

## Case Study: NHS Tayside

# Delivering exceptional Patient care through Digital Transformation

NHS Tayside and Catalyst BI have come together to deliver a pioneering integrated hub for service capacity across the Health Board, resulting in the delivery of exceptional patient care.



## Overview

NHS Tayside is an NHS board which forms one of the fourteen regions of NHS Scotland. It provides healthcare services in:

- ✓ Angus
- ✓ Dundee
- ✓ Perth & Kinross

NHS Tayside is headquartered at Ninewells Hospital in Dundee; one of the largest hospitals in the world. The Board's boundaries have a combined population of over 400,000.

NHS Tayside's governance includes three major and a number of community hospitals. It also includes over 60 GP surgeries and a variety of health centres staffed by thousands of employees of the health region.

## The Highlights

NHS Tayside have been able to make key timely decisions with confidence that make a difference to patient care, staff engagement and morale and the overall management of the Health Board.

**01**

### 360° Visibility

360-degree overview of patient flow into the Emergency Department (ED), through ED and admission to discharge patients

**02**

### Analyst hours saved

The command centre's efficiency gains resulted in saving the equivalent of 1 full-time business analyst's hours per week.

**03**

### Reduction in admin time

A reduction in admin burden on clinical staff with ability to release time back to patient care

## The Partnership

Catalyst have worked with NHS Tayside for over six years and supported their use of the Qlik platform to maximise the value they get from the vast amounts of data that are processed every second at the Health Board.

NHS Tayside have continued to use analytics to adapt their processes to ensure that they can continue to deliver exceptional patient care. The last few years have especially been challenging with Covid-19 causing huge upheaval across the NHS. NHS Tayside were able to analyse their data and implement suitable Covid-19 and non Covid-19 virtual wards to help them have detailed control over managing the flow of patients through the Hospital.



This investment in the Qlik analytics platform has meant that NHS Tayside continue to be one of the best performing Health Boards in Scotland. They are a fabulous example of NHS experience and knowledge working in harmony with third party technology partners and solutions to deliver real value that has had a direct effect on improving patient care.

**Barney Ulyatt** - Business Development Manager, Catalyst BI

## Situation

NHS Tayside lacked visibility of patient flow; an understanding of the demand coming in to their hospitals, and the current state of beds across hospitals. This created delays in understanding patient flow and being able to see and respond to pressures and bottlenecks in real-time. Their situation was as follows:

- ✔ Patient flow management was undertaken within 'hospital huddles', meeting three times daily
- ✔ Nursing staff presented information on paper on their current occupied and empty beds, and admissions for the previous day to admin staff
- ✔ Admin staff would then enter this information into a spreadsheet and circulate to the hospital huddle staff.

**By this time, the data was already out of date.**

When trying to identify the state across the hospitals and within wards, the service manager or duty manager would sometimes need to call the wards to understand the latest patient flow position.

*Emerging bottlenecks across the system were not visible until they had happened, creating a reactive patient flow system heavily dependent on clinical staff providing updates on the position of their wards.*

## NHS Tayside had no...

- ✘ Visibility of real-time ambulance information
- ✘ Predicted arrivals or admissions by time slot throughout the day, beyond a total number of estimated admissions for the day
- ✘ Visibility of the hospital's current state for staff on call who spent a considerable amount of time trying to find this out

## The Challenge

**Project aim:** To create a Command Centre to support the organisation with real-time information on activity in a dynamic, usable format, to enable the clinical and operational teams to make faster and more evidence based decisions regarding care across the hospital setting.

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Throughout my 20 years working for NHS Tayside, our aim and commitment remains: to provide the best information to people supporting front line patient care in order to help decision making and patient flow.

**Jenni Woods** - Health & Business Intelligence Lead, NHS Tayside (HBI Team)



## Key steps in the Command Centre design and delivery

**Engagement with senior management and clinicians:** The Health and Business Intelligence Team at NHS Tayside worked with senior leaders, consultants, associate directors, service managers, eHealth and the TrakCare team. HBI and Catalyst BI engaged with all stakeholders, the Chief Executive, Senior Leadership Team, Chief Operating Officer and Medical Director. They also met with consultants and nursing staff, to ensure that there was sharing of information between the technical side and end users.

**The system was locally configured:** Work was undertaken to develop the local footprint requirements, ensuring that the Command Centre fitted with their patient flow model, pathways and ward footprint

**System requirements were implemented:** In order to provide a live position, the system loads every three minutes and provides a bird's eye view across all acute, community and mental health beds. Users can filter by hospitals, wards, specialty groups and side rooms.

**Initial diagnostics to full implementation was completed in just three months (3-week build)**

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Importantly we do not only want to know where we had been so far in the day, nor where we are at, at any particular moment, but to have the facility to predict what the rest of the working day would look like in respect of demand and capacity. This enables change actions which anticipate, and so provide for, challenges in the patient flow, demand/ capacity profile.

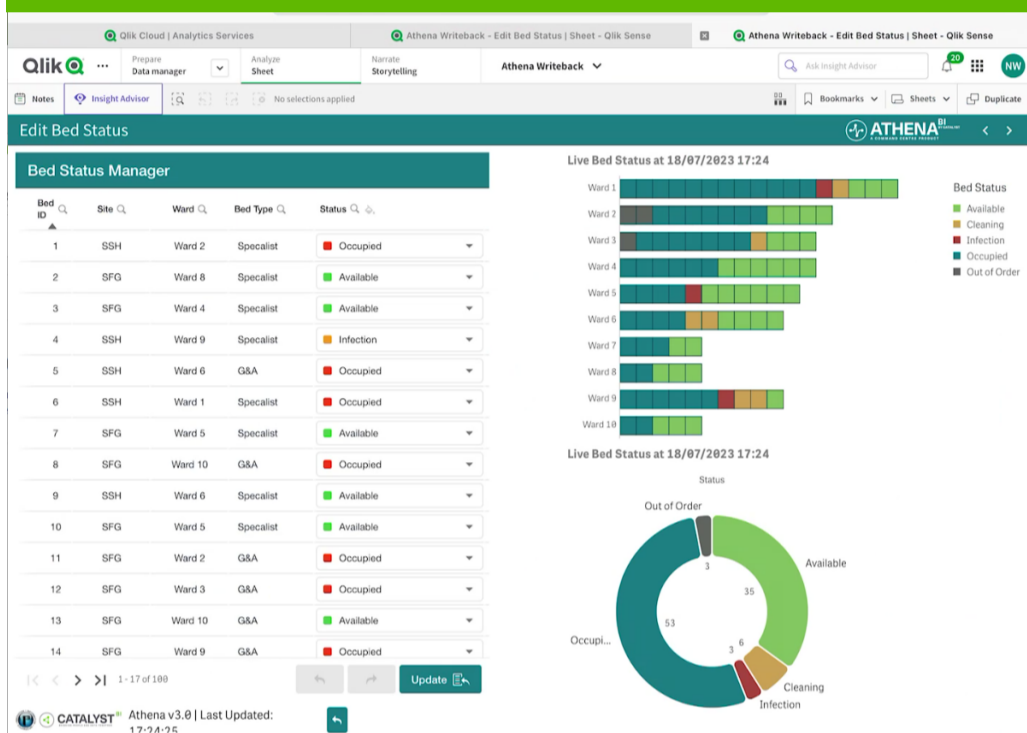
**Professor Grant Archibald** - Chief Executive, NHS Tayside

# The Command Centre

A highly effective, live, patient flow management system.

The Command Centre uses advanced analytic predictions for the full day and week ahead to enable the planning of:

- ✓ patient pathways
- ✓ staffing and service capacity
- ✓ predicted potential pressure points in the system



The project engaged with clinical, operational and managerial staff from across Acute and Health and Social Care Partnerships with a primary focus on sharing the benefits of using real time data to inform decision making, alongside gathering learning and feedback from users to enhance the benefits the Command Centre provides. This has led to further development opportunities including:

01

Predictive modelling to identify risk of patients requiring admission and a downstream general inpatient bed on initial triage within the Emergency Department

02

Predictive modelling to identify patients at risk of becoming delayed enabling earlier intervention and prevention of unnecessary stays for patients

## The Results

The visibility of any bottlenecks that exist within patient flow in real-time allows all across the system to work together and help improve patient flow including:

- ✓ reducing emergency department waiting
- ✓ reducing bed boarding
- ✓ increasing morning discharges
- ✓ reducing delayed discharges

**Outcome: This creates a better experience for both the patient and staff involved in the patient journey.**

The Command Centre is web-based and available to staff groups, including consultants, duty managers, ward staff and H&SCPs. The user is able to view the screens off-site via NHS Tayside secure access.

**Outcome: This saves excessive time, effort and resource currently used to find out the flow position across hospitals either in or out of hours.**

## Phase 1 to Phase 2 Progression

The progression from Phase 1 of implementation to the development and implementation of Phase 2 is shown as follows.

**Command Centre Type: NHS Tayside Centralised Patient Flow View**

- ✓ Location: Ninewells Hospital
- ✓ Beds: 760
- ✓ Patient admissions (annual): 70,000

## The Command Centre

At the outset of the Covid-19 pandemic, NHS Tayside had no way of understanding the volume of Covid and non-Covid pressures across the hospital system. In three days, using the alert system within their local patient administration system and through working with internal Qlik developers, they were able to quickly develop a Covid Command Centre front screen, which is still active and in use today. The Command Centre grew from being visible in their safety and patient flow hubs to being displayed within the Senior Leader Gold Command Room, presented across a large screen and providing a health status real-time position across the Health Board.

## Phase 2 Developments

### Command Centre Type: **Hospital Site Specific Patient Flow View Development**

- ✓ Location: Perth Royal Infirmary
- ✓ Beds: 270
- ✓ Patient admissions (annual): 12,500

### Command Centre Type: **Mental Health**

*Reporting on inpatient mental health, admissions, bed availability*

- ✓ Location: Four hospital sites across Tayside
- ✓ Beds: 265
- ✓ Patient admissions (annual): 1,600

### Command Centre Type: **Emergency Department**

*Presenting key emergency department flow and pressure points*

- ✓ Location: Ninewellls Hospital
- ✓ Beds: N/A
- ✓ Patient admissions (annual): 85,000

### Command Centre Type: **Medical Division**

*Patient flow information and key pathway steps for medical emergency patients*

- ✓ Location: Ninewellls Hospital
- ✓ Beds: 279
- ✓ Patient admissions (annual): 22,000

### Command Centre Type: **Surgical Division**

*Patient flow information and key pathway steps for Surgical Acute Receiving Unit patients*

- ✓ Location: Ninewellls Hospital
- ✓ Beds: 108
- ✓ Patient admissions (annual): 9,500



In terms of Covid planning, the Command Centre has enabled us to monitor the situation and deploy staff effectively across both Covid and non Covid pathways depending on fluctuating demand.

**Lynne Morman** - Discharge Manager  
Dundee Health & Social Care Partnership

## The benefits of a 360-degree overview of patient flow

The Command Centre has given NHS Tayside a 360-degree overview of patient flow into the Emergency Department (ED), through ED and admission to discharge patients. This information is available in real time.

**Outcome: This empowers the team at NHS Tayside to have a real-time overview of the task at hand and make key timely decisions with confidence that make a difference to patient care and the management of the Health Board.**

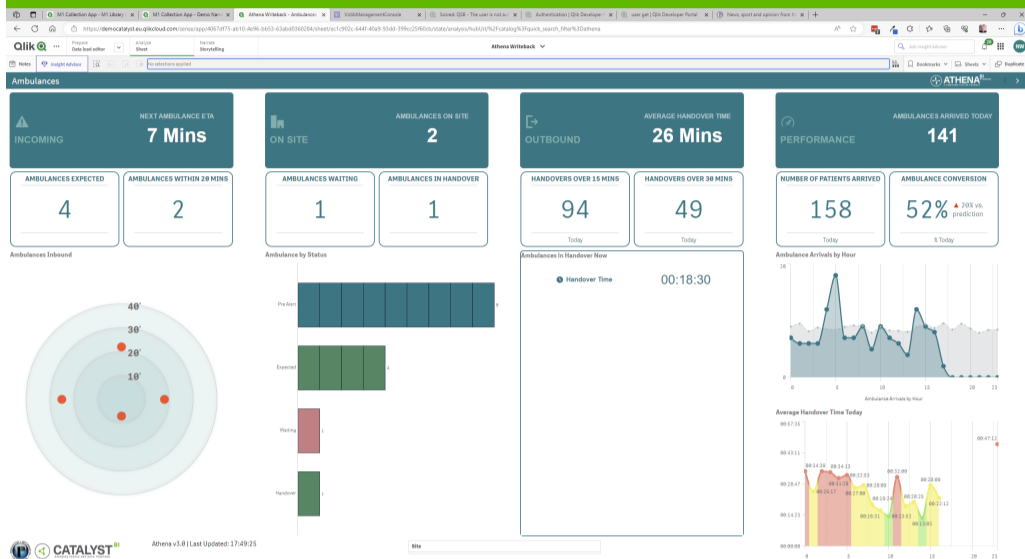
## Patient Flow Benefits

- ✓ Visibility of patient flow from ambulance arrival to leaving hospital, with predictions for the day ahead to allow planning within
- ✓ Improved patient management, care and experience
- ✓ Prevention and proactive intervention in respect of unnecessary patient hospital stays
- ✓ Creation of a flexible and responsive Covid pathway building a Covid hospital in a hospital
- ✓ Clinical and managerial engagement through the provision of decision ready data
- ✓ Consistent vehicle to deliver information across the organisation
- ✓ Clinical and managerial engagement through the provision of decision ready data
- ✓ A new process for approaching winter planning, developing and incorporating escalation triggers across the patient pathway



As a senior clinician, focused on capacity and flow on a daily basis, and also in a strategic context, the command centre concept is an invaluable tool

**Douglas Lowdon** - Associate Medical Director, NHS Tayside



## Staffing and Financial Benefits

An affordable product offering a view of whole system pathways

A reduction in admin burden on clinical staff with ability to release time back to patient care

Increased staff engagement, morale and improved data quality

Web access reduces requirement to come on site as Duty Manager in an evening or at weekends

Partnership organisation access reduces the time spent discussing various streams of data via one source of the truth

Negated requirement for an additional Information Analyst post to support Covid data reporting

Highly skilled and specialised hands-on development, continual support, skills and expert knowledge

## The Future

The next steps in development involve making the Command Centre accessible via mobile phone. The current application can render on any device so work is underway from a technical and security perspective to allow this to happen.

**Outcome: This will make the Command Centre even more accessible to multiple parties involved in patient flow and care.**

NHS Tayside are also engaging with services to design a Planned Care dashboard which will complement their current Command Centre.

**Outcome: This will help to provide further insight, allowing planning and predictions for service delivery.**



The real-time hands on support provided by CatalystBI has allowed us within NHS Tayside to gain the skills, expertise and confidence to develop more specialised Command Centres hosted using the same product and viewing platform. This has created a ground-breaking opportunity to view a complex whole system patient flow pathway from arrival to departure.

We now have the ability to view everything in one place, one source of information on current hospital status with visible alerts to any potential or current flow issues. This has helped support the transformation of NHS Tayside in to a data-driven organisation that uses evidence-based data to understand and support their patient flow."

**Jenni Woods** - Health & Business Intelligence Lead, NHS Tayside (HBI Team)