



Goal-oriented patient treatment

- of a higher quality and less administration

Anticoagulation treatment requires a treatment manager

In Europe, around one per cent of the population - or approximately 5 million people - are receiving tablet-based anticoagulation treatment. Around 50,000 of these are Danes. The treatment prevents thrombus formation by suppressing the blood's capacity to coagulate.

The blood's coagulability is measured in INR (International Normalized Ratio). An INR value of between two and three is optimal for most conditions. If the INR becomes too low, the patient will be at risk of thrombosis. If it becomes too high, the risk of haemorrhaging will increase.

The most common reasons for starting anticoagulation treatment are:

- Thrombus in the leg (deep vein thrombosis, also abbreviated DVT)
- Thrombus in the lung (pulmonary embolus)
- Chronic heart rhythm disturbance, atrial fibrillation
- Artificial cardiac valves

To avoid thrombosis or haemorrhaging, it is important to se-

cure the best possible anticoagulant effect by monitoring the treatment and adjusting the dosage continuously. The goal with anticoagulation treatment is a stable INR without fluctuations of great amplitude.

Traditionally, processing information about these patients has been a major challenge since many have been treated in a variety of places such as outpatient clinics, on hospital wards, with general practitioners or at home. One of the problems with this is that the case notes stay with the treatment manager, for instance, the GP has one set of case notes, the hospital has another and self-monitoring patients keep a handwritten diary which is periodically exchanged with the treatment manager.

Without central control of this information, the loss of information at each stage - and, at worst, patients - is unavoidable. The patient may also be admitted to hospital in an acute condition and without the "course of the disease being known and recorded in case notes" no one there will know if the patient is undergoing anticoagulation treatment - and even if they do, the doctors will not have access to the patient's history.

"Many general practitioners are concerned about putting patients under anticoagulation treatment. It is much more dangerous to leave things as they are. With CSO/Anticoagulation, we are able to prevent a minimum of 100 cases of thrombus formation in Vejle County."

Laboratory manager, consultant, doctor of medicine Ivan Brandslund, Vejle Hospital.





Optimising anticoagulation treatment on a daily basis

IntraMed A/S has developed a new software system, CSO/Anticoagulation, that opens up completely new opportunities for exchanging information.

Using this system, the individual patient's case notes originate with the patient and accompany him or her regardless of where the treatment is administered. This means that all those with responsibility for the treatment of the patient have the full history at their disposal - whether or not responsibility is transferred according to plan, e.g. through referral of the patient from hospital to his or her own doctor when in-patient treatment has been completed, or if responsibility is assumed at an acute stage, e.g. through his or her own doctor or a visit to the accident and emergency department. At the same time, self-monitoring patients are also able to gain access to the case notes which completes the dissemination of knowledge as the patient (or his/

her agent) will have the opportunity to update the case notes on a continuous basis.

In addition to this, CSO/Anticoagulation includes a decision-supporting module which operates proactively and provides the treatment manager with expert support in all decisions. The system functions in a similar manner to an intelligent sparring partner for the treatment manager - whether that person is an experienced specialist or a GP with only a few patients receiving anticoagulation treatment.

CSO/Anticoagulation meets all the demands of future-oriented IT systems in terms of accessibility, compatibility, consistent quality, openness and transparency.

CSO/Anticoagulation contains modules with functionalities which cater for various user groups. All modules can be expanded and adapted according to need.

CSO/Anticoagulation **ensures** equal access for all users

CSO/Anticoagulation is built upon an integrated database, and is web-based, so that the users' (hospital, doctor, patient) service is as simple and straightforward as possible. The database contains all essential information about the individual patient and, on the basis of this individual data, the system provides the treatment manager with expert support in all decisions. For example, the treatment manager is presented with specific recommendations for medication dosage on the basis of the INR process and in continuation of this the system recommends blood samples and check-ups.

When a patient makes an enquiry over the telephone, the doctor can offer qualified guidance straight away because all data has been collected and is immediately accessible. This is a service improvement that saves the time of both doctor and patient.

If the patient's laboratory reports (INR) move outside thoroughly established limit values, the system recommends ways of adjusting the medication and ensuring the patient receives optimum treatment. If a patient fails to attend a check-up, the system will automatically draw attention to his or her non-attendance and ensure that the patient is given a new appointment.

The system processes all data concerning the patient's course of treatment and functions like an advanced clinical database that can generate documentation, statistics and reports of every conceivable kind. Systematic registration forms the ideal basis for research, quality assurance, continuous improvements to the quality of treatment and benchmarking.



CSO/Anticoagulation secures the following benefits for the doctor/treatment manager and administrator:

- Proactive patient treatment system
- Decision-making support at expert level
- Reduction in routine procedures
- Optimisation of internal resources consumption
- Safeguarding of treatment quality
- Access to updated information about own patients
- Clinical database with standardised data registration
- Report and statistics generator:

Integrated Course of treatment

CSO/Anticoagulation functions simultaneously as a decision-supporting system and electronic medical record that collect all information about the patient in one place in standardised form. The patient's data can be integrated in central EMR (Electronic Medical Record) systems used in the public health sector.

CSO/Anticoagulation is based on a well-tried and user-friendly IT platform and communicates seamlessly with most laboratory systems, practice management systems, home-monitoring devices and official databases subject to reporting obligations. One of the completely unique benefits of the system is the fact that data about an individual patient can be shared between treatment managers and nursing personnel in the primary and secondary sector. The creation of a fully-integrated course of treatment is possible when the GP and nursing personnel in outpatient clinics and hospital wards, in home care and nursing homes, have access to the same data.

Less routine work and **simpler** procedures

Good, safe anticoagulation treatment involves a large number of administrative tasks.

The time-consuming, manual transfer of information from a large number of different sources can now be collected and processed in one system. The system can print out patient information about test results and medication dosage, and includes tools, for example, for planning visits, registration of attendance and calling in patients for check-ups. Many of the work processes are thereby simplified while many sources of error are removed.

Optimum use of resources

CSO/Anticoagulation automates and simplifies the processes involved in patient treatment as well as patient and personnel administration.

This means that a major proportion of the routine elements of patient treatment can be performed by nurses and administrative personnel. In this way, doctors are able to free up resources that can be used for attention of more complex and, consequently, demanding patients.

When routine work is replaced with more meaningful tasks, additional gains can be made in the form of greater job satisfaction among doctors, nurses and administrative personnel.



Lower costs

Anticoagulation patients pay approximately half a million visits a year for outpatient check-ups at hospitals and general practitioners. On average, a check-up at hospital costs DKK 1,300.

When several patients can be treated safely and effectively by their GPs, the number of check-ups at hospital can be expected to be reduced by up to 50 per cent. A check-up by a GP costs an average of DKK 300, a saving of approximately DKK 1,000.

With CSO/Anticoagulation, major savings can be made in hospitals in the form of fewer patients with complications, fewer admissions and less administration, just as resources can be saved when several patients are able to carry out self-monitoring and self-medication.

CSO/Anticoagulation is future safeguarded. The software is upgraded on a continuous basis and can be expanded by the number of users and the amount of data.

The price of implementing CSO/Anticoagulation in a hospital is calculated on the basis of the number of patients the system can handle. The cost per patient contact is about DKK 20. By way of comparison, in 2004, the average DRG rate per patient receiving anticoagulation treatment was DKK 1,300.

With CSO/Anticoagulation, 60 patients an hour can be seen by one doctor.

"In Vejle, we conduct 6,000 check-ups a year. The DRG system is based on the calculation of average costs for patient treatment and the system rewards efficiency. Consequently, we gain DKK 7 million a year on the treatment of patients receiving anticoagulation treatment while, at the same time, CSO/Anticoagulation helps us reduce our consumption of resources."

Laboratory manager, consultant, doctor of medicine Ivan Brandslund, Vejle Hospital.

Greater **patient safety**

Anticoagulant medicine can prevent two out of three cases of thrombus formation in the brain and is one of the most effective but also most dangerous medicinal drugs available.

The danger lies in incorrect medical treatment which has cost the lives of several people in Denmark. In all such cases, poor communication has largely been the cause of incorrect medical treatment. The risk of making mistakes is a serious burden for doctors and nursing personnel in hospitals and the primary sector.

CSO/Anticoagulation can prevent serious incidents as the system eliminates the sources of incorrect medical treatment.

The system offers qualified decision-making support for all treatment managers who can then calculate the dosage with the same precision and assurance as an experienced specialist. If the patient's laboratory reports (INR) move outside the normal range, the system will immediately draw attention to this.

At the same time, the system will eliminate the many sources of human error associated with paper-based procedures where all data is recorded manually in the patient's case notes and treatment guidance.

Incorrect medical treatment of anticoagulation patients

The Danish National Health Service has become aware of a frequently recurring way of presenting the problem concerning the incorrect medical treatment of anticoagulation patients, in many cases resulting in death. According to the Danish National Health Service, most cases of incorrect medical treatment are the result of a lack of communication between the discharging hospital department and the patient's own doctor, home care or nursing home personnel who do not have in-depth knowledge of treatment using blood-thinning medication.

Read the Danish National Health Service's report on incorrect medical treatment in connection with anticoagulation treatment at: http://www.sst.dk/publ/Off_Medd/Off_Medd_AK.pdf





Patients at hospitals including Århus, Skejby, Viborg, Vejle, Kolding, Fredericia, Horsens, Give and Brødstrup are now being managed by CSO/Anticoagulation. The quality of the treatment, which is as good and in many cases better than before the introduction of the system, is measured on a continuous basis.

Support for self-treatment

Today, a growing number of patients are choosing to take responsibility for their own treatment so that they can make an active contribution to the quality of the therapy and achieve benefits in the form of the greater mobility, flexibility and independence that self-medication can provide. The patient's own knowledge of the factors affecting the blood's coagulability (INR) increases compliance and functions as an extra quality control of the treatment.

The patient can gain access via Internet to his or her own medical record in CSO/Anticoagulation. Integrated in a proven and user friendly interface, the patient can also get information and help for the management of self-medication and self-monitoring, dosage guidance and advice concerning lifestyle changes. This guidance is based on INR values from the patient's own self-monitoring device.

CSO/Anticoagulation and the patient communicate using a secure network connection which ensures that no unauthorised person gains access to the patient's medical record.



CSO/Anticoagulation secures the following benefits for the patient:

- Easy access to advice and guidance
- Greater independence and advice concerning self-medication
- Greater flexibility
- Access to updated information about the course of the disease
- Sharing of information with treatment managers
- Increased compliance
- Better INR regulation
- Extra quality control
- Fewer check-ups



IntraMed

References

CSO/Anticoagulation has been developed by IntraMed A/S in collaboration with laboratory manager, consultant, doctor of medicine Ivan Brandslund, Vejle Hospital. The system is used in a number of hospitals in Denmark, including those in the counties of Vejle and Viborg as well as other parts of the world.

Professional users describe their experience of using the system at <http://www.intramed.dk>.

IntraMed A/S

IntraMed A/S develops and distributes one of the world's most advanced systems for the management of integrated patient treatment for chronic diseases - Clinical System Organiser (CSO).

IntraMed's mission is to secure an interactive and effective treatment for chronically ill patients.

For further information and a demonstration of CSO/Anticoagulation, please contact IntraMed A/S on +45 70 22 62 60.

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