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Smart
Health Care
SOLUTIONS



Unlocking potential
Smart Health Care Solutions

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*in pilot phase

Smart Health Care Solutions

There are big expectations for the potential of smart health technologies to support the more efficient and effective delivery of health care. While this type of technology is still in its infancy it is expected to be commonplace in the future. At Deloitte, we are committed to ensuring that the application of any “solution” is embedded in a real world understanding of hospitals and the associated changes in processes and behaviors required to deliver a more responsive service. All of our solutions have a clear and compelling return on investment.



Dr. Stephanie Allen
**Deloitte Global Health
Care Leader**

+61 2 9322 3118
steallen@deloitte.com.au

Health care systems around the world are experiencing unprecedented levels of demand against a backdrop of worsening financial, operational and workforce challenges.

Innovation offers huge opportunities for health care. From simple robotics to advanced artificial intelligence and cognitive processes, data analytics and voice recognition, the possibilities are exciting and infinite.

Over the past two years Deloitte has brought together teams of clinicians, hospital managers, data and analytics specialists, digital designers, technology and innovation experts, academics and strategists to work together to develop innovative solutions that address some of the greatest service delivery challenges health care systems face today.

Smart Health Care Solutions brings together our international expertise and deep industry knowledge to provide affordable, user-friendly solutions across the patient pathway. By combining quality improvement measures and service improvement objectives, we have produced solutions that support effective and sustainable service optimisation and redesign.



Sara Siegel
**Lead Partner for UK Public
Healthcare**

+44 7917 307590
sarasiegel@deloitte.co.uk



ECO – Emergency Care Optimisation

Improving Accident and Emergency (A&E) operations

Background

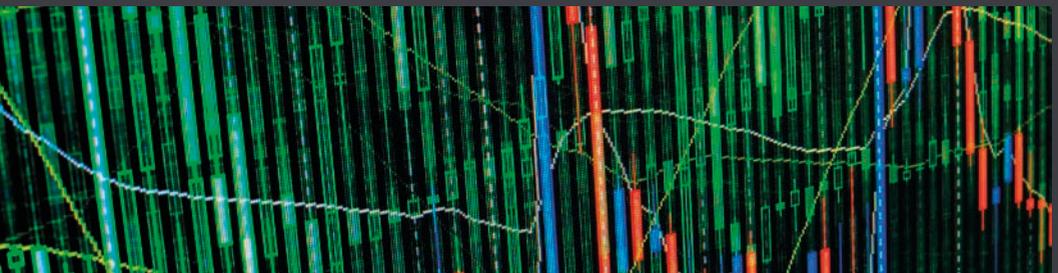
Accident and Emergency departments are under unprecedented increasing pressures, so effectively managing resources and driving efficiencies within the departments has never been more important.

To support these challenges Deloitte has created ECO, a data driven simulation model to map patient pathways and staffing. ECO analyses historic data to assist understanding and future design of services. In addition, ECO can be used to diagnose and direct action in real time through a state of the art user friendly dashboard, with displays designed for both clinicians and managers.

ECO has been built to provide a digital model of the emergency department, which allows a simulation approach based on granular data to experiment with alternative processes and pathways. The tool has been co-created with clinical and operational experts who provide support in developing, challenging and implementing new processes.

Impacts and benefits

- **Optimises performance** on four-hour A&E target
- **Reduces conversion rate** of attendance to admission
- Enable sites to create and test **contingency and resilience plans**
- **Dashboard control centre reporting** for clinical staff and management
- **Identify, test and deliver** targeted improvements within A&E around:
 - Process steps that can mitigate avoidable delays within the department.
 - Workforce deployment approaches that minimise excess costs and maximise staff value-add.
 - Insight-driven decision-making to ensure time, effort and resources are focused on changes that bring real value.





RITA – Referral & Intelligent Triage Analytics

Insightful data-driven demand management

Background

Most health care services are experiencing a significant disparity between demand and capacity. This means seeing the right patient, in the right place, at the right time, having used as little administrative resource as possible to get them there.

Proof of concept

RITA uses the latest in AI and robotics to automatically triage incoming patient referrals and assign patients to appropriate pathways.

We have undertaken a successful proof of concept with a Gastroenterology department in Scotland.

Initial results

In the proof of concept RITA analysed over 21,500 incoming referrals, using natural language processing to identify patterns between referral letter language and triage pathway.

RITA was 96% accurate in triaging patients with suspicion of cancer (versus previous clinical decisions).



Impacts and benefits

• Saving clinical time

Consultant clinicians are released from triaging duties equivalent to multiple hours of administrative burden per day.

• Real-time capacity & demand planning

RITA can use incoming referral letter data and historical data to map out:

- Future demand on the service e.g. how many extra clinic or endoscopy slots the service will require to meet targets.
- Individual demand per patient on the service from referral until discharge.

• Faster patient triage

Automating the triage process is estimated to reduce the overall Referral To Treatment (RTT) pathway by 2-3 days – approximately 15% of a two week wait target.

• Clinical pathway redesign & variation assessment

RITA can use a 'definitive truth' (for example NICE guidelines) and assess triage for variation from these protocols.

• Quality Assurance and education

RITA can assess incoming referrals for low quality, incomplete or insufficient referral information, helping ensure the correct clinical decisions can be made and focusing the secondary to primary care educational agenda.



ATOM – Advanced Theatre Optimisation Method

Advanced data analysis

Background

ATOM® is a theatre optimisation tool that has been designed in conjunction with clinicians. It uses evidence-based algorithms to estimate specific procedure times, accounting for patient complexity.

These times are then applied to identify an optimal scheduling configuration in order to eliminate unnecessary gaps in schedules, and therefore maximise theatre utilisation.

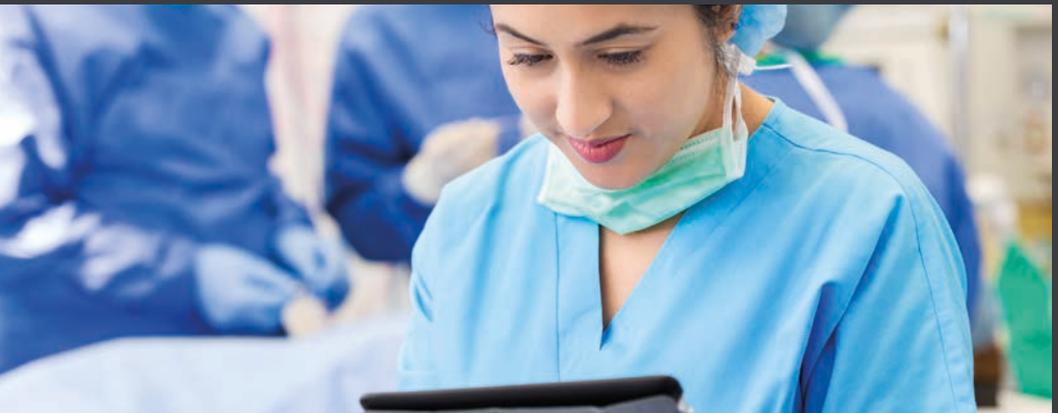
The ATOM® dashboard offers a live forward view of theatre performance including late starts, early finishes, unnatural gap time and theatre flow. The dashboard is also able to account for natural and unnatural downtime in theatres. ATOM® has been deployed in the market for over 6 years and has achieved multiple successes in that time.

ATOM® provides distinct benefits for clinicians and operational staff:

- Converting notes into classified procedures for predicting list flow.
- Enabling staff to plan in line with current performance.

Impacts and benefits

- Typically there is a 15% real improvement in enabling users.
- Improved operation visibility of theatre usage.
- Reduced overtime and WLI payments.
- Reduction in cancelled operations.





OPUS – Outpatient Productivity & Utilisation System

Real, sustainable change

Background

OPUS is a multi-layered interactive dashboard that illustrates specialty and consultant level productivity opportunities. OPUS provides hospitals with an interactive benchmarking dashboard with which to review and interrogate the performance of their outpatient service and to benchmark themselves against peer providers. The dashboard allows for a granular drill down to clinician-level productivity, speciality-level patient flow, clinical variation and opportunities for technological optimisation.

OPUS allows providers to identify opportunities for improved productivity and efficiency, based upon technological optimisation, pathway redesign, and demand management.

Impacts and benefits

Increases productivity by reducing the number of appointments that should have occurred but did not.

This is achieved by identifying patients that did not attend their appointment, and cancellations where the appointment was not refilled as well as assessing the overall utilisation of the outpatient clinic.

In addition, OPUS is also able to predict which patients are likely to DNA in future appointments and highlights future clinics that are under utilised.

Releases capacity by reducing the number of appointments that are occurring in secondary care and reallocating where appropriate to primary care in order to release capacity and improve patient experience.

This is achieved by reducing unnecessary clinic variation in referrals, identifying patients with excess follow up appointments compared to the norm; and highlighting procedures not routinely commissioned.





ALICE – Automated Live Coding Engine

Reducing the administrative burden smartly

Background

Clinical coding is a key function of every health care provider – converting the patient’s admission into a series of diagnosis and procedure codes to ensure accurate and timely payment of activity and precise reporting of health outcomes to inform data analysis.

Clinical coding is ripe for automation. It is heavily reliant on manual entry and human processing, and involves multiple systems to gather information. Furthermore, there is a national shortage of clinical coders with recruitment and retention being a serious challenge.

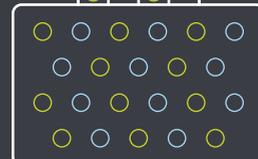
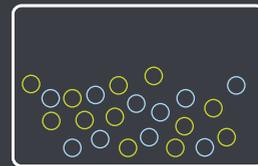
ALICE uses a combination of robotic process automation and a cognitive model to automate the existing manual process of assigning diagnosis and procedure codes to hospital activity.

Impacts and benefits

- Efficiency savings generated from reduced **data entry & administrative burden**
- Larger and faster revenue generation from quicker and more **accurate coding**
- Allows clinical coding resource to focus on more **complex cases**
- Improved health outcome reporting allowing for **improved data analysis** on clinical pathways

RCA in action

Electronically held clinical information



Input the AI engine result into the system



Health Connect

Connecting through Telehealth

Background

The Future of Smart Health will primarily aim to sustain well-being, providing care only in the rare instances when well-being fails, and leveraging data as the new health care currency to solve some of the most complex health care challenges while reducing cost.

HealthConnect is a SaaS-based, off-the-shelf solution, purpose-built to better manage Home and Community-based Care. It is designed to connect health care professionals and consumers in order to improve health and economic outcomes. It enables easier access to care, supports new care models, and brings care closer to home. When teamed with the latest Health Interoperability support, HealthConnect provides the key points of engagement for all stakeholders in clinical care.

Impacts and benefits

Provide easier access

- Enable telehealth and virtual care models
- Quick access to care network via Chat, Video and Messaging channels
- Access to personal health information when connected to the broader health system via health interoperability (i.e. test results, referrals, appointments, and home care / health services plans)

Support new models of care

- Enable screening and early detection for complex diseases.
- Provide preventative, outreach and health coaching programmes to reduce chronic disease and acute care costs.
- Extend virtual platforms for patients to engage with clinical professionals and health coaches.

Bring care closer to home

- Enable health and hospital at home models of care.
- Connect and coordinate home care services.
- Enable collaboration between care network, health care professionals & caregivers.
- Monitor patients' vital signs and home activity, and proactively engage to avoid complications.





DeloitteASSIST

Transforming patient communication through AI

Background

Within the hospital setting the majority of patients do not have one to one nursing cover. Patients therefore must actively call for assistance from nursing staff when they need support. Typically this is done by pressing a call button, however for many inpatients their mobility and coordination is adversely affected for a multitude of reasons. This makes appropriate utilisation of the call button challenging. In addition, this process does not indicate to nursing staff what is required, and patients receive no feedback to acknowledge their request for assistance until someone physically responds to their request.

DeloitteASSIST is an AI enabled patient communication solution supporting patients to request assistance without the need to press a button. Simply by vocalising the request, nurses are alerted to the patient's need, with AI prioritising and smart-routing requests to the right resource. DeloitteASSIST also provides immediate acknowledgment of their request.

DeloitteASSIST also allows patients to access FAQs and to interact with smart devices in their rooms such as entertainment systems, lights, blinds etc.



Impacts and benefits

For Hospital Administrators & Nurses

- Increase nursing time for patient care. Nurses can spend around a quarter of their time completing tasks that are not critical patient care activities. DeloitteASSIST uses AI to eliminate unnecessary activities.
- Improve overall management of clinical teams through enhanced data sets and dashboards that supports decision making associated with skills development and rostering.

For Patients

- Enhance overall experience and improve patient satisfaction by providing a modern, patient-centered technology experience with immediate feedback.
- DeloitteASSIST provides immediate responses to patients, confirming they have been heard and that a nurse is on their way. Patients can also access FAQs without nurse assistance and receive proactive alerts to assist in medication management.

DeloitteASSIST connects patients with entertainment services and can enable smart controls of the patient environment (i.e., lights, TV, blinds).



DeloitteINDICATE

Reducing waiting list times and breaches

Background

There is limited visibility on the volume of incoming referrals, no real time visibility of the waitlist and no predictive forecasts to allow proactive preparation for demand increases associated with complex or high volume cases.

DeloitteINDICATE is a secure cloud-based user interface, accessible on mobile and desktop devices. It provides an integrated, simple view showing real time information on waitlist, predicted demand for the future and upcoming breaches.

The solution

An algorithm forecasting breaches and waitlist demand based on historical data patterns which may encompass:

- Number, procedure and complexity of cases on a monthly basis.
- Average operating time per procedure.
- Leave & conferences (historical, overridden if planned).

Impacts and benefits

- Empowers teams to use a proactive decision making approach in addressing forecasted demand, using reporting tools that provide a real time view of the waitlist.
- Supports teams to meet clinical priority waitlist targets through visualisation and forecasts of potential breaches.





ConvergeHEALTH

Advanced data analysis

Our software solutions help you strengthen your organisation by uncovering hidden revenue and identifying opportunities for strategic growth.

The ConvergeHEALTH suite of software solutions are built with the understanding that, in today's market, truly actionable insights are derived from a combination of real-world information, evidence, and experience, not just data. Powered by Deloitte's unparalleled industry experience, our solutions are designed specifically to solve the biggest business and operational challenges that the health care and life science industries face.

Use Care Intellect™ to create a meaningful feedback loop with your customers

The opportunity to measure variation across patient encounters within a health care organisation is more important today than ever before. Unnecessary variations in the provision of care not only impacts quality, but cost as well. Developed within Deloitte's Health Care Consulting practice, Care Intellect™ is a provider performance improvement analytics solution that is designed to manage variations across patient encounters, integrating leading evidence-based practices to improve patient outcomes and discover related cost-saving opportunities.

Impacts and benefits

- **Accelerated access:** Improve patient access to therapy and provide high-touch, consistent patient interactions across shared business processes and therapeutic programmes.
- **Informed patient insights:** Increase insights into patient treatment and interactions to demonstrate value to Health Plans and improve drug efficacy.
- **Facilitated care team collaborations:** Provide value to Health Care Providers and partnership through shared patient insights and a platform for care team collaboration; facilitate interactions between Health Care Providers and patients.
- **Improved adherence:** Leverage tools to engage and educate patients; act proactively to help ensure product, therapy, and care plan adherence, reducing discontinuation.

Optimise your physician networks with Network Insight™

The opportunity to look at new and innovative ways to ensure success for health care organisations as it relates to their physician network and ambulatory services significantly impacts the quality and continuity of care to meet changing market demands. Network Insight empowers health care organisations to thrive by deploying an optimal mix of primary care practitioners and specialists to support value-based, outcomes-centred care.

Impacts and benefits

- **Market overview:** Make strategic decisions for your physician networks with clear insight into the market landscape, including detailed demographic, hospital, physician and client data.
- **Network optimisation:** Optimise your physician network by targeting physicians and physician groups based on user-defined performance and geographic value metrics.
- **Performance management:** Engage your physicians and align their practice patterns across four performance indices: quality, cost, utilisation, and care navigation with the Performance Manager desktop and mobile application.
- **Asset efficiency:** Evaluate and restructure your market footprint and assets for greater efficiency and market coverage by evaluating and restructuring ambulatory services footprint and operations against geographic, demographic, financial, and clinical services strategies.
- **Care pattern index:** Create a programmatic approach to improving physician loyalty and patient retention with the necessary continuity to sustain a high-quality, low- cost population management plan.

Transform your revenue cycle with Revenue Intellect™

Revenue Intellect™ is a cloud-based, guided-analytics platform that is designed to help maximise and sustain financial margin. Revenue Intellect enables users to identify hidden or hard-to-find sources of revenue loss and access data, ranging from targeted analyses to free-form data exploration, to provide value to all levels of a health care provider's operational structure.

Impacts and benefits

- **Preventative denials analytics:** Compare financial performance across multiple metrics against benchmarks compiled from the entire Revenue Intellect client base. Compare current and past performance, while monitoring the effect of specific events (e.g., ICD-10).
- **Proactive underpayment avoidance:** Count on constant updates to the analytics and functionality available within the solution, based on evolutions in the industry and advancements in technology. Our out-of-the-box targeted analytics solution is designed to answer needs specific to health care organisations like yours.
- **Continuous support:** Get access to a dedicated, ongoing Deloitte revenue cycle expert to help with identifying insights within your data and working as a partner to improvement your initiatives.



CARDEA

Identifying those at risk earlier

Background

Patients admitted to hospital who are at high-risk of readmission due to heart failure or acute coronary syndrome require out-of-hospital, community care programmes to manage and/or recover from their condition after discharge.

However, eligible inpatients are sometimes missed and therefore not referred to the appropriate community care programme as part of the discharge process.

This can lead to unnecessary readmissions because missed patients do not access the right community health services to manage and/or recover from their condition when they leave hospital.

It may not be until the patient is readmitted one or more times for the same condition that they are then identified and referred.

Impacts and benefits

- Cardea provides a dynamic data analytics model based on static criteria and machine learning algorithms to quickly and easily identify high-risk patients and the key factors impacting on readmission.
- High-risk patients are notified to clinicians daily via a secure user interface.
- This provides clinicians with information that enables them to take appropriate clinical action based on a patients' risk profile.
- In particular, this supports identifying the high-risk patients that would need referral to community health services after discharge.
- This solution could be adapted beyond heart failure and ACS to support a more patient-centred and comprehensive discharge process across other conditions.





Health Interactive for HIE

An end-to-end health information exchange solution that delivers cutting-edge interoperability

Background

From biomedical data to patient information, the amount of health care data doubles every 12-14 months. All of this data must be secure but accessible, private but practical, and must be sent to and from diagnosticians, doctors, hospitals, and governments quickly with no loss of information. It's no small task. When you're dealing with health care information, one missed connection could mean someone's life.

That's why Deloitte has dedicated itself to refining and distilling its health information exchange (HIE) solution over the past 20 years. We've helped the largest commercial and public-sector health organisations around the world develop and operate their HIE platform so that it works quickly, effectively, and efficiently.

Introducing Health Interactive: a pre-built, cloud-based HIE solution. It's already up and running, connecting more than 30,000 providers with high-speed processing of up to 700 transactions per second. Our paint-by-the-numbers service design already factors in 85 percent of commonly identified clinical requirements, cutting the time for it to become operational from months to mere weeks.

Health Interactive provides participating organisations with end-to-end oversight, including self-service onboarding, discrete data access, practical alerts, and timely notifications. We aim to provide quality patient data when and where it is needed, and to deliver administrative tools to ease the burden of overwhelming operational challenges.

Impacts and benefits

Get operational in a fraction of the time

Through our decades of experience with health care ecosystems on almost every continent, we have learned precisely which clinical workflows are necessary for a fast, efficient, and secure HIE. Instead of rediscovering these needs each time, we've streamlined the process, baking these necessities into HealthInteractive right from the start..

Transparent and secure

The more organisations are involved, the more health care data information there is. It's frequently stored in different locations, with its own security and related costs. This can cause many problems in compatibility and operability, especially as the volume of data increases exponentially. HealthInteractive is a cloud-based solution that provides an appropriate level of security for all partners involved. It also provides each participant with a unique window, a discrete and customisable view of the data. This ensures that the right information gets to the right people at the right time.

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