

Modernising the service

When Gottlieb Daimler and Karl Benz built their first automobile in 1889, the vehicle they built looked more like a horse-drawn carriage than a motor car, and for decades to come, these 'horseless carriages' simply mimicked the design and appearance of the era that had come before. Daimler and Benz were bringing new technology to solve an old problem without realising that the technology itself was going to make such a fundamental change to transport that they could just about forget everything that had ever been developed to support horse-drawn transport, and start again with a clean sheet. Of course, it wasn't all due to a lack of imagination on their parts. They had the infrastructure of carriage-builders and wheelwrights and component makers and potholed roads to deal with, so maybe it was natural that their first instinct was to add their new technology to what was already there.

Sometimes history and infrastructure can become a very difficult thing to change. History is all around us – we are where we are because of what has gone before. Not just in healthcare. Railway lines in England are 4ft 8½ ins apart. But how did we settle on that curious dimension? It was because the first railway lines were built by the same people who built the pre-railway tramways, and that's the gauge they used. The people who built the tramways used this gauge because they used the same raw materials, jigs and tools that they used for building wagons, and wagons wheels were 4ft 8½ ins apart. If they weren't, then the wagon wheels would break on some of the old, long-distance roads which had well established ruts, 4ft 8½ ins apart. The original ruts were first made by the wheels of Roman war chariots, which were, you guessed it, 4ft 8½ ins apart. And so it is, in the twenty-first century, that the width of our railway carriages carries a genetic blueprint from Imperial Rome. If practices and processes can become as ingrained and as hard to shift as that, then we can start to see why an organisation like the NHS can be so difficult to change.

Consider the cycle of events that often happens when an organisation introduces IT. They start by computerising the existing processes, and then it soon dawns upon the organisation that maybe the old processes don't make a lot of sense anymore. Take an example from the airline industry. The process for buying an airline ticket used to be tortuous. You would visit your travel agent, who would do the booking for you. Lots of phone calls later, and after parting with your cash, your travel documents would arrive in the post as a sheaf of carbon paper slips that would be progressively torn off as you made your journey, exchanged for boarding cards that would be torn in half, and generally the process seemed designed to support a tier of airline staff whose main role appeared to be to check your documents. Even when computers arrived, the process barely seemed to change. The big sheaf of carbon paper slips in your ticket were now computer-printed instead of handwritten, and it did seem as if IT could

do little more than save on ballpoint pens. No wonder air travel was expensive. Enter the budget airlines. You book on the Internet. No ticket, no boarding card, no frills. As a passenger your outcome is still the same – you reach your destination. Okay, you may not always arrive at the gleaming airport close to the city centre, but at an airfield with a Portakabin 30 miles out of town. But the price of your journey is half what it was when the old processes applied. The airlines now employ far fewer people per passenger, and so more people can travel. Airlines couldn't have done this without inventive and imaginative application of computer technology. So the lessons for the NHS are seductive. Could the NHS borrow something from the EasyJet experience? Could IT be used as a driver to change the processes from the familiar pattern of NHS behaviour to one where the patient outcomes were the same – or better – while the resources needed to get there were cut dramatically?

To understand how the NHS plans to computerise healthcare, let us assume to begin with that 'form will follow function'. In other words, the NHS already has a way of working, and so the technology delivered through the national programme will start by underpinning the work it already does. We know that simply supporting the existing workflows is not enough. But that is how it will probably need to start.

There is a simple formula to explain this phenomenon:

$$T + OS = EOS$$

technology + old system = expensive old system

In other words, we shouldn't just try to throw computers at the NHS without changing the way that the NHS works. New technology brings real opportunities to the NHS. Not just more shining computers, but better ways of working. Simply adding a layer of technology onto an old system of working will result in an expensive old system and an opportunity to improve will have been lost.

Having said all that, we have to start somewhere. So in assessing the opportunities for change, let us understand the way the NHS currently works and identify how technology could support its evolution.

If your only contact with the NHS to date has been as a patient, the following section might open your eyes to the vast numbers of people and services involved in delivering health and social care. The organisational structure is complex and constantly changing. That makes it all a real challenge.

The following scenarios are not clinically accurate, nor are they intended as criticism aimed at any of the hard-working people in the NHS. As Michael Crichton stated in the author's note to the republication of his 1969 book *Five Patients*:

. . . the truth is that everyone works within the constraints of the present system – and it is the system itself that must be changed.

The patient's view

So let us consider the traditional patient journey today through the complex labyrinth of the NHS. Imagine you are Jimmy Rawthorpe. You are a 46-year-old builder, living and working in Huddersfield, and you feel ill. You telephone your

GP's receptionist who 'squeezes' you in a week on Tuesday. It's not her fault – the diary is chock-a-block.

You see the GP, who might either diagnose your problem and treat you, or send you for a battery of tests to help him diagnose, and then treat you. He examines you, and writes some forms for blood tests. 'Come back in a week for the results of the tests,' he might say.

So you do. He tears open an envelope and looks at some results from the laboratory. He sucks on a thoughtful tooth, and says nothing. At this point, if he is worried, he may refer you to a specialist at a local hospital.

You then wait for the specialist to send you an outpatient appointment. You receive a letter two weeks later advising you that an appointment has been made for four months on Wednesday.

You eventually attend the outpatient clinic and the specialist decides to do a battery of lab investigations (ignoring those previously done by the GP), again not his fault – not all the lab work requested by the GP is in the notes and the referral letter only gave a summary of those requested by the GP. He also requests some X-rays and makes an appointment for you to reattend in four weeks.

The specialist then reviews your results during your next outpatient appointment. Yes, during! It is often at this point, i.e. when you are sat there glumly in front of him, having waited four months, six weeks and 86 minutes, that he realises some of the test results haven't come back. He quickly scans the referral letter to remind him of the case, and his own notes (if he's seen you before), for what was planned. If you're lucky, he has all the results and he decides you need to be admitted for further investigations including an investigative operation in six weeks' time. In your case, some of the lab tests hadn't been done. So you have to reattend outpatients in another two weeks and then wait six weeks for your inpatient episode.

The six weeks drag by slowly and with each passing day your nervousness about your impending operation increases. Don't eat anything from the night before. Don't drink anything in the morning except 'sips' of water. Attend the Admissions office on the main ground floor. Bleary-eyed and nervous, you find somewhere to park very easily. That makes a change. Mind you, at 7 o'clock in the morning there are only burglars and milkmen about.

You sit fidgeting outside the admissions office and a clerk eventually arrives with a trolleyload of thick paper notes. She calls out your name and sits you next to an old-fashioned, steam-driven computer while she checks your name and age and religion and address. She then points you to the lifts and tells you to go to the third floor and ring the bell for Ward 34.

You do all this obediently. You are on foreign turf and completely subservient and worried. Your life is now firmly in their hands. On the ward you are taken to a bed, told to change into your pyjamas (which you had previously gone out and bought specially), and you wait. The ward is a hive of activity with all sorts of uniforms coming in, doing tasks, leaving. No one speaks to you.

Your named nurse is Britney a sign above your bed tells you. If only! A nurse (Britney you assume) comes and clerks you in. Checks your name, your age, your address, your religion. She goes through the procedure with you. You will have to wait on the bed till they take you down to theatre. When? 'Can't tell you that. It may be after lunch.' What? 'Oh no – you can't have any lunch. Nothing by mouth till after the op.'

So let's recap. How long has it been?

- A week and a half waiting for your GP appointment.
- A further week waiting for lab tests.
- Two weeks waiting for an outpatient appointment letter telling you of a date for the outpatient appointment.
- Four months waiting for outpatient clinic appointment.
- Four weeks waiting for results of tests before repeat outpatient appointment.
- Another two weeks while they repeat the tests that didn't end up in your notes or didn't get done in the first place.
- Six weeks to be admitted.

And the cost. You have to take a day off work for each appointment. That's one for the GP. Three for outpatients. At least the inpatient episode is classed as sick leave. A day off for the post-op outpatient check. That's nearly a week's wages. And a week's holiday gone.

Luckily for you, at least the right specialist was chosen for your problem, 'cos if not, you'd have to go through that whole cycle again!

But it's no one's fault. It's the way it works. Remember Michael Crichton: '... the truth is that everyone works within the constraints of the present system – and it is the system itself that must be changed'.

Experience Jimmy's episode: become Jimmy for a while.

An important looking group of people is heading down the ward, from bed to bed, heading your way. Led by a chap in a suit . . . he's the one you saw in outpatients. Mr Bob something or other. He's standing at the end of the beds, reviewing the paper notes of the patient next door. You're next. He's surrounded by an assortment of uniforms. A tired junior doctor struggling to keep awake after a bad night on call. Nurses, pharmacist, other uniforms you don't recognise. Your turn. Be calm. Be cool.

The gang approach and the suit holds out his hand to the staff nurse for the paper notes. 'Right,' he says, quickly flicking through the paper, knowing exactly where everything he needs is. To the referral letter. Flick to his outpatient notes. Flick to the lab results. 'I will be operating on you this afternoon. I am just going to see what we can find down there' – gently palpating your stomach – 'and then I'll come and see you after the operation. Any questions?'

'Millions,' you think, but you say, 'None spring to mind thanks.'

You are slightly overawed and underdressed and regret buying the 'cool' Homer Simpson jim-jams with an obese Homer stood holding a beer can in one hand and chicken leg in the other with 'Simply Irresistible' boldly printed under the swollen, jaundiced character of Homer. It seemed like a good idea when you were choosing them in Asda yesterday. Not a pyjama person, you were making a statement. Now you just feel a prat.

'No questions,' you hear yourself saying and with that they move on to the next bed with one of the nurses noticing the pyjamas and giving you a strange look.

So you're lying on the bed and have been since eight this morning. It's now two in the afternoon and no one can tell you when you will be going to theatre. 'Very soon now' was all they would say, and that was an hour ago. Oh what's this? Activity? A chap in a white coat over green theatre scrubs is heading your way with your fat paper notes. 'Can I just check your details?' he asks politely. 'Name,

date of birth? Right. I am Dr Singh, your anaesthetist. I will be looking after you during the operation. I just need to ask you some questions.'

Here we go again, you think. I've already been through all this 10 times over. No – you've no history of heart disease. No you don't smoke. 'I will be back to give you some medicine to make you drowsy, in about an hour. OK?' 'OK,' you say. Let's get on with it.

You are back alone on your bed with a flutter of trepidation in your stomach. 'I wonder what they will do to me?' you think. 'What will they find? Will it hurt? Will I die under anaesthetic?' Control the panic. Count to 10.

'Count down from 10 for me,' the anaesthetist says as he starts injecting a drug into a butterfly-type needly-thing they've taped to your forearm. You are now in the cold operating theatre – in a small room next to the one where a gaggle of assorted scrub suits are loitering around a big stainless steel table. It is an alien environment and you are totally and completely at their mercy. Whatever they want to do to you they can do.

The anaesthetist has been true to his word and came back to your bed within an hour and gave you some syrupy medicine which made you less stressed and fearful. He went away and eventually a porter and a nurse came to put you on a trolley. You saw the hospital from a new angle – the ceilings of the ward, the corridor, the lift, counting the fluorescent tube lights on the ceiling as they flashed by, slowing while the corridor ended with the big flappy plastic doors of what you presumed to be the operating theatre. You hear strange mechanical noises and are aware of a lot of people being very busy and knowing what they are doing.

You are wheeled into a very small room with shelves and cupboards and nurses and Dr Singh. So much activity and you are at the centre of it. 'Ten, nine, eight.' You'll show them.

You'll get down to one if it's the last thing . . .

Strange gassy noises wake you. Long, drawn-out breathy sounds. It's coming from . . . it's coming from you! You have a gas mask air-tube thing on your nose and you are back on your bed. You're alive. Praise the Lord. Whatever has happened, you are still here. Whatever the pain, you are still breathing. You wonder what they found. Is it good news? Is it bad? Whatever. You are still in the land of the living.

A smaller gang approach your bed but this time the suit man is wearing his green theatre garb.

'Right. Erhmm,' looking at your paper notes, 'Mr Rawthorpe. I've had a look inside you and found some inflammation in there which I will control with some drugs. I will keep you in for another day and you could go home on Wednesday. Any questions?'

Again, you hear yourself saying no.

The 'one day' eventually turned into five as you reacted to some of the drugs they gave you, which resulted in a nasty rash, which in turn needed some more drugs and cream.

All in all, it's been a miserable time and you couldn't wait to get home, which you did – exactly one week after you were first admitted.

You were given an outpatient appointment for eight weeks after discharge, which you went to. Another day off work; another struggle finding a place to park.

And to cap it all, you didn't see Surgeon Bob in outpatients. You saw a young lad fresh from school who didn't know you from Adam.

He read through the notes, had a quick palpate, asked you if you'd had any problems, and then discharged you. What a waste of a day's annual leave.

Still, the pain's gone and it's not their fault. It's nobody's fault really, is it?

But there's got to be a better way.

The GP's view

Busy, busy, busy. Waiting room full again of sniffing people and crying babies. A patient every seven and a half minutes. Surgery lasts two hours. Ten minutes allocated per appointment. That's 12 patients per surgery. That's a laugh. I regularly have 15 every surgery. But I still have to give them time. So I am always chasing my tail. The patients wait. The patients are grumpy. I am stressed, harassed. And yet the next one to walk through my door could have something seriously wrong with them. Or they may not.

I read the paper notes of the patient due in next. Not much in these notes. He's not a malingerer. No ongoing current problem. No idea why he's coming to see me. Better let him in now.

Talk to patient. Abdominal pain. Examine him. Look for obvious causes. Mmmm. Could be anything. Better do some tests and see him again in a week. Put prescription pad away. Can't prescribe anything yet. Write some laboratory request forms.

A week later

Surgery full of sniffing folk and crying babies. Next patient. Look at the paper notes. Ah this chap came to see me a week ago. I sent for some tests. Mmmm. Some slight elevation of white cell count. Amylase is raised.

Now then. He's more tender now than he was. Not sure what this is. Better refer him to the specialist. But which one? Erhm – well, it's not gynaecological. It's not bone (orthopaedic). It's not the tube man (urological) – too high up. Not skin (dermatological) – too deep. I'll refer him to a surgeon. I'll send him to Bob. This is his general area and he's a good mate. Playing cricket with him against the private hospital soon. Must go and have a drink with him sometime. I'll write a referral letter, telling him what I've found and the results of the tests I've requested.

'You will hear from the specialist soon who will give you an outpatient appointment. Goodbye.'

Now, who's next? Just another 10 to see before I go out on my rounds.

Four months later

Four months later and I'm going through my post before doing my visits. Letters from drug companies, various hospital lab reports, outpatient letters, A&E letters, discharge letters. Oh, lots today. All have to be seen and then filed in the patient's notes. I wish we could have these electronically – I could just put them into the patients' electronic records.

'I wish we could have these electronically Julie,' I say to the receptionist. 'It would save you having to type them into the computer, wouldn't it.'

'Wouldn't it just,' she said, opening an envelope 'Oh – here's another. An outpatient letter about Jimmy Rawthorpe.'

'Who? Ah yes – abdo pain. That was months ago. Does it say much?'

'Nope – they're doing more tests.'

'Oh, just stick it in his files. I'm going out on my rounds now, just phone me if anything urgent crops up.' And with that I get into my battered but serviceable Discovery.

Six weeks later

I get another letter telling me that the abdo pain is still there and the lab results are inconclusive and that Jimmy Rawthorpe needs to be admitted to hospital for a laparotomy. Jimmy Rawthorpe. That was ages ago. Can't remember him what he had wrong with . . . oh yes, Jimmy. Abdo pain. Not seen him since that first appointment. Wonder how he's doing?

Two months later . . .

'Morning Julie,' I say with a degree of optimism. A new week and all is good. Not for long. They've run out of teabags again and the coffee in front of you is decaff. Not what you need first thing in the morning.

'Post!' says Julie, equally feeling the strain of the caffeine deficiency, as she unceremoniously drops a pile on the table.

I start to flick my way through them. No, I don't need a credit card. No, I don't have time to go to a lecture on 'Parasitic Infections in Africa', and I certainly don't need to subscribe to a new journal. I've not enough time to read the ones I currently get.

Ah, now, lab test results. Mmm, they don't mean a lot without digging out the paper records. I can't remember this case. Outpatient letters and discharge letters. Mmm . . . had one or two in hospital recently. Didn't know that. Oh, and they've been home now for several weeks too! Didn't know that either. Why doesn't anyone tell me these things?

Oh – Jimmy Rawthorpe. Yes, went to see his mum yesterday. She said that Jimmy's been in hospital. It's bad when you hear it from the patient's relatives isn't it?

So what did they find? Mmm. Oh dear! Problems. A rash. A week! He was in a week! Oh dear. Ah well, at least he's sorted now. Must make a note about his drug sensitivity – do it later. Must get some teabags first, and then start on this week's patients . . .

Two months later still . . .

'Good morning, Doctor,' says Julie with a smile. Now that's a first! Wonder what she's been up to? Perhaps with a smile like that she shouldn't be on the front desk.

'Morning Julie. Another day, another dollar.'

'Here's your post today. Just some outpatient letters so far,' she says as she hands me a small pile of paper.

I shuffle through them, coming across one for Jimmy Rawthorpe. A brief note saying . . . Mmmm everything is OK, settled down to treatment, discharged back into the GP's care. I make a note to have the patient come in and see me. If I have to wait for him to contact me, it could be ages.

Did he really have to go all the way back to hospital for his post-op check? Losing a day's wages, and that parking! Why couldn't I have done that check for them? It's not as if the surgeon himself did it. It was probably one of his young juniors.

Anyway, I've enough to do without adding fresh work, and I certainly haven't time to start changing the way I work. It's easier just to keep battling on.

But there's got to be a better way.

The specialist's view

Just finished my operating theatre list. Time to do a quick ward round before I go to the outpatient clinic. But first let's catch up with my paperwork. 'Any new referrals Gladys?' I ask my secretary.

She's very organised and gives me a folder with a mixed assortment of letters from GPs of varying quality.

Dear Mr W,

I am apparently referring this patient to you! Unfortunately I can't find any records as to why, but I'm sure you will find out!

Regards

They're not all that bad. Here's a good one.

Dear Bob,

Re James Rawthorpe

This patient came to me complaining of abdominal tenderness which is tender to the touch. Not appendix.

Lab work done shows elevated WCC and Amylase but everything else normal.

I would be grateful if you could see him and let me know your opinion.

Kind regards and see you at the cricket match next Sunday.

Peter

Send him an appointment, Gladys – next available. Right, I'm just going on the wards and then clinic till five. Leave all letters for signing and I'll do them later.

Four weeks later . . .

Just finished my operating theatre list. Time to do a quick ward round before I go to the outpatient clinic. But first, let's catch up with my paperwork.

'Any new referrals Gladys?' I ask my secretary, who gives me a folder with a mixed assortment of letters from GPs of varying quality.

Having sorted them, I go to my ward round. Had a number of unexpected admissions overnight so I get delayed and eventually arrive at the clinic an hour late. The clinic waiting room is really crowded today, with people standing. I see the nurse asking the patients to move from one chair to another. 'Mrs Jones, can you sit over here please. Mr Finney, over here.' It keeps the patients moving, they think they are moving through the system. But actually, they're not. Once they've sat on all chairs, they're sent home! Not really – anyway, at least it prevents DVTs. I grab my trolley of notes and enter my room.

Right, first patient. I flick through the heavy notes, scanning the referral letter and flick through existing current notes. None. This is a new patient. Reasonable referral letter.

Dear Bob,

Re James Rawthorpe

This patient came to me complaining of abdominal tenderness which is tender to the touch. Not appendix.

Lab work done shows elevated WCC and Amylase but everything else normal.

I would be grateful if you could see him and let me know your opinion.

Kind regards and see you at the cricket match next Sunday.

Peter

We lost that game again – against the private hospital. Still, the food was good. Right; better see him. What time was his appointment? Oh – 2 o'clock. Time now: 3:26. Oops. 'Mr Rawthorpe please,' I ask the nurse.

The patient comes in. Looks a bit frustrated that he's been waiting. Probably thinks I've been playing golf or doing private work. Doesn't realise I've been on the go since 6:30 this morning after a rushed cup of tea, and won't get home till after eight tonight. I thought it was supposed to be the junior doctors that got this abused.

'OK Mr Rawthorpe. What's your problem?'

While the patient gives me the details I start prodding and poking, palpating and touching. All the while I am listening and 'mmmming' and 'Fine, OK'. What could it be? I allow a clinical algorithm to go through my mind. Let's exclude X and Y. If there's no pain here then it's not Z. That narrows it down a bit. But it could still be any number of conditions. Let's have a look at the lab work. Uh-oh – I've only got the GP's summary of what he's done. White cells raised. High serum Amylase. Everything else is normal. Yes but what other tests did he do, and how normal were they? I need to have more lab work and perhaps an X-ray.

'OK. Put your shirt back on now. I need some more work doing on you. I want you to have some blood tests.'

'But I've already had blood tests.'

'Yes but I need some more. And an X-ray. So see the receptionist on the way out and come and see me again in, say, four weeks. OK?'

The patient reluctantly takes the lab request forms. Obviously he was hoping for a quick resolution. But how can I sort this out without the information? I suppose he's worried he has to take another day off work to come and see me. And the car parking. Yes it is a pain being a patient.

Ah well. 'Next patient nurse.'

Another grumpy individual comes in looking like thunder . . .

Four weeks later . . .

Just finished my operating theatre list. Some tricky ones today. One overran by 40 minutes. That caused a knock-on effect throughout the whole of theatres. 'Why can't you tell us when I am going down to theatre?' they ask while sitting, gowned-up on their ward bed. 'Well, actually its 'cos I haven't a bloody clue,' I would love to say.

Time to do a quick ward round before I go to the outpatient clinic. But first, let's catch up with my paperwork.

'Any new referrals, Gladys?' I ask my secretary, who gives me a folder with a mixed assortment of letters from GPs of varying quality – again. Another Groundhog Day. 'Oh OK. I'll do those later,' I say when Gladys asks if I've done the discharge letters yet which are piling up on my desk.

Having sorted them, I go to my ward round. I spend a bit of time with those I've just operated on, especially the difficult case, currently on ICU. They've put one of my patients right at the other end of the hospital, on a gynaecology ward no less. I nearly forgot. Damn – I'm going to be late for clinic again. And I've got my clinical audit meeting to get ready for, and a Trust Board meeting about some computer project. Hah. Where will I find the time for all that?

Clinic is very busy today again. Queuing at the desk. Standing room only. I dodge quickly past the angry stares. I would love to stop and tell them what kind of a day I've had. But no time. Straight in.

First patient. Where are the notes? Ah here they are. Flicking through the notes I read my last clinic notes first. Flick back to the referral letter. Flick back to my notes. Oh yes I remember. Not enough information. Requested lab tests. X-rays. Flick to the radiologist's report. Mmmm, nothing specific. Lab work. Flick down the coloured report forms. Where's the Biochemistry? There's one report there but the serum 'rhubarb' is missing. Oh bugger. Bugger. Bugger. I'm still as much in the dark. I need that test result.

'Nurse. Can you phone Biochem and chase this result up please?' I'll take the next patient while we are waiting.

Good, this one's routine. Flick through the notes. Give a quick check. No complications. Surgery went well. Lab work OK. Good. Finished.

I suppose the patient is wondering why a 90-minute wait for a three-minute assessment has cost him a day's wages. I bet he wonders why the GP couldn't have done that for me. Or a specialist nurse. But he's my patient. I am accountable. I have to make sure I am sending him out into the world completely OK. 'You're completely OK, Mr Jones. I will write to your GP but I don't have to see you again.'

The nurse comes in. Pretty little thing she is.

'What – they haven't done the tests? Why not? They never received it? Oh bugger. Bring him in.'

I'll examine him anyway and get some more tests done. 'Mr Rawthorpe. I'm sorry but I need these tests before I can be sure what's wrong with you. I will have to ask you to have some more tests. Go to the lab and come and see me again in two weeks' time. OK?'

If looks could kill.

'Next patient please, nurse.' Cor! I'm starving. Not eaten today again. Have to call in at the WRVS shop when I've done here.

Two weeks later . . .

What a night! Called in at three o'clock for an emergency op which ended up in ICU. Must have a word with the family today. Not much hope. Will have to ask them about switching off the life support. What a job. Oh, and I mustn't forget to ask them about donating their loved one's organs. What a time to hit them with that question.

Ah well, must rush down the corridor into Outpatients. At least I'm on time today! Mind you, I've not been home yet. Eyes prickly and feeling a bit grubby, I sit at my desk and pick up the first set of notes.

Jimmy . . . now what is this one about? Flicking through the notes, I remind myself of the story so far. Abdo pain. Mmm, lab tests – weren't all there, had to do them again. Ah here they are. Good. X-rays. Mmm. OK – I'd better get him in.

'Bring him in please, nurse,' I ask the staff nurse.

'Mr Rawthorpe. Good to see you. How's the tummy? Oh, the same? OK, I have the results of all tests now and I think we'd better bring you in for an operation. I need to have a look around you. No, it's not a big operation, but you will have a general anaesthetic and I will have to open up your tummy about there. Should be in and out within a couple of days. What? No, I don't know when that will be. You will get a letter. OK? Any questions? No? Good. Bye.'

And with that I pick up the next set of notes and flick through to remind myself of the next case.

'Next.'

Six weeks later . . .

Theatre day today. First, do a ward round. Oh, I wish they wouldn't split my patients up like this. These two here on Ward 34, and then three more patients at the other end of the hospital on Ward 10. I'll be doing some mileage today.

Let's see who I have on the list today: One gall bladder removal and laparotomy. The two colorectal jobbies and a haemorrhoid. And a working lunch first. Something about computerising the hospital. Probably so that management can keep their eye on me! Don't trust computers. I have enough trouble at home with it locking up. I don't need that at work too! Last thing I need is to have my ward round delayed while we 'Ctrl-Alt-Delete' to start it up again. And I hate typing. What will my juniors think of me and my two-fingered typing?

No, that's not for me. I'll steer well clear of that nonsense. If they want computers, they can jolly well do all the typing. I'm not going to change the way I work, and I don't want to look daft, do I? Cor, I'm grumpy today aren't I!

OK, let's get started. 'Are we ready for the ward round?' I ask, gathering together my team, who assemble behind me hierarchically. It's nothing I've told them to do – it just happens. Once auto-arranged, we set off down the ward.

I stand at the end of the first bed, reviewing the paper notes of the newly-admitted patient for gallbladder removal. I tell them the usual: 'little keyhole job', should be home later today. No problems.

I walk on to the next bed accompanied by my army of assorted uniforms. Andrew Castle looks tired. These junior docs don't know they're born. In my day, I'd think nothing of working seven days and nights straight through with no sleep. They think nothing of it either! Junior doctors' hours! Rotas! Pah! All that extra work for me.

I hold out my hand to the staff nurse for the paper notes. 'Right', I say quickly flicking through the paper . . . referral letter. Flick to outpatient notes. Flick to lab results. 'I will be operating on you this afternoon. I am just going to have a look around, see what's going on down there,' gently palpating the patient's stomach, 'and then I'll come and see you after the operation. Any questions?'

The patient – erhm . . . Jimmy Rawthorpe – shrugs as if he's considering a multitude of questions and settles on 'None spring to mind, thanks'.

What hideous pyjamas he's got on. That's the Simpson character, isn't it? I wonder if he realises that he looks like a prat!

Ok, so on we go to the next ward. What a hike – almost a mile.

Eventually I return to my office where my secretary has all the new correspondence for me to read, and some she has just typed for me to sign.

Fast approaching lunch, I quickly scan-read the correspondence, making notes for my secretary to action. I sign the discharge letters I dictated last night. Yes, the patients have been discharged several weeks ago, but I can only do so much.

Done. And so to my working lunch. It had better be quick, my theatre list starts at one. Computers? Pah!

Scrub. Scrub. I wonder if Semmelweis is happy now? All this scrubbing. And yet we still have the odd MRSA infection problems. Well, it's not coming from these hands, that's for sure.

Here we go. This is what I like best – surgery. This is what it's all about. Let's hope it all goes smoothly today.

But it doesn't. It starts off badly with the 'little keyhole jobbie' turning into a major operation. The gall bladder was very fragile and swollen and I decided to dispense with the time- (and scar-) saving keyhole surgical procedure and opt for the open cholecystectomy. Once the patient was completely opened up, the removal of the offending swollen organ was relatively simple, but it had put me back in my list. I was now running late. Here we go again, chasing my tail.

While the patient is wheeled into recovery, I take the notes and a cup of coffee into the staff room and write my theatre letter.

A quick stretch, another scrub, and it's the next one. Flick through the notes to remind myself why the patient – erhm . . . Jimmy Rawthorpe – is here. Laparotomy. OK. Open him up, have a scoot round. Severe inflammation, no obvious cause, rinse. Antibiotic wash.

Done. Send him back.

Write letter.

Next!

Colorectal. Let's see if we can get to the bottom of this one! (The old ones are the best.)

Three hours later and still in my theatre greens, I visit each of my patients now back on their wards. Quick glance at my theatre notes and tell them reassuring things about their case. Back to the office to do some more letters, and then home.

Wonder what's on the telly tonight? I'm knackered.

Four weeks later . . .

' . . . And I'll just do the letters and I can be found on the golf course if needed urgently.'

Taking an armful of fat paper notes with me and a cup of coffee, I sit in the quiet office and slowly dictate the discharge letters for the last week or two. They've been piling up. Not had time. Getting to the last one, I began to imagine a nice quiet afternoon chasing a little ball around the grass with a stick.

' . . . And finally, a letter to Dr Peter Barnes, at Westbourne.

'Dear Peter, re Jimmy Rawthorpe. Thanks for referring this patient to me. As you know, I saw Jimmy in outpatients where I did some lab work which, whilst repeating your raised white cell count result and a high Amylase, was pretty inconclusive. I admitted him and performed a laparotomy on the . . . ' (now, when was it . . . flick flick . . . four weeks ago, that'd be . . .) '27th September.

'We found some inflammatory changes, but no obvious evidence of an acute problem.

'We put Jimmy on antibiotics, but he reacted to them. Has he ever experienced a penicillin allergy before? There's no mention in his notes or in your referral letter. As a result, we had to keep him in till his rash subsided. He was discharged on the 3rd October and is due in clinic in eight weeks' time.

'Kind regards

'Etc. etc.'

Have to be careful what you write in letters and notes these days. Patients actually see what's in there now! What's the world coming to?

'Gladys. I'm off now. Can you type these and I'll sign them first thing Monday morning. Bye!'

I shouldn't be seeing Jimmy again. My junior will do the post-op clinic check. It's only a routine series of questions. Don't know why we drag the poor patient all the way up here to hospital, to be honest. Still, I'm too busy to change the way we work.

But there's got to be a better way.

Wouldn't it be better if . . .

Perhaps there is a better way. Perhaps the extraordinary paper-chase and catalogue of delays that typifies Jimmy Rawthorpe's journey through the NHS could be swept away and replaced by something more dynamic. Jimmy's experience is a fictional one, but is so typical of the experience of every NHS patient who has ever been bounced between GP and specialist and placed on a seemingly interminable waiting list, that most of us can probably identify with it from some personal experience. Yet there is something ludicrously old-fashioned about the process, with its handwritten notes and missing results and oversights and errors and delays. It hearkens back to an era before we had technology to help cut through all this wasteful paper-jam. It has echoes of a centralised, bureaucratic, almost Orwellian system about it, with its apparent disregard for the patients or even for the staff who operate within it. And yet it is a process so deeply etched into the fabric and minds of the NHS that even the victims of the process resist attempts to change it.

But change it must. We talked earlier about the National Programme as if it was a fog, enveloping a city. It is hard to see the shape of the fog, but we can see things around us clearly. So in this book we are going to have to zoom in a lot and consider the detail before we can really explore the vision that the government has.

Let us imagine that vision – 10 years hence.

We'll start by zooming in through the fog, right into Edith Road in Huddersfield. We met a patient, James Rawthorpe, in the scenarios above – so now let's meet his mum. Hilda Rawthorpe is an old lady with some problems. Well, not that old. She's 74, and even though she has a bus pass she still stays pretty active. She walks every day to the shops, and only takes the bus to the library. She helps out at the primary school with domestic science, and does the flowers at church. She lives alone. Her husband John died over 20 years ago of a bad heart. Her children are grown up now, with children of their own. Hilda doesn't grumble. She still sees them quite regularly – well, as often as can be expected 'cos they've all got busy lives. Her youngest son, Jimmy, was quite ill some years ago. Spent time in hospital and things didn't go as well as they had hoped. Still, he's through that now.

She too has her problems. She has a difficult hip, and she's on a waiting list for a replacement. But she stays cheerful. Last Christmas her consultant told her she had diabetes. It's something to do with sugar in the blood, apparently. But according to Doctor Rose it helps to explain her aches and pains, why she was always thirsty and tired, and why she'd been losing weight. Now she's supposed to check her blood sugar every day by pricking her fingertip with a little pen. Actually it is something of a hassle. It doesn't hurt – well not much. But she's never got particularly good at doing it. On Monday, when Eastenders was on, a little reminder popped up in the corner on her television set. 'Please remember to test your blood sugar,' it said. 'Would you like to do the test now?'

Why does it always wait until the soaps begin before it reminds you? She waited until the documentary at nine o'clock, and then went out and found the testing kit. It read twelve point five. She punched the number out on her television remote control.

'Thank you for entering your test result' said the message. 'You entered a result of 12.5 mmol/l. This means your blood sugar is running a little high. What time was your last meal?'

Hilda thought about this. She had eaten a biscuit or two at eight o'clock, but did that really count? She hadn't actually eaten a meal this evening, not a proper cooked meal, but she felt that this was not what the television wanted to know. So she pressed the arrow buttons and chose 5.00 pm. That would do. It seemed to satisfy the TV. Now back to the documentary.

'You are running low on testing pens.' It's at it again. 'Press the red button if you would like to order a new set?'

Hilda pressed the red button hoping this was the last question. But there was more.

'We can deliver this to you at home, or if you like you can collect it from Boots in the High Street. Press red if you want us to deliver, and green if you would like to collect this yourself.'

Hilda pressed the red button. 'Thank you,' said the TV message. 'A new pack will be delivered to you at 27 Edith Road Huddersfield on Wednesday between 10.00 am and midday.'

She thought that was the end, but then a new message appeared. ‘Dr Rose has suggested that you should come and see her if your blood sugar starts to rise beyond 12 mmol/l. Would you like to make an appointment now? Press the red button, or press green to make your appointment later.’

Hilda sighed. She pressed the green button. All this computer stuff was tiring.

But that was all on Monday. Now it was Thursday and she hadn’t tested her blood again, even though the television reminded her every time she turned it on. She was tired. And her whole body ached. That mobile phone that Jimmy had bought for her kept beeping, but when she tried to answer there was no one on the other end. Jimmy knew how these things worked, but she couldn’t work it out. The last time this happened Jimmy told her that this was a text message from the hospital. She slumped down in her armchair and tried to reach for the remote control. It was out of reach. The room seemed to be turning. She felt curiously dizzy.

At Ambulance control in Halifax, an alert began to flash on a computer screen. Zoe Kelsall was at her desk. An elderly patient was causing some concern. A monitor at her home had reported that she had stayed in her armchair overnight. She hadn’t moved. The toilet had not been flushed. On its own that might have been enough to raise an alarm – but this patient was also diabetic and her blood sugar had not been tested for some days. Zoe checked the graph. Okay. For a month or so Hilda’s blood sugar a couple of hours after a meal had been fairly steady at seven or under. But the graph showed it had been rising slowly. Zoe hit the mouse button.

As Ambulance Seven idled by the traffic lights in Huddersfield, a beep came from the onboard control screen. ‘Edith Road,’ thought George as he glanced at the on-screen map. Just a couple of streets away.

For Dr Nita Patel this was only her third day on A&E. It had been hard work, but not as harrowing as she had feared. Broken bones mainly, cuts and bruises.

She unzipped the case that carried her tablet PC – funny how this had become as important a tool in medicine as the stethoscope, she thought. There didn’t seem much to it. Just like a laptop screen and a clever electronic pen that she could carry around with her. She was new enough to the technology to be apprehensive as she slipped her smartcard out of her top pocket, and slid it into the device. What if it wouldn’t let her log on? With no keyboard in sight, she scribbled her PIN number onto the screen and a couple of seconds passed. Then the inevitable hourglass, and then a welcome screen. ‘Welcome Dr Nita Patel’ read the screen. She slung the device over her shoulder and started to walk off down the corridor. In this job there was no time to be indulgent with computers. These things were a tool for the job, nothing more. As she walked, however, she glanced at the screen. Sixteen e-mails! Already! She grimaced. Heaven knew when she would have time to read them all. The screen showed a schematic map of the A&E department. Little dots represented the patients – some in reception, some in examination rooms, some in X-ray. The dots changed colour from green to amber to red depending upon how long they had been waiting.

Before Nita swished open the curtains of the first examination room, she tapped her pen onto the dot that represented the patient waiting within. Up popped a new screen. ‘Hilda Rawthorpe’ read a bold line at the top, followed by Hilda’s age and date of birth. Nita wasn’t overfamiliar with this new computer system, but you didn’t need to be an expert to read *this* screen. Hilda had triggered an

automated alert when she fell into a diabetic coma last night. Ambulance staff had treated her and brought her in. A scrolling graph right there on Hilda's front screen showed her slowly rising blood tests. A note at the top also made Nita raise an eyebrow. Hilda was on a clinical pathway waiting for a hip replacement in the next few weeks. She clicked on the screen to send a note to Hilda's consultant. If there were complications caused by the diabetic episode, then he would want to know, it might cause a variation in the planned pathway of care. Otherwise, who knows, maybe the operation could be brought forward.

And so this is the vision of the future. Not science fiction but science fact.

The National Programme for IT is nothing less than an ambitious plan to leverage technology into the whole delivery process for healthcare, so that stories like Hilda Rawthorpe's stop being fiction and simply become commonplace; everyday stories about the NHS delivering better care for its millions of users. Every piece of this jigsaw already exists – perhaps not in Huddersfield, perhaps not for Hilda Rawthorpe, but none of this actually needs to be invented. It is here already. This is what technology can already do for healthcare.

Imagine what might have happened to Jimmy. Instead of visiting his GP he goes to one of the new NHS walk-in diagnosis and treatment centres. Before he even sees a doctor a triage nurse orders a routine profile of blood and urine tests and sends him for an abdominal X-ray. A nurse takes some blood and sticks a bar code label on the bottle and passes it through a window to the laboratory. The lab technician simply pops the bottle into an analyser machine. The bar code on the bottle will tell the analyser who the sample belongs to, and what tests to do, and the results will go straight back to the computer. When Jimmy sees the specialist 40 minutes later, the results of those tests and the image from the X-ray are already there on the consultant's tablet computer. Labs are so fast these days. The specialist checks the theatre schedule. 'I'm putting you in for a small operation this afternoon,' he says. 'The nurse will take you to the day ward.' The computer shows that Jimmy is allergic to penicillin. That's okay. It won't let anyone prescribe it. Jimmy should be back home tonight.

Tonight? Isn't this a process that took several months back in 2004? Could it really happen in less than a day?

Remember the experience of the budget airlines. Technology isn't about supporting the old processes. It is about introducing new ones. And this is what this book is about.