Applying TOC thinking to health and social care - theory and practice

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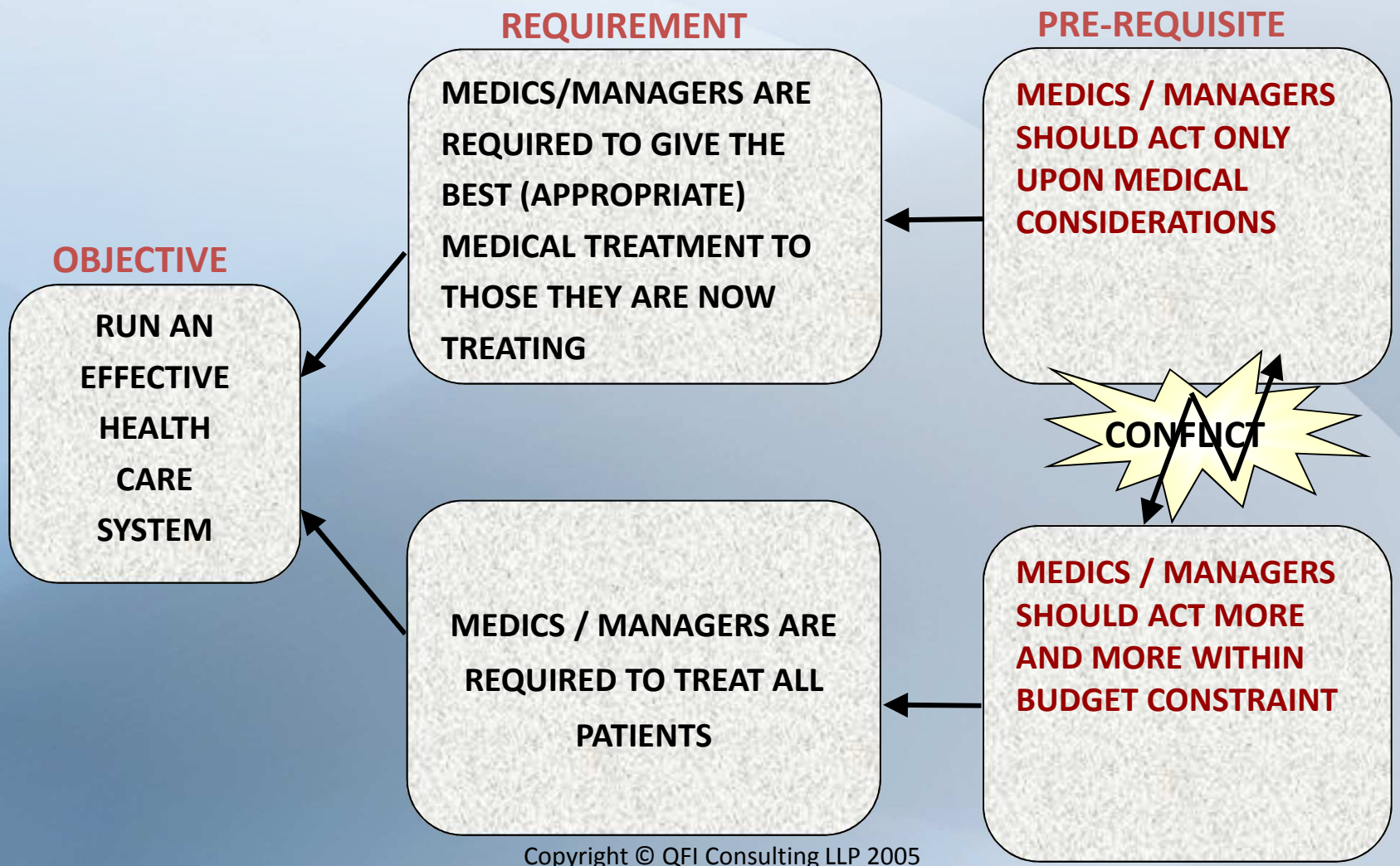
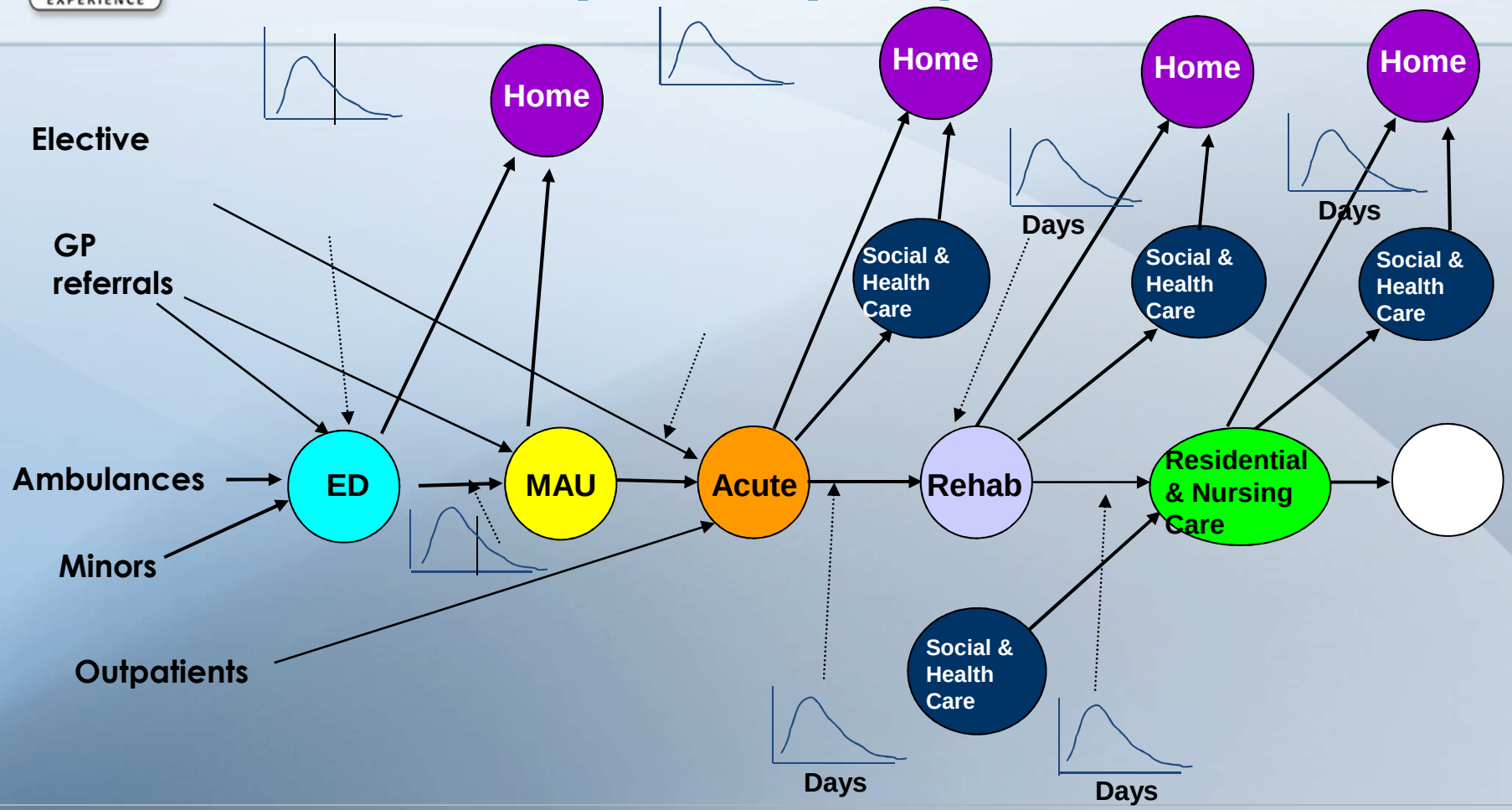
Applying TOC thinking to health and social care - theory and practice

- **Structure**
  - Viewing patient flow across health and social care – UK context.
  - Applying the 5 steps to patient flow.
  - The QFI Jonah approach to emergency and planned care management.
  - Applying the functions of Time Buffer Management.
  - Necessary but not sufficient - implementation issues.
  - Identifying the inherent simplicity of health and social care.
  - DCHS case - community health and social care.
  - Understanding the place of TOC and lean in health and social care.
  - Conclusion.

An ever pressing core problem…



Health and social care: a systems perspective



- Emergency Room
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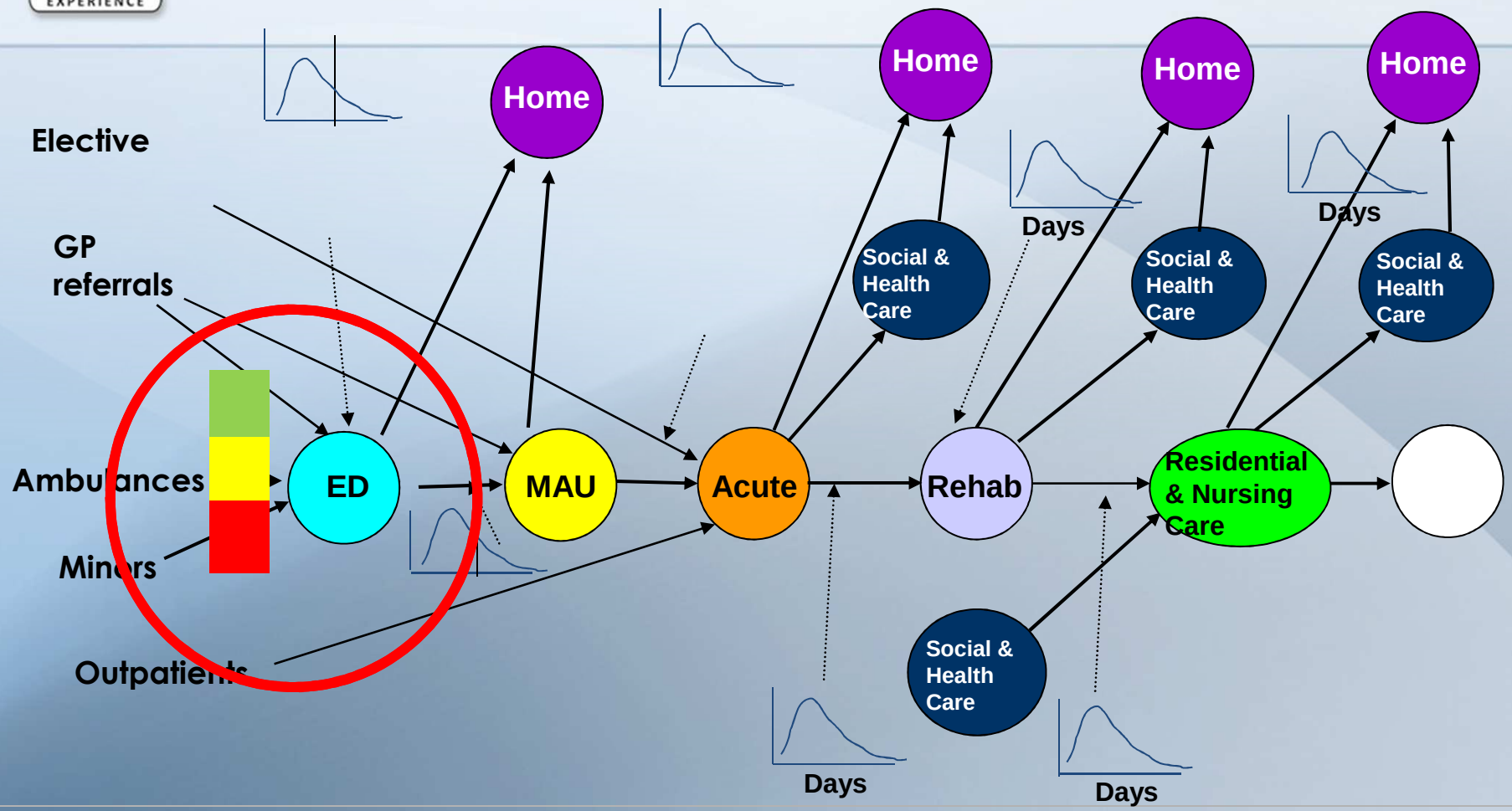
NHS Access targets: ED=4 hrs Elective surgery=18 weeks

TOCPA
Theory Of Constraints Practitioners Alliance
SHARING EXPERIENCE

TOC headline benefits in healthcare

- *'The application of TOC has helped us to **reduce our length of stay by up to 23%** in one of our hospitals, but the real benefits from QFI Jonah are around improving how we deliver care to our patients through better planning and co-ordination of their care - ultimately it's about recognising that patients should go home as quickly and safely as possible.'* CEO
- *'TOC has been applied to **improved patient flow in A&E, Assessment Units, and discharge planning**. This has resulted in a sustained reduction in medical **length of stay from 8.6 to 6.3 days (>25%).** Released bed capacity supported the achievement of the 18 week GP referral to treatment target, a year ahead of schedule.'* Director of Governance and Nursing.
- *By working with QFI to apply their Theory of Constraints approach to our discharge processes across all our twelve community hospitals, we have been able to **reduce our length of stay by a third within a matter of weeks and make big improvements to the quality of our patients'** rehabilitation and discharge. The process has developed staff's confidence in their ability to take control and make changes which improve quality and productivity and has significantly improved multi-agency working across health and social care in Derbyshire."*
- *Following a review of Intermediate Care by Derby City PCT Commissioners, we were challenged to reduce the average length of stay in our Community Hospital **from 40 days to** 30 days within the next six months. I knew this would require a swift, sustainable major change in the way we delivered our service. My confidence in QFI-Discharge-Jonah was rewarded by an **average length of stay of 20 days** which is maintained and is likely to reduce further, thus benefiting patients and delivering Best Value.*

Health and social care:a systems perspective



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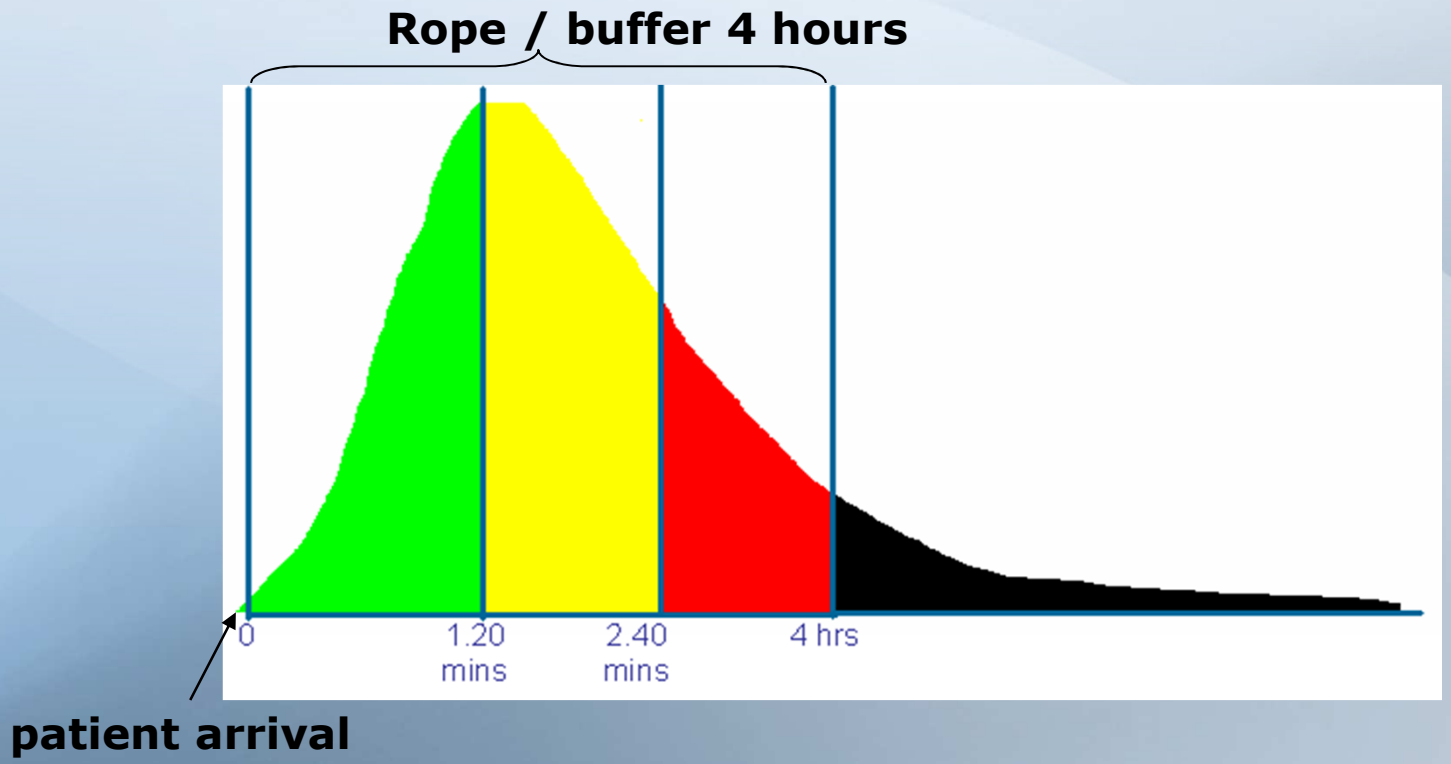
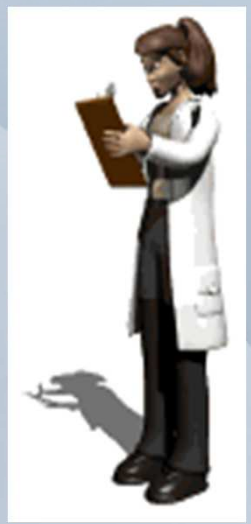
Time Buffer management in emergency care





Prioritise; Expedite; Signal instability; Target causes of delay.

ED Buffer Management system screen

Emergency Jonah - [Emergency Department current patients]

File Tools Help

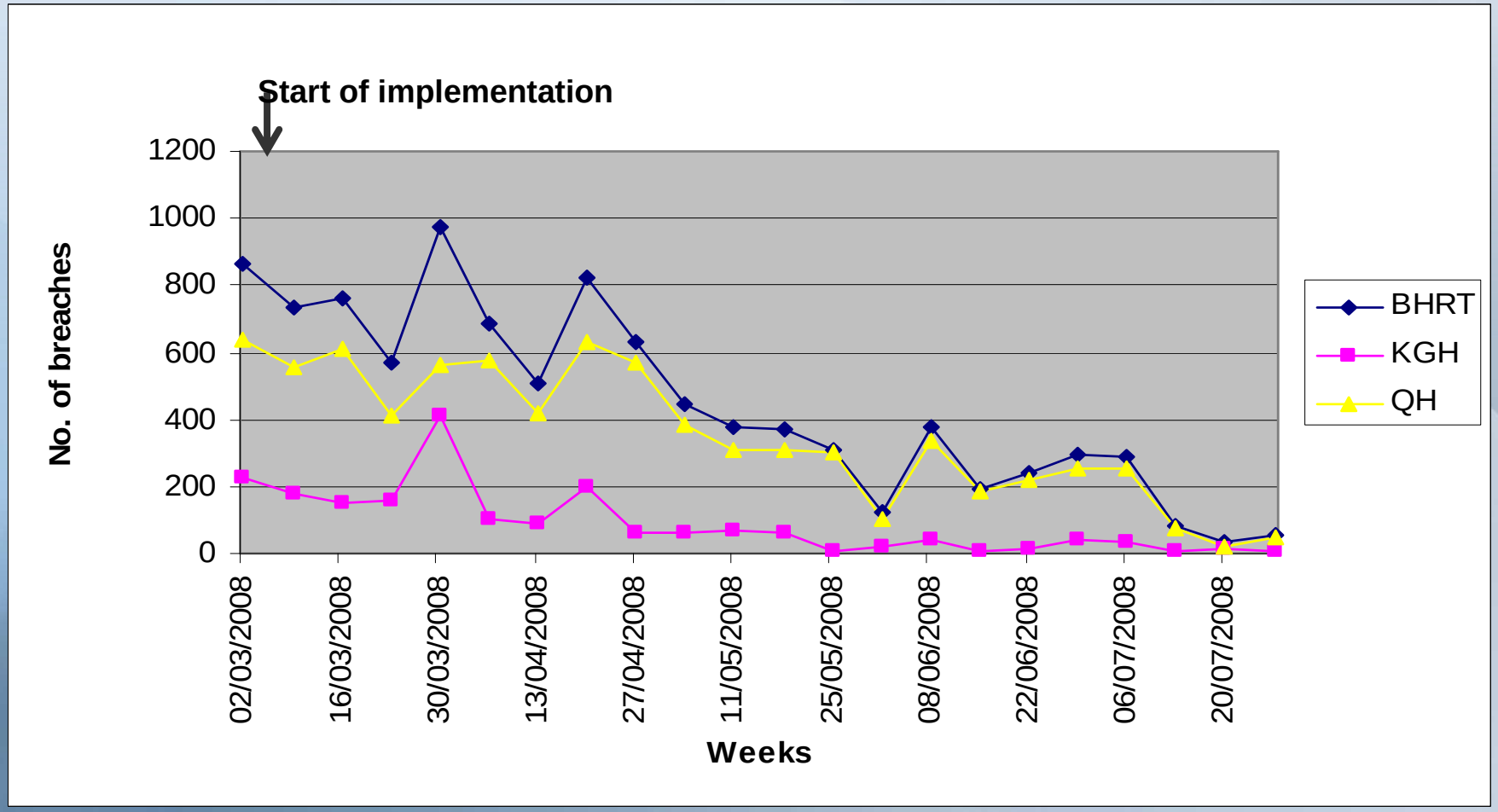
jonah — THEORY OF CONSTRAINTS IN HEALTHCARE

Target: 100.0% Last breach: 7 minutes ago New Patient ... Location: All locations Stream: All streams 48 patients

HOU, Male, 49	Coping problems	15:04	Minor	Minors	Disch:		4:36	
Nurse treatment	Psychiatrist	Psychiatrist	Ref:		DTA:			
WILL, Female, 49	Coping Problems	15:06	Minor	Minors	Disch:		4:34	
Psychiatrist	Psychiatrist	Delay in referral	Ref:		DTA:			
ELL, Female, 60	Sent from Doctors	15:22	Minor	Minors	Disch:		4:18	
Labs	Radiology		Ref:		DTA:			
TAN, Male, 60	SYNCOPAL	15:33	Major	Majors (Black delay reason)	Disch:		4:07	
Radiology	Speciality Medical		Ref:		DTA:			
OWE, Male, 47	VOMITTING BLOOD	15:41	Major	Majors	Disch:		3:59	
Speciality Surgical	Labs		Ref:		DTA:			
WHITT, Female, 56	SENT FROM CLINIC	16:04	Minor	Minors	Disch:		3:36	
Labs	Nurse treatment		Ref:		DTA:			
THOMP, Male, 22	S/P GSW ABDO	16:18	Minor	Minors	Disch:		3:22	
Speciality Surgical	Waiting bed		Ref:		DTA:			
BENTL, Female, 30	SEIZURE	16:19	Major	Majors	Disch:		3:21	
Nurse treatment			Ref:		DTA:			
MILES, Female, 57	CP	16:29	Minor	Minors	Disch:		3:11	
ER Review			Ref:		DTA:			

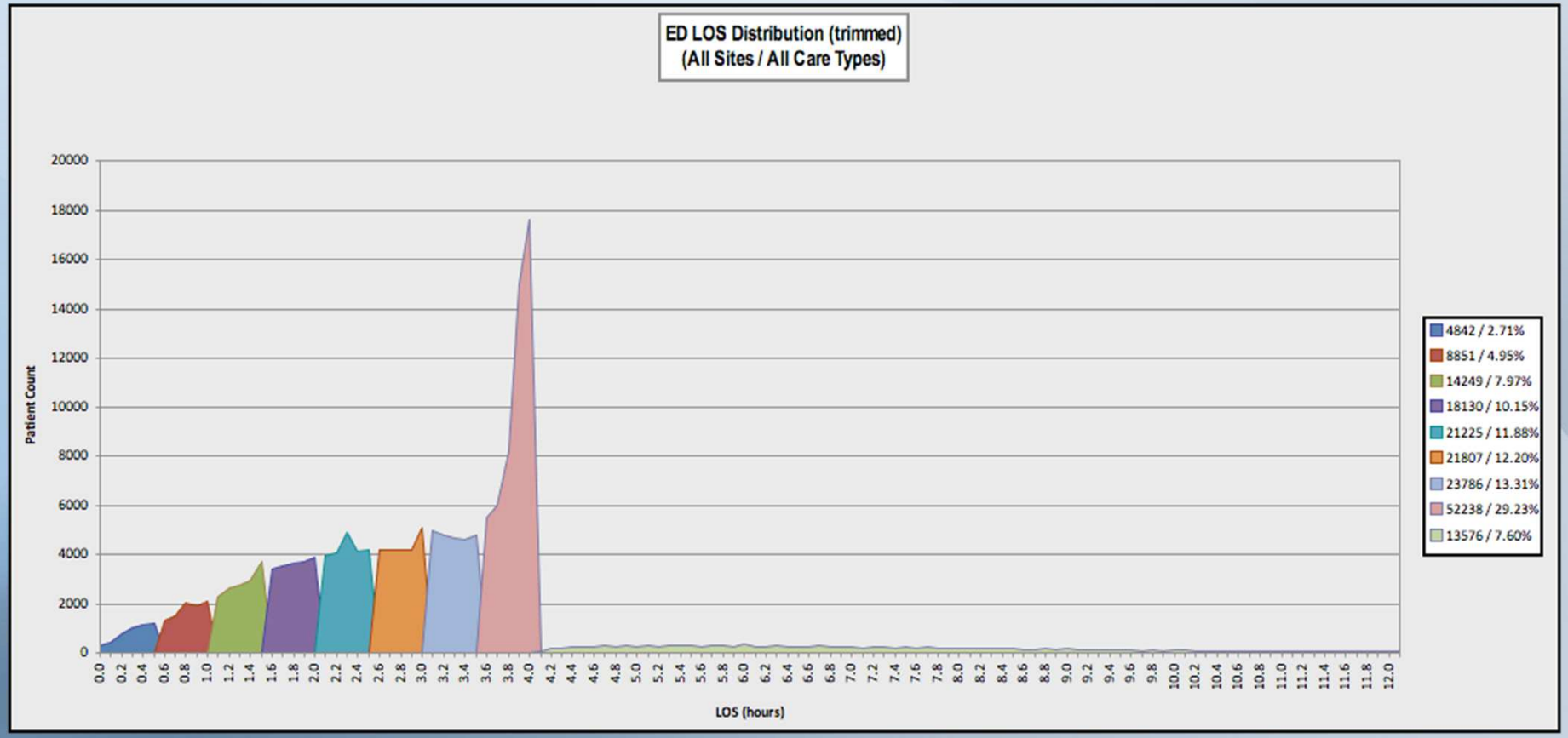
start | Emergency Jonah - [... | Detroit.ppt | DETROIT ER.ppt | EN | 19:40

Number of breaches against 4 hour target

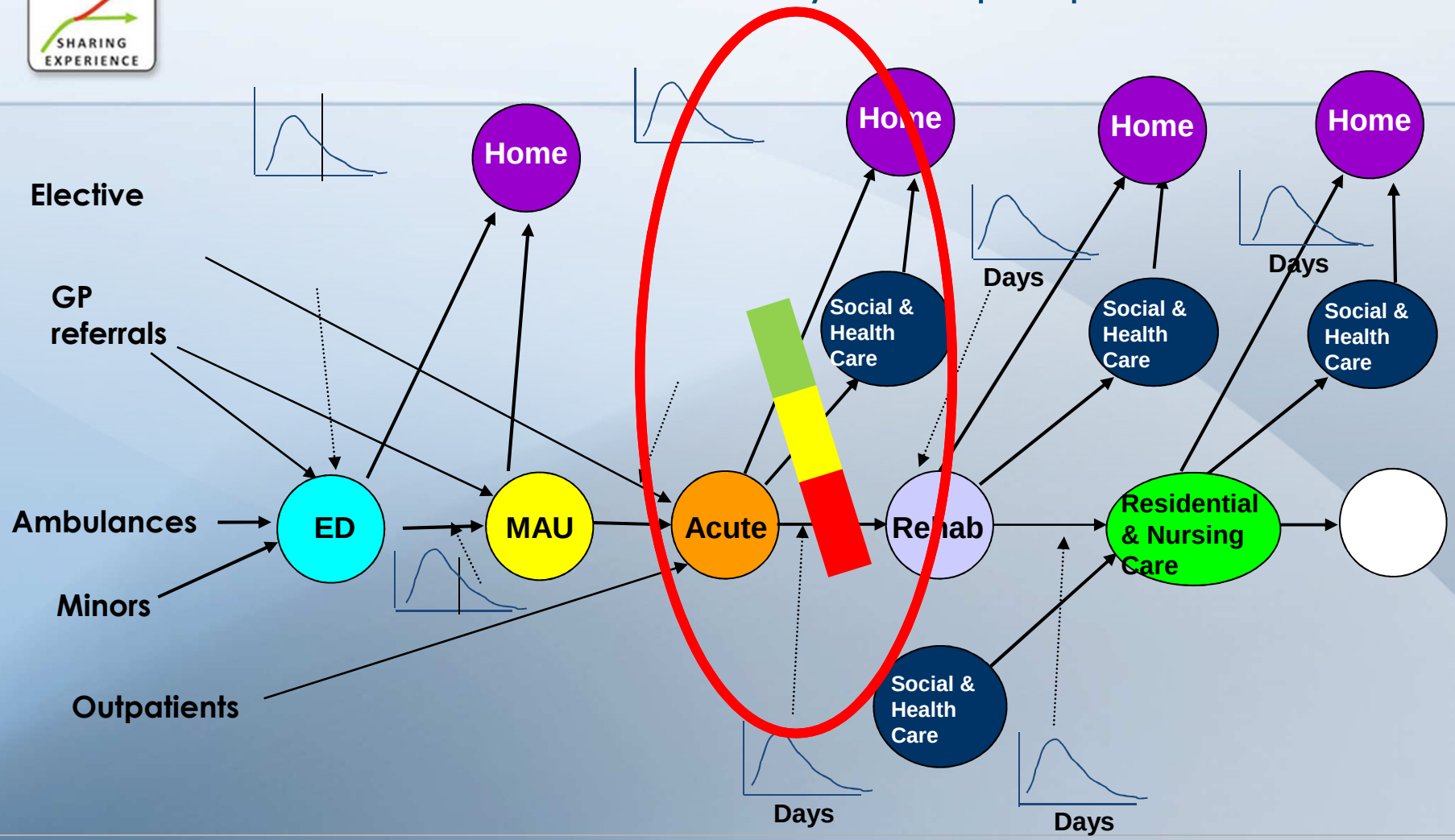


Drivers of instability

A typical example: >37% of patients are still in the ED department at 3hrs 30mins



Health and social care:a systems perspective



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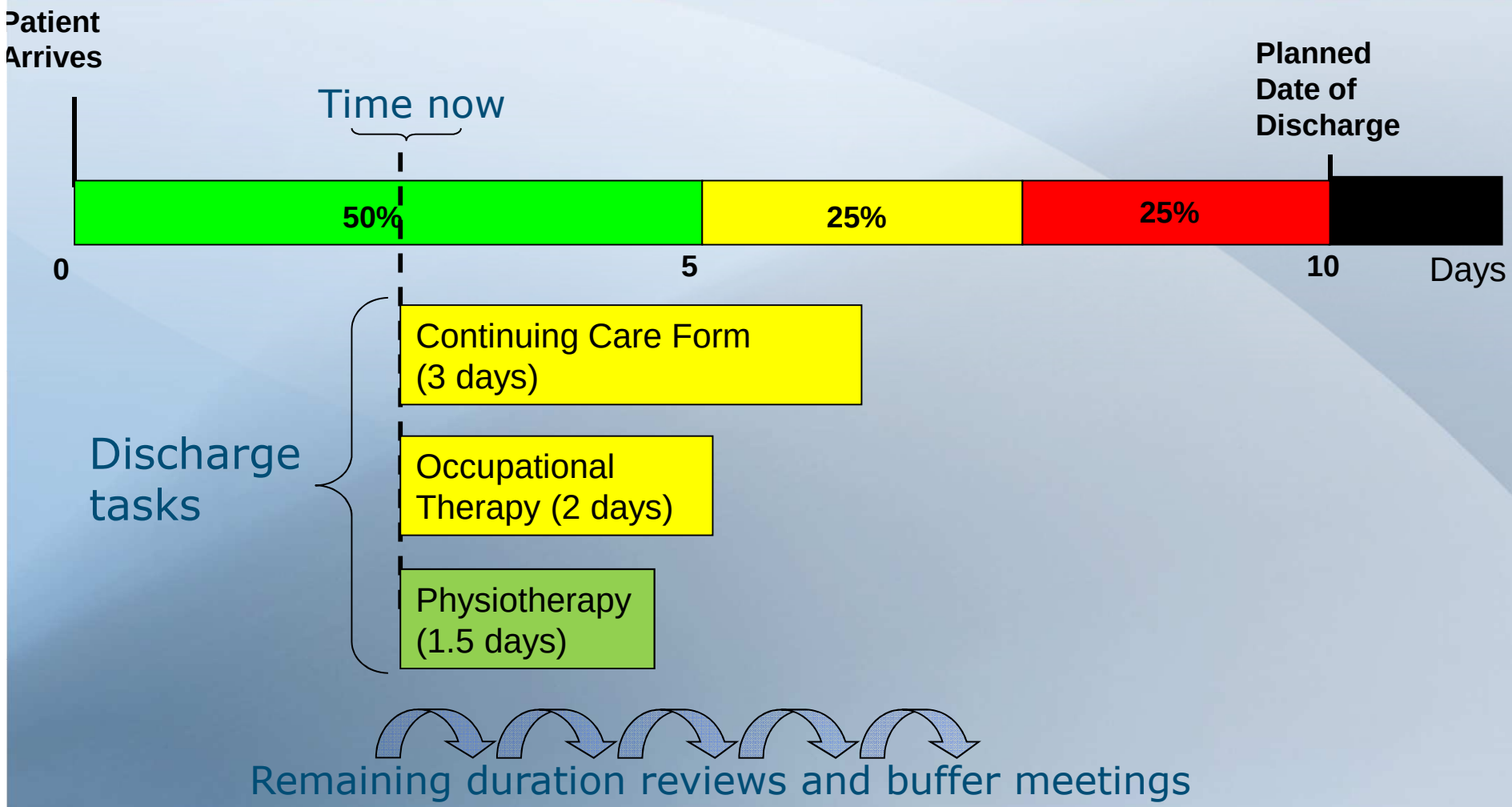
Applying the 5 steps of focusing

- 1 Identify the system's constraint(s)
  - *Beds : Length of Stay (LOS)*
- 2 Decide how to exploit the systems constraint(s)
  - *Manage flow using capacity buffer*
- 3 Subordinate everything to the above decision.
  - *Set and maintain planned discharge date*
  - *Synchronise discharge activities*
  - *Adopt buffer management*
    - *Prioritise, expedite, escalate, target*
    - *Huddles*
    - *Cross buffer management*

Healthcare Discharge Buffer Management

- A hybrid development



Healthcare Discharge Buffer Management

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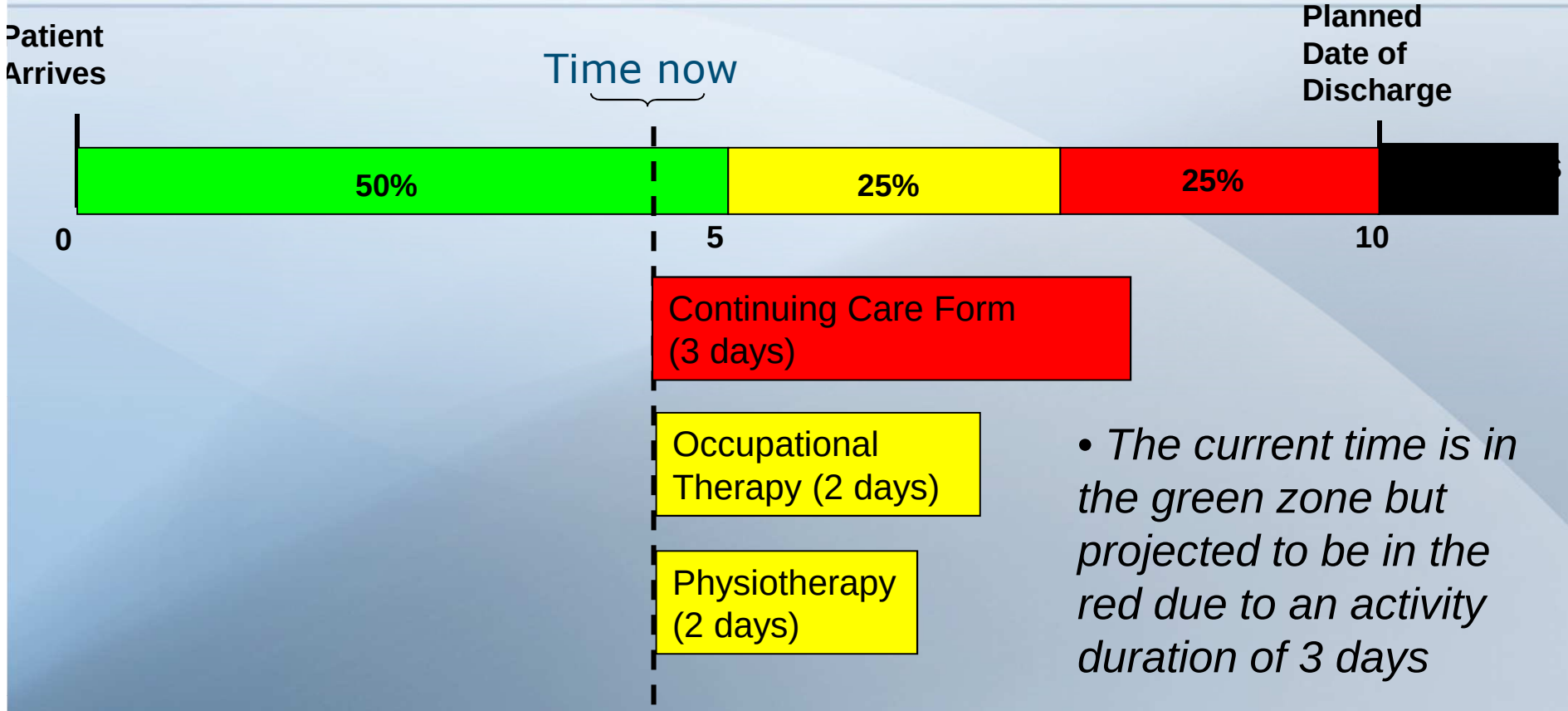


- *The current time is in the green zone but projected to be in the red due to an activity duration of 3 days*

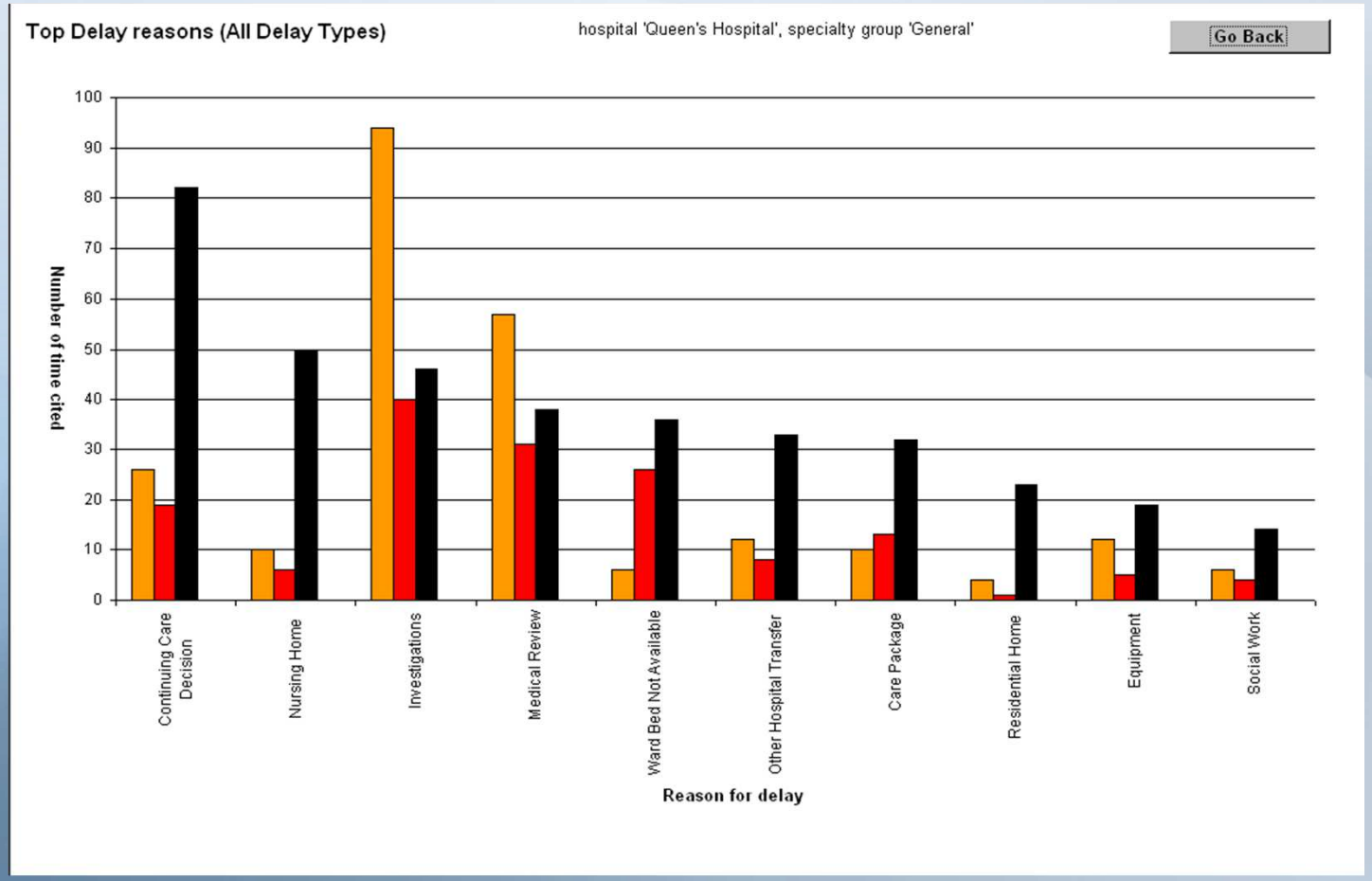
Remaining duration reviews and buffer meetings

How and why has time buffer management contributed to improved patient flow?

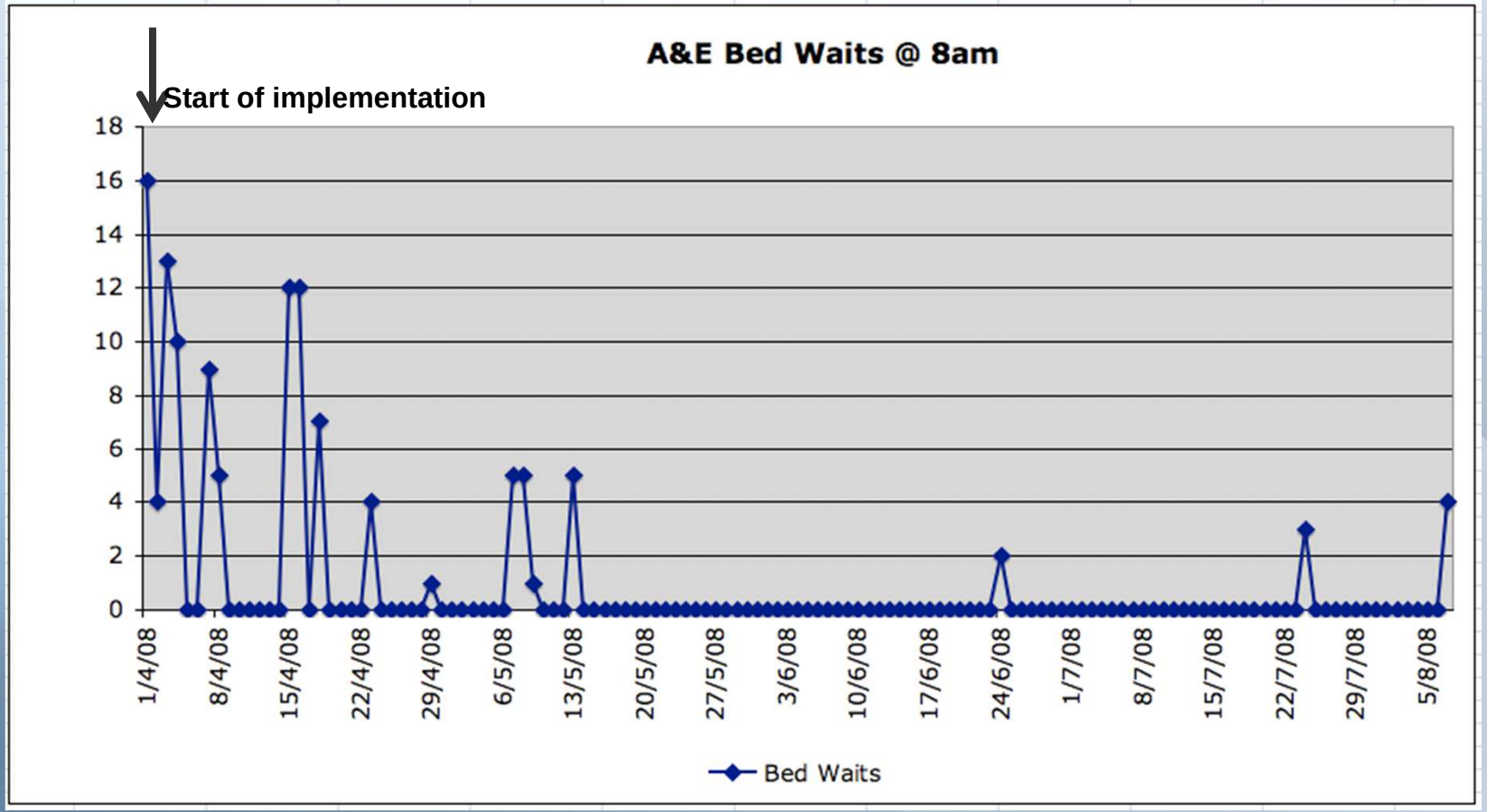
- ***Prioritise*** *the flow of work (buffer penetration).*
  - *A&E UK fixed lead time (4 hours)*
  - *Complicated by planned discharge dates changing*
- *Identify when to* ***expedite*** *potential delays.*
  - *Respond to individual red zone penetration*
- *Signals when there is a need to* ***escalate*** *increased capacity.*
  - *Respond to significant and growing red zone penetration*
- *Identify and* ***target*** *main sources of delay for improvement*
  - *Pareto analysis and target improvement activities*

Stratton, R., and Knight A., 2010. Managing Patient Flow using Time Buffers. ***Journal of Manufacturing Technology Management****, 21 (4) pp. 484-498.*

Discharge QFI Jonah top delay reasons by region



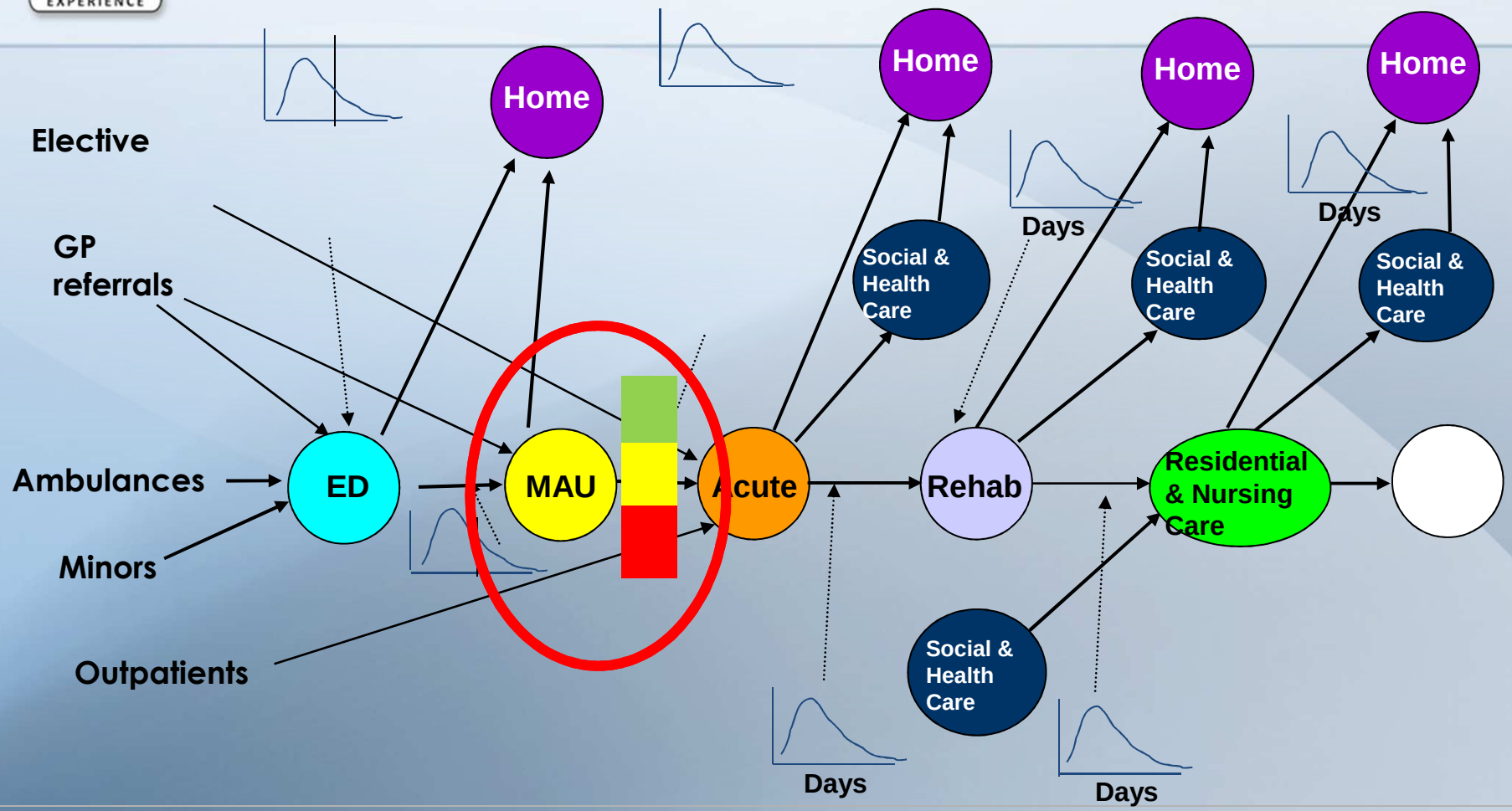
Major London Hospital: ED Bed waits: 8am



The inherent simplicity

Where is the leverage point in the system?

Health and social care:a systems perspective



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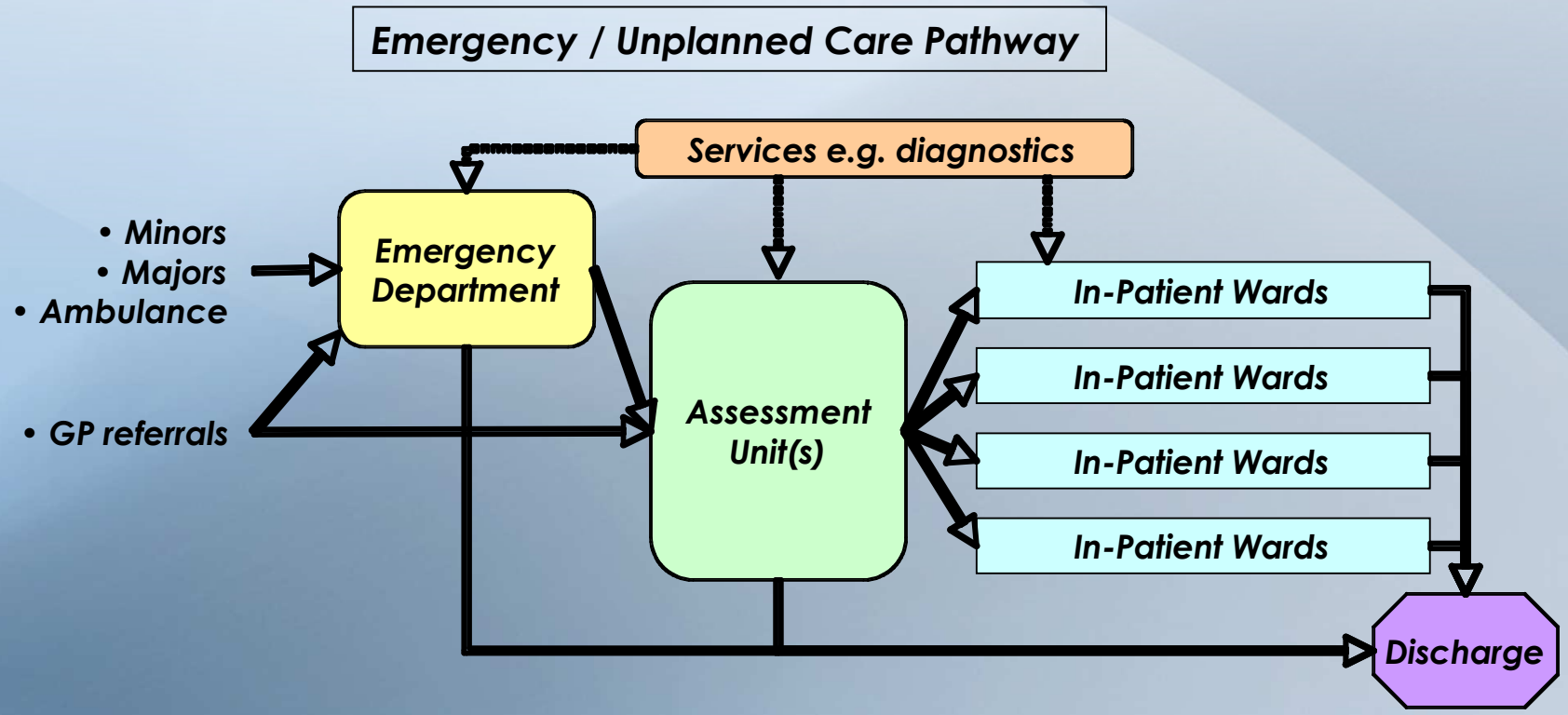
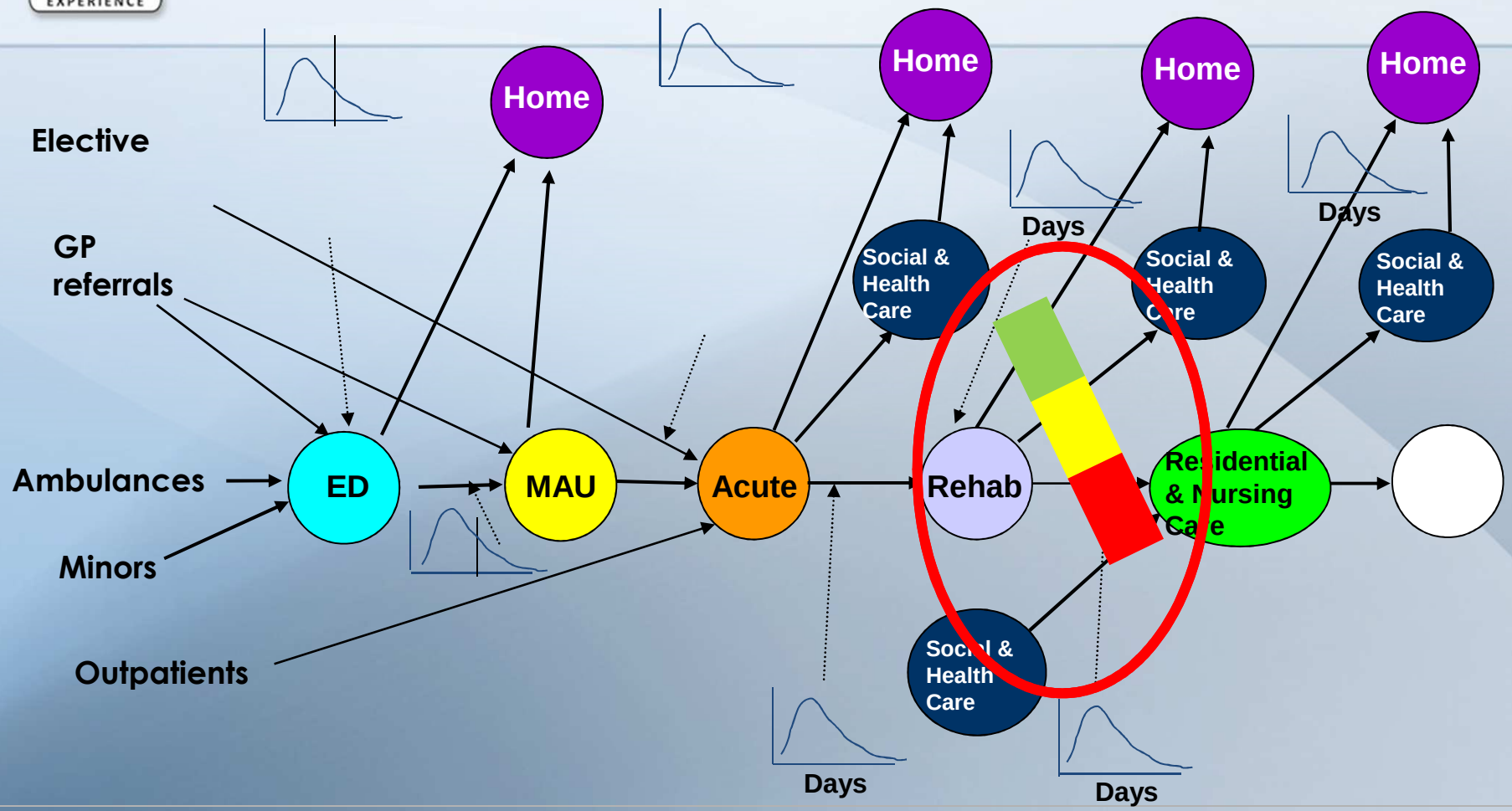
The MAU is at a divergent point in the emergency pathway and can act as both a filter and a bed capacity buffer for the medical wards?



Potential MAU Logistical Benefits

- Acts as an aggregate bed capacity buffer:
  - Provides a space buffer to meet ED 4 hour target
  - Avoids holding protective bed capacity at the ward level
  - Enables advanced signaling of bed requirements by ward
  - Focuses attention on the causes of delayed discharge
  - Avoids outliers - extended length of stay (LOS)
  - Provides advanced signaling of MAU bed capacity adjustments.

Health and social care:a systems perspective



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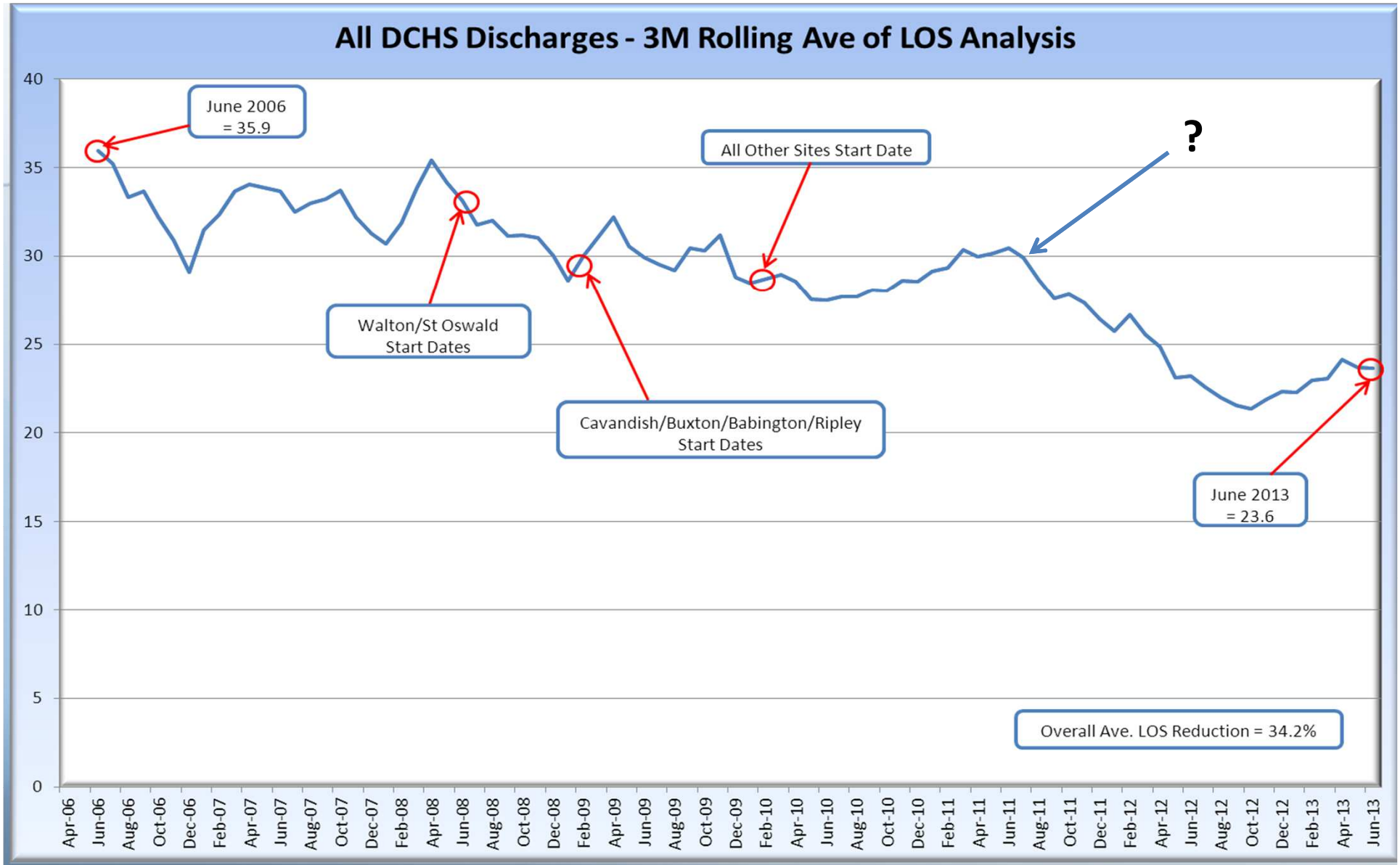
Derbyshire Community Health Services

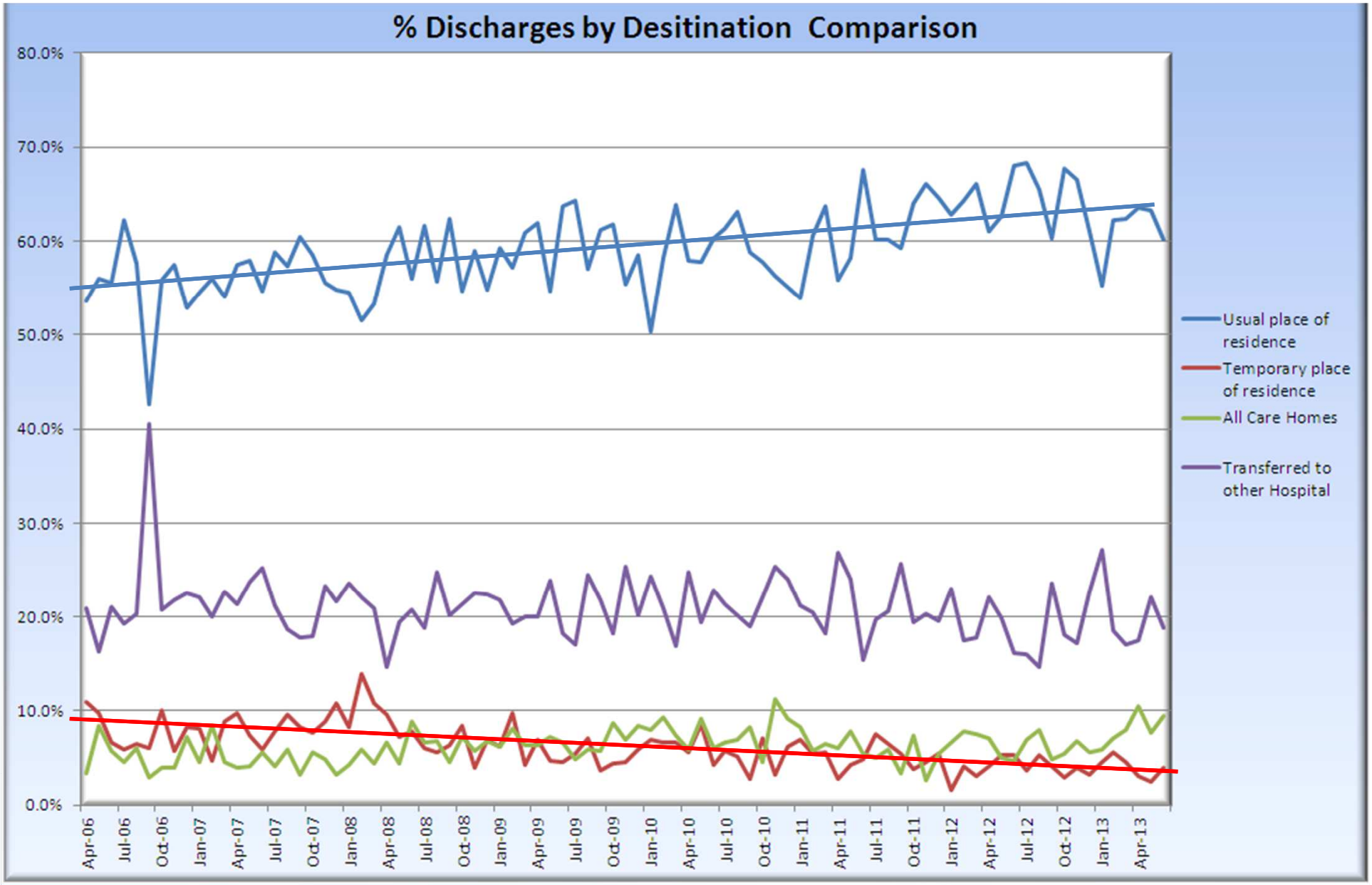
- Derbyshire Community Health Services (DCHS) is the largest provider of community services to the Derbyshire population

Community hospital results

The Jonah Discharge initiative has transformed the trust's performance. Average length of patient stay, which **fell 50% from 65 days to 32 days in some areas within two months of implementation**, has continued to fall.
As a result, DCHS **reduced its bed numbers from 525 beds in 2007 to 370 in 2011**.
"The Jonah approach is firmly embedded in the way we do things, and that is why we have been able to sustain and build on the progress we've made." "**We are not only adding value to our patients' lives, but also improving our own working lives**." MD DCHS

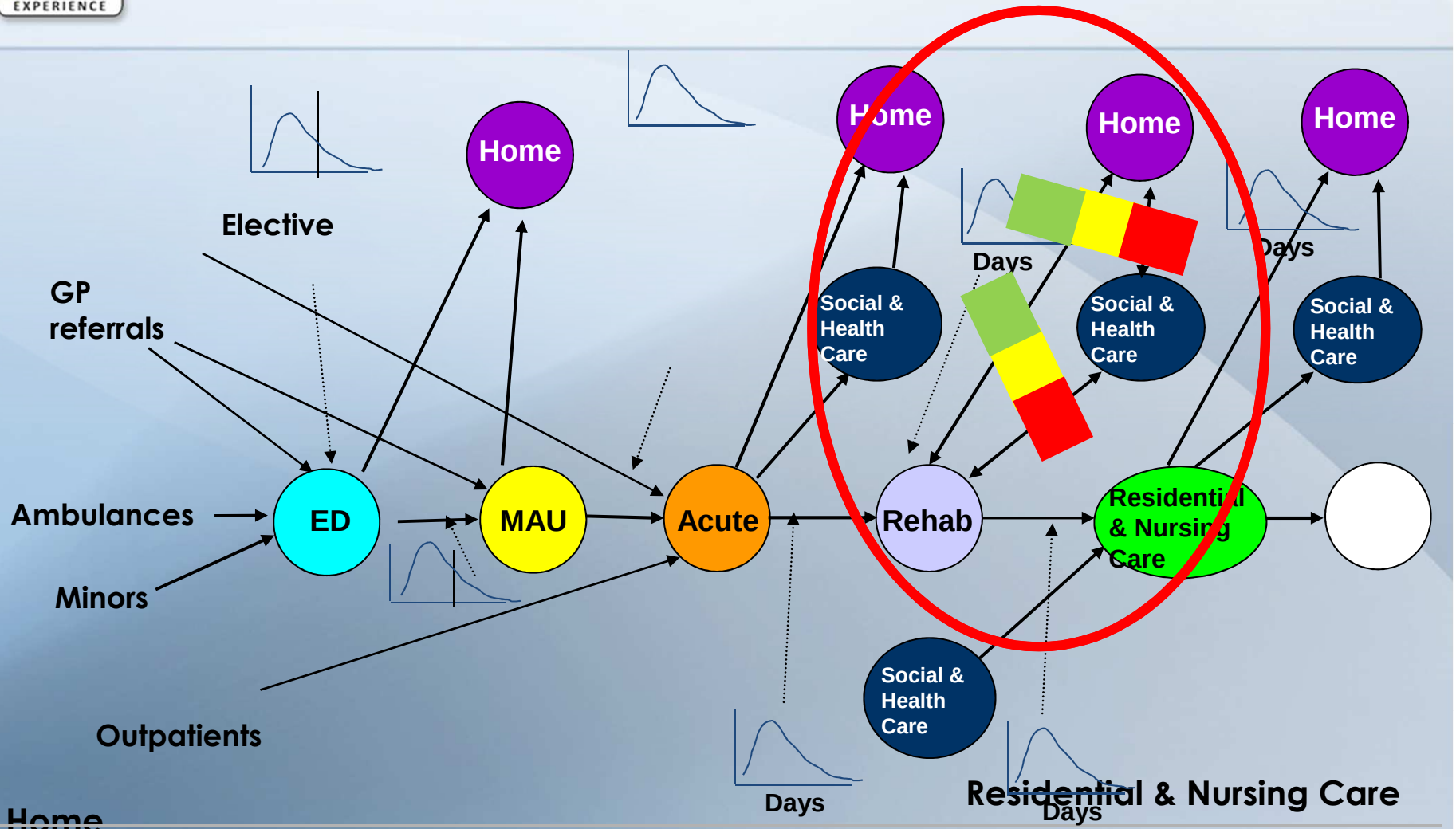


Length of Stay (LOS) across DCHS 2006-2013



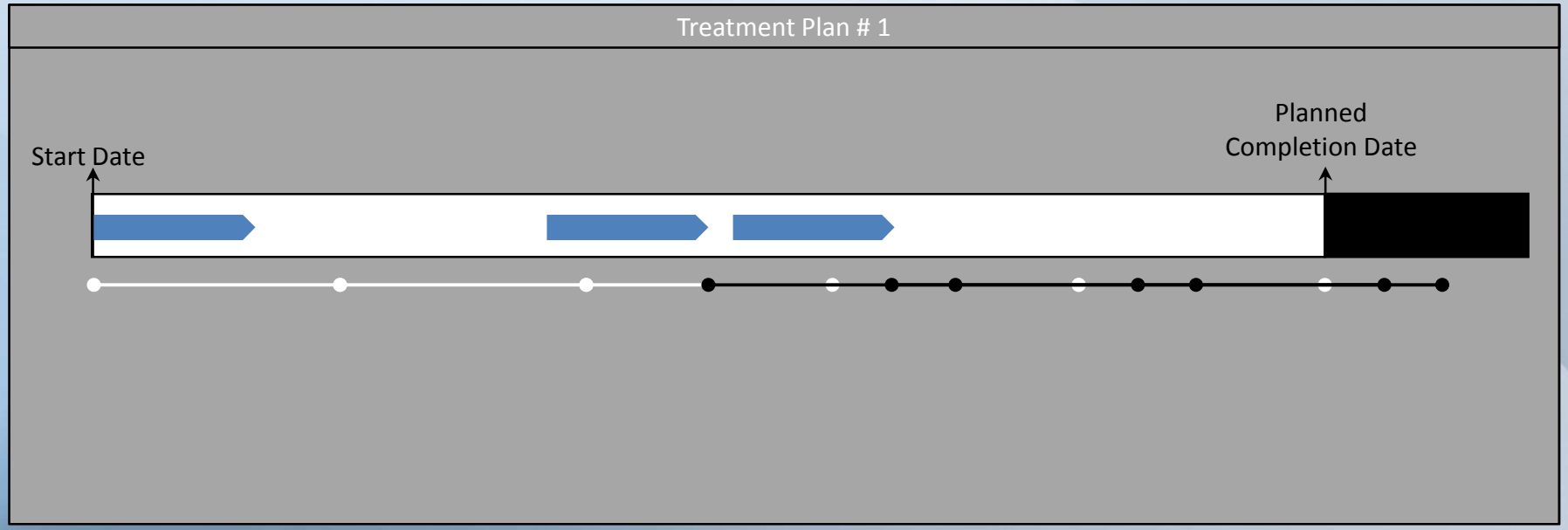
DCHS Discharge to destination 2006 - 2013

How to avoid the acute care route



Home
Emergency Room
Medical Assessment Unit
Acute
Social & Health Care
Rehabilitation Hospital

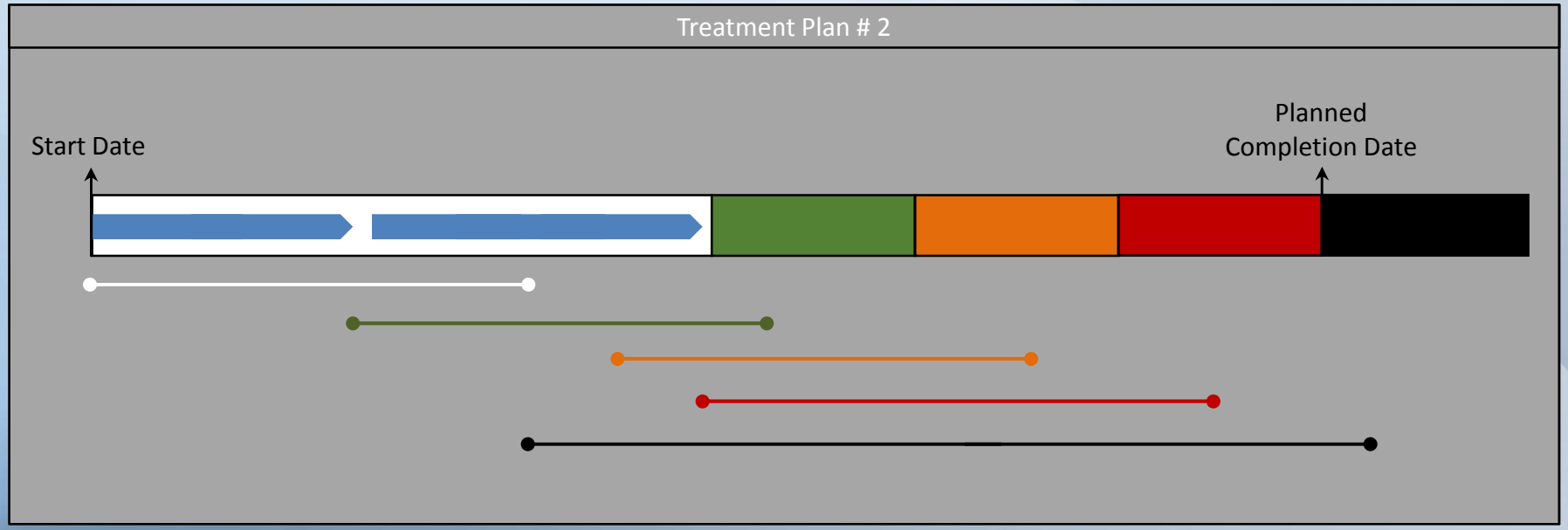
Treatment view (scheduled tasks)



Cause and timing of disruption is noted for future analysis

Time and change of buffer status is noted for future analysis

Treatment view (non scheduled tasks)



Task / resource combination is noted for future analysis

The current reality

- "Nobody involved in the treatment of each patient really knew how their overall care was being managed or had a clear view of what needed to be achieved in order to prepare patients for discharge."

  (Managing Director DCHS)

Current dilemma

CCGs want significant change if DCHS don't provide it someone else will. The Derbyshire strategy is to deliver patient centred, integrated health and social care
If DCHS doesn't lead the change then changes will be imposed by CCGs

The NHS strategic intent is to move care into the community, particularly of the frail and elderly

Meet the changing demands of the healthcare economy

Push on with significant changes in community service provision

DCHS is a flourishing Trust

High staff motivation and morale

Stop new change initiatives

A significant part of DCHS success has been the dedication and commitment of its staff

Staff have been through a period of continuous change
Staff and operational management express significant resistance to change
Full benefit of current change initiatives need more work to be fulfilled

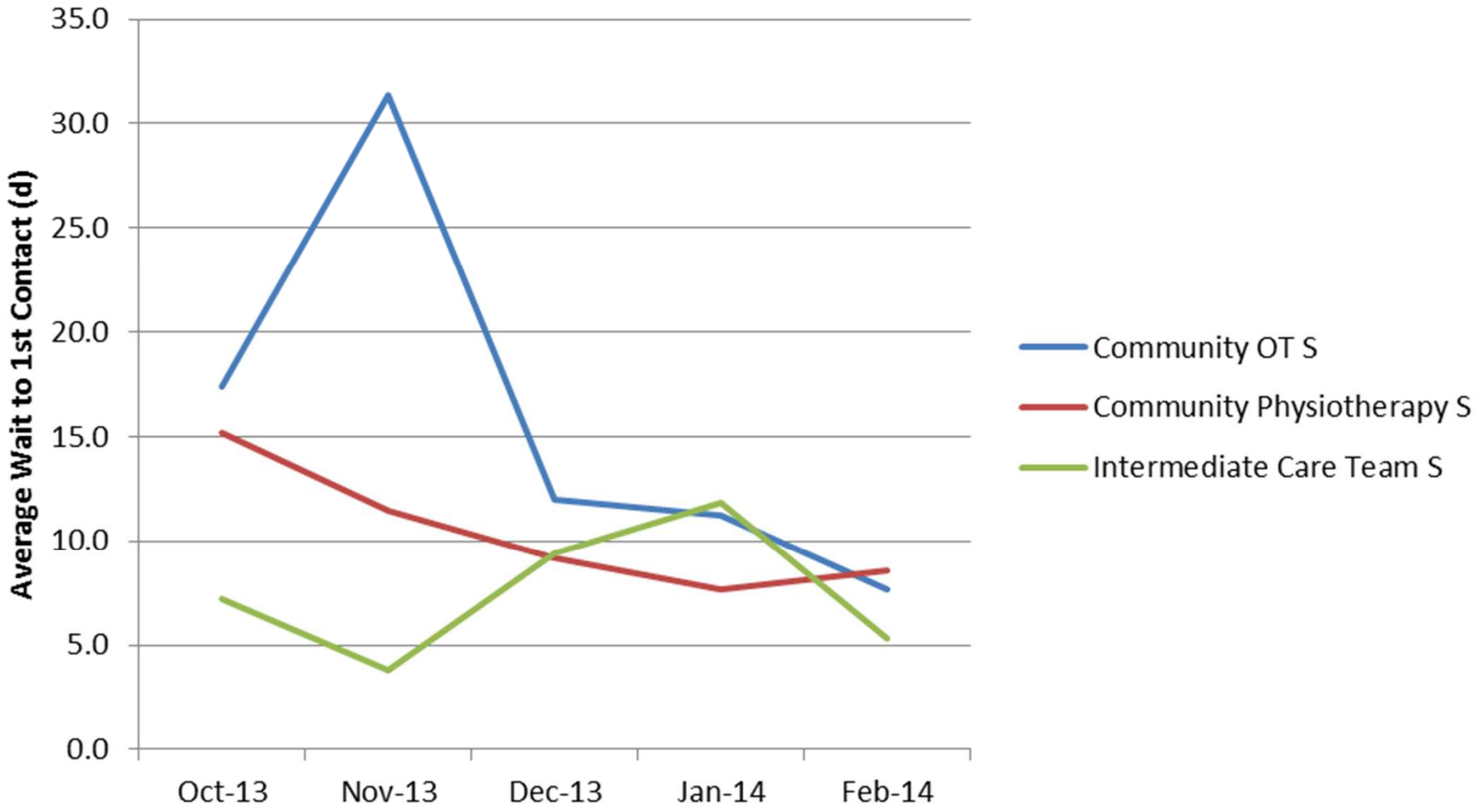
Methodology

- Results have been achieved through the setting of a patient-centred identification of episode end date or planned date of discharge
- Pooling of resources to cover gaps in service provision (holidays, sickness, capacity)
- Reduction in bad multi-tasking and cherry picking
- Leading to increases in the quality and timeliness of care

Progress to date: key outcomes

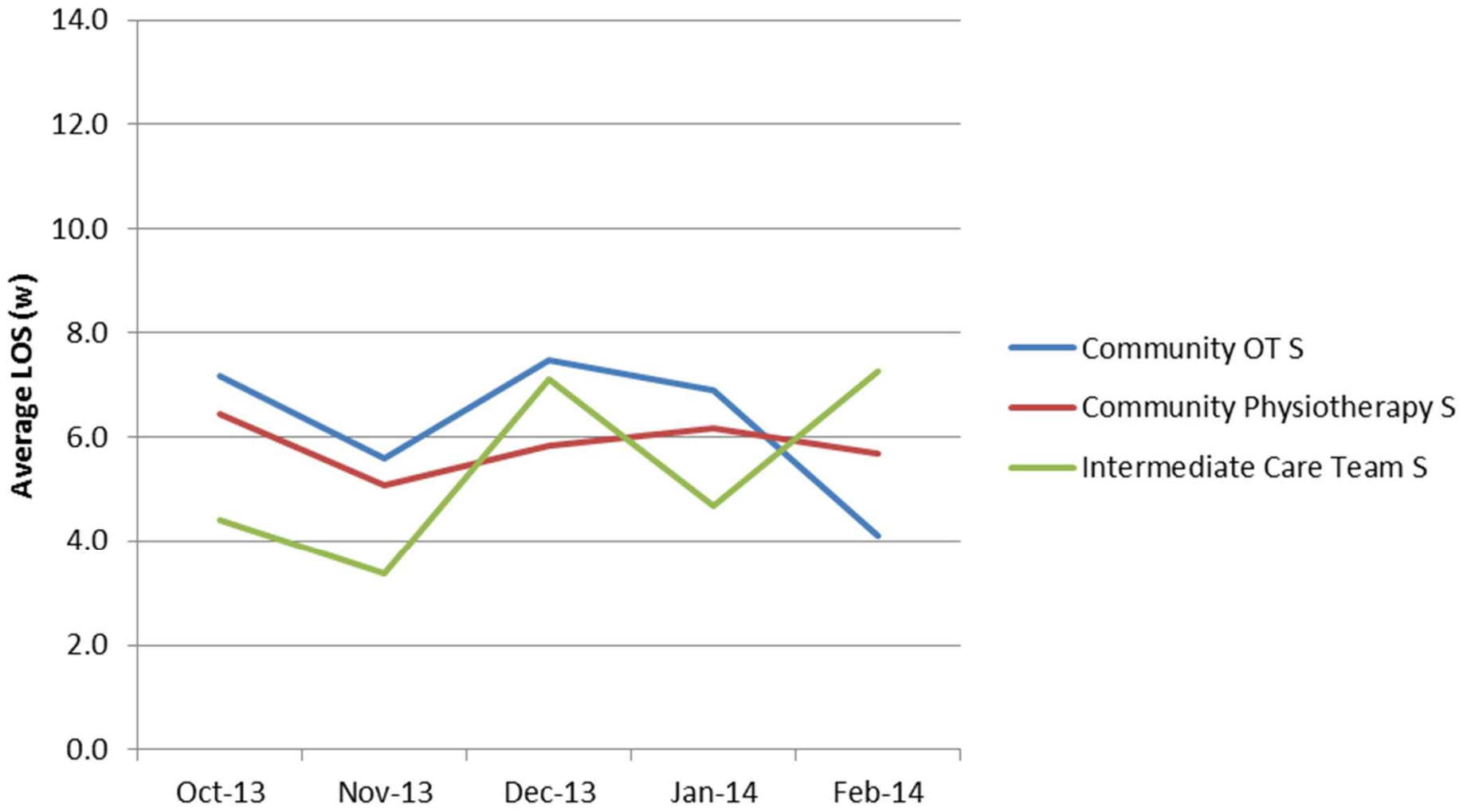
- Visible, transparent and active management of patients on waiting lists
- Community therapy waiting list results:
  - list numbers reducing by 44% since August
  - 20% reduction in waiting times since August
  - 5 areas are under 21 days
- Visibility of patients being actively treated and managed
- Shift in practice from autonomous working to integrated therapy teams
- 30% increase in throughput over a three month period
- Identification and progress towards elimination of reasons for delay
- Data captured is only from date of implementation. The process of implementing itself created significant benefits

DCHS Average waiting to first contact (Oct 2013 – Feb 2014) To be updated



DCHS Average Length of Stay (Oct 2013- Feb 2014)

To be updated



What are the alternatives to TBM and TOC in managing patient flow?

Health care improvement approaches

	Alterative approaches to system improvement		
Attribute	**Six sigma**	**Lean**	**TOC**
Environment	Standard processing	Stable flow	Complex flow
Key word	Variation	Flow	Focus
Key assumption	Process variation can be systematically reduced	Interruptions to flow can be simply reduced	Variation can be more effectively managed
Key scientific approach	Hypothesis testing (PDSA)	Hypothesis testing (PDSA)	Causal mapping (Necessity and sufficiency logic)
Key change	Specific processes	Process flow	Management rules
Distinguishing concept/tool	Statistical process control	Kanban control	Buffer management
Pre-requisite	Accurately measure parameters	Establish well defined value streams	Identify means of aggregating variation

Lean applications lack an integrated system wide approach (Radnor et al., 2012)

- "The literature shows **that few Hospital Trusts follow an integrated and system-wide approach** to service improvement (Branao de Souza, 2009; Radnor, 2010; Spears, 2005; Young and McClean, 2008) Radnor and Broaden, 2008) in their wider analysis of Lean within public services warns that a **narrow focus on just tools and techniques, particularly RIEs**, could fail to align improvements with wider strategy; with service providers getting caught up in short term activities, rather than the long term vision.

Conclusions

- TOC has been successfully applied to emergency and planned health and social care for over a decade.
- This systems approach is underpinned by hybrid variants on SDBR and CCPM Time Buffer Management (TBM).
- Improvements in LOS can be rapidly achieved but require discipline in applying the functions of TBM.
- A natural leverage point in the acute care system is the Medical assessment Unit (MAU) which can be managed as an aggregated capacity buffer.
- TOC is now being applied to synchronising community care, so relieving pressure on the hospital based care systems.
- TBM is a signalling system better suited to this environment than kanban which may explain the unfulfilled promise of lean (Radnor et al., 2012) in health and social care.

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