Unlocking potential
Smart Health Care Solutions
## Contents

<table>
<thead>
<tr>
<th>Service</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECO – Emergency Care Optimization</td>
<td>02</td>
</tr>
<tr>
<td>RITA – Referral and Intelligent Triage Analytics</td>
<td>03</td>
</tr>
<tr>
<td>ATOM – Advanced Theater Optimization Method</td>
<td>04</td>
</tr>
<tr>
<td>OPUS – Outpatient Productivity and Utilization System</td>
<td>05</td>
</tr>
<tr>
<td>ALICE – Automated Live Coding Engine</td>
<td>06</td>
</tr>
<tr>
<td>HealthConnect</td>
<td>07</td>
</tr>
<tr>
<td>DeloitteASSIST</td>
<td>08</td>
</tr>
<tr>
<td>DeloitteINDICATE*</td>
<td>09</td>
</tr>
<tr>
<td>ConvergeHEALTH</td>
<td>10</td>
</tr>
<tr>
<td>CARDEA*</td>
<td>12</td>
</tr>
<tr>
<td>Health Interactive for HIE</td>
<td>13</td>
</tr>
</tbody>
</table>

*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 Optimization
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 have never been more important.

To support these challenges, Deloitte has created ECO, a data-driven simulation model to map patient pathways and staffing. ECO analyzes 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**

- **Optimizes 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 center 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 minimize excess costs and maximize staff value-add.
  - Insight-driven decision-making to ensure time, effort, and resources are focused on changes that bring real value.
RITA – Referral and 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 tests the potential of using the latest in AI and robotics to automatically triage incoming patient referrals and assign patients to appropriate pathways.

We have undertaken a proof of concept with a gastroenterology department in Scotland with promising results.

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

RITA displayed a high level of accuracy in triaging patients with suspicion of cancer (versus previous clinical decisions).

Impacts and benefits
• Saving clinical time
  Consultant clinicians could be released from triaging duties equivalent to multiple hours of administrative burden per day.

• Faster patient triage
  Automating the triage process is estimated to reduce the overall time to triage by two to three days, with the potential to save time on the referral-to-treatment (RTT) pathway (which is crucial on a two week pathway.)

• Clinical pathway redesign and variation assessment
  The process of automation brings an opportunity to optimise the clinical triage pathway and reduce unwarranted variation in triage outcomes for patients. This could also include using a “definitive truth” (for example NICE guidelines) and assessing variation from these protocols.

• Quality assurance and education
  RITA can assess incoming referrals for low quality, incomplete or insufficient referral information. In addition the technology can be used to generate deeper insights into the referral process, helping ensure the correct clinical decisions can be made and focusing the secondary to primary care educational agenda.

• Real-time capacity and 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.
Background
ATOM® is a theater optimization 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 maximize theater utilization.

The ATOM® dashboard offers a live forward view of theater performance including late starts, early finishes, unnatural gap time, and theater flow. The dashboard is also able to account for natural and unnatural downtime in theaters. ATOM® has been deployed in the market for over six 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 percent real improvement in enabling users.
- Improved operation visibility of theater usage.
- Reduced overtime and WLI payments.
- Reduction in cancelled operations.
OPUS – Outpatient Productivity and Utilization System
Real, sustainable change

Background
OPUS is a multilayered 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, specialty-level patient flow, clinical variation, and opportunities for technological optimization.

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

Impacts and benefits

• **Maximizes outpatient appointment capacity** by identifying, benchmarking, and reducing unproductive patient time.
  
  - This is achieved by identifying patients who did not attend their appointment and cancellations where the appointment was not refilled, as well as assessing the overall utilization of the outpatient clinic.
  
  - In addition, OPUS is able to predict which patients are likely to not attend future appointments and highlights future clinics that are underutilized.

• **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 healthcare provider—converting the patient’s admission into a series of diagnosis and procedure codes to ensure accurate and timely payment 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 and 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
HealthConnect
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 breaks down. In this new paradigm, data will serve as the new health currency and be used to solve some of the most complex health care challenges, while also 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 programs 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 hospital operations with AI-enabled communications

**Background**
Even in modern hospitals, the primary alert system between a patient and nurse is a light and a bell. It is a system that fails to acknowledge or prioritize a patient’s needs, which may lead to:

- A poor patient experience
- Staffing inefficiencies
- Extra stress on nurses and care teams

Using the most recent advancements in technology, DeloitteASSIST combines the capabilities of speech recognition, natural language processing, and artificial intelligence to transform the way we care for patients.

DeloitteASSIST is an AI-enabled patient communication solution, enabling patients to request assistance without the need to press a button. By simply speaking their requests, patients alert staff to their needs, with AI prioritizing and smart-routing the requests to the right resource to meet the patient’s needs.

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

For more information, visit www.deloitte.com/uk/dassist

---

**Impacts and benefits**

- **Better prioritization**
  - Empowers nurses with better information
  - Enables prioritization and assignment of patient requests

- **Released nurse time to care**
  - Minimizes unnecessary visits to patient rooms
  - Enables the right person to respond to each request
  - Alleviates the nurses’ burden of responding to unnecessary tasks

- **Improved care team management**
  - Provides real-time, unit operations data
  - Supports workforce management decision-making

- **For patients**
  - Creates greater accessibility to care team
  - Empowers patients
  - Provides reassurance and peace of mind
  - Combats loneliness
DeloitteINDICATE
Reducing waiting list times and breaches

Background
Within hospitals there is limited visibility on the volume of incoming referrals, limited 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 service breaches.

The solution
An algorithm, that can forecast 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
- Physician time-off

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

The ConvergeHEALTH suite of software solutions is 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 impact 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 programs.

- **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.
### Optimize your physician networks with Network Insight™

A flexible guided-analytics platform that is designed to analyze and deploy an optimal mix of primary care practitioners and specialists to support value-based, outcomes-centered care.

### Transform your revenue cycle with Revenue Intellect™

Revenue Intellect™ is a cloud-based, guided-analytics platform that is designed to help maximize 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 analyzes to free-form data exploration, to provide value to all levels of a health care provider’s operational structure.

#### 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 optimization** | 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, utilization, 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. |

| **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 organizations 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 improve 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 programs 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 the 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 readmission.

• High-risk patients are connected 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 a referral to community health services after discharge.

• This solution could be adapted beyond heart failure and ACS to support a more patient-centered 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 to 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 is no small task. When you are dealing with health care information, one missed connection could mean someone’s life.

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

Introducing Health Interactive: a prebuilt, cloud-based HIE solution. It is already up and running, connecting more than 30,000 providers with high-speed processing of up to 700 transactions per second. Our paint-by-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 organizations 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 have streamlined the process, including these necessities into Health Interactive right from the start.

- Transparent and secure
  The more organisations are involved, the more health care data information there is. It is 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. Health Interactive 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 customizable view of the data. This ensures that the right information gets to the right people at the right time.