

SYSTEMATIC **COLUMNA**

Clinical Information System



Columna healthcare IT shifts the benchmarks for managing patient care effectively

- More cost-effective healthcare delivery
- Care focused on the individual patient
- Better-informed planning and decision making

SYSTEMATIC

SYSTEMATIC COLUMNNA

Systematic Columnna is one of the most advanced clinical information systems currently available.

The six Columnna modules together form a complete, integrated clinical workplace that enables healthcare professionals to work more efficient.



Facing multiple challenges

The challenges currently confronting healthcare services are many and varied.

Demographic trends result in growing numbers of senior citizens, while lifestyle diseases give rise to accelerating numbers of patients suffering from chronic conditions. Such patients strain healthcare resources, and require new forms of treatment that are often a poor match for existing structures.

On the organisational level, greater specialisation within healthcare increases the need for cross-sector coordination and for access to up-to-date information in order to ensure consistent, effective treatment. Furthermore, management demands and accreditation requirements give rise to the need for effective data collection as part of improving transparency as well as efficiency.

Impact on healthcare providers

The challenges currently facing the healthcare industry make multiple demands on healthcare providers to increase efficiency. At the same time, they are required to boost the quality of both treatment and care, as well as improving patient safety:

Healthcare providers have to:

- Deliver better quality of service to attract and keep patients as well as healthcare professionals with the necessary skills
- Document these levels of quality in a clear, easily accessible way
- Increase patient safety and reduce both the risk and the incidence of medical errors
- Provide new services and treatments in step with the emergence of new know-how
- Implement best practice effectively via standardised clinical pathways
- Treat more patients using the same number of staff
- Facilitate effective co-operation between different segments and levels in the healthcare system, in order to achieve both consistency and continuity of care
- Encourage and help patients to play an active role in their own treatment and care.

The Systematic solution

To meet these many demands, healthcare providers are increasingly dependent on their ability to exploit, improve and develop the opportunities available from using healthcare IT as an integrated element in the work of healthcare professionals.

This is where Systematic comes in. We enable healthcare professionals to quickly access relevant patient information via effective, reliable IT systems that are easy for everyone to use.

Systematic develops and supplies systems that:

- Help clinical staff do their work better
- Create more consistent courses of treatment and improve patient safety
- Help streamline work routines and enhance efficiency
- Help improve quality of service and boost the efficacy of research work.



State-of-the-art clinical information system

Columna is a fully integrated clinical information system developed and deployed by Systematic. In addition to providing a complete electronic clinical workplace Columna is unique in featuring an interdisciplinary patient record that all clinical staff share in order to manage their patient-focused tasks.

Columna has been developed to match the needs of any hospital department and to deal with any scope of operation, including a wide range of specialist applications. The system is in no way limited to the needs of any particular department, speciality or hospital – they can all use it. Furthermore, Columna can be customised to suit particular requirements, as these develop and evolve.

The Columna system is normally used to manage two types of information:

- Patient records that contain all relevant information about each individual patient
- The infrastructure that gathers and collates information from multiple patients and uses this to generate task lists designed to ensure effective coordination across patients, departments and professions.

Columna provides:

Patient safety

Columna is the clinical staff's central source of information about each patient. This helps make sure that patients get exactly the right treatment, as and when intended.

Clear overviews

It is essential for the clinician to maintain a clear, up-to-date overview of the treatments, procedures and plans involved. Columna provides such overviews by creating such lists appropriate to different work situations.

Communication across sectors

Referrals, discharge summaries, prescriptions, etc. are all available electronically within Columna to ensure effective coordination of healthcare efforts for each individual patient.

Decision support

Columna makes it easier for clinical staff to evaluate patient data and to lay out the most efficient treatment and care plans for each patient, including prescribing the right medication.

Quality monitoring

Columna supports ongoing follow-ups on the quality and efficiency of healthcare services via electronic clinical pathways, task lists and monitoring of key performance indicators (KPIs).

User friendly

A clinical information system has to be efficient, reliable and easy to use. The key is to provide an intuitive, practical system that is configured from the ground up with the clinical user in mind. Columna has therefore been developed in close collaboration with doctors, nurses and other healthcare professionals, on the basis of agreed international guidelines for graphical user interface design.

Interdisciplinary record with single sign-on

Columna is an interdisciplinary and integrated system. Each member of the clinical staff only needs to log on to a single system to access all the data related to each patient – including data from paraclinical systems. There is only one record for each patient, and every member of the healthcare team, regardless of department, accesses and enters data in the same record. This means data is only entered once, is always completely up-to-date and is available wherever it is needed – boosting efficiency and helping minimise errors.

Easy integration

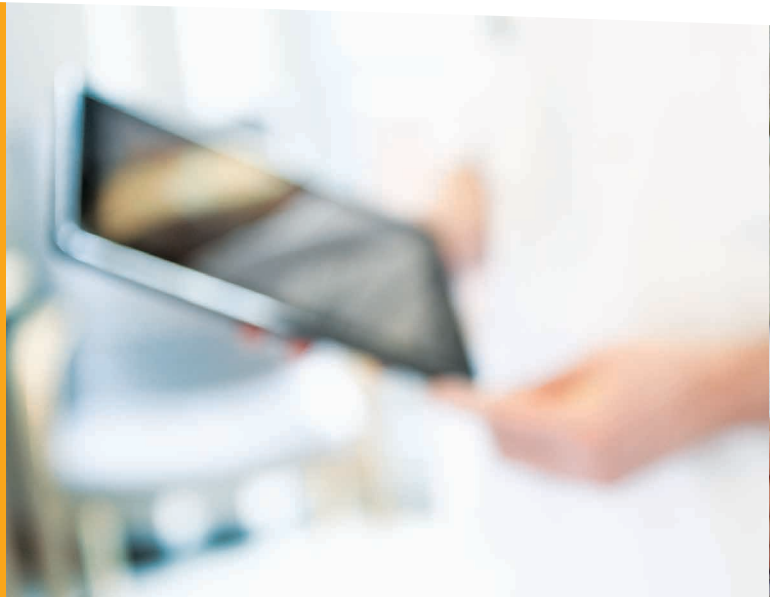
The open systems architecture at the heart of the Columna clinical information system makes it easy, rapid and cost-effective to integrate additional systems, capabilities and technologies from third-party suppliers.

SYSTEMATIC COLUMNNA

Clinical Information System

Columnna is a flexible, modular healthcare IT solution that can be continuously reconfigured and updated as required.

Columnna has been designed so that it also dovetails smoothly with other systems.



Flexible and future-proof

Health IT systems are long-term investments. The Columnna system can be continuously reconfigured and changed as required, and this means its capabilities will still be fully applicable 10 or 15 years in the future.

Flexibility

Columnna is a highly versatile clinical information platform consisting of modules that are easy to integrate into any hospital environment – and customised to meet the needs of a wide range of healthcare specialties, sectors and professions.

Without requiring new software, Columnna can be adapted to deal with

developments and new ideas in working methods, organisational and administrative changes, and alterations to classification systems of all kinds.

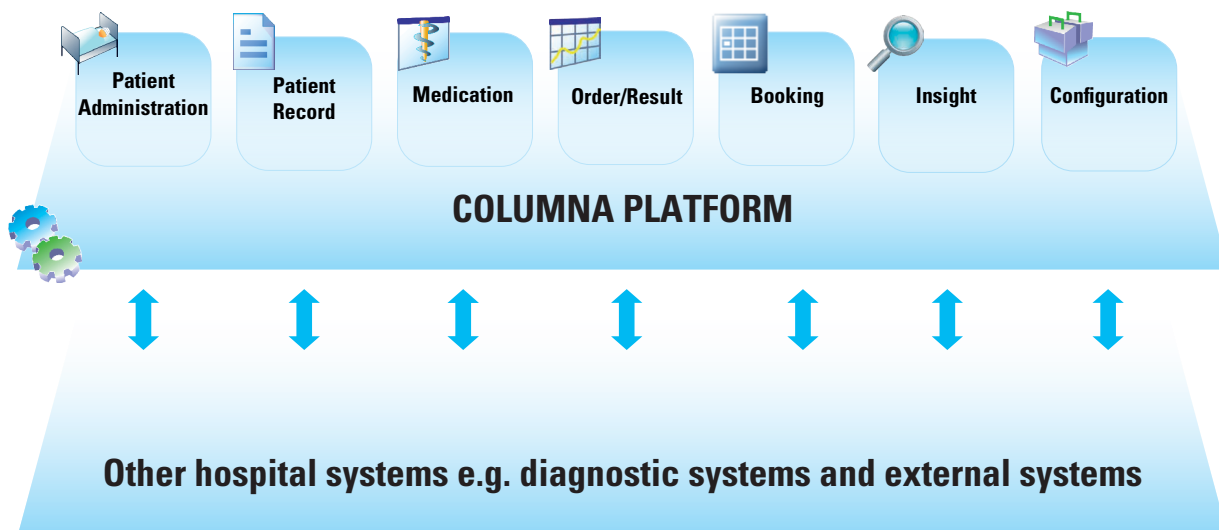
Open architecture

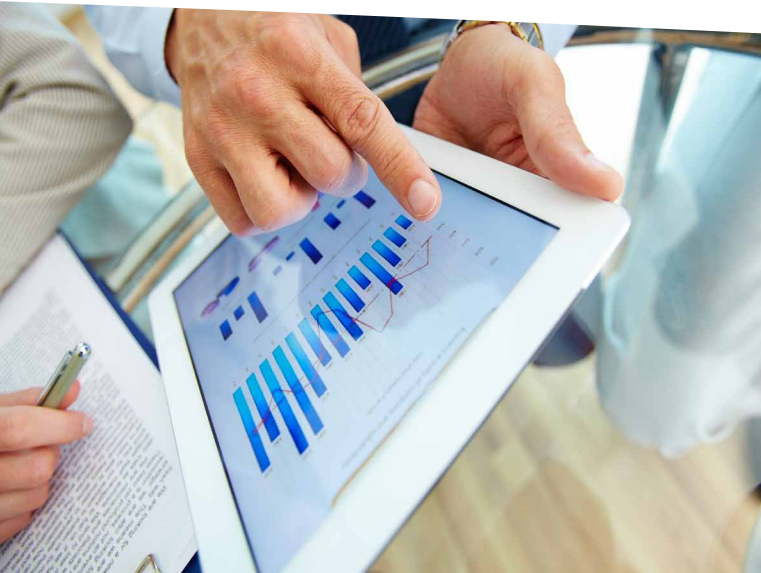
The integration platform that constitutes the backbone of the Columnna clinical information system is fully compliant with the widely recognised HL7 and IHE healthcare standards.

The flexibility and open architecture of this integration platform also play their part in making Columnna the ideal future-proof solution for healthcare IT systems.

The primary task of this integration platform is to:

- Ensure stable, reliable access to all important data
- Store and manage this data securely
- Exchange data between the different clinical applications within Columnna, and with other sources and recipients of data elsewhere
- Link these clinical applications together, so they are presented as one single well-integrated work platform that is easy to use.





SYSTEMATIC COLUMNNA Insight

Columnna Insight enables those involved in monitoring and improving the quality of patient treatments to transform large amounts of data in patients' journals into valuable knowledge.

Turns data into knowledge

The Columnna Insight module makes it possible for department managers and quality managers to reuse day-to-day clinical data for the purposes of in-depth documentation.

Columnna's consistent, standardised documentation means that relevant and valid aggregate data can be extracted as lists, tables and graphs, which provide an overview of the data in relation to selected focus areas called Key Performance Indicators (KPIs).

For example, in Columnna Insight users can navigate from an on-screen table direct to the electronic patient journals relevant for the focus area and access more information about both patients and treatments. This enables department managers and quality managers to carry out efficient and reliable audits to follow up on issues such as national standards of care, new treatment methods or special focus areas for individual departments.

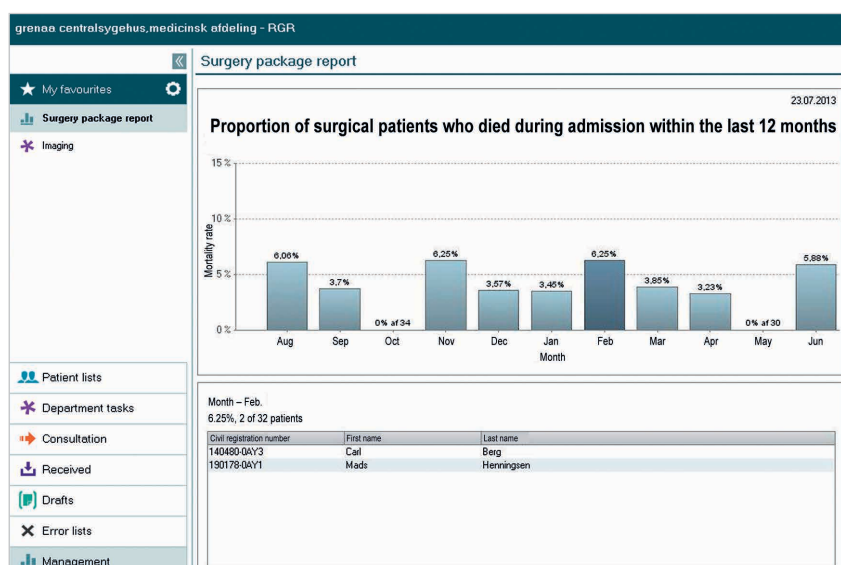
Examples of KPIs that Columnna Insight supports:

- Total number of patients in treatment using a specific drug, along with the recommended length of treatment
- Total number of patients who have not received nutritional screening within the first 24 hours of admission
- Total number of ventilated patients who develop pneumonia during admission

- Total number of patients who have developed post-operative infections

- Total number of patients who have an EWS score above a specific level.

Columnna Insight supplies a set of pre-defined KPIs as standard, but users are free to specify others and use them in relevant organisational units.



Columnna's consistent, standardised documentation means that relevant and valid aggregate data can be extracted as graphs, lists and tables, which provide an overview of the data in relation to selected focus areas.

SYSTEMATIC COLUMNNA

Patient Record

Columnna Patient Record is the central point of access for all clinical information about patients.

It provides an overall view of the patient's course of treatment. Day-to-day communication and planning are supported by clinical pathways, etc. in conjunction with diagnostics, planning, care and treatment.



Interdisciplinary patient record

The Patient Record module provides smooth, efficient management of the flow of information between individual members of clinic staff, and between different departments and hospitals. This Columnna module therefore provides the ideal basis for effective inter-disciplinary collaboration, collaboration involving different departments and working with external partners.

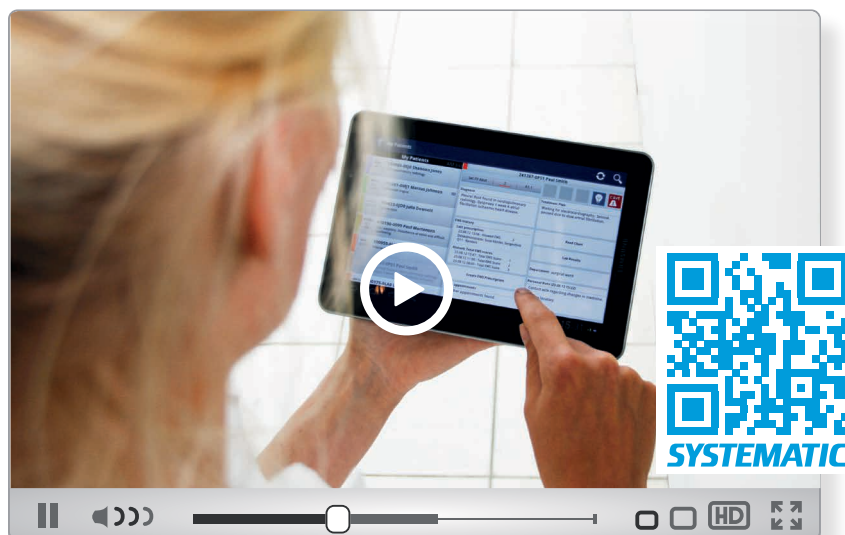
The task lists in this module make sure staff are able to maintain an ongoing overview of the tasks they are responsible for. These task lists are generated automatically from the data in the individual patients' treatment and care plans.

This module is highly flexible, and can be repeatedly reconfigured to tackle new requirements and priorities. Authorised users can configure the clinical content and structure in the journals themselves. The clinical pathways consist of standardised activities and other typical workflows, combined so that they make up an effective plan targeted at a specific disease, treatment or procedure.

One of the advantages of such standardised clinical pathways is that they make it possible to keep to consistent, efficient work routines. This helps ensure the best possible treatment and care for each patient.

Due to the highly structured documentation, the Columnna Patient Record module is capable of providing staff with a wide range of different overviews:

- Up-to-date overview of current status of the patient, including the latest results and activities to be carried out shortly
- A 'read record' function that enables the clinician to easily find and read relevant information in the patient record
- Graphical overviews of values, test results, medication, etc.
- Diagnosis overview that includes all diagnoses and summaries, including admissions and ambulant treatments
- Patient plan that provides a clear overview of all activities planned for each individual patient, irrespective of disease, department and specialist focus. These include clinical pathways, bookings and orders for paraclinical examinations.



Scan the QR code to watch a video clip explaining the Columnna clinical information system.



Flexible overview

Columna is characterised by how easy it is to configure to meet different needs. It is only necessary to have one single shared record to meet the needs of all departments and healthcare disciplines, yet this still supports the particular documentation needs and workflows of each profession.

Clinic staff can configure and customise both the structure of data needed for documentation and the ways this data is presented. The Overview function is a good example of this.

Staff often rank the ability to provide clear overviews as the most important consideration in easy-to-use clinical information systems. Clear, unambiguous overviews of the patient's data are a prerequisite for the right decisions in patient treatment and care.

The healthcare sector is characterised by substantial quantities of widely differing kinds of information from many different sources. This is why the primary job of a clinical information system is to support, filter, collate and present all of this information in a way that provides healthcare staff with the clearest possible overview of all this disparate information.

Get an overview

Using the 'Overview' screen in the Patient Record module, different staff groups can customise the exact patient record overview they need for their particular

purposes. 'Overview' compiles the most central information in the patient's records – in its most up-to-date format. This enables doctors, nurses, administrative staff, therapists and other user groups to quickly assess the patient's condition and current treatment, based on the type of information each group deems essential.

The 'Overview' screen is formed from a range of centralised information from the patient's records, including diagnoses, clinical documentation, treatment notes, medication, booking appointments, blood test results and other test data.

Navigate easily between screens

At the same time, users can quickly and easily navigate back and forth between 'Overview' and details.

For example, nurses can use the 'Overview' screen to see which tests and tasks they have to carry out, and can easily navigate to the summary of results where the findings are documented. Similarly, doctors can see which operations are scheduled for a patient and with a single click can access documentation for each operation.

Setting up decision support

With the built-in "rule generator", users of the Patient Record module are able to create rules for supporting effective decision-making. This is particularly suitable in situations that include entering diagnoses.

The screenshot shows the 'Overview' screen for patient Matti Suominen, 47 years old. The interface is divided into several sections:

- Diagnoses:** Lists various conditions such as 'Hypertension arterial essential', 'malignant neoplasm of the colon or rectum', and 'Anamniotic sac for contact'.
- Medication:** Lists current medications including 'Kaleonid - 750 MG', 'Marevan - 2.5 MG', 'Fragmin - 12500 xAM', 'Fuxin - 40 MG', and 'Corodil - 5 MG'.
- Test Results:** Displays a table of laboratory results, including 'P-Kalium-ion (malt i seru...)', 'P-Kreatin (BUN) IN...', 'P-Parathyrylin (intakt) PT...', 'P-Phosphat (P, urogeni...)', 'P-Elektrokardiografi 12...', 'P-Urat stoff...', 'U-Glucose stoff.', and 'U-Kalium-ion stoff.'.
- Operations:** Lists surgical procedures, including 'Resection of rectum'.
- Microbiology:** A section for microbiological test results.

The left sidebar contains navigation options like 'My favourites', 'Administration list', 'Results', 'Period overview', 'Biochemistry', 'Person and course', 'Documentation', and 'Medicine'.

Each healthcare profession is able to tailor the Columna clinical information system to provide a full overview of the information relevant to its own specialist needs.



SYSTEMATIC COLUMNNA Medication

Columnna Medication improves patient safety by making clinical work routines more efficient. It also provides better documentation for medication ordering.

Improved patient safety

The Medication module supports all the work routines related to medication – from medication ordering, the generation and administration of prescriptions and body fluid accounting to informing patients about the medication they are receiving.

This helps improve safety in all aspects of medication used in healthcare.

Better quality of service and greater safety

Details of patient medication are only registered once. This helps prevent errors in transferring data between the doctor's journal, the nurses' journal and medication plans.

Better decisions when prescribing medication

When new drugs are prescribed, Columnna automatically checks for drug interactions with other prescriptions. The system also checks whether there are specific types of medication that the patient should avoid to prevent things like allergic reactions.

This module also helps give staff a better-coordinated overview of each patient's medication, including medication prescribed during previous periods of hospitalisation and in conjunction with other courses of treatment.

Reducing medication costs

The Columnna Medication module guides doctors towards prescribing drugs that

are in the standard pharmacy range for the department in question. This can play a big role in rolling back medication costs in any healthcare facility.

Optimising processes with robot drug dispensers

The Medication module can be integrated with robot drug dispensers that pack the prescribed medication in the correct dosages in unit-dose packs, as instructed electronically by the physician.

Pharmacies normally distribute medication to the wards in two ways – either as packs to be stored in the medicine cabinet for subsequent use, or collected on rings for individual patients for a pre-defined period.

Preventing mistakes when administering

When the nurse administers the medication, he or she scans the bar code on the patient's armband and the medication pack. Columnna then checks for compliance between the patient and the physician's prescription with regard to drug, dose, time and method of administration.

All these Columnna capabilities help ensure maximum safety in conjunction with medication.

T	Start	Approved	Form	Drug	Adm. path	Unit	7.13	17	20	22	8	12	15	17	20	22
R	10.07.12	22.07.13	DEPT...	A-12 Kaleoid - 750 MG	OR	mg	1500				1500				1500	
R	10.07.12	23.07.13	TAB	B-01 Marevan - 2.5 MG	OR	mg										
R	19.07.13	22.07.13	INJVES	B-01 Fragmin - 12500 XAM	IM	mg	12500									12500
R	10.07.12	22.07.13	TAB	C-03 Fuite - 40 MG	OR	mg					40					
R	10.07.12	22.07.13	TAB	C-09 Cocodil - 5 MG	OR	mg					5					
R	21.07.13	23.07.13	TAB	J-01 Pondocilin - 700 MG	OR	mg					700					700
PN	20.07.13	22.07.13	TAB	N-02 Morfin SAD - 10 MG	OR	mg					700					700
R	20.07.13	22.07.13	TAB	N-02 Pinex - 500 MG	OR	g	1				1				1	
R	10.07.12	22.07.13	TABFL	N-05 Imoclon - 7.5 MG	OR	mg					7.5					7.5
R	10.07.12	22.07.13	TYGT...	A-01 Vitaminal med Selen...	OR	unit					1					

The administration overview in the Medication module shows nursing staff which medication individual patients should have and when it should be administered.



SYSTEMATIC COLUMNNA

Order & Result

Columnna Order & Result enables staff to order different types of services electronically.

Columnna gathers information from a wide range of hospital systems, including microbiology, clinical biochemistry, cytology, image diagnostics, histology, physiotherapy and occupational therapy – and others where appropriate.

More efficient examinations and tests

All the examinations and treatments carried out elsewhere than the hospital ward or outpatient clinic are normally dealt with by specialised IT systems, using a whole spectrum of legacy hardware and software set-ups. This makes for incompatibility and inefficiency.

By contrast, the Columnna Order & Result module enables healthcare professionals to effortlessly order and plan examinations and treatments using a single, integrated system. This paves the way for establishing and maintaining effective courses of treatment, as well as making it easy to inspect examination results side by side with other clinical information.

The Order & Result module provides clear information about:

- Examinations and treatments that have been ordered
- Results received and the progress of examinations
- Alert messages for results that fall outside normal limits
- Prompts for any supplementary clinical information required for special examinations
- Copies of results to departments other than the originator, when necessary
- Set-ups for sample profiles and guidelines for individual departments
- Results received and displayed directly in Columnna can be viewed in textual, statistical, pictorial or graphical formats. Test results are shown in the standard Columnna overviews, along with measurements and medication.

To expand the clinicians' access to data, no matter where they are located in the hospital, Systematic has developed a mobile functionality, Columnna Mobile. Columnna Mobile makes it possible to access data from smart phones, tablets, etc. This saves time, and the patients can benefit from the time saved.

Lab results	
261265-0631 Matti Suominen	
04.05.13 12:50	
P-Koag.fakt.(II,VII,X) INR, AK-kontrol	2.3
04.05.13 07:15	
Pt-Elektrokardiografi 12 afledninger	FORM
03.05.13 11:48	
P-Koag.fakt.(II,VII,X) INR, AK-kontrol	2.1
02.05.13 07:15	
U-Kalium-ion stofk.	20
U-Natrium-ion stofk.	30
U-Protein massek.	0.20
U-Glucose stofk.	65
01.05.13 12:13	
P-Natrium-ion stofk.	136
Historic	
29.04.13 07:00	*****
28.04.13 07:00	140
25.04.13 07:43	140
27.01.13 06:00	140
25.01.13 06:23	140
Comment	
Det anbefales at der også tages andre vasketal. Se evt. håndbog med Klinisk Biokemisk Analysefortegnelse, s 234	
Limit values	
Maximum:	146 mmol/L
Minimum:	136 mmol/L
Updated: 23.07.13 16:19	
All	Abnormal
Requisition	



SYSTEMATIC COLUMNNA Booking

Columnna Booking improves performance in hospital departments and across hospitals by providing staff with a unique set of tools for resource scheduling, managing patient flows and enabling digital communication with the patients

Powering improved performance in hospitals

The Columnna booking module is a unique technology solution developed in response to the challenges faced by hospital managers and medical staff.

The Booking module allows hospitals to manage the scheduling of patient appointments, planning and resources electronically and dispense with paper methods, but that is only the start. Using intelligent business rules which can be configured to the needs of every department or hospital, it manages the workflow resulting from every patient's journey through the treatment process, and optimises resources and logistics across the organisation to improve efficiency.

Visualises the logistics

The logistics from all departments in the hospital (wards, operating theatres, outpatients and accident & emergency, service departments) can be visualised on work stations, electronic whiteboards and mobile devices across the whole hospital. The Booking module provides visual representations of the entire patient flow in emergency wards, outpatient clinics and operating theatres. The current status of each patient is constantly monitored and updated in order to provide consistent, shared communication between different departments within the healthcare organisation. The module also provides support for large interactive displays that give staff a unique overview of work processes and logistics within each department, as well as between departments.

The Booking module features effective coordination of all aspects of hospital operating programmes up to and including the day of each individual procedure, including re-arranging the schedule, staffing adjustments, recalculating start times for operations and dealing with unplanned acute cases as well as cancellations.

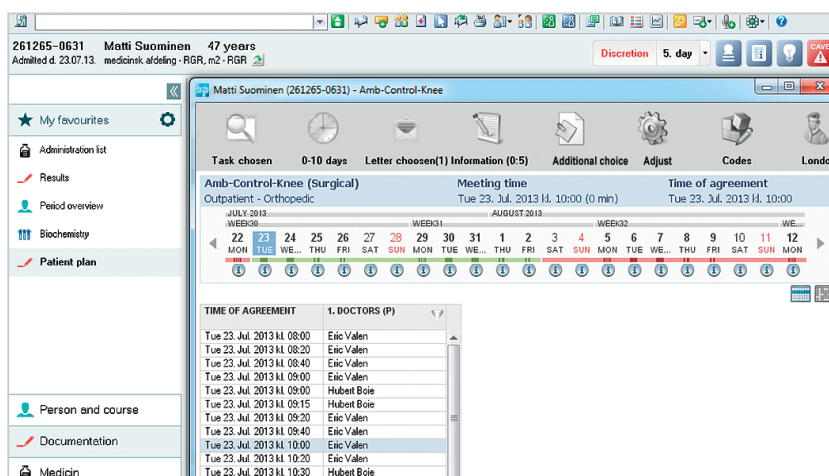
Supports communication with patients

The Booking module supports communication with patients via text reminders (SMS) and web booking. Through the integrated web booking module the patient can book, see and change appointments at the hospital.

Business intelligence tool

Columnna Booking provides a business intelligence tool for utilisation of staff and resources, waiting times, and appointment durations so that hospital staff can monitor and improve effectiveness and develop new ways of managing bottlenecks and pressure points. For operations, it provides useful statistics about the numbers of acute patients, cancellations, etc. as well as automatic analysis focused on room occupancy, surgery times and anaesthetic times correlated against types of operation, the individual surgeon, etc.

The Booking module is based on the Bookplan standard product from the Capgemini Ready2Series, but is fully integrated into the Columnna system.



The Booking module features effective coordination of all aspects of hospital operating programmes up to and including the day of each individual procedure, including re-arranging the schedule, staffing adjustments, recalculating start times for operations and dealing with unplanned acute cases as well as cancellations.



SYSTEMATIC COLUMNNA Patient Administration

Columnna Patient Administration handles all the tasks associated with courses of treatment, payments and reporting.

The full spectrum of administrative information about each patient is an integral element of the ongoing clinical documentation, making administrative procedures faster, cheaper and more efficient.

Easier administration and correct billing

The Patient Administration module simplifies administrative work routines as well as helping with data quality assurance. An important additional capability is that the module automatically provides the data needed for prompt, accurate billing.

The Patient Administration module consists of four parts:

- Course of treatment
- Settlement of accounts
- Reporting
- Communication with external health operators

Course of treatment

The course of treatment section helps healthcare professionals as well as administrative staff with smoothly and effectively registering all the administrative details regarding hospitalisation, outpatient visits, emergency department, etc.

This is crucial for day-to-day planning and helps ensure a reliable basis for management information, settlement of accounts and reporting to the appropriate health authorities – whether local, regional or national.

Columnna Patient Administration provides an excellent overview of each patient's previous contacts with the hospital or

hospital organisation. When the patient arrives at the hospital, this makes it easy for staff to get an overview of previous contacts and episodes.

The Patient Administration module supports all the stages associated with referral, consultation and booking. When referrals are accepted, a consultation can be booked and carried out, and planning of the patient's course of treatment can begin.

Registration of admission or appointments can be done quickly, because only the most necessary and clinically relevant information has to be registered. Administrative staff can subsequently supplement these admission registrations and appointments with any further details necessary for effective administration and finance.

Settlement of accounts

Accurate financial calculations depend on reliable, good-quality clinical data. This can best be achieved when this is registered in the natural course of each patient's treatment.

The accounts section is therefore designed to receive all the appropriate data from the more clinically-oriented Columnna modules. This means clinical staff do not need to spend time on registering data only needed for accounting purposes.

The settlement of accounts section in the Patient Administration module supports both DRG and cost-controlled settlements. This accounts section is used to set up a register of rates, calculate invoices, etc.

Reporting section

The reporting section supports the setting up and implementation of extracts, and the reporting of mandatory data to the appropriate national registers. Such data is automatically reported on the basis of the data already registered in the course of day-to-day use of the Patient Administration and Patient Record modules.

Communication with external health operators

Columnna contributes to streamlining patient flows between different operators within the health sector because it also deals with correspondence with both the primary and secondary sectors.

For example, discharge summaries are sent quickly and electronically to the GP. Similarly, messages regarding rehabilitation, etc. are sent to the appropriate health authority.

Contact Systematic

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About Systematic

Systematic is an internationally renowned developer and supplier of off-the-shelf scalable software products for use in the healthcare sector, the defence industry, financial services and the public sector. Headquartered in Denmark, we also have subsidiaries in the United Kingdom, the United States, Australia, Germany, Finland and Sweden.



Systematic is certified as a CMMI Level 5 company.

More info at www.systematic.com