




Mr. John Deverill

**Managing Principal, GE Healthcare Partners
EMEA**

Command center: Myth or reality for hospitals in
Europe?





Breakthrough Performance

Command centres – a new approach to the management of care at scale

October 28, 2019

Confidential. Not to be copied, distributed, or reproduced without prior approval.

nd Centre Breakthrough

The image shows a man in a light purple shirt pointing at a large wall of data screens in a control room. The screens display various data visualizations, including bar charts, line graphs, and tables. The man is standing in front of the screens, and a woman is visible in the foreground, looking at a computer monitor. The background features a large blue banner with the text "nd Centre Breakthrough".

The data screens display the following information:

- DIAGNOSTIC READINGS (MODALITY)**

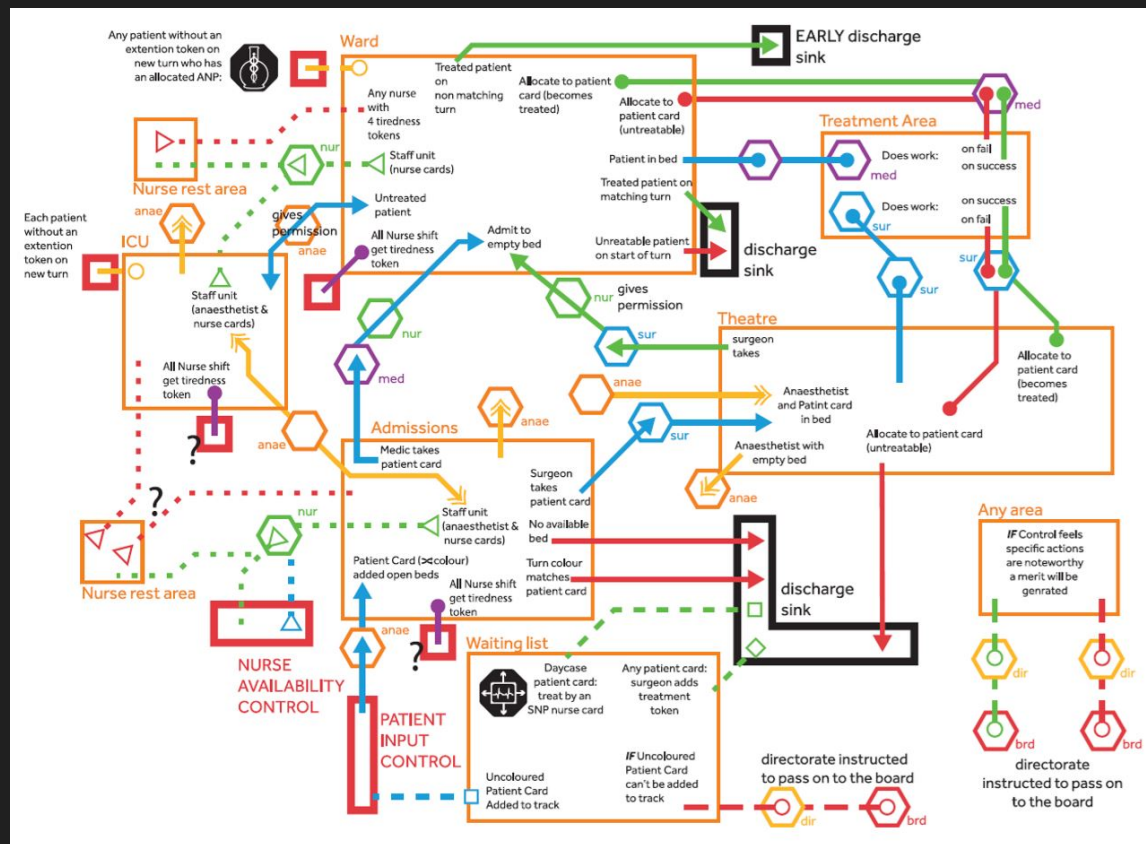
DATE	TIME	MODALITY	PHYSICIAN
10/15	10:00	CT	J.SHO H654512785
10/15	10:45	CT	PCAP H987650132
10/15	11:30	CT	LPM H045233982
10/15	12:15	CT	WREM H134654387
- SCHEDULED**

DATE	TIME	PHYSICIAN	PATIENT ID
10/15	10:00	CT	D.HOP H765418210
10/15	10:45	CT	S.THA H776513465
10/15	11:30	CT	R.SHR H675340136
10/15	12:45	CT	S.THA H517351723
- ORDERS**

DATE	TIME	PHYSICIAN	PATIENT ID
10/15	10:00	CT	D.HOP H765418210
10/15	10:45	CT	S.THA H776513465
10/15	11:30	CT	R.SHR H675340136
10/15	12:45	CT	S.THA H517351723

Hospitals and care systems are (very) complicated

- Complexity – hundreds of interlinked pathways
- Multiple long queues
- Multiple managers (20-50) looking at different elements of flow
- Multiple (30-200) information systems
- Multiple reasons and pressure to improve patient care and performance
- Throughput – the rate of patient flow impacts:
 - Quality and safety
 - Finances
 - Access to care



NASA

MISSION CONTROL CENT 1

Centralised team



Airline Operations Centre

Centralised team
Shared information



Chinese Railways
Centralised team
Shared information
Predictive analytics





Hospital command centre

Centralised team

Shared information

Predictive analytics

Action-focused

What is a Command Centre?

A co-located team using artificial intelligence 24x7 to optimize the delivery of patient care in real time

- **Actions** designed to enable, help and support front-line caregivers
- **People** co-located to collaborate and act on common, consistent, real-time information
- **Analytic Tiles** to scan, detect and alert using real-time intelligence and advanced analytics



Starting from a problem – the Bradford (UK) example

Challenges in non-elective flow



Pressure on ED: Congestion in ED and in Majors specifically is causing waiting, sub-optimal decisions, and pressure on staff



Capacity & Demand: Bed and staff capacity is not consistently matched to demand, resulting in delays and congestion.



Care Setting: Patients are not always placed in the most appropriate care settings first time, leading to sub-optimal care and extended length of stay.



Situational Awareness: Information required to make highly reliable decisions in real-time is not readily available or visible, leading to delays in care and variation.



Process-Driven Delay: Lack of process standardisation and operational rigour results in unwarranted variation, waste and extended length of stay.



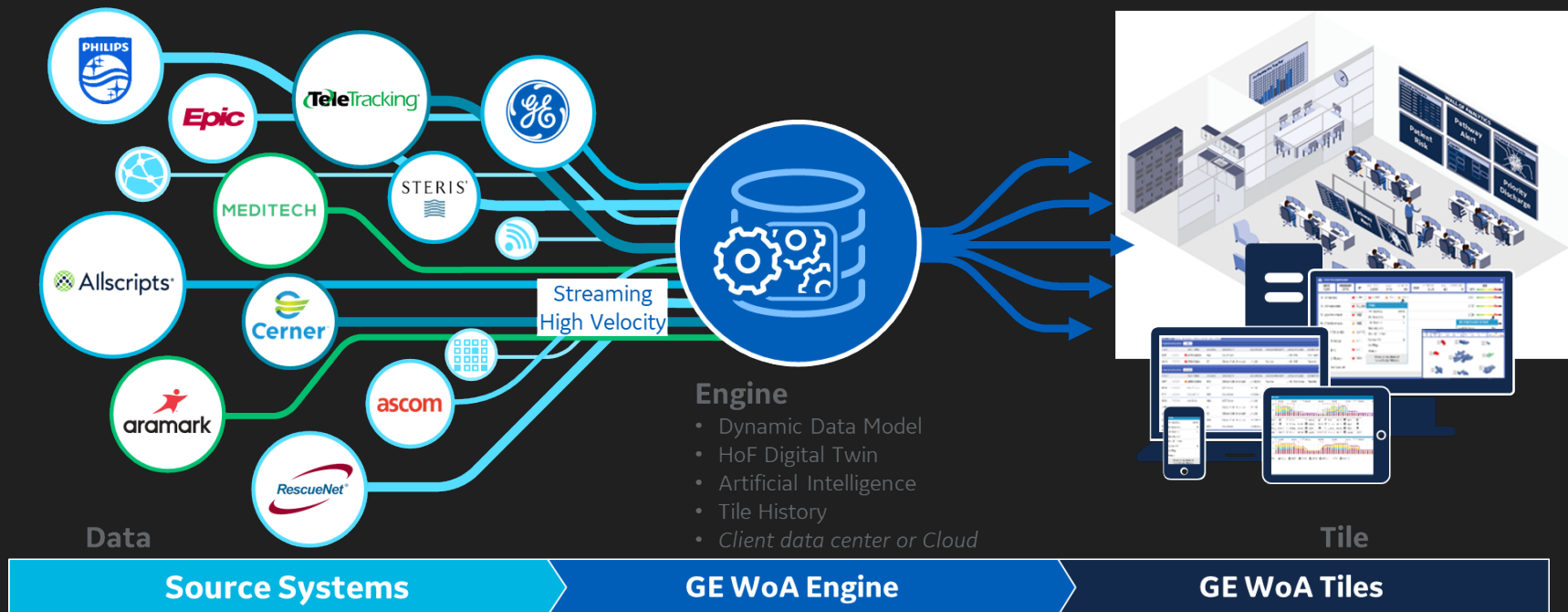
Bringing teams together – bed managers, theatre managers, logistics managers, clinicians

- 73 BTHFT staff using design thinking principles to form the foundation of the BTHFT Command Centre



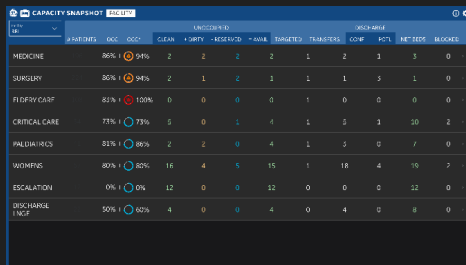
New Intelligence from Existing Systems

GE “Wall of Analytics” software platform applies advanced analytics to data from across existing systems, bringing it into one place to provide intelligence not available from any one system alone.

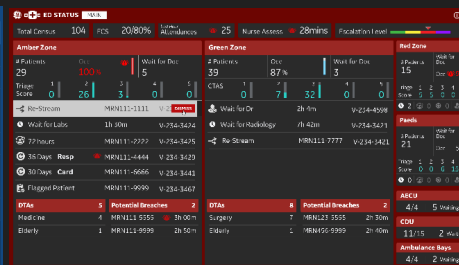


Analytic Tiles

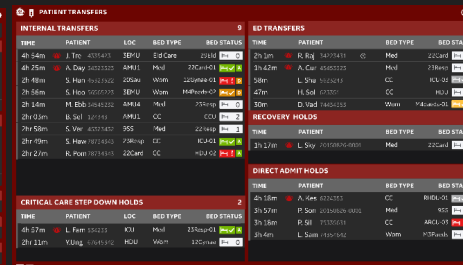
Capacity Snapshot



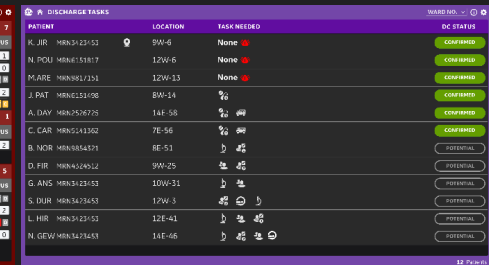
ED Status



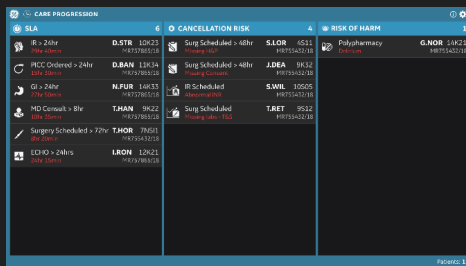
Patient Transfers



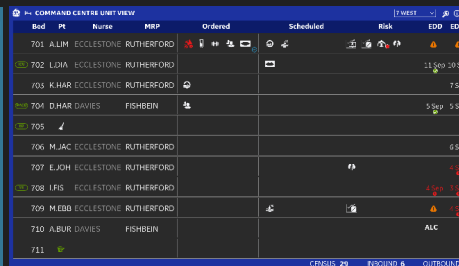
Discharge Tasks



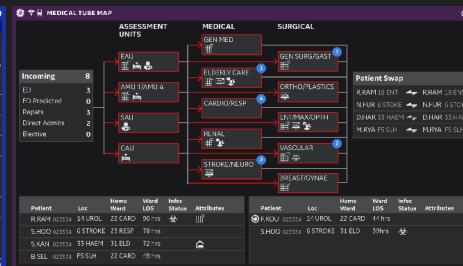
Care Progression



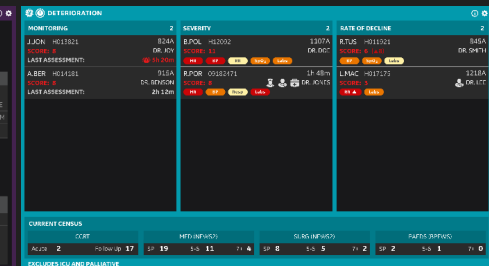
Ward Link



Right Patient, Right Place



Deterioration



Care Progression

Real-time patient-level delays, potential cancellations and clinical risks

CARE PROGRESSION			CANCELLATION RISK		RISK OF HARM		
SLA	6		4		1		
IR > 24hr 29hr 40min	D.STR 10K23 MR757865/18		Surg Scheduled > 48hr Missing H&P	S.LOR 4S11 MR755432/18		Polypharmacy Delirium	G.NOR 14K21 MR755432/18
PICC Ordered > 24hr 15hr 30min	D.BAN 11K34 MR757865/18		Surg Scheduled > 48hr Missing Consent	J.DEA 9K32 MR755432/18			
GI > 24hr 27hr 50min	N.FUR 14K33 MR757865/18		IR Scheduled Abnormal INR	S.WIL 10S05 MR755432/18			
MD Consult > 8hr 10hr 35min	T.HAN 9K22 MR757865/18		Surg Scheduled Missing labs - T&S	T.RET 9S12 MR755432/18			
Surgery Scheduled > 72hr 8hr 20min	T.HOR 7NS11 MR755432/18						
ECHO > 24hrs 24hr 15min	I.RON 12K21 MR757865/18						

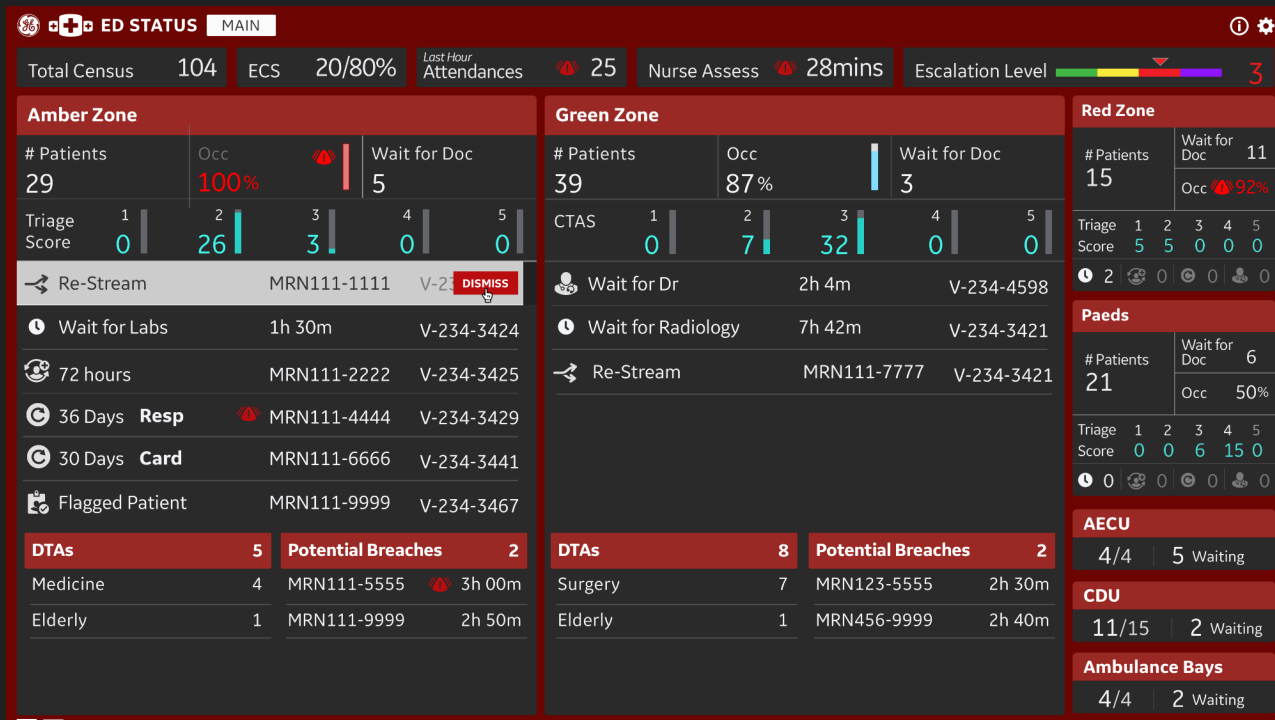
Patients: 11

- Which patients are likely to cancel a procedure?
- Which patients won't be ready for their CT scan?
- Who has waited too long for lab results?
- Who is at high risk of infection?



ED Status

Exception based alerts to patient-level delays in ED and essential situational awareness



- Who are my likely breaches and what is preventing them from moving?
- Is pressure balanced across all zones?
- Who was streamed to the wrong area?



Deterioration

View of BRI's sickest patients to ensure they are being seen by the right staff at the right frequency

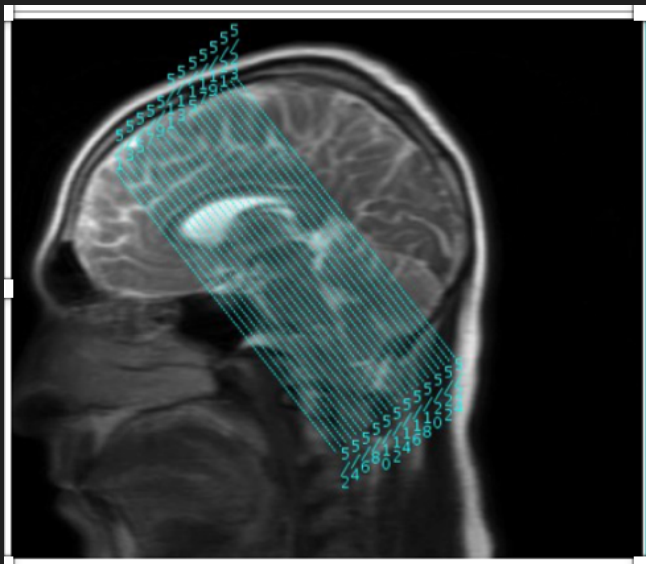
DETERIORATION					
MONITORING 2		SEVERITY 2		RATE OF DECLINE 2	
J.JON H013821	824A	B.POL H12092	1107A	R.TUS H011921	845A
SCORE: 8	DR. JOY	SCORE: 11	DR. DOE	SCORE: 6 (▲8)	DR. SMITH
LAST ASSESSMENT:	🔔 5h 20m	HR BP RR SpO ₂ Labs		BP SpO ₂ Labs	
A.BER H014181	915A	R.POR 09182471	1h 48m	L.MAC H017175	1218A
SCORE: 8	DR. BENSON	SCORE: 8	DR. JONES	SCORE: 3	DR. LEE
LAST ASSESSMENT:	2h 12m	HR BP Resp Labs		RR ▲ Labs	
CURRENT CENSUS					
CCRT		MED (NEWS2)		SURG (NEWS2)	
Acute 2	Follow Up 17	SP 19	5-6 11 7+ 4	SP 8	5-6 5 7+ 2
		PAEDS (BPEWS)			
		SP 2		5-6 1 7+ 0	
EXCLUDES ICU AND PALLIATIVE					

- Where are my sickest patients?
- Who is due for another clinical assessment?
- Which patients are showing the early signs of deterioration?
- What factors are driving a patient's deterioration score?



Predictive analytics

we already embed AI in medical devices – applying machine learning to create a digital twin of a whole hospital



The Bradford Command Centre

Physical Space

1,000 square feet • Video wall with 8 monitors (55") • 15 workstations • Office • Conference Room



Together, putting patients first



Confidential. Not to be copied, distributed, or reproduced without prior approval.

Scalable Sustained Impact – the first



**Johns Hopkins
Capacity Command Center**

- 1: Access
- 2: Throughput
- 3: Care Progression
- 4: System Capacity
- 5: Critical Care
- 6: Imaging

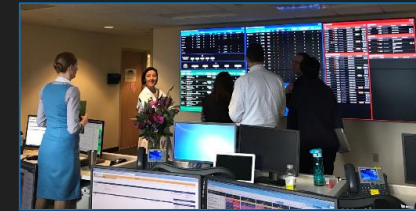
- ✓ **65% increase in transfer acceptance**
- ✓ 6 point increase in admissions
- ✓ 25% reduction in ED boarding
- ✓ 70% reduction in OR holds



**Humber River
Quality Command Centre**

- 1: Throughput & Access
- 2: Quality
- 3: Staffing & Imaging
- 4: Mother Baby
- 5: Deterioration
- 6: Risk of Harm
- 7: Frail & Elderly Patients

- ✓ **56 bed equivalents created**
- ✓ 8 point increase in admissions
- ✓ **52% reduction in acute conservable days**
- ✓ 23% reduction in ED boarding hours
- ✓ 38% reduction in U/S turnaround time



**OHSU
Health System Mission Control**

- 1: System Capacity
- 2: Throughput
- 3: Care Progression
- 4: Sepsis
- 5: Periop
- 6: Observation Mgt.
- 7: NASA Style Space

- ✓ **+913 acute complex transfers**
- ✓ +519 admission to partner hospitals
- ✓ Sustained occupancy of +3.4 pts
- ✓ CMI +.24 points
- ✓ 7:1 ROI in year 1



