

NTT DATA



ehCOS

We're here to help
by NTT DATA

Critical Care

Continuous information system to help healthcare professionals make accurate decisions at all stages of care.

Commercial Proposal
NTT DATA_v1.6
Mar 2022

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NTT DATA Health

A benchmark in Health with a global presence.



+20

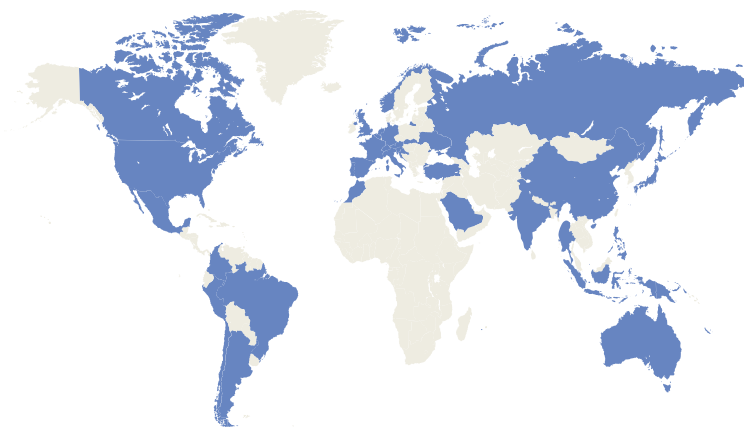
years helping
Healthcare
organizations

+200

healthcare
organizations we
work with.

+1000

specialized
professionals in our
team.



We are part of NTT Group, with a global presence in more than 50 countries and with more than 130,000 professionals



Towards new health systems that are more proactive, more innovative and smarter

The transformation of Health in search of maximum speed, quality, and safety.



The great challenges of health systems

We must evolve towards a smarter, patient-centred system



Clinic

Analytical solutions for the clinical phases of Prevention - Diagnosis - Treatment - Recovery - Control and Monitoring



Epidemiological

Analytical solutions for prediction, management and epidemic monitoring



Genomics

Analytical solutions in the field of genomics for the development of appropriate personalized treatments before the disease develops



Management

Analytical solutions capable of supporting operational improvement, financial management, resource planning and improvement of clinical and operational processes

Pharmacovigilance

Analytical solutions to improve the efficacy and safety of medicines

Clinical Research

Provide the organization with a global platform of data from multiple sources at the service of clinical research.

Our digital healthcare transformation

NTT DATA Health framework



Digital excellence

Digital models of relationship with citizens based on the centrality of patient citizenship and community health, oriented to prevention and anticipation that guarantees care and continuum of care.



Digital talent

Health professionals have new needs and expectations in the face of the challenges posed by a much more empowered digital society.



Clinical improvement

Apply advanced technologies throughout the value chain of health care to improve clinical management (disease prevention, health promotion, diagnosis, treatment, and monitoring).



Operational excellence

Digitalization and automation of management and healthcare processes, from the perspective of developing state of the art clinical management systems and from the automation and operational efficiency of management processes.



Data Driven Health

Data driven health to align short and long term decision making based on evidence from data.



**We are here to
help patients,
healthcare
professionals
and to help you.**

NTT DATA believes that the most important thing in healthcare is people: the health professionals who provide medical care and, of course, the patients who receive it.



That's why we developed ehCOS, a suite of digital healthcare solutions developed in conjunction with healthcare professionals to increase efficiency and encourage best practices in clinical and organizational processes.

The health solution designed to help the health system

Designed by professionals, developed by NTT DATA, tested by everyone



ehCOS is a modern suite of products to deliver digital healthcare at scale and securely and cost-effectively. An open and flexible solution with a modular design that allows the progressive adoption of ehCOS, adapting to the needs and availability of each center, and is fully interoperable to ensure easy integration with other standards-based applications.



Scalable and Secure Digital Health Solution

ehCOS is a modern suite of products to deliver digital healthcare at scale, safely and cost-effectively.



Designed by and for healthcare professionals

It has been developed in collaboration with healthcare professionals to drive efficiency and encourage best practices in clinical and organizational processes.



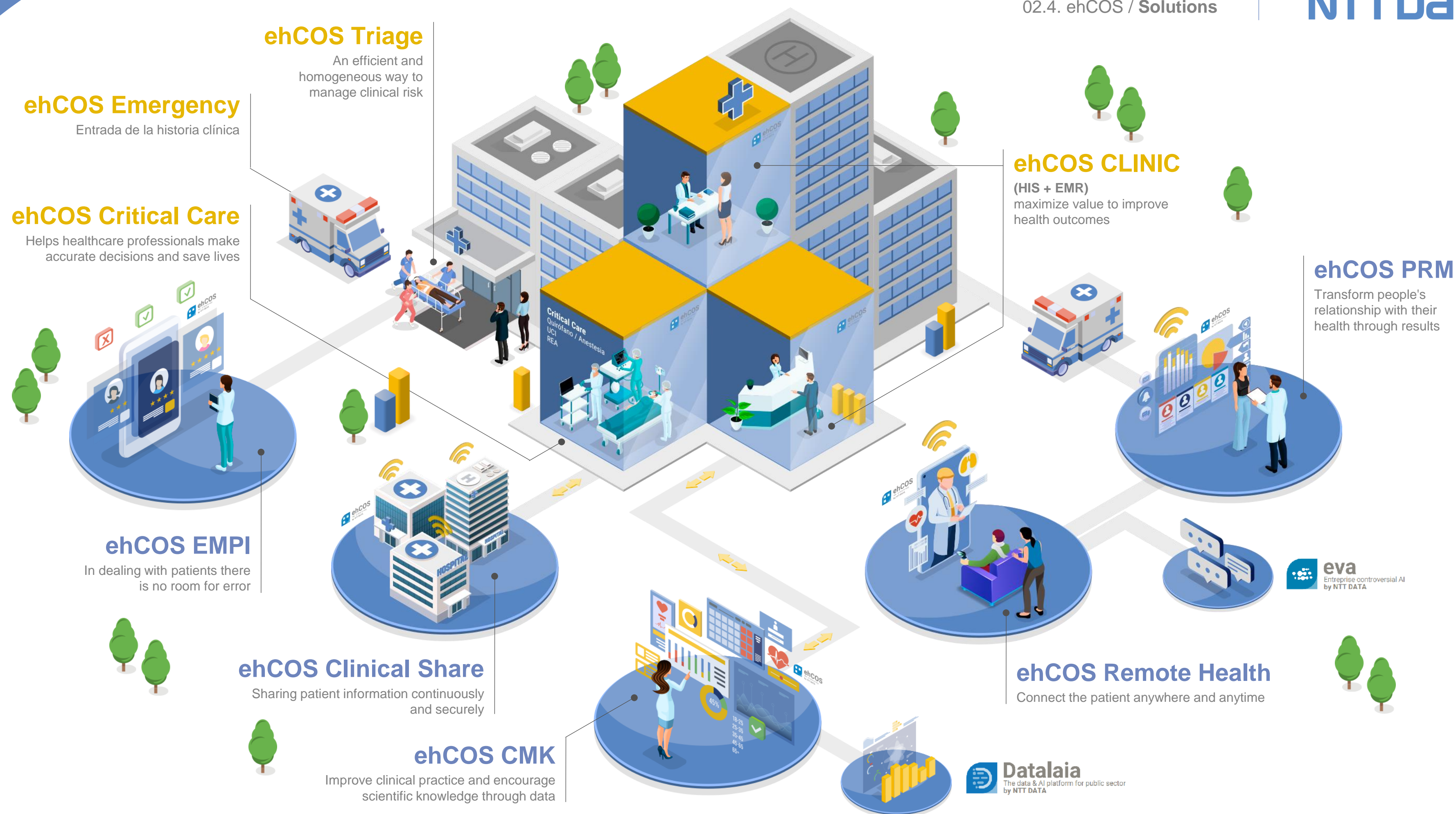
Modular design adaptable to the needs

Its modular design allows to adopt ehCOS progressively, adapting to the needs and availability of each center.



Open, flexible and easily integrated solution

It is an open, flexible, standards-based solution, and is fully interoperable to ensure easy integration with other standards-based applications.



A solution that grows more and more every year

Acute Care EMR Latin America



Corporate Research Unit



GLOBAL SOFTWARE RANKINGS | ACUTE CARE EMR

Acute Care EMR Latin America

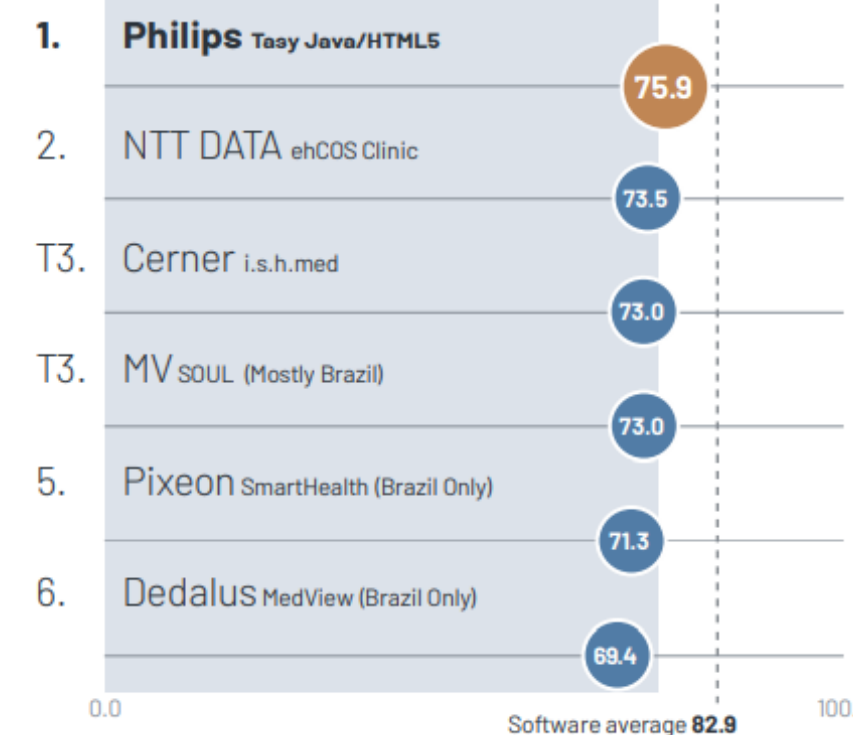
Segment definitions can be found on page 28.



Solution Comparison

Overall performance score

Acute Care EMR—Latin America average **74.8**



Grading scale (Grading methodology can be found on page ii)

A+ = 95.0+ B+ = 85.0-87.9 C+ = 75.0-77.9 D+ = 65.0-67.9 F = <58.0
 A = 91.0-94.9 B = 81.0-84.9 C = 71.0-74.9 D = 61.0-64.9
 A- = 88.0-90.9 B- = 78.0-80.9 C- = 68.0-70.9 D- = 58.0-60.9

	Trend	Total evaluations	Culture	Loyalty	Operations	Product	Relationship	Value
1. Philips Tasy Java/HTML5	-1%	n=18	D+	B-	C+	B	C	C
2. NTT DATA ehCOS Clinic	+8%	n=9	D+	C	C	B	C+	C-
T3. Cerner i.s.h.med	-4%	n=10	D	B-	C	C+	C+	D
T3. MV SOUL (Mostly Brazil)	-9%	n=22	D-	B	B-	B-	D+	D
5. Pixeon SmartHealth (Brazil Only)	-4%	n=12	D-	B-	C	C	B-	D-
6. Dedalus MedView (Brazil Only)	0%	n=10	C-	C-	B-	D+	B-	F

KLAS

- ehCOS Clinic is positioned in the TOP 2 in the best of KLAS Global Software 2022 for the "Acute Care EMR Latin America". Last year ranked 4th, winning 2 positions.
- In 2022 ehCOS Clinic increased its scores by 8% compared to last year, going from 68.3% in 2021 to 73.5% in 2022 in overall performance.
- Product and Value categories improved their indices in 2022. Product scored a "C" in 2021, now a "B". Value went from a "D-" last year and now is getting a "C-"

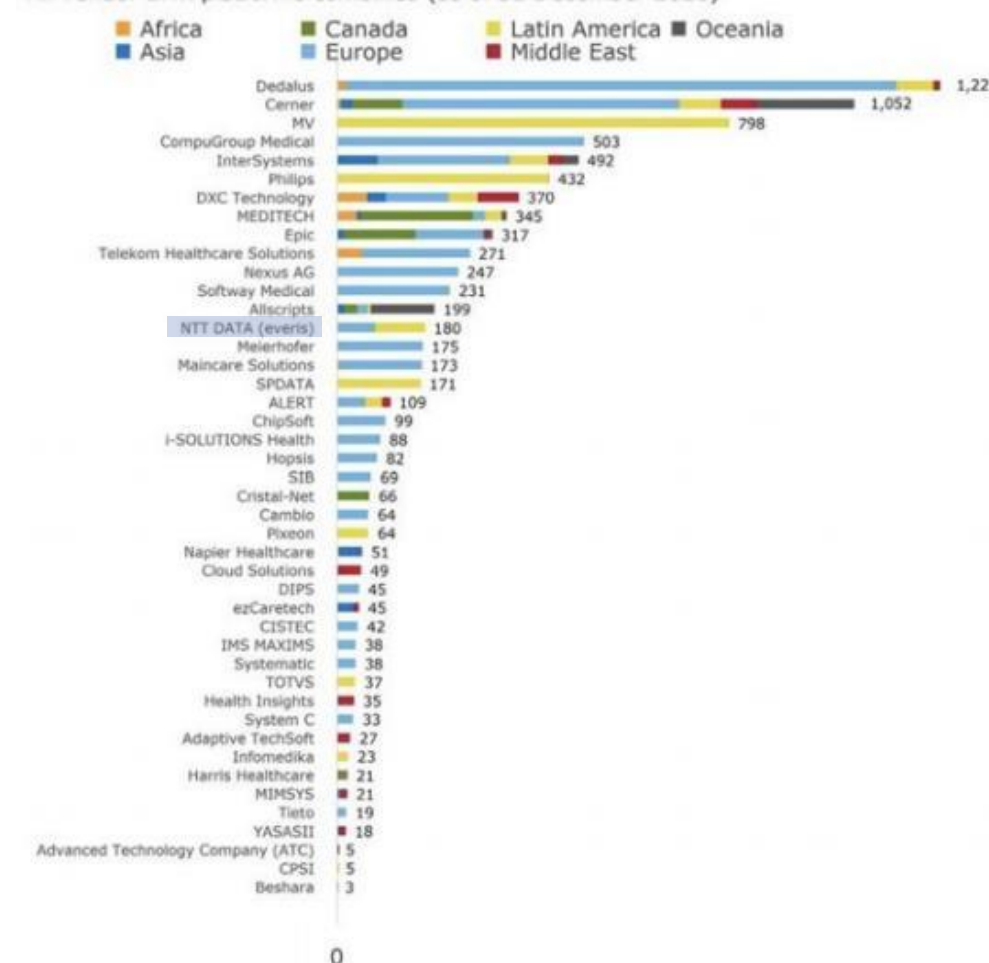
A solution that grows more and more every year



Ranking NTT DATA Health

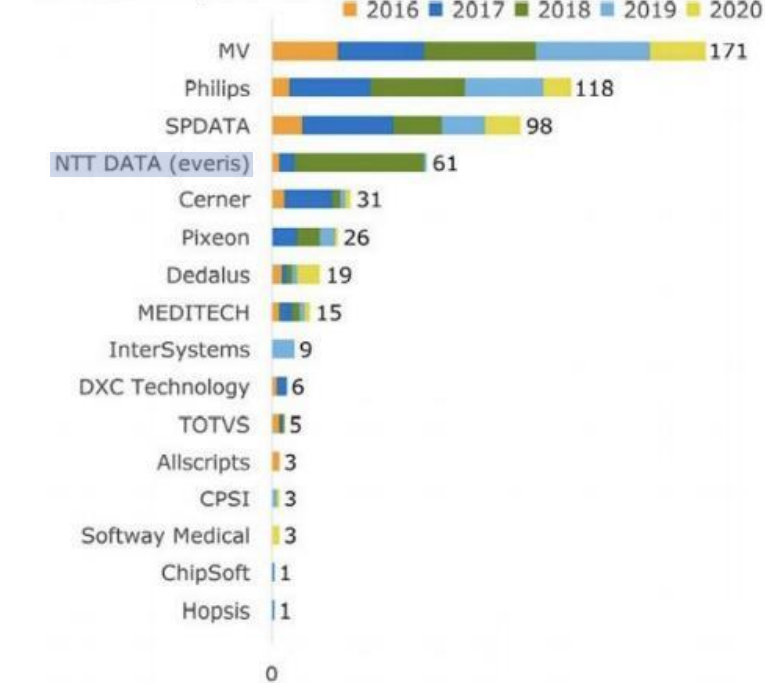
NTT DATA ranks 14th globally (outside the U.S.) with the largest customer base

Estimated Hospital Customer Base by Region
All vendor EMR platforms combined (as of 31 December 2020)



In Latin America, NTT DATA maintains the TOP 4 at Wins Hospital

Hospital Wins, 2016–2020—Latin America
All vendor EMR platforms combined, excluding migrations



The 9 hospitals achieved in Portugal place NTT DATA in the European TOP 18

Hospital Wins, 2016–2020—Europe
All vendor EMR platforms combined, excluding migrations



KLAS

“In the last 5 years, NTT DATA has been the largest seller of EMR solutions in Spanish-speaking Latin American countries, increasing its customer base by 90% since 2015, thanks to the ehCOS Clinic solution”



NELSONHALL

“NTT DATA Named a Leader in Healthcare Operational Analytics Services by NelsonHall”



PEAK MATRIX

“NTT DATA recognized as a leader in the evaluation of the PEAK matrix of digital services for healthcare providers by the Everest Group”

A health solution with global presence and assistance

Everyday healthcare professionals and patients use ehCOS solutions



The NTT DATA Health Ecosystem

Customized, integrated and fully connected solutions

syntphony Health



Innovative and personalized solutions for the Health sector with technologies such as Artificial Intelligence and Big Data to develop better processes and new models that help research and transformation of the sector in the near future.

Soluciones tecnológicas:

	Clonika Intelligent automation platform by NTT DATA
	Dolffia Unlocking unstructured data with NLP by NTT DATA
	eva Enterprise conversational AI by NTT DATA
	Datalaia The data & AI platform for public sector by NTT DATA



Omnichannel Health Experience Between Patient, Center and Physician.

- The day of health: well-being and prevention.
- All at a click: digital front door.
- The hybrid experience.



Tools for the digitalization of the Health System.

- Integral remote care.
- Population health and patient segmentation.
- Ongoing care of chronic diseases.



Automation to make operations more efficient.

- Optimization of reimbursement operations.



Improvement of clinical aspects. Liquid and connected health.

- Connected Health Ecosystem.
- To the liquid hospital.



ehCOS Critical Care

Continuous information system to help healthcare professionals make accurate decisions in all phases of critical care.

Data management in new critical care

Health challenges in the area of critical care

- ✗ Critically ill patients
- ✗ Stressful environment and numerous life support devices
- ✗ Many professionals in little physical space
- ✗ High costs
- ✗ Noise pollution from alarms
- ✗ High turnover of intensive staff

- Ensure continuous patient care ✓
- Prevent loss of information between areas ✓
- Greater safety of professionals and patients ✓
- Minimize costs ✓
- Avoid clinical variability ✓
- Improve decision- making ✓
- Increase efficiency ✓
- Maximum interoperability ✓

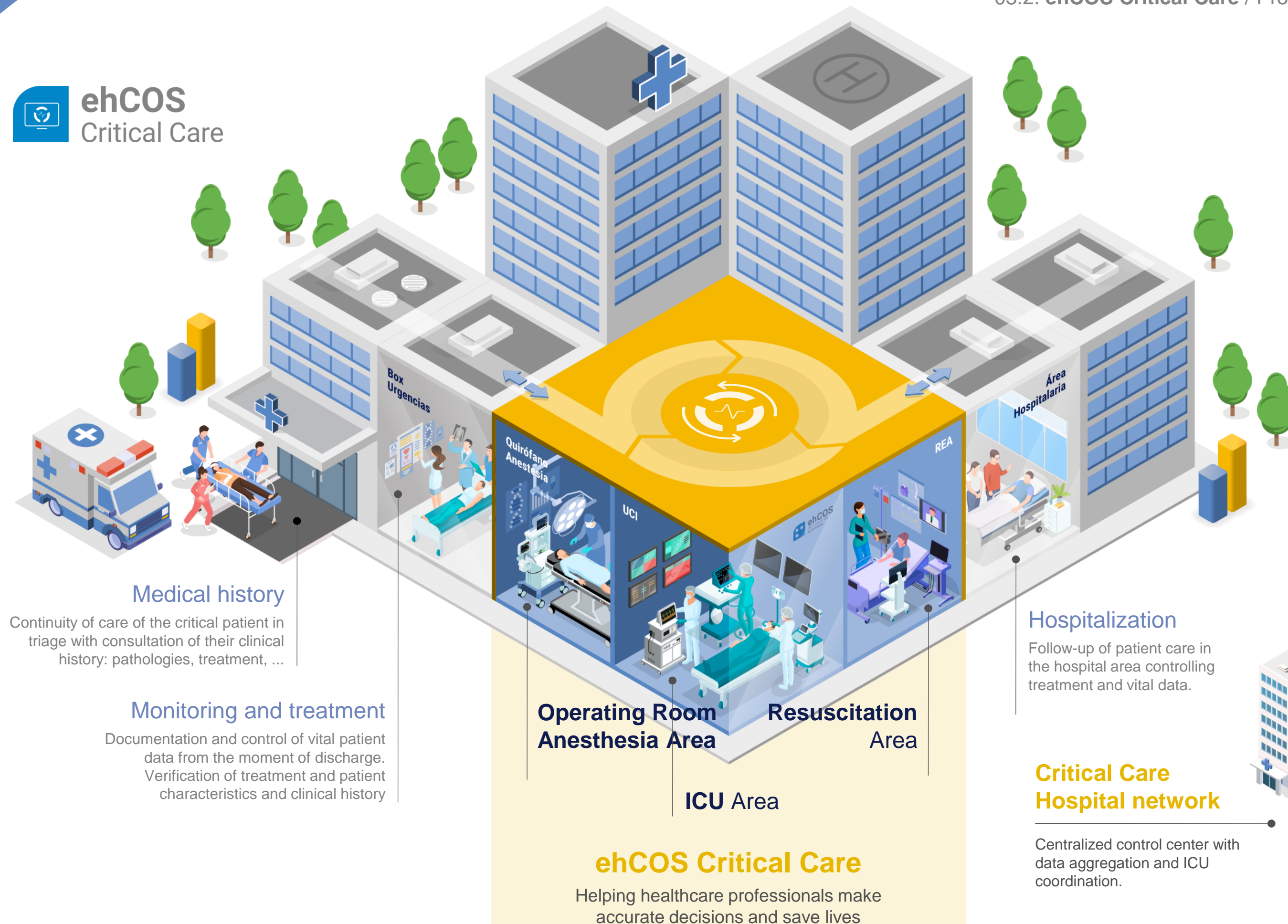


“The avalanche of data in critical care contributes to paralyze many decisions”

*Dr Francisco Murillo, IBIS/CESISC/
Universidad de Sevilla, Spain*

236
Categories of variables generates a patient in the ICU
Morris, Crit Care Clin 1999; 15:523

5-9
Variables are able to properly manage human beings
Miller, Psychol Rev 1956; 63:81



Medical history

Continuity of care of the critical patient in triage with consultation of their clinical history: pathologies, treatment, ...

Monitoring and treatment

Documentation and control of vital patient data from the moment of discharge. Verification of treatment and patient characteristics and clinical history

Operating Room Anesthesia Area

Resuscitation Area

ICU Area

ehCOS Critical Care

Helping healthcare professionals make accurate decisions and save lives

Hospitalization

Follow-up of patient care in the hospital area controlling treatment and vital data.

Critical Care Hospital network

Centralized control center with data aggregation and ICU coordination.



"If there is one area where technological changes have sparked a real revolution, it has been in intensive care"

*Dr Francisco Murillo, IBIS/CESISC/
Universidad de Sevilla, Spain*



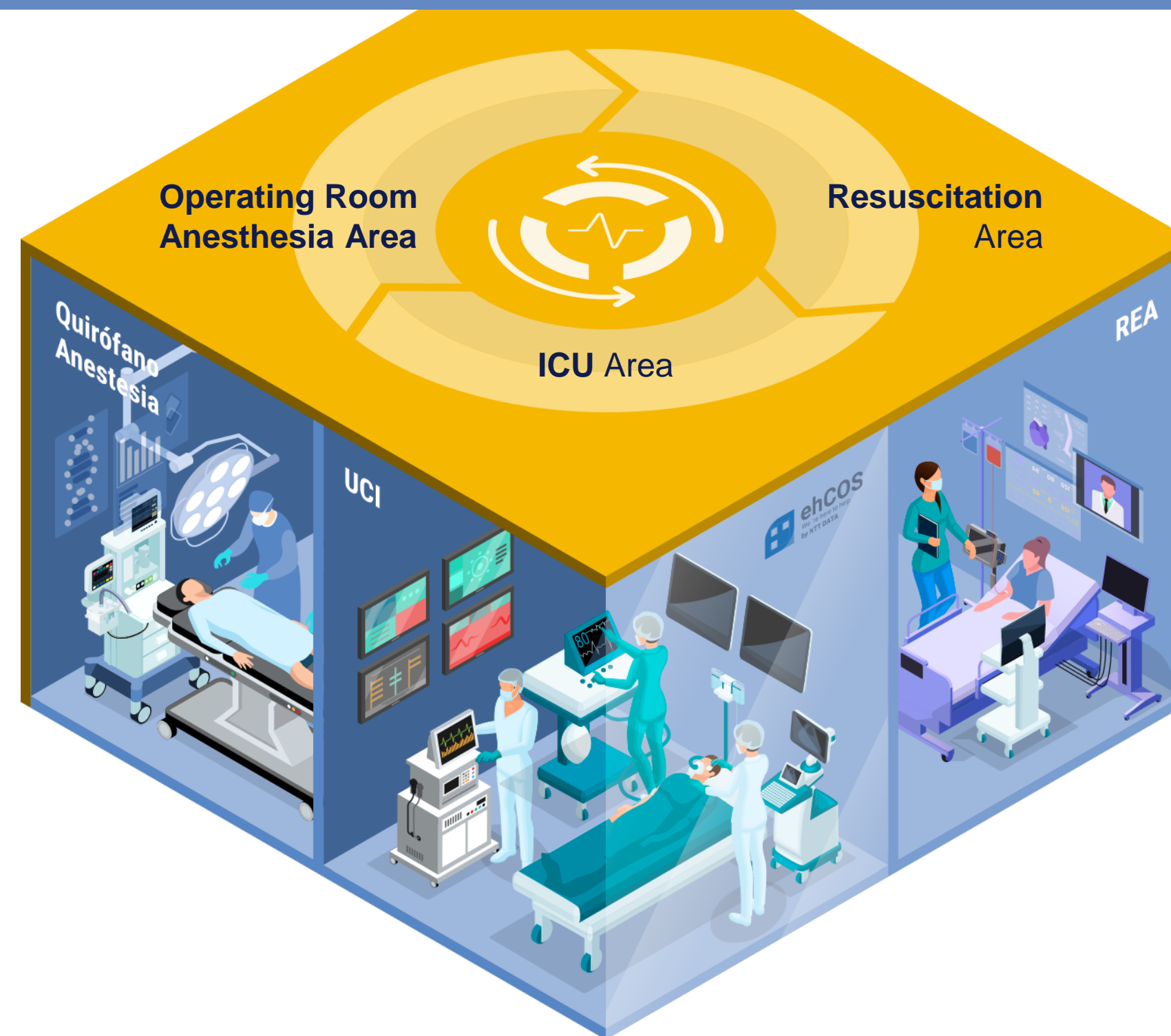
Continuous interconnection in all critical areas: ICU – Operating Room – Anesthesia – Resuscitation

A new model of care focused on the patient and healthcare professionals



Architecture, technology and intelligent use of information to improve patient care and the protection of professionals.

- Hospital bed
- ehCOS Device Gateway
- ehCOS Critical Care
- Monitoring



Full interoperability

Not only from medical systems and devices, but also from the patient's environment.

Data-driven decision making

The exploitation of data as a basis for the generation of knowledge and analysis of aspects of diagnosis and treatment impossible to know through daily observations.

At critical moments, all the information when it is needed and from where it is needed

The patient as the absolute center of all information systems



Integrated and continuous critical care assistance

A clinical information system for critical care areas that guarantees continuity of care and integrated information. It makes it easier for critical care doctors and nurses (such as ICU, Anesthesia, or Resuscitation) to access data across multiple devices in real time and perform accurate clinical interventions.

Generation of knowledge and improvement of clinical practice

This data is available at all times, avoiding information gaps, reducing uncertainty, increasing patient safety, enabling anticipation and improving clinical practice and favoring the generation of knowledge.

Increases service efficiency and reduces hospital costs.

Greater peace of mind and comfort for healthcare professionals

ehCOS Critical Care has been built by experienced critical care professionals and engineers to optimize clinical workflows, improve usability and patient safety during care, and ensure the best ROI.

Increases patient safety, allowing to anticipate problems.

Integration of digital history with nursing sheet.

Greater ease of training new professionals.

Creation and coordination of critical care networks

Digitalization of critical care networks achieving the coordination of the units to optimize the care capacity of all of them, controlling all the essential information for correct decision making: TYPES of ICU and utilization, activation of alerts, transfer management, comparison of units, cost control, ...





Transform health data into evidence and clinical knowledge

Knowledge generation and analysis through data with ehCOS Critical Care



Obtaining a unified repository of critical patient data generates an extraordinary knowledge base that provides the following advantages:

All controlled in one place

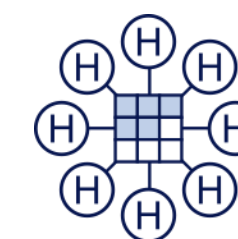
Unified control panel for all centres (indicator of number of admissions, average stay, mortality, indicators of quality of care).

Accessibility to structured data

Availability and easy access of professionals to a large amount of structured patient data for research and knowledge generation.

Anticipation with AI and Big Data

Generation of a Data Lake and the possibility of applying AI and Big Data algorithms to anticipate critical events, prevent mortality and improve efficiency in the use of resources.



Management of ICUs in hospital network

Data visualization to manage the ICUs of a hospital network, allowing a global vision that allows greater efficiency correct decision making.



“When we can analyze the data, information is generated, and when that information generates evidence, knowledge is produced”

Eduardo Vigil Martín.
ehCOS Medical Director



Managing in real time the resources of an entire network of hospitals

Digitalization of hospital network to have a global vision of the available resources



Coordination and care optimization of all ICUs in real time of a hospital network to facilitate decision-making and resource management.

Centralized Control Center

Digitalization of data and coordination of communication mechanism between critical areas of hospitals of the same network in real time.

Remote Critical Care Management



Control and supervision of critical care services, allowing remote monitoring by a professional of these units.



Real-time data dashboard

Generation of knowledge and cost reduction thanks to occupancy information, types of ICU, activation of alerts, transfer management, indicators, resource control, comparison of units, ...

Improve to focus on the main goal: save lives

Increased efficiency and productivity of healthcare professionals



Improving patient care and outcomes

- Access to real-time patient information and minute-by-minute progress monitoring.
- Predictive warnings and alerts with its complex engine of configurable rules and adaptable to the reality of any ICU.
- Continuous and coordinated monitoring from a single place.
- Integrable with any of the electromedical devices as with the infusion pumps.
- Interoperable with hospital systems (HIS, LIS, RIS/PACS and Pharmacy).
- Tele-ICU, TELE-Resuscitation capabilities and support to hospital fast response systems.

Improving resource efficiency in treatments

- Professionals manage with their clinical decisions, 70% of the manageable resources for an intensive care unit.
- The ability to exploit information related to the direct costs of an ICU (pharmacy, laboratories, complementary tests, consumables, etc ...) according to the patient's disease and complexity allows retrospectives that lead to a more efficient use of resources.

Improvement of clinical practice and scientific knowledge

- Facilitates the understanding and exploitation of data for analysis by the professional himself.
- Allows structured search of clinical cases and unstructured by free text.
- Ability to configure new reports and reports autonomously and customized.
- Dashboards parameterized and adapted to the service.
- Use of data to accelerate clinical knowledge, scientific production, benchmarking, development of protocols and indicators of quality and patient safety, as well as efficiency and efficacy for the improvement of clinical practice.

Increased peace of mind and comfort for professionals

- Thanks to the continuous flow of information from each patient who is registered in ehCOS Critical Care, we offer the possibility to professionals to be able to anticipate possible complications that may arise as a result of the clinical history lived in intensive care previously.
- Saving time in the management and exploitation of data that is grouped in one place.
- The system offers autonomy to health professionals helping them to develop protocols and indicators of quality and efficiency and obtain the CMBD, without the intervention of the IT areas.

Reduction of care pressure and greater productivity

- Intuitive and easy to use and easily integrated into the day-to-day life of the clinical team .
- Quick access to information and automation of tasks and processes.
- Prescription and management of requests without leaving the screen.
- Graphs configured without the need for data manipulation.
- Real-time visualization of prescribed medication, administration and water balance.
- Access to established protocols and clinical guidelines.
- Standardized reports of admission, evolution, discharge, transfer or mortality
- Module of evaluation, diagnoses, and nursing care, adapted to the NANDA classification.
- The automation of the information registry allows to eliminate the registry in paper ("ICU nursing sheet"), reducing the time spent on this activity.

Reduction of cost per patient and average stay

- Optimizing the clinical and operational efficiency of the ICU reduces complications.
- Decrease in the average patient's stay during hospitalization.
- Reduced cost of care per patient.

30%

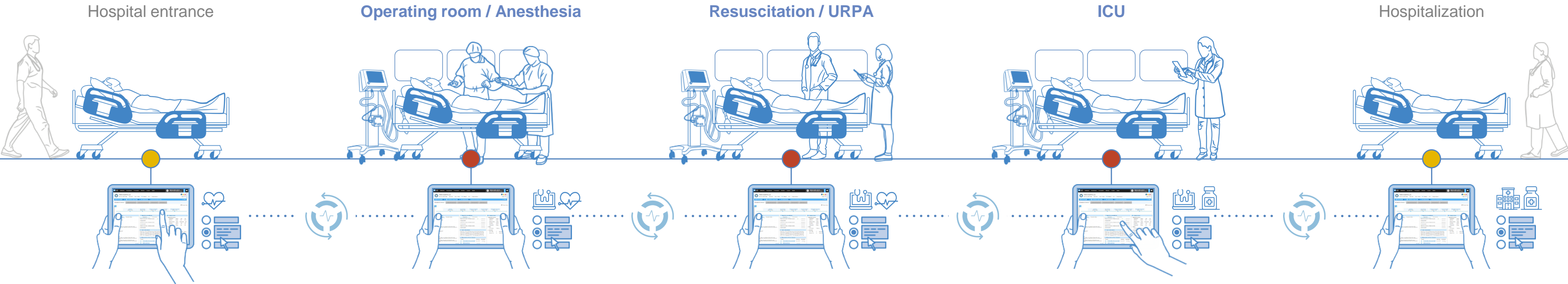
**Intensive Care
Services consume
about 30% of available
resources for acute
patient care with 8% of
total hospital costs.**

**But they account for
only 5% to 10% of
hospital beds.**

G. Carrasco, Pallarés, L. Cabré. Costes de la calidad en Medicina Intensiva. Guía para gestores clínicos Medicina Intensiva 2006; Vol. 30. Núm. 4. páginas 167-179

Patient information flows and it is shared anytime and anywhere

Ensuring continuity and comprehensive care in critical care



It is of vital importance that during the passage through critical care of the patient there is no loss of information and at the same time that it is accessible at all times and from any point that is needed.



ehCOS Critical Care ensures data connection and continuity from different critical care areas. The information is documented in a common digital history ensuring its control and access whenever needed.

Patient information flows and it is shared anytime and anywhere

Ensuring continuity and comprehensive care in critical care



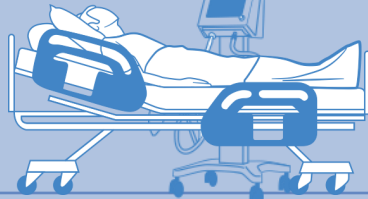
Biomedical devices



ehCOS Device Gateway
Signal hub. Central
surveillance system



Hospital Bed
Patient



Integration module

HL7 / FHIR



- Reports
- Prescription of medicines
- Laboratory
- Radiology

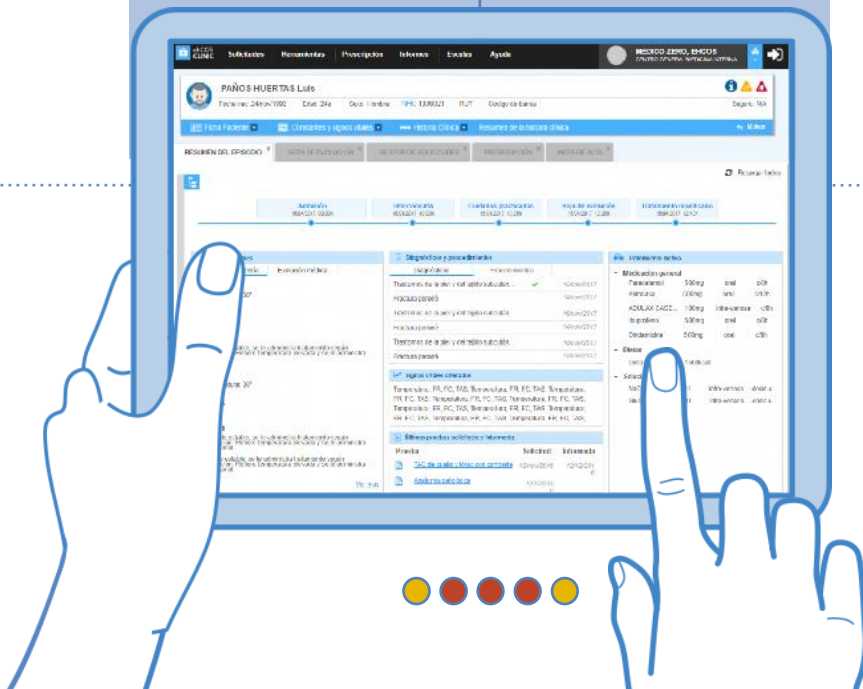
- ICU Admission Report
- Note of evolution in ICU
- Discharge summary for nurse and doctor

Monitoring



Critical care
professionals

Doctors (ICU, Anesthesia, Resuscitation)
Nursing (ICU)



A truly interoperable and integrated system with great flexibility

Equipped with high safety standards

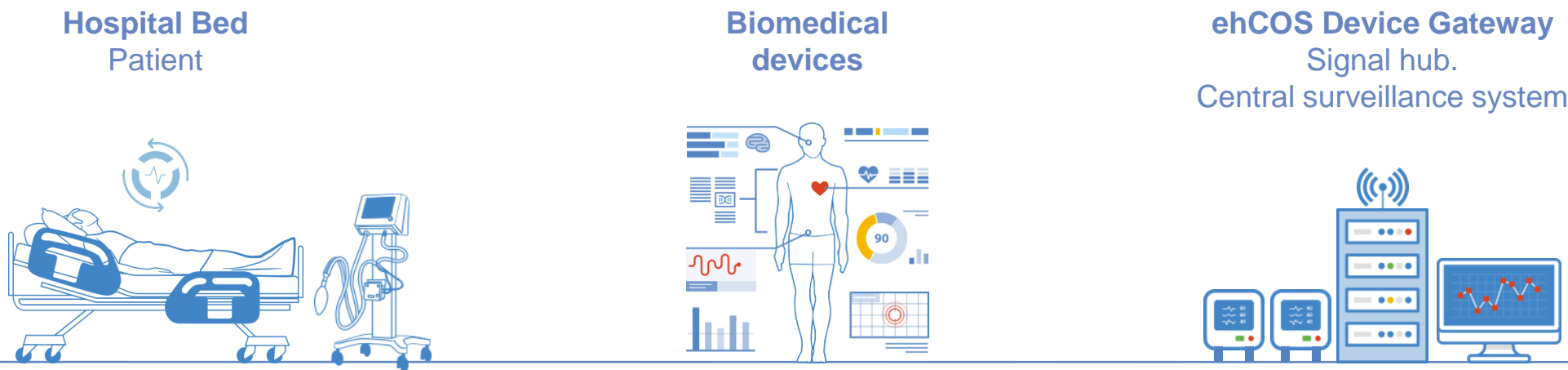
	100% integrated with different HIS, including HCIS or i.s.h.med Clinical System, the clinical layer of SAP.
	Integrated with different systems of Prescription and Electronic Administration of medicines.
	Integration with different laboratory systems.
	Integration with different PACs and radiology systems.
	



Integrable with any system that meets the HL7 standard or FHIR standard.

A truly interoperable and integrated system with great flexibility

High integration capacity with devices regardless of manufacturer



GE Healthcare

Dräger

mindray™

HAMILTON
MEDICAL

MAQUET

MASIMO



COVIDIEN

ALARIS™
MEDICAL SYSTEMS



FRESENIUS



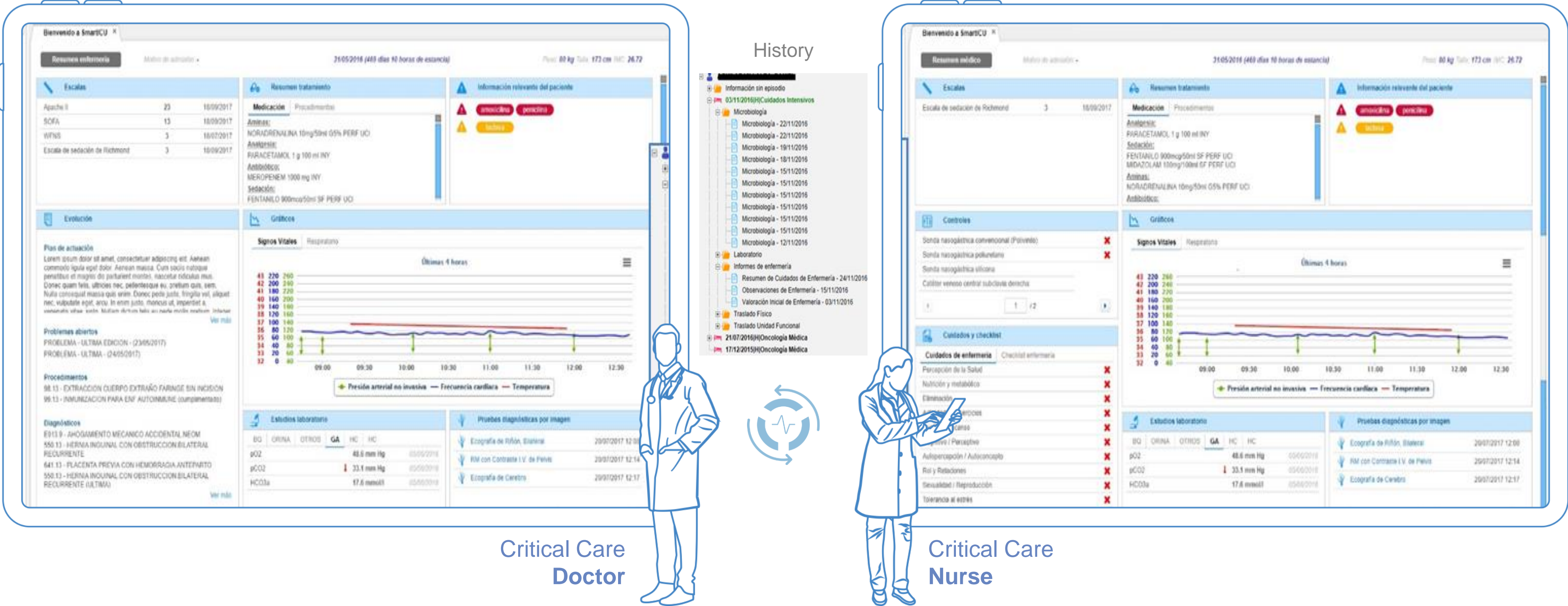
ehCOS
Critical Care



Any device that meets
the IHE Patient Care
Device profile on
HL7/FHIR standard

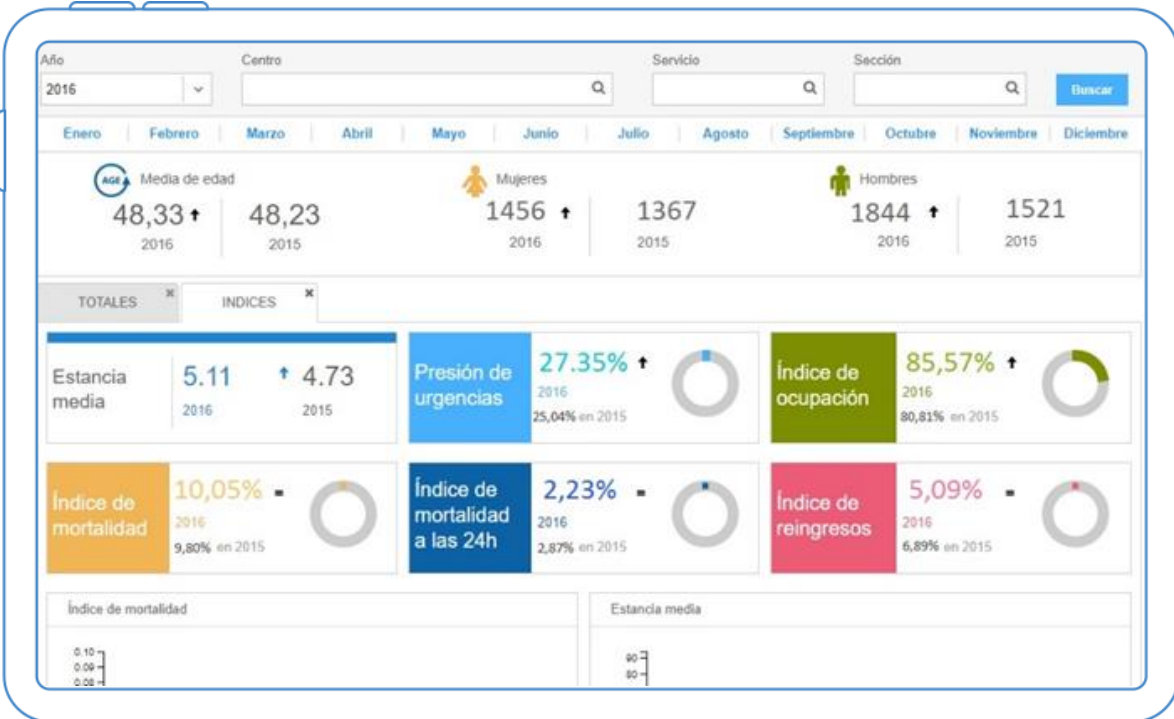
A single point of view 360° of the patient's condition in real time

Improving the experience of professionals and the adoption of technology



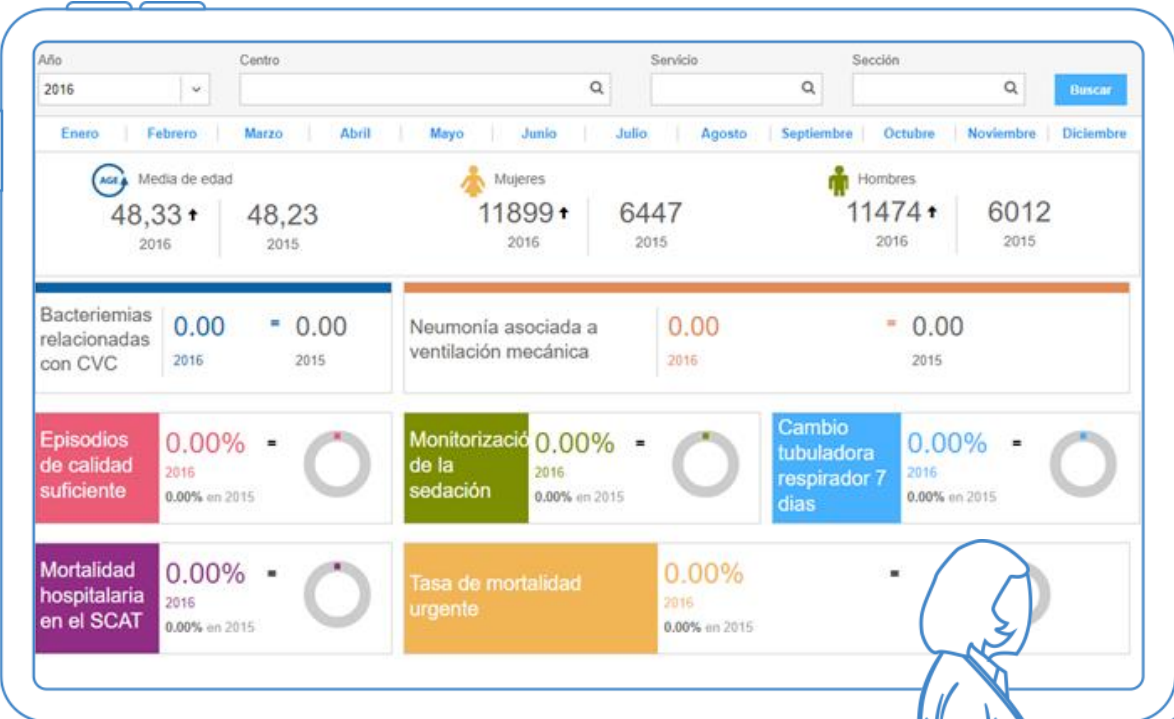
A clinical practice equipped with more data and more intelligence

Monitoring and analysis of quality indicators



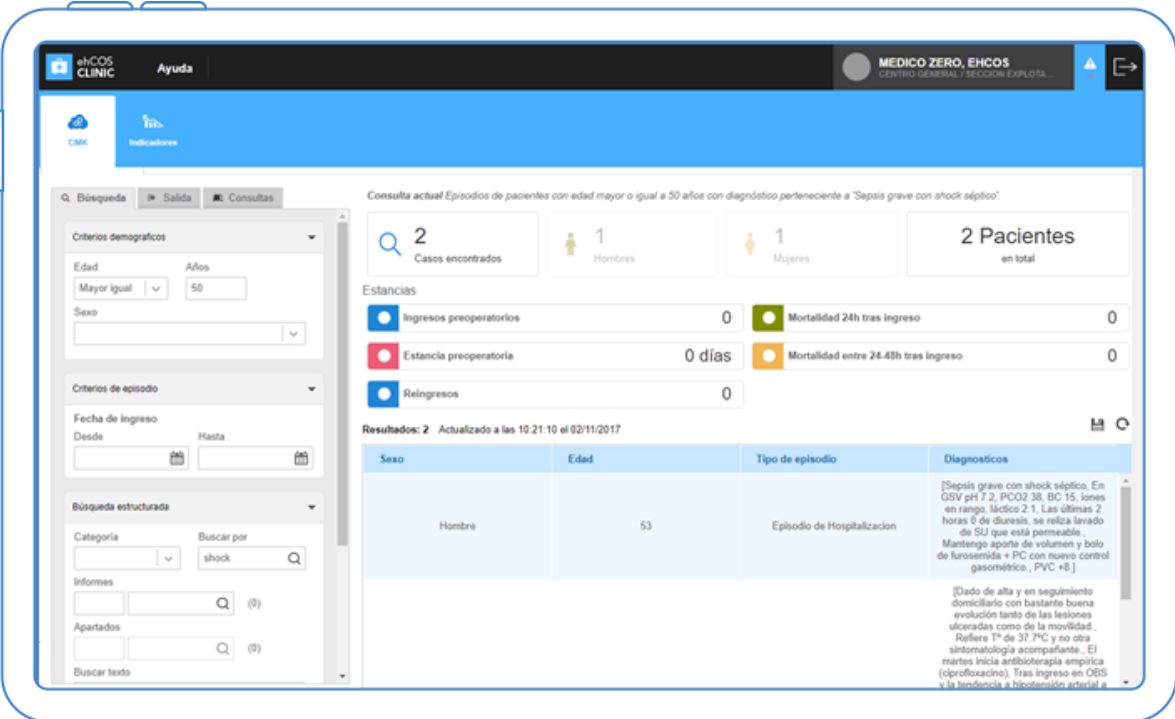
ICU Indicators

Obtaining the main management indicators such as average stay, occupancy rate, mortality rate or readmissions.



Clinical indicators

Obtaining clinical indicators such as bacteremia related to central venous catheter, or pneumonias associated with mechanical ventilation.



Case mix knowledge

ehCOS CMK ehCOS CMK allows the exploitation of the case mix through the ability of personalized searches:

- Ability to filter episodes by diagnosis, procedure, age, or sex.
- Ability to search by a range of high or risk dates.
- Possibility of exploiting clinical reports, even exploring text in natural language.

Access to patient status anytime and anywhere

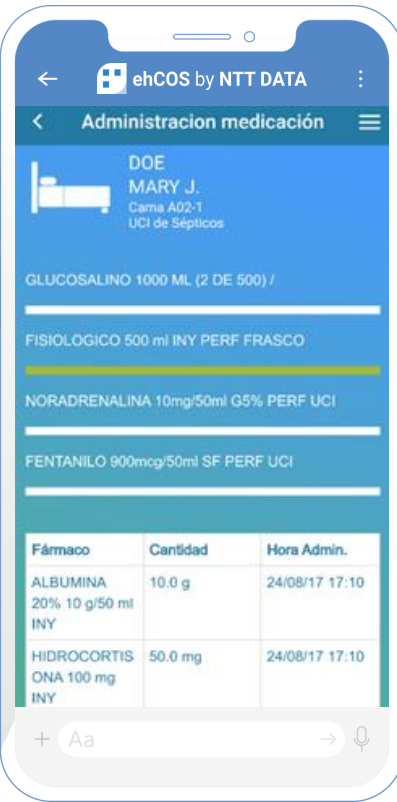
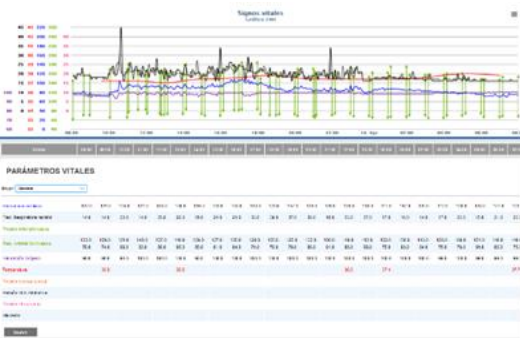
ehCOS Critical Care APP available for iOS and Android devices



The information a critical care professional needs at the fingertips of a mobile



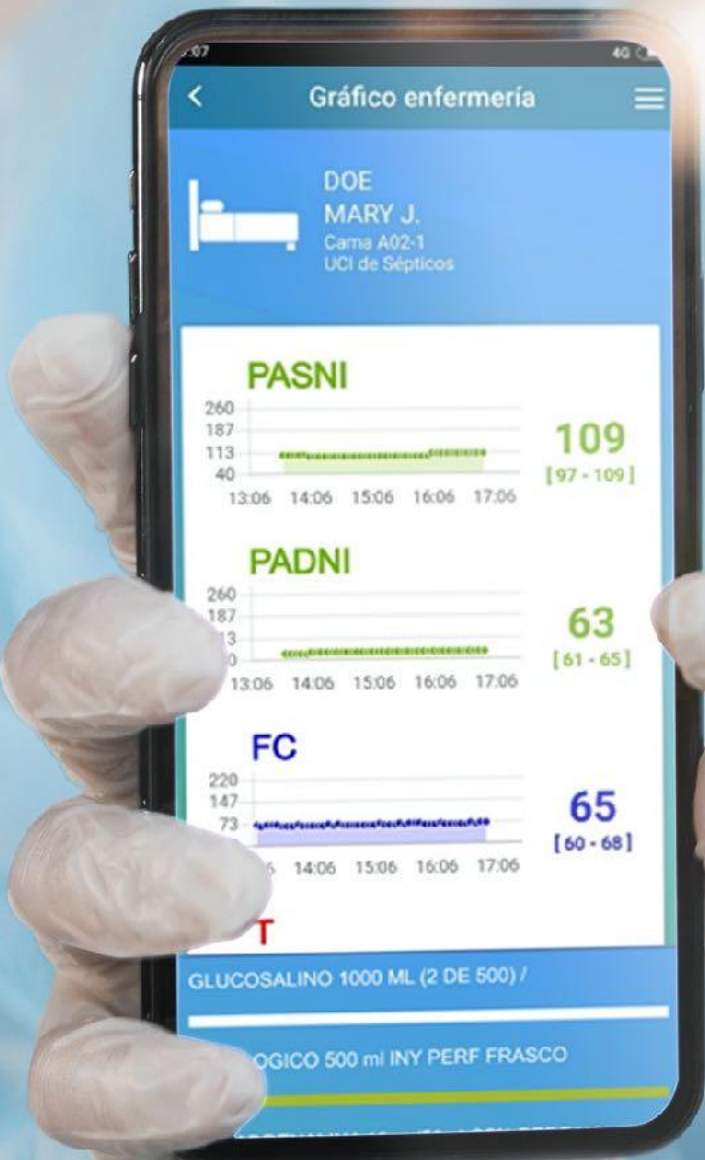
Constant



Treatment

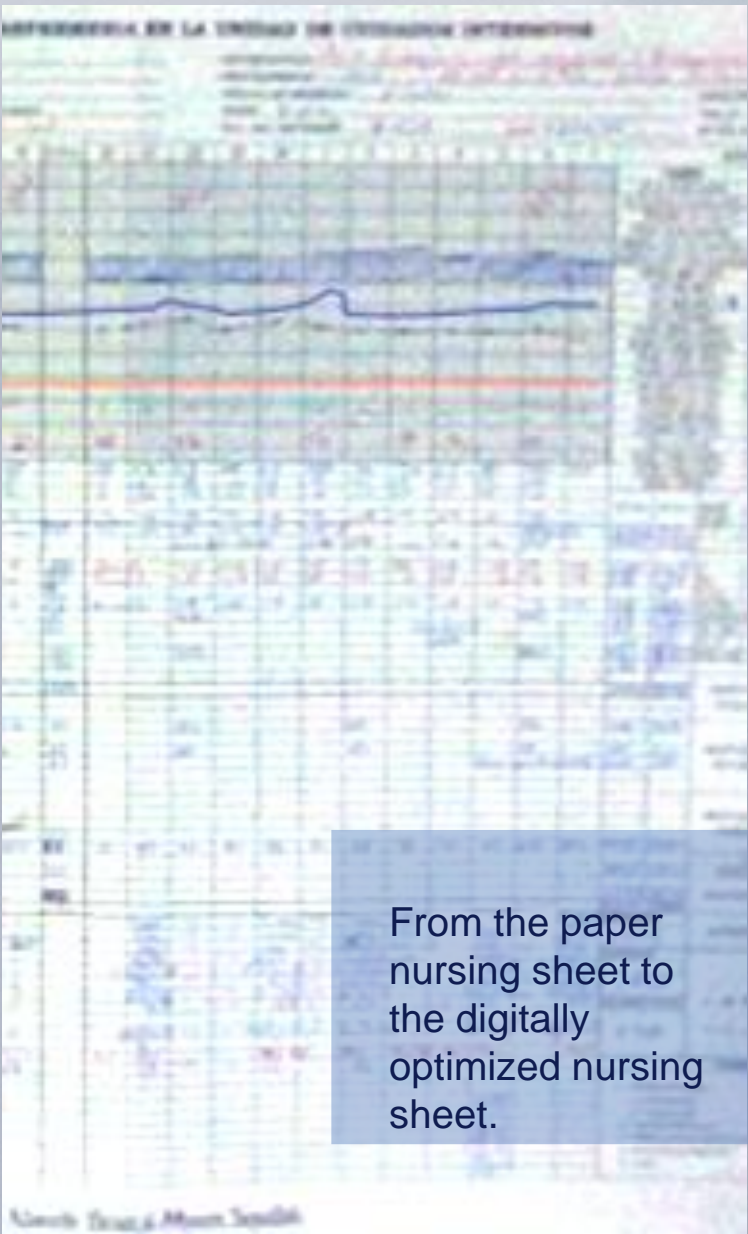


Liquids

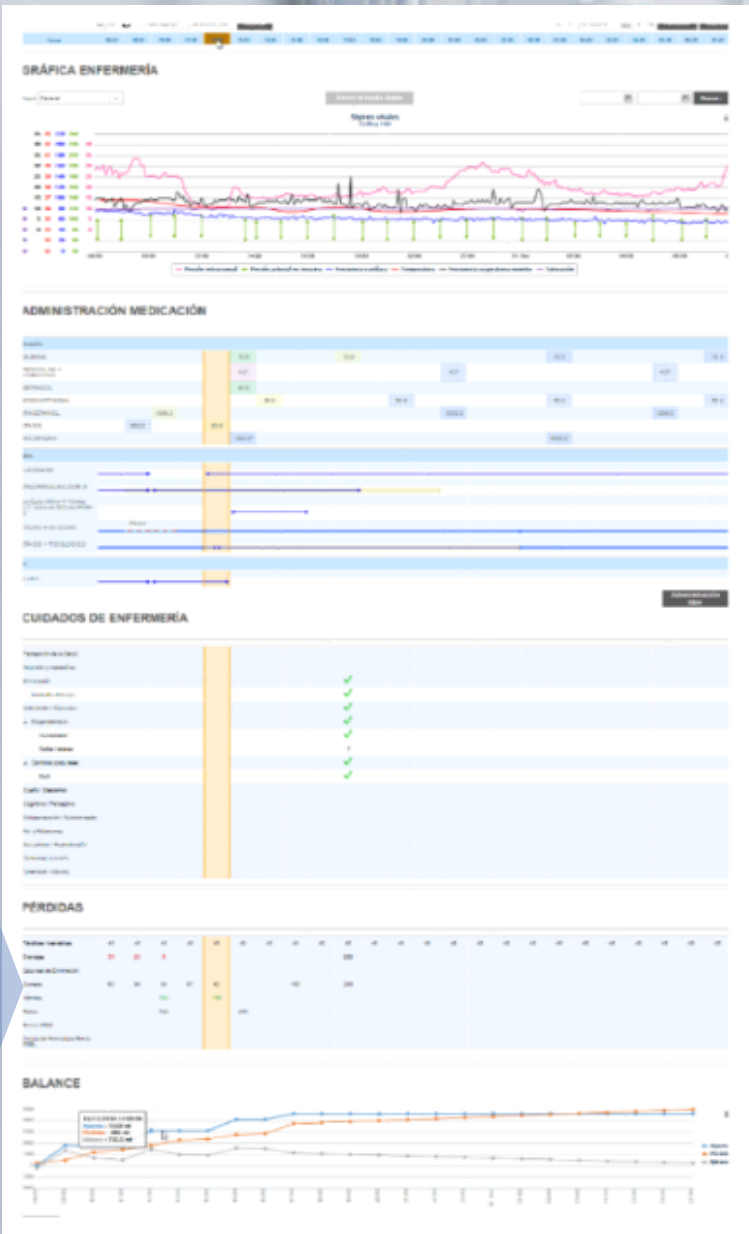


Digitalised and optimised ICU nursing sheet

Digitization of the nursing sheet with data capture and alerts



From the paper nursing sheet to the digitally optimized nursing sheet.



NTT DATA is innovation for health

Artificial intelligence based on data, applied to the health system



Critical Care AI module

AHE Prediction, Hypoxemia and Septic Shock



Critical Care AI module aggregates data, predicts the short-term conditions of patients admitted to the ICU and, if necessary, warns the professional of the cases to watch.

- Accumulation of data: vital, ventilator, infusion pump, laboratory, scores, ...
- Real-time prediction
- Alert: Bedside Monitor, Doctor's Smartphone

The **goal** of the predictive solution is to create models of artificial intelligence using machine learning techniques to differentiate the positive and negative cases of a certain disease.

The end **result** is a tool that helps the professional by alerting them to patients who are at risk of entering into crisis in the near future.

Virtual Patient Observation (VPO)

Artificial intelligence applied to the transmission of images in real time to generate early warning alarms in order to improve the safety of patients in ICUs.



Features

Nurses can attend to the patient to avoid fatal consequences for their health.

- VPO monitors patients 24 hours a day.
- VPO detects unwanted events and situations of risk to patient safety.
- VPO will send an alarm to medical staff in real time if any events are detected.

Detected incidents by VPO

- Limbs outside the bed.
- Empty bed.
- Falling risk (patient sitting in bed).
- The patient falls out of bed.
- Nurse raises arm to call for help.
- Hands on the face: risk of extubation.



ehCOS Critical Care

Success cases

Digitalization and optimization of intensive care units



- **+30 M Automatically recorded constants .**
- **+20.000 Medications infused automatically.**
- **+10.000 Calculated scales**
- **+2.000 Patient Safety Alerts Issued.**
- **72 ICU Beds**
- **+7.000 Patients monitored.**

Challenge

Intensive Care Units (ICUs) are environments characterized by the large number of monitoring devices connected to the critical patient. This huge amount of data generated is impossible to manage by the human mind and, far from that information helping decision-making, hinders the priorities of doctors and nurses in the ICU.

As in many other hospitals, the ICU of the Virgen del Rocío University Hospital was disconnected from the rest of the hospital systems, causing the relevant loss of critical patient data and creating a trail of information as it passes through this unit.

Solution

ehCOS Critical Care integrated the ICU into the rest of the hospital systems as a laboratory, pharmacy or radiology, etc having all the relevant information for care.

The system captures, analyzes and represents the information intuitively giving a good support to the decision making.

Automatic data capture from biomedical devices provides real-time update information on the status of the critical patient, eliminating manual recording.

The analysis and exploitation of the data with the system allows to obtain indicators, and to promote research and clinical analysis.

Results

The implementation of ehCOS Critical Care in 4 intensive care units of the VRUH has allowed professionals to increase the accuracy of clinical decisions and decrease the risk of error.

With the automation of data recording, nursing work has been optimized and patient safety has been increased.

Digitalization and optimization of intensive care units



- **+2 M Automatically recorded constants.**
- **+1.000 Medications infused automatically.**
- **+7.500 Calculated scales**
- **+1.000 Patient safety alerts issued.**
- **58 ICU beds**
- **+3.000 Monitored patients.**

Challenge

The ICU of the Gregorio Marañón University Hospital was disconnected from the rest of the hospital systems, causing the relevant loss of critical patient data and creating a trail of information as it passed through this unit.

Solution

ehCOS Critical Care integrated the ICU to the rest of hospital systems such as laboratory, pharmacy or radiology, etc. having all the relevant information for care.

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We're here to
help patients, to
help clinical
professionals &
to help you.



Thank you