



“The more complicated the problem, the simpler the solution must be...”

Dr Eli Goldratt

THE OXFORD STORY

Oxford Radcliffe Hospitals 
NHS Trust

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THE OXFORD STORY – FROM THEORY TO PRACTICE

The Scribe: “It’s been said that ‘Nothing is more practical than a good theory’.¹ The success in Oxford is largely owed to the Theory of Constraints, TOC for short. Perhaps we should give a little insight into it.”

Alex: “Without being overly theoretical, let’s just mention those few key notions of TOC that we employed in Oxford. First and foremost is the principle that in each system, large or small, there is, by definition, only one constraint, one weakest link. Logically, the capacity of the weakest link determines the capacity of the whole system. The objective therefore is to identify it, make it work to its full capacity, align the other, non-constraint, parts of the system with the capacity of this bottleneck and, in doing so, make the whole system begin to fulfil its potential.

As Dr Goldratt says, “the more complicated the problem, the simpler the solution must be”, therefore you start with what you’ve got – the presenting issues. In Oxford, it was things like ambulances queuing outside the A&E department, medics and patients being frustrated with the provision of the service, and many other things people told us. It is important to remember that these undesirable effects are likely to be the symptoms of the problem. However, they invariably point towards a common cause – the weakest link in the system, which you are trying to find, so that you target your improvement efforts to the root of the problem not its symptoms.”

The Scribe: “What was the specific situation in Oxford?”

Alex: “The major issue in Oxford was the frequent failure to meet the 4 hour turnaround targets in the A&E departments and regularly exceeding the 12 hour trolley waits before being admitted to the acute hospitals. It seemed like an A&E problem but when we looked across the whole Oxford Health and Social Care System we could see every part of it, be it the Community Hospitals, the Acute Trusts, the actual A&E departments, experiencing capacity problems. In the TOC language, we describe it as a chain of dependent events where natural fluctuation in performance of every one of them has amplified into a sense of insufficient capacity everywhere; something which in TOC we call ‘wandering bottlenecks’.

Our analysis showed us that it was the delays in moving the patients from one kind of care to the next, especially in expediting the patients out of the acute care, that manifested itself as a problem in the A&E. In the perfect world, that’s where we would start. Ideally according to TOC, you align the inflow into the system with the capacity of its weakest link. In Oxford, it would mean, more or less, aligning the admissions into the A&E departments according to how many patients walked out of the back door of the acute hospitals on the day. In practice, it’s not that simple.”

¹ Jules Henri Poincare, French mathematician, 1854 -1912

OXFORD HEALTH AND SOCIAL CARE SYSTEM - The chain of activities

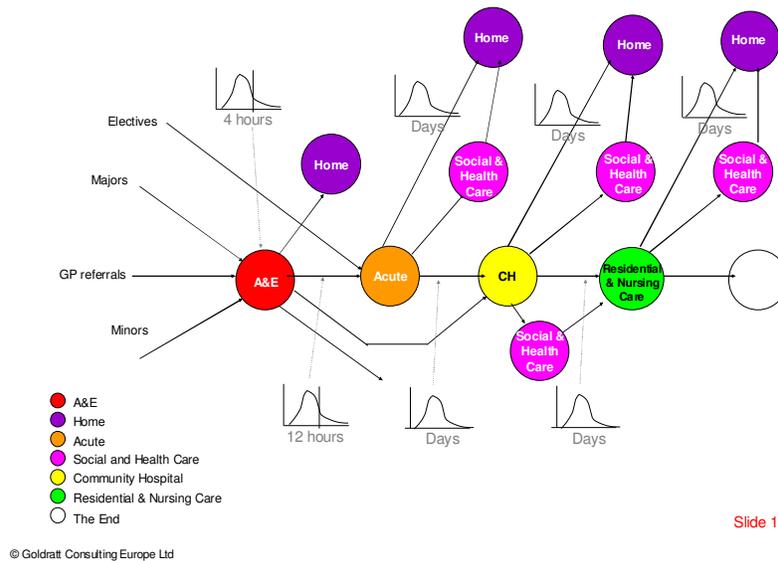


Fig 1. Chain of Health Care Activities

The Scribe: “So how did you ‘practically’ apply the Theory of Constraints?”

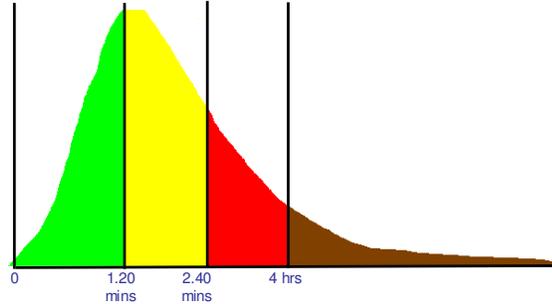
Alex: “Oxford’s A&E services had been under a severe political pressure for a very long time and things had to change. That’s where we had to start like it or not. The breakthrough was in using a TOC application, something that we called Dynamic Buffer Management, to expedite the patients through the A&E as effectively as possible.

A little more theory here – according to TOC, you implement a buffer not everywhere in the chain of dependent activities but before the bottleneck to make sure that the bottleneck is always working at its maximum capacity because it is, in effect, what you get out of the whole system. Not only that you implement a buffer but you manage it according to how it is being ‘eaten into’. There are three zones, three parts of the buffer – green, amber and red – and you deploy different activities according to how far the buffer has been used up to make sure that you meet the deadline.

Practically, the Dynamic Buffer Management in A&E in Oxford looked like this. We divided the 4 hour turnaround period into the already described zones; green: arrival to the A&E – 1 hour 20 minutes, amber: 1 hour 20 minutes – 2 hours 40 minutes, red: 2 hours 40 minutes – 4 hours. Two principal kinds of activities delivered the Dynamic Buffer Management: a/ accurate monitoring of the reasons why a patient’s journey penetrated from one time zone to the next, and b/ taking appropriate action according to which zone the patient was in.

4 HOUR TARGETS: IMPLEMENTING 'DYNAMIC BUFFER MANAGEMENT'

Split the 4 hour process into 3 zones: green, amber, red.



Actively manage patients in the amber zone to avoid them moving into the red zone. Patients in the Red/Brown zone to be 'expedited' through the remaining steps in the system. Review and eliminate underlying causes once a week

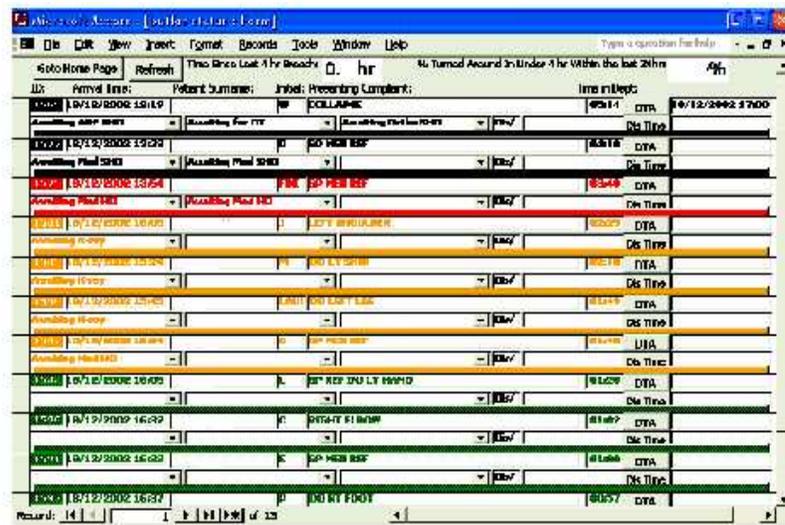
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Fig. 2. Managing the 4 hour Processing Target as a Time Buffer

Developing an information system to record the real data about where the time went was critical for making the right improvements in the right places. Every Monday, representatives of all the activities that need to come to place to see a patient through the A&E would look at the data and identify the main pattern in what was causing the penetration of the zones. And that's where they would channel their improvement activities. The beauty of this is every week everyone can see and agree on the number one cause and everyone can focus on eliminating it by the meeting the next week. This really is a focussed process of ongoing improvement”

BUFFER MANAGEMENT MAIN SCREEN



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Fig 3. Buffer Management Main Screen

The Scribe: “What you’ve described sounds to me like people in the front line doing things differently from day one. How did you manage that?”

Alex: “The traditional approach to change, i.e. have a good idea – get people’s buy-in – plan – implement, has been done to death. We didn’t think that saying to people in the NHS ‘Trust us, this is *the* change initiative and it will work’ would have got us anywhere. Instead, we needed a process that would deliver positive results quickly so that people could see the benefits for themselves within days.

In addition to delivering quick results, we also needed to be quite bold in saying to people ‘You can’t expect other parts of the system to change until you change your practices so that you are ‘squeaky clean’. Monitoring real data about how things actually happen along the patient path and focusing the energy for improvement to where it makes the biggest difference to the outputs put a stop to all the old myths, fantasies and the blaming of others, and, instead, invited others to change.”

The Scribe: “This reminds me of something I read: ‘Twenty first century organisations will find it hard to survive, let alone flourish, unless they get better work from their employees. This does not necessarily mean harder work or more work. What it does mean is employees who’ve learnt to take active responsibility for their own behaviour, develop and share first rate information about their job [e.g. not just good news], and make good use of genuine empowerment to shape lasting solutions to fundamental problems.’² How does it sound to you in the context of Oxford?”

Alex: “There is a lot of talk about resistance to change in the NHS and, indeed, it’s there. But, if you bring in something that works, people quickly cotton on and get it done in no time. I have never seen a speedier organisational change than in Oxford.”

The Scribe: “So what was it that worked?”

Alex: “I think, apart from the approach, it was the two-prong solution. First was the Dynamic Buffer Management, and second was treating the discharge practice as a complex multi-project environment. This meant treating every patient as a unique project, relatively small in terms of the number of tasks and activities that need to be carried out, but very complex in terms of resources engaged in delivering them. Without too much theory, the key here was to prioritise and synchronise the work of all the departments involved along the patient path whilst meeting the medical requirements of each patient.”

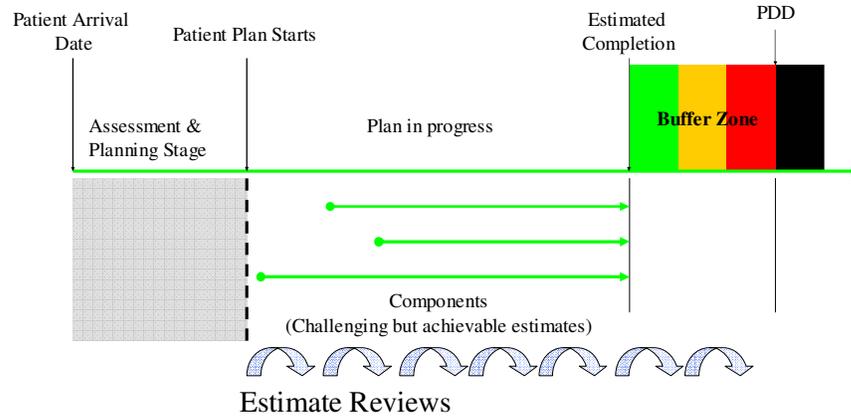
² C. Argyris; “*Good Communication that Blocks Learning*”; Harvard Business Review, July – August 1994.

JONAH DISCHARGE PLANNING TOOL

Not to scale

Action Plan

- Frequent component re-estimates required
- Enter completion date if component is ready (Components background turns Blue)



Patient's plan in progress- Components setup

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Fig 4. "Jonah" Discharge System

PATIENT BUFFER SUMMARY

Visit ID	ArrivalDate	FirstName	Surname	NHSNumber	Age	PDD	Est Completion	AdmissionCat	Buffer Status
81	01/02/2003	Daniel	Baker	12345	78	20/02/2003	20/02/2003	Acute	Plan In Progress
83	20/02/2003	Sarah	Ives	12345	10	20/02/2003	18/02/2003	ReHab	Plan In Progress
84	01/02/2003	Sally	Green	12345	101	20/02/2003	15/02/2003	Acute	Plan Complete
82	01/02/2003	John	Baker	12434	99	20/02/2003		Acute	Assessment/Planning

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Fig 5. Patient Buffer Summary

The Scribe: "In many organisations, lots of change energy gets expended with little lasting progress. What is, in your opinion, needed in Oxford to sustain and build on the success so far?"

Alex: "Three things, in my view: First, we need to continue developing people with real understanding of this change approach and TOC. Second, the software we developed on the run for the Dynamic Buffer

Management does a good job at the moment but will have to be integrated with the other systems. Third, a lot of potential for further massive improvements rests on the centrally applied policies and measurements, which currently govern the internal processes. I would guess that looking into those could improve the waiting times in A&E by 30% to 50%. Further more the dramatic reduction in admission and discharge blockages frees up capacity across the whole system. We believe we are freeing up enough capacity to allow the Acute Trust to make major inroads into its elective backlog without the addition of any resources. I have calculated that the level of wasted capacity in one year is equivalent to approximately half the capacity needed to eliminate waiting lists. This means within two years the whole Oxford Health System can make waiting lists a thing of the past without any extra resources. All it will need is the funding of the consumables required to deal with this increase in productivity.”

The Scribe: "Let's hear from the rest of the team who have been involved in the project."

THE OXFORD STORY – FROM PRACTICE TO EXPERIENCE

The Scribe: "Can somebody spell out for me how people fit into this project and what the broader context is?"

Sally: "We are the doers and also the 'translators' of the ideas into practice because we understand who to approach in the system and who to get involved in what."

Mike: "As for the context, Oxfordshire was first or second worst in terms of 12 hour trolley waits in the A&E departments. And when you are and have been in that position for over a year then that is serious."

Jan: "We had lots of visits and we struggled with all these action plans. No matter what we did, we were not able to sustain performance improvements."

Elaine: "Things had to change because of the national targets that we have to meet. Not just that we had to eliminate 12 the hour trolley waits but also another target is that by March 2003 we should be able to get 90% of admissions through the A&E department under 4 hours.

We've been very very honest about reporting our figures. We had quite a lot of 12 hour trolley waits and that's been seen as negative and indeed it made us think 'Oh my word, what's going wrong? We can't be the only department having problems.'

We are not a large department, we see about 30,000 patients a year. With the continuously increasing pressure to get beds we got into the situation where more and more patients were kept in the A&E department over night and at times it felt like being an in-patient ward, not like an A&E

department. So that was one thing which was quite frustrating for the staff.”

The Scribe: “One more question, this time to the first client of the Jonah Project. Elsa, what made you choose an approach based on the Theory of Constraints rather than any other?”

Ailsa: “Somebody made an unfortunate comment by asking ‘Are you taking 12 hours waits seriously or not?’ I found that hugely offensive because I’ve lived, breathed, ate and slept emergency admissions now for two years. At the same time, I have experiences of externals coming along with absolutely simplistic approaches which clearly couldn’t work. I wasn’t going to go down that route.

I think I understand and know all there is around the issues relating to admitting into the emergency stream. I was not to be convinced by jargon or a glib approach to the problem. What interested me was that Alex, Jan and the team took the trouble to sit down here for two and half hours and run through the whole Jonah Project. I threw hundreds of challenges and, in the end, it seemed to me that I was answered intelligently and with a lot of thought. That made me decide.

What also helped was that I have already had an experience of this approach. We have achieved loads of good things in the recent past with the Theory of Constraints people.”

Mike: “There were a number of reports written which contradicted each other and yet the performance has not improved. So there must have been something underlying which nobody had quite got to.

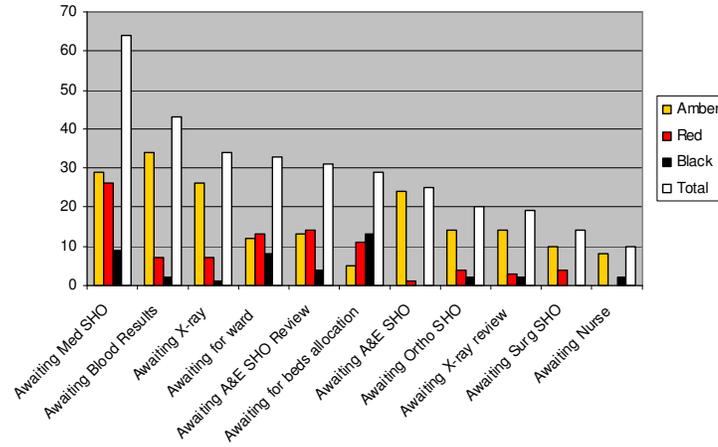
We decided that we would start the Jonah Project in the Horton first because politically if you get yourself off the 12 hour issue you buy yourself time to improve other aspects. In discussions with the staff in the Horton, we have realised that what was happening in the A&E department was merely a symptom.

Get Oxfordshire off the political radar and keep Oxfordshire off the political radar was a number one priority and we could only do that by bringing the 12 hour trolley waits under control and improve the 4 hour targets. If we can deliver these improvements it will buy us a lot of time to tackle the deeper, more systemic issues, such as working across the boundaries of the different parts of the system – social services, acute hospitals, community hospitals, GPs, etc.”

The Scribe: How did you start?

Elaine: “We had a lot of anecdotal evidence but no hard data that would enable us to say ‘These are the issues in A&E because ...’. Realising that helped us to get a general agreement that we had to have a system where we could start to break down what the problems with these delays were.

ALL PATIENTS - BUFFER ANALYSIS



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Fig 6. All Patients – Buffer Analysis Report

However, I went into the first meeting with the Jonah Project team thinking ‘OK, let’s see what’s going to be expected of us? Will I be asked to do even more jobs?’ We’ve been already working flat out.”

Ailsa: “To me, it was clear that there would be two components of the solution, one around the process, the way we did things, and one would be around capacity. I think that adding more and more capacity is not sustainable. I did learn that capacity on its own won’t get me to where I need to be but I am equally convinced that process alone might not necessarily do it either. We needed the two together.”

The Scribe: And as for the actual doing ...

Sarah: “I think the approach of all of us is first going in and listening to people and being able to empathise, and acknowledge that change is difficult, but not letting it be an excuse.”

Mike: “We were saying to people ‘We think we understand what the issues are, and we’ll help check that those are the issues’. We helped them design the information process according to what they found helpful. Consequently, they took the responsibility for generating the operational data pointing to the issues that needed to be tackled. No one told them ‘You have to do this and you have to do it in this way’.”

Elaine: “The staff have been very positive about this approach and put a lot of effort into identifying the slices of the patient journey through the department, what was happening in the first hour and half, what’s happening in the next hour and throughout the 4 hour period. People have realised that collecting the operational data is of value – we looked at those findings every week, discussed them and fed back as information about what needed to be done to improve the performance. It has become

a dynamic process rather than ‘This is yet another job that I have to do’ scenario.”

Mike: “The system that we put in helped the staff find out what caused the delays. Each week, we flagged up in the buffer management meeting what was causing the problem and what we therefore needed to focus on to achieve improvements.”

The Scribe: How did you support the people implementing new practices?

Ailsa: “In the early days, we had Daniel here, doing the techie bits sitting next to the people, being the temporary extra resource put in at the sharp end. And we had Sarah and Sally and Alex. The team were physically here. Front loading the project with the people with the skills was key to asking from the staff only a minimal investment whilst the team were supplying the necessary support. The result was that the A&E people embraced the new ways of working in under a month.

A key thing was the weekly meetings, getting the right people round the table and seeing very quickly that we were making a difference. When we began to have data, and we saw that the new ways of working were making a difference, that itself generated so much enthusiasm for the project.“

Sally: “I think that the audacious nature of what we did and that we actually came up with the goods, and that we found different wins for different people made it work. It wasn’t about egos it was about getting a job done.”

Ailsa: “This is not to say that it was easy because it wasn’t easy. One of the hardest bits was to convince the people that this way of working had to become a part of their day job. All staff are working under enormous pressure and to require them to work differently is difficult. They are not wrong when they say ‘I haven’t got time’ because everything new takes extra time. So it wasn’t always easy to get our hard pressed staff work differently as a part of their day job.”

Elaine: “When the department got really busy it was difficult to enter the data in real time and that caused us a little bit of a hiccup because it didn’t get done and then the information could be lost. So we had to reiterate to the staff how vital it was to enter the information as soon as possible. What we found was that entering the data in real time has promoted closer relationships with the medical team, because the nurses who were looking after the patients were able to say to the medics ‘Is there anything I can do to help?’.”

Sarah: “Previously, we tried to do it manually and collect the data on paper. It lasted one day because it was too laborious. From the change management point of view getting the extra help, i.e. computers, software and hands on assistance from Daniel, was crucial. The staff started taking it quite seriously because they’ve realised that we were going to put our money where our mouths were.”

Daniel¹: The implementation plan was very audacious but when the people saw it happening they couldn't believe that change was happening so quickly nor they could believe that we were not walking away."

Mike: "By the way, in addition to the Horton, we have a buffer management system in the John Radcliff's A&E. We have also been to two community hospitals, Whitney and Didcot, to help them with their discharge, because there are big wins to be got.

The Scribe: Looking at the Jonah Project in terms of organisational change, what did you do to achieve it?

Mike: "The most important thing is to have the information and the conversation in a non-blaming way."

Elaine: "It's been a win: win situation because people saw the turnaround time improving. It also had a positive effect on the staff morale because of being able to do something positive, to make the process better for the patient."

Jan: "It must not be done in a blame culture but as an explanation of what people can actively do to expedite treatment because this whole thing is about expediting patient care."

Elaine: "It's not always the case of putting in more money, it won't solve the problem. It's looking at the way you work, your internal policies, and as we say here – and it is now a common phrase – making sure that your department is squeaky clean, that you are in control."

Jan: "What is really interesting from the change management point of view is the 'squeaky clean' approach, which means 'Get your own department squeaky clean before you ask anybody else to change their practices'."

The Scribe: Is the change sustainable?

Ailsa: "You can't sustain change, unless you've got process improvements. We will continue to work with the Jonah approach for a simple reason, we have to find ways of delivering the nationally mandated targets and provide excellent service for the patients."

Elaine: "The nurses understand the significance of the buffer management for improving the patient flow. The piece of software that we are using offers a visual prompt indicating where, in terms of the time, the patients is in the 4 hour journey and due to what circumstances. It's very positive to see that the Jonah approach has worked and we'll be trying to extend it as far as we can. It's got to be a win:win situation."

Mike: "There is an advantage in starting in a small place like the Horton. We were able to learn the necessary lessons more quickly and we designed the system with the people. What we are doing in larger places

is, to a large extent, tailoring these processes and information systems. Having learnt those lessons, we are able to work with people more quickly. I think it is possible to scale it up but it will take a little longer.”

Daniel: “Considering our involvement in the John Radcliff so far has been smaller than in the Horton, the staff there are using the system really well. What’s been really interesting is how very quickly it became a part of what they do. I haven’t seen anything become so much a daily routine in such a short space of time.”

The Scribe: What were the leadership lessons that you’ve learnt?

Mike: “The tradition in the health service is that if you see ten problems you come up with twenty solutions and off you go trying to do all twenty. We were saying ‘Yes, we have identified ten issues but we’ll ask you to work on one, maybe two, most critical. Let’s come back next week and let’s see whether this one or two got sorted, and if not, let’s keep working on it. Basically, we were trying to give people a sense of focus.”

Jan: “There is no doubt in my mind that the organisation needs that credible leadership role and that you need to have a significant player in that role. It is about the ability of that individual to cut through some of that bureaucracy and to promote the ‘can do’ mentality. I think you need a level of credibility and being known for getting things done, and you also need a level of courage because you will be asking people to do and think differently.”

Mike: “You can ask people to have a go at something, and if having a go proves to bring benefits to them and to the patients then they are likely to stick with it. However, if it does not work relatively easily and very quickly than they’ll go back to normal behaviour. My sense is that keeping up the early gains and the momentum requires a considerable degree of focus.”

Jan: “It’s important that you live through the change process and its consequences with the staff. The lesson that has been learnt nationally is that imposing ready made solutions from the outside has not delivered sustainable improvements.”

Elaine: “When staff are frustrated they vote with their feet. It’s important that we as managers recognise what causes that frustration and try and do things focused at those causes. It is also important to recognise that certain things are best done by involving the staff right from the start because then they feel the ownership of it.”

Jan: “The people need not understand the underlying principles of the Theory of Constraints. However, it is important to explain the patient management process or, as we call it, buffer management in the space of those 4 hours. It is important for the staff to understand why the patients have moved to the different time zone and what they, within their department, can actively do to change the practices. In this way, you’ll achieve ongoing improvement.”

Mike: "I have a sense of danger in that the Jonah approach could be seen as a couple of information-gathering systems because that's the visible part, a kind of 'We put an IT bit on the ward and things improve' mentality. But it is lot more fundamental. The danger is that if it is just seen as an information system, people will put these in and they will make absolutely no difference. You have to help people to understand the underlying issues."

Daniel: "I hope it won't become just IT focused. The Horton guys understand the Theory of Constraints but we need to be mindful of this danger when we are extending this way of working to new areas."

The Scribe: What is for each of you a really memorable moment from the past few months?

Ailsa: "I can think of one particular team, the team responsible for the allocation of beds. The bed allocation was a constraint. And when they watched their figures come down it was like lights coming on."

Elaine: "I think the main reason why this worked is the attitude of the staff and their co-operation."

Jan: "For me, the first memorable issue was the first meeting we had with the staff at the Horton. We had probably 12 people sitting round the table and you could see the penny drop."

Sarah: "For the first time I saw people motivated by targets."

Sally: "Everybody knows about Jonah, people are talking about it to each other, they've seen it, they've heard about it and if they don't they come and ask us about it."

Daniel: "For me it was the cultural change and the fact that people embraced it so quickly."

Mike: "The thing that will live with me from the past few months is the light coming on in people's eyes and the smiles coming back to their faces."

The latest results achieved by the Horton Hospital will be presented by the team on 27th March 2003 at the Promoting Access in Health and Social Care Conference led the inventor of the Theory of Constraints, Dr Eliyahu Goldratt.