week*
- *Patient arrives, and is checked in,* *arrival day*
- *Patient is prepared for treatment* *same day*
- *Procedure is performed* *same day*
- *Patient leaves – for home or for other hospital.*
  - PCI and RFA *1 day*
  - Surgery *5 to 7 days*
- *Follow up* *1 month*

The physical flow is short, since the entire unit is small, and there are no long distances. No long transports between units are necessary, and the short transports may even be handled by the MD himself. There is a ambition to minimise all extra personnel, and in some cases the transports form the patients room to the operating room is even performed by the doctor, which both gives him time to talk to and prepare the patient, and saves extra resources. Only a handful persons are involved in the entire visit.

A few characteristics of the process is that:

- *Patients have treatments planned before arrival.*
- *There is very little unplanned emergency surgery.*
- *A large number of patients have similar procedures.*
- *All facilities are gathered in one small building.*
- *All equipment is located close together.*
- *No long transports are needed.*

On arrival, the patient is assigned to a team, and sees the same doctor and the same nurses during the entire stay.

HCV has chosen to have all necessary equipment in-house, to be self sufficient on all necessary types of tests and procedures. This includes equipment such as Ablation (Stereotaxis), CT-scanner, X-ray lab, ultrasound, respirator and dialysis equipment. This state of the art equipment has required required considerable investment, but is seen as necessary to be able to deliver the advanced treatments offered.

Productivity and quality

HCV has a small organisation performing a limited number of advanced procedures. This allows the employees to be focused on their main task, and thus makes it possible to be efficient in producing advanced heart treatments. Some key figures on productivity and quality are presented below in table 2.

	Surgery	PCI	Ablations
# performed per MD/day	2	6	4
# performed per OR /per day	2-3	6	4
Time for procedure	2 hour	15 min	2 hour
Time in hospital	7 days	1 day	1 day
Deaths per 1000	10	0,5	0,5

Table 2, comparison between HCV and Public hospitals on cost and quality

The new hospital building

Today's facilities are located in a wing of the old local hospital in Varde. These are fairly functional but not in any way luxurious facilities. They are also not designed originally for the activities of HCV. When HCV continues to grow, today's facilities will become too small, and in the choice between expanding in the existing buildings and construction a new hospital of their own, HCV has decided to build a new hospital. The advantages are several with a dedicated building. The layout can be designed specifically for the treatments and needs of the patients. There is also the fact that private customers or international customers expect better standard than what is offered at the old regional hospital. The building is designed to be able to treat twice as many patients as today, and may also be expanded further in the future if needed. There is a risk involved in investing in a new building, and this has been considered carefully before the decision was taken in 2008, and building started in 2009.
The new building site is located in a field a few kilometres from Varde hospital.

Appendix

Appendix 1 - The product – heart treatments and examinations

Examinations

Medical Examination

The medical examinations involve a thorough examination of the patients health – with special emphasis on heart complaints. The examination lasts 1½-2 hours.
The examination enables the centre both to diagnose complaint and to give good advice and guidance on how to live a healthier life and thereby prevent serious disease. The guidance includes advice on diet, smoking and exercise and how exactly these influence your health.
If the examination reveals the need for actual treatment the patient is under no obligation to choose the Varde Heart Centre as the place of treatment.
The examination lasts 1½-2 hours and includes the following:

- *Discussion with the cardiologist (heart doctor)*
- *Measurement of blood pressure*
- *Measurement of cholesterol*
- *Screening for diabetes and for diseases of the kidney, liver and metabolism*
- *Examination of lung function*
- *ECG (electrocardiogram)*
- *Exercise ECG*
- *Echocardiogram*
- *Review of the results*

Echocardiogram

An echocardiogram is an ultrasound examination of the heart. Through an ultrasound, you can create a picture of the heart structures (chambers, atria, valves), calculate its size and measure its pumping function. The purpose of an echocardiogram is to determine the reasons for a heart murmur, to test the heart pumping function, or to monitor patients with known heart defects.

Coronary angiogram

A Coronary angiogram (CAG) is an examination of the coronary arteries. The purpose of the examination is to reveal any narrowing of the arteries that requires treatment.
The examination is carried out via an artery in the groin. A thin catheter is inserted through which a dye is injected into the coronary arteries. The arteries then show up on X-rays taken of the heart.

CT scan

A CT scan is an X-ray examination that provides very detailed pictures of the inner organs of the body. In a CT scan a series of cross-section pictures are taken from different positions. The photographs are then processed in a computer that can show 3-dimensional pictures on a screen. Scanning is a non-invasive method of investigating the coronary arteries. Non-invasive means that there is no need to insert catheters into the arteries. 30-40% of the patients scanned annually for narrowing of the arteries prove to be healthy. Screening patients with a CT scanner can obviate the need to perform an actual CAG, with the risks and discomforts that may be involved when catheters are inserted into the smallest vessels of the heart.

Electrophysiological examination
An electrophysiological examination is an examination of the electrical pathways of the heart. The purpose of the electrophysiological examination is to diagnose the reason for abnormalities in the electrical impulses of the heart and in the way these impulses are conducted. Such abnormalities can make the heart rhythm (or pulse) too slow or, more often, too fast. The examination is carried out by inserting small probes (catheters) via the blood vessel system into the heart (see the picture showing where the catheters are placed in the heart).

Treatments
Heart Center Vardehas three main areas of treatment, radiofrequency ablation, Balloon angioplasty or PCI and heart surgery.

Radiofrequency ablation
Radio frequency ablation is used to treat atrial fibrillation (förmaks-flimmer) or abnormal heart rhythm. The treatment is carried out under local anaesthetic, with the doctor inserting a number of thin electrode probes (catheters) through the blood vessel system from the groin up to the heart. By this means the doctor can first determine what kind of rhythm abnormality the patient is suffering from and then "tailor" the treatment to fit his/her needs. By sending radio waves (a form of microwaves) into the heart muscle tissue, the doctor can give highly localised heat treatment to the heart muscle cells that are responsible for the heart rhythm abnormality.

Atrial fibrillation is the commonest kind of heart abnormality. Around 50,000 Danes suffer from episodic or constant (chronic) atrial fibrillation. A number of patients cannot be satisfactorily treated with medicine, either because it is not sufficiently effective or because it has unacceptable side effects. Atrial fibrillation is usually caused by an extra beat (extrasystole) from the atria of the heart. These extra beats usually originate close to the pulmonary veins that bring the fresh, oxidised blood from the lungs back to the heart. Figuratively speaking, pulmonary vein ablation for atrial fibrillation involves electrically isolating the areas in the left atrium around the entrance of the pulmonary veins from the rest of the heart. This is achieved by applying "circles" of heat round the areas where the pulmonary veins enter the left atrium. This heat treatment has no effect on the ability of the blood to flow back to the heart from the lungs.

With current technology, roughly 20% of patients have to undergo 2 operations in order to obtain optimal results. Approx. 80% of patients suffering from episodic atrial fibrillation can expect to be free from attacks after treatment, and a further proportion will have significantly fewer attacks. In cases of chronic atrial fibrillation the outcome of treatment is approximately 10% less successful.

Radiofrequency ablation is also an effective treatment for abnormal heart rhythm, with a similar procedure as described for atrial fibrillation.

Balloon angioplasty (PCI)
Deposits in the coronary arteries hinder the flow of blood, causing chest pain and increasing the risk of thrombosis. Balloon angioplasty is an effective treatment for these attacks of chest pain (angina pectoris), but does not in itself eliminate hardening of the arteries. The principle behind balloon angioplasty is quite simple. The doctor inserts a catheter via the groin into the affected arteries. At the end of the catheter is a small balloon that pushes

the constricting deposits aside so that the blood can flow freely. A little inflated balloon at the end of the catheter pushes the constricting deposits aside so that the blood can again flow unhindered through the veins. In most cases small tubes of stainless steel mesh (stents) are now inserted to keep the coronary arteries open following balloon angioplasty.

Bypass operation

In a bypass operation the surgeon creates a new pathway, bypassing constricted areas in the coronary arteries. The bypass is created with the help of one or several extra veins (grafts). The extra veins are taken from the leg where they can be removed without causing problems. In cases where veins from the legs cannot be used, veins from the arm are often used instead. In addition a vein known as the mammaria (LIMA), taken from the inner side of the thorax, is almost always used. In ordinary bypass operations mortality is under 1%. After a successful operation the risk of fatal thrombosis is reduced to a tenth of the risk before the operation. Over 95% of patients feel better immediately, and the great majority have significantly less need for medication afterwards and significantly fewer attacks of chest pain.

Heart valve operation

The aim of a heart valve operation is either to repair the heart's own valve (valvuloplasty) or to replace it with an artificial valve.

There are two kinds of artificial heart valves, the biological and the mechanical. Mechanical valves are made from synthetic materials. They do not wear out, but require life-long treatment with blood-thinning medicine. The biological valves are made from processed pigs' valves. The advantage of these valves is that there is only a short-term need for blood-thinning medicine. The disadvantage is that the valves wear out in time and may eventually need to be replaced. Before a heart valve operation the patient must be examined by a dentist to ensure that there is no hidden infection that could later spread to the heart valve. Patients over the age of 40 must in addition undergo a CAG

Operation on the aorta

An aortal aneurysms is an outpouching in the thorax (thoracic cavity). Half of all aneurysms are found in the aorta ascendens (the part of the aorta immediately next to the heart), 40% are located in the aorta descendens (the downward part of the aorta) and the rest are located in the arcus (the top of the aorta). Varde Heart Centre operate on aortal aneurysms in the ascendens and arcus aortae.

Operation for atrial fibrillation

In the mid-1980s a method was developed in the USA to treat chronic atrial fibrillation. The method is known as the "MAZE" treatment. It involves a surgical technique that creates a maze in both atria. By this means cardiac rhythm is normalised and becomes regular. Often, patients no longer need to take medication or go to regular check-ups after this operation.

Fifteen years on, the first patients to undergo this operation still have normal heart rhythms. Results to date have documented that the operation has been successful in 97-99% of cases. The risk of fatality in connection with the operation is approximately 1%.

Appendix 2 - Characteristics of the health care sector

The health care sector in the Nordic countries is mainly publicly financed, and private health care takes only a small part. This is slowly changing towards increased private units, but still largely within the publicly financed system.

The health care sector exhibits several characteristics, which influences the organization and management of both inter- and intra-organizational relationships. Generically, the sector has a high degree of organizational, financial and operational complexity.
There are many organizations – at the local, regional, national and transnational level – involved in the production, financing and regulation of health care services. Some examples are primary care practitioners, general and specialized hospitals (most of them with numerous clinics), rehabilitation units, assisted housing for the elderly and private clinics for elective treatements. However, the actual activities undertaken by these different organizations are often strongly dependent on each other. Patients routinely require treatment that has them moving between the primary care level, to hospital treatment, to rehabilitation – and back to primary care. This requires an extensive coordination within and between organizations. The formal relationship between these different organizational units varies considerably.

In many welfare states there has been a successive development towards contractual relationships since the 1990s. This has followed in the aftermath of widespread marketization reforms, which have involved changes such as the deregulation of health care service provider ownership and the introduction of tendering procedures.
The variation in formal interrelationships between organizations in the health care field can partly be attributed to the fact that the financing of health care services tends to be distributed between numerous parties. Both private and public health care systems operate with more or less extensive third party financing, provided either on the part of the state or private insurance companies. This financing is typically complemented by patients' direct contribute through co-payment fees. In summary, the health care sector is characterized by a distributed customer role. Notwithstanding a sustained distribution of fiscal responsible, it has been observed by many scholars that a recent development in most welfare states has been an increased focus on the 'patient-as-customer'. Through various structural reforms, for example the introduction of patient choice models for resource allocation, there has been a move to empower patients. The idea has been that making patients more financially powerful can contribute to improved quality and economic efficiency.

The organizational, financial and operational complexity is further exacerbated by the importance ascribed to the health care sector by many parties. There are many values that are sought, including medical quality, safety, cost-effectiveness, budgetary balance and egality. There are extensive regulation both in the form of formally binding directives (for example concerning the certification of professional practitioners and the marketing approval of pharmaceuticals) and formally voluntary standards (such as treatment guidelines). Such rules are set by various parties, including but by no means limited to individual nation states.

One category of actors which has a historically very strong position in the organization and management of health care services is the medical professions – primarily physicians

but also nurses, and emerging professions such as speech and physical therapists. Health care has long been characterized as an archetype for a knowledge-intensive, professionally organized sector. The institutionalized knowledge asymmetry of physicians, in particular, has resulted in the many organizations have tended to operate with a de facto matrix structure: one administrative/hierarchical and one professional/collegial.

The Danish health care system[2]

Overarching structure

Structurally, the Danish health care sector – like Denmark as a whole – has three political and administrative levels: the state, the regions and the municipalities (national, regional and local levels). The guiding principle is that health care service are to be organised in such a way that responsibility for services provided lies with the lowest possible administrative level. In this decentralized system, the three levels play different roles.

In the health field, the 98 municipalities are responsible for home nursing, public health care, school health service, child dental treatment, prevention and rehabilitation. The municipalities are also responsible for a majority of the social services, some of which have to do with the health care service and are of great importance to the functioning of this service (for example, housing for elderly people with care facilities and associated care staff).

The responsibility for providing the majority of health care services lies with the five regions, which run hospitals and organize the practice sector, i.e. primary and secondary care practitioners .

The task of the state, finally, is first and foremost to initiate, coordinate and advise. One of the main tasks is to establish the goals for a national health policy.

In accordance with the guiding principle of free and equal access to health care for all citizens, the vast majority of health services in Denmark are free of charge for the users. They are financed in large part through the state-imposed health care contribution tax (amounting to 8% on taxable income). These funds are then allocated out, primarily to the regions. The regional health care services are financed by four kinds of subsidies: A block grant from the state, a state activity-related subsidy, a local basic contribution and a local activity-related contribution paid.

The state block grant is the single most significant element of financing, constituting approx. 75% of the total cost. The state activity-related subsidy can constitute up to 5% of the health care expenditure of a given region. Its purpose is to encourage the regions to increase the activity level at hospitals. Since an extensive local government reform in 2007, the municipalities contribute to financing health care in the regions. This local financing consists partly of a basic contribution and partly of an activity-related contribution .

2 This section draws heavily on (The Ministry of Health and Prevention, 2008).

3 Under the Health Care Reimbursement Scheme, primary and secondary services are provided by self- employed professionals such as general practitioners, specialists, dentists, etc. who are licensed by the state. These services are provided in accordance with collective agreements between the regions and the relevant unions. Collective agreements include prices of individual services which are covered by the Health Care Reimbursement Scheme.

4 The activity-related contribution depends on how much the citizens use the regional health services. It will primarily reflect the number of hospitalisations and out-patient treatments at hospitals as well as the number of services from general practitioners. In this way the municipalities that succeed in reducing the need for hospitalisation, etc. through efficient measures within preventive treatment and care will be rewarded.

Together they constitute approx. 20% of total financing of health care in the regions. As a part of the activity-related contribution to the regions, the regions have to redistribute the contributions to the hospitals. In 2007, the agreement between the government and regions specified that 50% of hospital budgets should depend on activity-related contribution.

The hospital sector

As mentioned above, the hospital sector is the responsibility of the five regions which are tasked with providing free hospital treatment for the residents of the region and emergency treatment for persons in need who are temporarily resident. This obligation is typically fulfilled by the individual region's own hospital, and to a lesser extent by hospitals in other regions. Private hospitals are also used to a certain degree, especially specialist hospitals which have an agreement with one or several regions.

The principal framework for how the region provides hospital services is prescribed in a plan setting out the organisation and preparation of the regions' activities in the health sector. Through the National Board of Health, the Ministry of Health and Prevention contributes to health care planning in the form of guidance and regulation regarding the basic and specialised treatment and functions within the hospital services and information on how different forms of treatment should be organised, including coordination of the different levels of treatment.

With the local government reform in 2007, the National Board of Health has been bestowed with increased leverage regarding the planning of specialist functions. There is an on-going process in which the National Board of Health are formulating new and revised standards regarding the basic treatment and regulation regarding specialist treatment (specialised and highly specialised treatment). This planning is expected to result in changes in the hospital structure.

Patients' freedom of choice

Since 1 January 1993, citizens who are in need of hospital treatment have the possibility, within certain limits, of choosing freely which hospital they wish to be treated in. The citizens may choose among all public hospitals which offer basic treatment and a number of smaller, specialist hospitals owned by associations which have agreements with the regions. If a citizen after a medical evaluation is judged to need treatment on a specialist level, he has a further choice between hospital departments which offer treatment on a highly specialised level.

From 1 July 2002, the citizens may choose among private hospitals or clinics in Denmark or abroad if the waiting time for treatment exceeds two months and the chosen hospital has an agreement with the regions' association regarding the offer for treatment. In 1 October 2007, this waiting time was reduced to one month. However, the Government recently reversed decision; patients currently do not have the right to choose treatment at any private hospital in Denmark. This will naturally impact the number of patients referred to HCV.

The European context for health care services

Although health care remains outside of the EUs formal mandate, there are many rules and regulations which nevertheless create a European context for such services.

Recent rulings by the European Court has upheld the principle that social security and health care are competence of Member States but that this does not preclude respecting Community law, particular as regards the common market. One of the devices for creating a European context is the health insurance card which will, on top of all other objectives, foster intra-EU mobility. This card covers care which becomes medically necessary during a stay in an EU county, provided that this treatment is covered under the delivering-state system. However, is also formally allows for treatment that is covered in home state if said treatment can not be given within a medically justifiable time-limit[5].

Currently, there is legal contention over the circumstances for when patients can exercise this right. At present, the stance is that treatment in another EU country can require prior authorization, under particular circumstances such as preserving the financial equilibrium of the social security system and maintaining a balanced medical and hospital service and accessible to all. However, the generic requirement for prior authorization has been ruled an obstacle to free movement. The criteria for restricting mobility must therefore be proportional, as well as objective and non discriminatory.

5 This has been elaborated to mean that authorization or ex post reimbursement can only be refused if the same or equally effective treatment is available without undue delay in a national contracted establishment. Undue delay should be judged in relation to the actual medical condition (incl. degree of pain and nature of disability) and the individual patient's medical history

Case instructions

This case is primarily intended to be used in teaching operations management and operations strategy, but may also be useful as a business strategy case, and to illustrate organisational networks and market behaviour.

Key words: Health care, hospital management, operations, SME, strategy.

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