

Driving Medical Device Interoperability in Hospitals with Connected Technologies

Improving patient care by enhancing human capabilities
with connected medical systems solutions

Our Vision: Hospital Automation



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“Helping to reduce the number of preventable deaths in hospitals is a pledge that I made. My personal goal goes beyond: Improving Acute Care with technologies and services that lead to therapy assistance and ultimately to hospital automation.”

Stefan Dräger, Chairman and CEO (2018)

We envision a future where human capabilities to deliver patient care in high acuity environments are enhanced by interoperability. Medical devices will be connected as systems and interact with one another, enabling new clinical applications in a safe and secure network. These new clinical applications include decision-supporting technologies, remote control capabilities or automated processes.

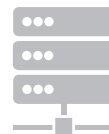
Let us lead you into the future with our integrated solutions, services and expertise that are Improving Acute Care.

Did you know that...



... **\$35 billion of economic waste could be saved annually** in the US healthcare system by a reduction of adverse events, avoidance of redundant testing, decreased manual documentation and shortening length of stay?^[1]

...**up to 75% of medical devices around an ICU bed are not integrated** into hospital information systems leading to incomplete records?^[1]



...**87% of physicians perceive administrative tasks as the primary source for the increasing burden of job-related stress?** Symptoms of burnout can be observed in nearly half of physicians physician putting patient safety potentially at risk.^[2]

The Value of Medical Device Interoperability

Interoperability is the ability to **seamlessly, automatically and securely exchange interpretable data** between devices and systems within an information technology network **in a standardised way** without technical restrictions.^{[3],[4],[5]} Interoperable medical devices can process the data to actively impact the delivery of care.

Interoperability: designed to enhance human capabilities in patient care, not to replace them.

Improving patient outcomes

Adverse events can be reduced by assisting and enhancing human capabilities with smart technologies^[1] for an immediate and individualised delivery of care while also minimising the chances for human errors to occur.

Optimisation of workflows

The risk of errors and staff burnout can be reduced by eliminating today's inefficiencies.^[3] The entry of data into charts and programming of devices could be automated, and data would be accessible remotely at any time in an aggregated format to support decision making.

Increased future-readiness

A connected medical device platform which is scalable and modular, secure and based on open standards is an optimal pre-requisite to react flexibly on dynamically changing requirements in the future.^{[1],[4]}

Driving Medical Device Interoperability with Dräger

Learn more about how we as Your Specialist in Acute Care are utilising medical device interoperability to improve patient outcomes, support you in managing costs and improve staff satisfaction.

Data Integration: Streamlining administrative tasks with electronic documentation

87% of physicians perceive administrative tasks as the primary source of the increasing burden of job-related stress. Symptoms of burnout can be observed in half of physicians putting patient safety potentially at risk.^[2]

Automatic documentation into electronic patient records makes data available in a timelier manner and can reduce errors that are a potential threat to patient safety.^[6] We offer the necessary infrastructure to implement automatic and electronic documentation of reliable therapy-, patient- and device-related data into hospital information systems. Vice-versa, we make data available at the point-of-care for utilisation in clinical decision making.

- Reduce errors through automated documentation and spent fewer time on administrative tasks
- Facilitate transparent, standard-compliant documentation in HL7 format with consistent time stamps
- Improve care with comprehensive, and reliable medical-grade data at the point-of-care



Remote Care: Stay up to date on the patient status while protecting staff

The International Council of Nurses (ICN) claims that at least 90.000 healthcare workers have been infected during the Covid-19 pandemic just within the first four months of the outbreak.^[7]

Modern technologies enable you to make clinical information available wherever it is needed throughout a hospital. Utilising remote and mobile capabilities allows you to bridge distances within clinical processes around the point-of-care. We provide access to data remotely wherever and whenever, it is needed within the hospital's facilities. Our connected solutions support the timely and efficient delivery of care with remote view functions and control capabilities from an actionable vicinity.

- Increase staff safety by reducing exposure to potentially infectious patients
- Improve outcomes and patient satisfaction by reducing patient disturbances
- Utilise remote and mobile capabilities to bridge distances for supervision



Alarm Management: Reducing stress levels and keeping patients safe

Up to 350 alarms a day can occur at an intensive care bed.^[8] Of these alarms, up to 95% are clinically irrelevant.^[9] The remaining clinical alarms are only noticed properly by a rate of 50%.^[10] In a busy critical care unit with several patients, the volume of audible alarms from medical devices is typically high. Signals can overlap and compete for the attention of care providers. Clinical alarms need to be managed correctly to reduce the stress levels for both patients and healthcare workers. We help to reduce the clinically irrelevant quantity of alarms while keeping patients safe. Our solutions aim to decrease stress levels and reducing disturbances for both patients and caregivers while reduce alarm fatigue amongst clinical staff in the long run.

- Apply smart algorithms and analyse alarm history data to identify actionable insights for nuisance reduction
- Increase patient safety with alarm notifications on mobile devices for flexible and prioritised delivery of care
- Access decision-supporting context information with mobile alarm notifications and combined hemodynamic and ventilation data at central monitoring





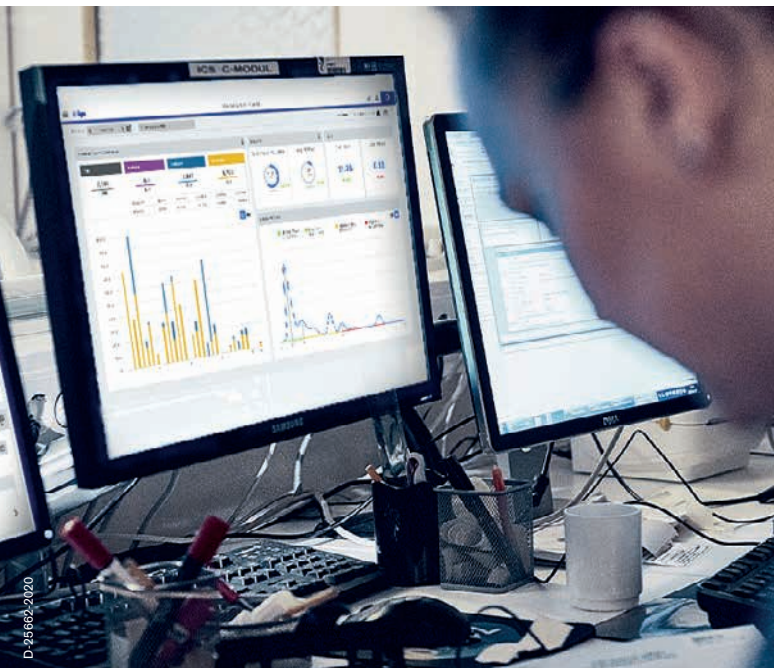
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Assisted Therapies: Allow you to shift focus from technology to patients

16,6% of hospitalised patients suffer from adverse events, 51% of these were determined to be “highly preventable”.^[11]

Ventilated patients require close attention to avoid severe lung diseases like VILI or ARDS. We want to make the utilisation of our solutions as easy and safe as possible so that you don't need to worry about technologies but instead can focus on your patients. Our system solutions utilise synergies from interoperability between medical products and IT systems to reduce redundant and manual work steps.

- Streamline workflows and availability of clinical insights for healthcare workers
- Individualise treatments to enhance patient protection and improve their outcomes



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Hospital Data Analytics: Leveraging the power of data through customer-specific analysis

Working together, Dräger and Avera Heart Hospital evaluated the current state of alarms, and after initial changes, they were able to reduce the average per bed/per day alarm by 40%.^[12]

We enable and support you in generating valuable insights out of available data from therapy devices and patient monitors, which previously have remained unused. Based on that foundation, optimised processes can be implemented, and their effectiveness measured over time.

- Utilise Hospital Data Analytics for better decision-making
- Leverage the power of data through customer-specific analysis
- Optimise clinical and administrative workflows supported by Dräger experts

Cybersecurity: Your Cybersecurity is our Priority

Within two years, 91% of healthcare organisations have had at least one data breach involving the loss or theft of patient data.^[13]

In acute care environments, it is compulsory that therapy and monitoring devices are protected against unauthorised access and manipulation. Our goal is to ensure the continuous delivery of care while protecting assets and sensitive data of hospitals and their patients in sync with regulations. We incorporate cybersecurity measures to develop secure solutions and achieve a secure data exchange between them by default. In addition, we invest in keeping devices secure in the field over their lifetime.

- Implementation of security measures in devices, systems and data exchange
- Limit the access to data, devices and systems to the appropriate users only

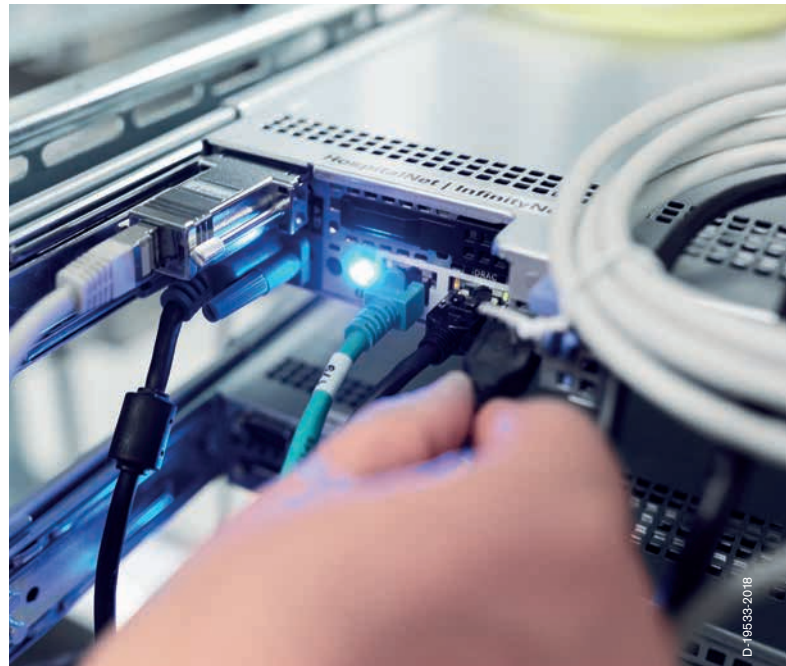


Digital Services: Keeping system performance at high levels

The downtime of an operating room can cost \$3,600/hour of unused operating time.^[14]

Maintaining a heterogeneous installed base of medical devices and software solutions is a complex and challenging task. We support you to enhance operational efficiencies and keep system performance at high levels with digital services and solutions.

- Increase uptime within the medical device fleet by enabling timely interventions and remote status insights
- Centralise the fleet management to improve transparency on integrated medical devices and systems



Discover our System Offerings

As **Your Specialist in Acute Care**, we know that connected solutions play a vital role in driving outcomes and efficiency of patient care.

If you want to learn more about Connected Technologies from Dräger visit www.draeger.com

References

- [1] West Health institute (2013). The value of medical device interoperability: Improving patient care with more than \$30 billion in annual health care savings.
- [2] Bodenheimer, T. & Sinsky, C. (2014). From Triple to Quadruple Aim: Care of the Patient Requires Care of the Provider. *Annals of Family Medicine*, 12(6). S.573-576.
- [3] Pronovost P.; Johns M. M. E.; Palmer S.; Bono R. C.; Fridsma D. B.; Gettinger A.; Goldman J.; Johnson W.; Karney M.; Samitt C.; Sriram R. D.; Zenooz A. & Wang Y. C. (2018). *Procuring Interoperability: Achieving High-Quality, Connected, and Person-Centered Care*. Washington, DC: National Academy of Medicine.
- [4] Taylor, K.; Steedman, M.; Sanghera, A. & Thaxter, M. (2018). *Medtech and the Internet of Medical Things. How connected medical devices are transforming healthcare*. Deloitte Centre for Health Solutions.
- [5] Beyerer, J. (2013). *visIT Interoperabilität*. Karlsruhe: Fraunhofer IOSB.
- [6] Fielier V. K., Jaglowski T. & Richards K. (2013). Eliminating Errors in Vital Signs Documentation. *CIN*, 31(9).
- [7] International Council of Nurses (2020). ICN calls for data on healthcare worker infection rates and deaths. Accessed online on July 20th 2020 at: <https://www.icn.ch/news/icn-calls-data-health-care-worker-infection-rates-and-deaths>.
- [8] Jones, K. (2014). Alarm fatigue a top patient safety hazard. *Canadian Medical Association Journal*, 186(3).
- [9] Association for the Advancement of Medical Instrumentation (2011). *Clinical Alarms*. AAMI 2011 Summit.
- [10] Bridi, A.C. et al. (2013). Reaction time of a health care team to monitoring alarms in the intensive care unit: implications for the safety of seriously ill patients. *Revista Brasileira de Terapia Intensiva*, 26(1).
- [11] Bellani G et al. (2016). Epidemiology, patterns of care, and mortality for patients with acute respiratory distress syndrome in intensive care units in 50 countries. *JAMA*, 315(8).
- [12] Drägerwerk AG & Co. KGaA (2017). *Reference Case: Avera Heart Hospital. Data-Driven Approach Helps Hospital Build Effective Clinical Alarm Management Program*.
- [13] Ponemon Institute (2015). *Criminal Attacks: The New Leading Cause of Data Breach in Healthcare*.
- [14] Giroto, J. A.; Koltz, P. F.; Drugas, G. (2010). Optimizing your operating room: Or, why large, traditional hospitals don't work. *International Journal of Surgery*, 8(5), p. 359-367.

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