

# Fast discovery

The imperative for high velocity learning  
by everyone, about everything, all of the time

Steven Spear



## **About the author**

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*Fast discovery: The imperative for high velocity learning by everyone, about everything, all of the time*  
is published by the Health Foundation,  
90 Long Acre, London WC2E 9RA

ISBN: 978-1-906461-87-4  
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# Foreword

About 25 years ago I was a junior hospital doctor doing what was then a one-in-three rota (or 90-hour week) in a neonatal intensive care unit. In the middle of a Sunday night, on work hour 41 of a 56-hour stint over a weekend, an unstable premature newborn on ventilation who was rapidly ‘going off’ needed bloods taken urgently, an X-ray, and fast results before starting treatment. The unit had run out of blood request forms and sample bottles; the porter would not take the samples down to the lab because he was on a rest break; the radiographer was uncontactable – her ‘bleep’ was faulty – then arrived late. Loathe to leave the fragile patient as the only duty doctor, I had to sprint down to the lab with the samples, then find the radiographer. I felt at the time I was battling the system on behalf of a helpless sick patient with no voice. Now, as I look back, I was also a small cog in a system that was avoidably disordered for the people working within it.

This is one small example – luckily, as it happened, with no adverse impact. Was this type of workaround usual in my experience? Yes. Did it happen in an unusual hospital? No, in a major London teaching hospital. Does it happen now? Workarounds, some major some minor, happen in all corners of the NHS. At the front line they frustrate, waste time and add avoidable risk to care for patients; at national level they add up to slow progress on quality, waste resource and dent staff enthusiasm and morale.

Leaving aside the human cost of, let's call it, ill-managed care, the aggregate loss of value could be high. In the NHS today the pressure – mainly coming from rising demand and a financial squeeze in the NHS and social care – is intense, with people working flat out to do their best for patients, in many cases at some personal cost to themselves. Suggestions to those working at the front line that things could be done differently are usually met with a chorus of derision 'but we have no time to think/no support/no resources'.

But some do carve out the space to 'discover' what needs to change and design improvements. Health Foundation-funded improvement projects run by clinical teams across the UK provide ample testimony of what is possible, even in some very pressurised environments. There are some truly impressive achievements – including some truly innovative work, as well as much that is making good progress on what really should be normal management of everyday services.

A lot of what is provided in health care is a service, a process, which should be able to be highly routinised and streamlined to become, in Steven Spear's word, 'graceful'. Building this kind of everyday improvement into the NHS as part of normal business is the big task at hand. Technology will help, but there is no need to wait for that to make progress.

But what are the active ingredients? In this thought paper (which follows on from his 2013 paper, *Reinventing healthcare delivery*\*), Steven Spear gives us useful examples from other industries, from aluminium production to car manufacturing to health care.

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\* Available from: [www.health.org.uk/publication/reinventing-healthcare-delivery](http://www.health.org.uk/publication/reinventing-healthcare-delivery)

The message is that accelerated learning about the causes of problems is critical for success. This is done through the use of information (such as data or staff/patient experience) and ‘swarming’ to find rapid solutions to test quickly, refine and test again – a state of ‘permanent beta’. Sounds simple? The question is why this is done in pockets across the NHS, but such activity is not yet part of normal working to become a learning health care system, as described by Don Berwick in his report following the Francis Inquiry.\* If we can crack that, the prize will be great indeed.

A handwritten signature in black ink that reads "Jennifer Dixon". The signature is written in a cursive style with a long horizontal line extending to the right.

**Dr Jennifer Dixon**

Chief Executive, the Health Foundation

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\* Berwick D. *A promise to learn: a commitment to act*. Department of Health, 2013. Available from [www.gov.uk/government/publications/berwick-review-into-patient-safety](http://www.gov.uk/government/publications/berwick-review-into-patient-safety)



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# Introduction

There are extraordinary gaps between the ‘theoretical limit’ (eg what would be achievable in the absence of misfire, misdirection, etc) and what organisations actually achieve in terms of taking the innate potential of the people they employ and the technology they use and converting that into services and goods of societal value. When we step back from the dry, aggregated measures of ‘productivity’ and actually watch people in action, it can be horrifying to realise how little of their time is spent doing what they’re trained to do – and what would be appreciated by other people. Instead, much of their time is spent correcting, coping, reworking and otherwise compensating for things not working well.

Management studies luminary Steven Wheelwright studied design engineers and found a fraction of their time was spent actually designing.<sup>1</sup> The bulk was spent putting aside one project, ramping up on another and getting started, only to be interrupted and having to put that aside and repeat the same churn for the next. I had the experience of watching fighter jets being built – I expected to think ‘What a cool factory!’ – and was nearly made catatonic watching people search, mostly fruitlessly, for the drawings, instructions, tooling and materials they needed to actually build the machine. And I challenge you to do what my colleagues and I have done – shadow doctors and nurses in the clinical setting – and track how little time is spent examining, diagnosing, treatment planning, treating and following up, and how much is spent doing the scut work of finding people, information and supplies.

The consequence of churning rather than putting effort to good use – recognising needs to be fulfilled and capitalising on those opportunities – means denial of service, inadequately met needs, and squandered time, effort and resources.

That leads to the inevitable question: What goes wrong that so much time is used so unproductively?

To answer that, let's step back for some perspective on the whole idea of creating 'systems' through which the work of many is meant to combine towards the achievement of some common purpose.

In his 1776 work *The wealth of nations*, the economist Adam Smith encapsulated the benefits of dividing labour. Individuals who fabricate objects from start to finish barely scratch out subsistence. When each instead focuses on a particular subset of tasks, developing specialised skills and using specialised tools, the explosion in productivity is unbelievable. Even for something as banal as making pins, Smith estimated that 10 men working together could produce some 48,000 pins each day, whereas individually they each could do at most a few hundred. Without the division of labour, humankind could never have enjoyed the fruits of the agricultural, industrial and knowledge revolutions. With it, our first-world complaints are frequently about excess rather than deficit.

However, with the division of labour comes a challenge: how do you break the whole into pieces and how do you make sure the pieces come back together into something far greater than the sum of its parts? This is where management comes in: creating an environment in which the breaking down and building up of

individual efforts can occur so there is harmonious alignment with a common and useful purpose, thus achieving outcomes far greater than any individual could ever deliver.

It is well documented that managing organisations – identifying the societal needs they can fulfil, establishing their purpose, and designing, operating and improving the complex interactions of people and technology through which greatest value is created with least time and effort – is neither mechanistic nor formulaic. The differences between those who do this work well and the average are enormous. It has been established across time and sector that human experience is hardly homogenous in this regard.

For example, much management research of the 1980s and 1990s was prompted by the existential threat that Japanese manufacturers posed to US corporations.

David Garvin found that for complex manufactured products, ‘the failure rates of products from the highest quality producers were between 500 and 1,000 times less than those of products from the lowest.’<sup>2</sup>

For the creation and adoption of new technology, ‘Jai’ Jaikumar compared the ease with which manufacturing firms created and capitalised on flexible manufacturing systems.\* The differentials were gigantic. The best performers got their systems up and running in half the time, could support nine times the product variety, had more than 30% greater productivity and could

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\* Flexible manufacturing systems are ones that overlay machining operations with computerised controls to allow higher variety, productivity and quality.

introduce new products 20 times more frequently.<sup>3</sup> In short, on every measure relevant to competitiveness, they were better, faster and more efficient with the day's cutting-edge technology.

John Krafcik documented that the best performers in vehicle manufacturing required half the labour hours per vehicle and achieved twice the quality levels.<sup>4</sup> Ward, Liker, Cristiano and Sobek showed that superiority in quality–productivity pairings – better at everything versus making trade-offs between one desirable attribute and another – wasn't limited to the manufacturing environment where cars were actually put together; it was also evident earlier in the process in the complex work of designing new models. There were marked differences in engineering years required, total elapsed calendar time and design quality.<sup>5</sup> And where design and production didn't quite mesh, JP MacDuffie showed huge gaps between the speed and efficacy with which production problems were handled in three assembly plants. In one, problems were quickly seen and solved and never recurred; in a second, problems were eventually addressed and happened but with lesser severity and frequency; in the third, shop floor associates had to incessantly cope and work around conditions that were never rectified.<sup>6</sup>

Of course excellence delivering huge advantages in speed and ease is not just an industrial phenomenon. In 2001, researchers found a fourfold difference in speed in adopting minimally invasive cardiac surgery techniques across 16 US hospitals.<sup>7</sup>

However, despite the intensity of attention paid towards understanding how exceptional results are achieved, and despite the (espoused?) intensity of efforts to make such excellence more common, the gaping differences between the very best and everyone else persist.

For instance, Toyota – the exemplar of superlative industrial performance – still dwarfs its competitors, three decades after they first tried to close the competitive gap. Toyota currently has unit sales in the US somewhat less than General Motors and somewhat more than Ford. However, the results of their similar efforts are hardly similar outcomes. Toyota earns some \$2,700 per unit sold, while Ford earns about \$1,000 and GM closer to \$700.<sup>8</sup>

In the major undertaking of developing a new vehicle technology and creating the manufacturing, logistics, sales and service infrastructure, every vehicle manufacturer had the same challenge: greatly increasing fuel efficiency by developing hybrid drive systems. Despite a level competitive playing field that should have promised equal outcomes, Toyota launched its solution to the problem – the Prius – 10 years ahead of GM’s Chevrolet Volt. With a 10-year head start, Toyota has been able to put its technology through six generations of innovation and has installed it on some two dozen Toyota and Lexus platforms. It has sold around 9 million units; GM’s one offering is barely at 100,000 sales.

## Getting beyond ‘We don’t make cars’

As fantastic as these gaps might seem, I’ve spent 20 years of my career confronting the reality that most people don’t seem to care about these staggering differences in outcome, despite the benefits that would accrue to all stakeholders. (Imagine saying there is a £50 note on the floor and no one bothers to look, let alone pick it up!) More often than not, I hear, ‘We don’t make cars,’ or ‘Our work is different (unique), and this doesn’t really matter to us,’ or (from doctors especially), ‘What we do is life

and death' (as if keeping the wheels on a speeding vehicle is not). Persuading people to improve their situation with quantitative and qualitative data from outside their direct experience has often proven to be frustratingly futile.

So, let's step back from 'productivity', 'yield', 'quality' and 'efficiency' and all other measures of performance that are distilled, depersonalised and otherwise emotionally sanitised. Instead, if you were to spend a few minutes in different work environments – it wouldn't matter if it's design, manufacturing, services, tech support or engineering – what would be the noticeable differences that distinguish the best from the rest?

Well, in a typical situation, people try to do their work but often find that their best efforts are compromised: information is missing or inaccurate; materials are misplaced or wrongly formed; directions are inaccurate or otherwise misleading; supporting services are absent; operating conditions are overly oppressive.

The reaction to that? People making do, improvising, juggling and otherwise displaying a persistent awkwardness in trying to work individually and get their work to harmonise with what others are doing.

The alternative to awkwardness must be gracefulness – an inherent fluidity both for each person and for the teams as a whole. This can be seen in standout athletic team and artistic performances; the 'theatre' of a well-run restaurant or the bed and breakfast where the owners seem to have extra-sensory perception of your needs and how to meet them. Instructions arrive, information is provided, materials appear, people are in place exactly where, when and how they are needed.

Shifting from internal operations to the point of contact between those doing work and those who benefit from that work – at that moment of transaction or exchange – what distinguishes the standouts from the run of the mill? Sure, there are all the delayed quantitative metrics (customer satisfaction, reliability, purchase and maintenance costs, and so forth), but it's more than that. People may factor those quantitative measures into their purchase decision, but first they will translate them into an experience and gauge their emotional reaction to it.

For instance:

- ‘When I get those designs from that engineer, I know they’ll be timely, thoughtful, accurate and usable. They won’t require decoding, clarification and a whole host of time-consuming additional effort.’
- ‘Why should I buy that car? Because when I’m running late in the morning, it will always start and I’ll never have to explain why I was late for an appointment. When there’s ice on the road and snow is falling at night, I can put my kids in the back seat of this car knowing they’ll get home safe and sound.’

It’s the anticipation of gratitude not disappointment that drives many a transaction.

## Confronting disappointment due to awkwardness

This contrasting pairing – gratitude from gracefulness on the one hand and disappointment because of awkwardness on the other – is a simple but powerful real-time indicator of where and when problems exist that can be resolved.

Let's take a look at a tangible example.

Several hospitals where I live are clamouring for expansion, claiming that time, money and resources have to be spent in expanding their physical footprint because they are 'at capacity' and have to get bigger still for 'the greater good'. (Not mentioned in their advocacy is that in gobbling up resources for their own expansion, they're pulling them away from other needs – hunger, homelessness, education – also in need of support. Saying so would highlight the win-lose nature of their proposition.)

The question is, though, are they really 'at capacity' and needing to consume more resources, or are they not using existing capacity well? Do they need to get better at generating value from what they already have at their disposal?

I visited one such hospital with a friend, 'Dr Ben', walking through the emergency department to look for awkwardness versus gracefulness and disappointment in lieu of gratitude. Here's what we found.

Within 15 feet of the emergency department entrance there was a young woman, sashaying around the unit wearing brown 'scrubs'. 'What does she do here?' I asked. 'I've seen green, purple, blue and pink scrubs, but I've never seen brown before. What job has those?' Dr Ben mumbled at first and then explained that brown scrubs weren't for staff. They were to make it obvious who was a psychiatric patient.

Now, in the moment, this brown-scrub-garbed lady seemed delighted, but it's certain that not long before, she wasn't. She would have been having some crisis that merited someone – maybe herself, maybe a family member – admitting her to

the emergency department. But, ‘at capacity’, there was no place to put her where she was protected from doing harm to herself or others.

A few more feet into the unit, there was a young woman sitting slumped over in an adult-sized pushchair. The pushchair suggested a chronic or congenital condition. The look of her parents – both of whom were tightly clutching the pushchair’s handlebar – suggested that her condition had worsened precipitously. Despite that, no one was paying attention to her – hence the obvious concern on her parents’ faces.

Now, at that moment, the conjecture that capacity was the problem was still plausible. It might be that these two patients were unfortunate to have arrived later or were triaged lower in the queue than others. To test that possibility, we started looking at Dr Ben’s colleagues.

In one room, packed with terminals and white-coated clinicians, doctors were trying to use the new electronic medical record. Nothing was working quite right and, in frustration, one stood up, slammed the keyboard to the desk and declared, ‘That’s it. I retire! I was going to retire in June anyway, but I can’t last another three months.’ Outside that room, nurses were searching for medication trolleys that weren’t where expected, trying to locate supplies that weren’t in the cabinets they should be, and trying to find a monitor that had seemingly disappeared.

An ambulance backed in, lights flashing, with heroic-looking paramedics rushing a patient into the unit, only to find no response. ‘Hello? Anyone home?’

When Dr Ben and I did a count, it turned out that one, maybe two, out of 10 clinicians were actually doing something for which a patient or her family would be grateful. The rest were struggling with a system that was sabotaging their best efforts by not having the right materials, information or directions in the right place, at the right time, in the right form, for the right person. It was all solvable, but unresolved situations added friction, obstacles and stumbling points, making gracefulness impossible to achieve.

And this experience wasn't limited to one hospital, one time. We took our daughter to another hospital following a playground fall. There were 17 breaks in process, fortunately for a relatively minor injury (buckle fracture) to a child with assertive English-speaking parents. And don't get me started on the process breaks that happened when our son, then two months old, was in the emergency department with such laboured breathing that he was 'retracting' his abdominal muscles to help his overwhelmed diaphragm. It took his mother's constant intervention to keep the system on track.

The obviousness of awkwardness leading to disappointment isn't limited to hospitals. For example:

- A bank's IT chief reflected on walking into a branch to see a cashier navigating three monitors with several program windows open on each, trying to process a simple transfer for a client who was less and less patiently waiting for her transaction to go through.
- A call centre manager recounted the challenge of finding a meaningful resolution to a customer's pressing problem, frustrated in the experience and increasingly upset by the vitriol being directed at him.

- On the production line in a large assembly plant, workers had to hoist a body panel up and over a light post because that obvious awkwardness hadn't ever been recognised and addressed. With every panel, there was a good chance it was going to be 'clunked' before being set in its place.
- At a nutritional supplement company, people generating new marketing material went through time-consuming rework loops because it hadn't been well articulated what they couldn't, could and had to say for legal reasons.

In these examples, the awkwardness was resolvable but was not resolved. The screens could be consolidated to what was actually needed by the client-facing cashier and a different presentation provided for an agent opening accounts or helping with mortgage applications. The call centre database could be better organised for easier sorting. And there was no reason that light post couldn't be moved. Resolving the awkwardness would mean greater ease for the person trying to create and deliver value, leading to increased gratefulness from the beneficiary.

The long and short of it is, those who do much more with much less are so much more effective and efficient through the gracefulness of their efforts. The results of their gracefulness include increased levels of gratitude from their internal and external customers.

That leads us to the next important question: How do we transform an organisation from one that is disappointing with its awkwardness to one that is gratifying in its gracefulness?

## Discovering our way to gratitude through gracefulness

There's a conventional wisdom that if we equip people (typically the select or the elect) with enough data and sufficient analytical tools to process it, they can arrive at good decisions about what to do and how to do it. But that runs into the basic nature of problems. They typically are not situations we have previously ignored. They are situations we paid attention to, but didn't know enough to arrive at a meaningful and useful answer – the issue wasn't that we weren't smart enough or didn't think hard enough. Rather, our problems are rooted in what we don't know; our challenge is not to make an 'informed decision' – it is that we must first make discoveries.

At least in certain parts of our life, when we don't know enough, individually and societally, we have a default habit. We run experiments. We start with a problem, collect what we think we already know about it, and then start making (controlled) changes in materials, methods, approaches and so forth, to test the impact of changing inputs and operating conditions.

This behaviour, of running experiments, is not limited to the esoteric world of laboratory sciences and engineering. We all do it; for example, in the kitchen where we start with a recipe and change ingredients, measurements and cooking conditions to improve taste and presentation.

Similarly, this is exactly what athletes do to master a skill: start with a known approach and then test controlled alterations of stance, timing, preparation and so forth to be more effective.

## Workplaces: the face of the learning organisation

The one place where this experimental approach towards deepening our skills and knowledge is too often missing is the workplace.

More often than not, people are confronted with broken systems that present them with inadequate information, instructions, materials, equipment or skills. Not only are people's best efforts compromised by the environment, they continue to be compromised because mechanisms don't exist to identify conditions that are inadequate and invest time and resources to correct them.

In sharp contrast, the best individuals and organisations know better what to do and how to do it well, and they get to that 'knowing' quicker and better. Long and short, they win on speed of learning (as well as breadth and endurance) with incredible results.

So, if learning matters and learning better faster matters a whole lot, what's the face of learning? Who are today's knowledge workers? What do they look like; what do they do?

When I put this question to people – 'Who is a knowledge worker?' – the answers are what you might expect lay people to say: doctors and nurses, lawyers, architects, engineers, programmers, scientists, and occasionally even professors, librarians and teachers.

What do those professions have in common? Among them are (generally) clean clothes, clean hands, degrees, titles, daylight working hours and computers. By and large, they are people who are more likely to spend a good chunk of their day sitting rather than standing, thinking big thoughts and having big ideas. (In fact, of the several thousand people I've exposed this question to, only one person spoke outside the group's thinking and called out 'auto mechanic'.)

Most people think that knowledge workers typically are those who get up in the morning and shower to get ready for the day; they're not the ones who shower after work to wash their day away.

So, pretty much everyone is surprised to hear that someone working in the heat of one of Alcoa's\* smelting cells, wearing full protective gear – face shield, hard hat, leather apron, kevlar gloves, steel toed boots – is doing the epitome of knowledge work. Smelting cells are where alumina is converted into molten aluminium by huge electrical currents ripping oxygen free of aluminium atoms. Doing so should be crazily dangerous. Aluminium melts at around 650°C and smelting releases gas that can be pressurised under a crust on top of the molten metal. And it's not only this process that is loaded with dismembering opportunities. Aluminium production involves all sorts of processes that introduce things that are heavy, hot or sharp, under tremendous pressure, and often moving quickly.

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\* Alcoa is the world's third-largest producer of aluminium. Its products are used worldwide in a variety of ways, including in aircraft, vehicles, packaging, construction, oil and gas, and other industrial applications.

Yet, with Alcoa's smelting – as with its welding, extruding, forging and the like – the ripping, tearing, shredding, crushing, cutting, burning or poisoning of luckless individuals that is certainly theoretically possible simply doesn't happen. The company ranks as one of the safest employers in the US.\*

Which begs the question: How did they pull it off? The answer is that it was a multiple step process, each one of which violated long-held conventional wisdoms.

First, Alcoa's most senior leadership set safety as a paramount concern. That's not what corporate titans normally do, worried as they are by revenue, returns on capital, stock prices and the like.

Second, they established their goal. This was not something relative like 'better than last year', 'top quartile', 'better than the industrial average' and the like. Instead, they set the goal as 'perfect' – that no one should get hurt.

Now, you might get push back that perfect is an unachievable goal. 'With all due respect,' you'll hear, 'everybody knows how dangerous it is to work with aluminium processes'. (We hear such push back in health care – that, after all, perfect safety is impossible because patients are sick, perfect access is impossible because demand is unpredictable, and we should be satisfied with just steadily getting better.) But here's the issue: no one will volunteer to get hurt to 'make up the numbers'. And no one will volunteer to call the next of kin or loved one to explain what happened on the job that day. At least in the aluminium setting, perfect has to be the goal because no one

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\* For more details, see chapter 4 of my book, *The high velocity edge*: [www.thehighvelocityedge.com/book/](http://www.thehighvelocityedge.com/book/)

will want to be the recipient of imperfect. That should at least provoke our thinking about whom we are asking to accept imperfect in the health care setting.

So, if you've got no volunteers to absorb imperfect, then perfect is the only reasonable target. But it wasn't just for workplace safety that Alcoa set perfect as a goal. It's not like Coca-Cola or Pepsi would have accepted bad chemistry in the aluminium supplied for their cans, subjecting their product to spoilage and flavour changes. And neither would Boeing or Airbus have accepted bad parts that would fatigue faster or worse than engineers expected.

And wouldn't you know, supermarkets didn't want to get shipments of foil and roasting pans late and risk disappointing customers. Perfect had to be the goal across the board – safety, quality, timeliness and on and on.

The company then got to figuring out why things weren't perfect. Why did Harold have to jump back so as not to get burnt by spattering metal? Because he didn't know not to stand there. Why did the metal spatter in the first place? Because the engineer who designed the process didn't know enough about the chemistry, physics and thermodynamics to have it not spatter. Why did Anne have to duck not to get struck by a swinging boom? Because she didn't know not to go where she was at risk. And Joe didn't know Anne was in the way when he released the boom on its swing.

Over and over again, Alcoa came to realise that ignorance was the cause of all imperfection and that the way to close the gap was to learn – to convert ignorance into useful knowledge. This was another 'against conventional wisdom' stance.

After more than 100 years of messing with things hot, heavy and dangerous, the common assumption was that things went wrong... well... because they had to. As if it was woven into the fabric of the universe and dealing with those problems was a matter of character, woven into people's moral fibre.

So how do you convert ignorance into knowledge?

- First, recognise that problems are occurring. Sure, they may be seen as 'normal' because they've happened a lot. But they should not be normal as they are departures from perfect. Have to jump? That's a problem. Have to duck? That's a problem. Bang your hand or head, or drop something on your foot? Those are problems too!
- Second, if you've got a problem, 'swarm' it right away – those affected by the problem and those in supporting functions (in Alcoa's case engineering, safety and the like) all work together both to contain the issue and to begin solving it.

Why the need for immediacy? Because information spoils. Those doing clinical work certainly know that. People forget things, even what they are doing, let alone all the situational conditions that might have contributed to the problem. Processes change. Run to a smelting pot when it's spattering, you might grasp the power flows, chemistry and heat profiles associated with the problematic conditions. Wait and those conditions might be showing you not what is associated with going wrong but the conditions that match with things going right.

It would be like going to a doctor to understand why your knee hurts, but only a week or two after the issue. Good luck getting a meaningful diagnosis and any kind of informed treatment.

- Third is another ‘against conventional wisdom’ requirement. Alcoa recognised that the team who saw the problem and started working on the solution were now the *bona fide* world experts on that situation. After all, it hadn’t been anticipated by anyone else. So, the team that rapid-responded were the only ones who understood it. This means overcoming all the prejudices of Tayloristic ‘scientific management’ (eg time and motion studies done by a ‘brilliant elite’ on those assumed to be there for their brawn and certainly not their brain) – the condescension of those with degrees towards those without or those with white collars towards those with blue ones (or none at all).

The results of challenging these conventional wisdoms to generate an ‘everyone, about everything, all of the time’ learning dynamic were profound. Alcoa’s risk went from a 2% chance of getting hurt on the job to 0.07% each year. Quality, yield, productivity, timeliness, customer service and back office operations all improved. Safety served as a beacon, shining a light onto ignorance that affected all sorts of other issues.

Alcoa had to violate lots of conventional wisdoms on the way to becoming one of the safest industrial employers in the US while also enjoying enormous business rewards. These included: make safety the priority; make perfect the goal;

recognise ignorance as the root cause of all problems; make it part of everyone's job to see and solve problems; treat those who learned something from an experience as the world experts, who had the right and obligation to teach others what they had discovered.

## Accelerated learning in the clinical setting

People working in clinical services are better pre-wired to act in this fashion than most. After all, you don't have to learn a new set of behaviours. You have to take ones that have served with such power in understanding what ails patients, and in planning and delivering treatments, and extend those behaviours out from the bedside to the myriad services that have to flow together to provide the best care most effectively and efficiently. Accordingly, the same problem-solving discipline should be applied to the environment in which bedside care is conducted.

- Just as you've identified 'normal' indicators of health (eg 37°C for core temperature, 120/70 for blood pressure, oxygen saturation above 95%, blood sugar less than 100 mg/dL, etc), identify healthy indicators for patient and staff experiences: materials, information and services arriving defect free, when needed, in the amount needed, and so forth.
- Seek out aberration and departure from health for the processes through which you all work, just like you monitor patients whose conditions are obviously compromised.

- When a problem is seen, swarm it – examine the problematic situation right away, close up. For example, find out why a colleague was confused, inconvenienced or otherwise compromised just like you would find out why a patient’s heart started to race or why his breathing became laboured.
- Based on what you learn, develop a ‘treatment plan’ – a logical course of action to target the causes and thereby alleviate the symptoms.
- Test the treatment plan – off-line, in simulation, as a pilot – before unleashing it more systematically. This will help you be more sure of your reasoning, just like you might give a smaller intervention to a patient to test for impact before committing to a full-blown course of treatment.
- Follow up to see what about your reasoning is confirmed or refuted.
- Share what you’ve learned: initial discoveries through the informality but rapidity and familiarity of making rounds; more substantiated findings through demonstrations and reports.
- And if you’re responsible for other people, model these behaviours to those colleagues several steps removed from the bedside, just as you would when developing the professionalism of technicians, doctors, nurses, case workers and pharmacists more junior to you.

## In summary...

In short, speed and excellence matter. If a customer needs something, he doesn't want to wait, and he doesn't want something defective or inadequate when he is finally served. If someone has work to do, she doesn't want to wait for 'the code', doesn't want to deal with bugs, and doesn't want to have to somehow make do. If a patient arrives at a hospital, it's because he is already in distress and doesn't want to endure the problem longer than the core biology and chemistry of the treatment dictate.

So, if speed and excellence (even perfection as Alcoa determined) is the standard, with slowness and imperfection unacceptable, then the way to close the gap has to be learning – also done with speed and excellence. After all, the root cause of all problems is ignorance – our own lack of understanding of what to do, why to do it and how to get it done.

This means ending the deliberations about zero-sum decisions:

- *(For patients)* you can't have the care you want or need, so you'll have to take a lesser alternative; you can have the care you need, but you'll have to wait; you may not have to wait but the care will be delivered in a way that forces compromise in convenience or respect.
- *(For payers)* you can cover more people at higher cost or spend less but deny care.
- *(For clinicians)* you have to work harder or longer and accept more risk and lower pay.

It means using as inspiration the energy that propels the scientific and technological discoveries responsible for improving quality of life and extending life expectancies. Anaesthesia, antibiotics, the influence of genetic characteristics, bio-pharmaceuticals – these were all frontiers that allowed exploration and discovery and an expansion of understanding of what was possible and doable. Improvements started with recognising a problem, and admitting that what was known and put into practice was but a small fraction of what was knowable and could be applied.

Alcoa, Toyota and a few standout health care organisations put just as much effort into improving the social/organisational systems in which science and technology – and those who use it – are embedded. This lets them get ever closer to the theoretical limit of what they are able to achieve – with extraordinary results.

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The Health Foundation is an independent charity committed to bringing about better health and health care for people in the UK.

Our aim is a healthier population, supported by high quality health care that can be equitably accessed. We learn what works to make people's lives healthier and improve the health care system. From giving grants to those working at the front line to carrying out research and policy analysis, we shine a light on how to make successful change happen.

We make links between the knowledge we gain from working with those delivering health and health care and our research and analysis. Our aspiration is to create a virtuous circle, using what we know works on the ground to inform effective policymaking and vice versa.

We believe good health and health care are key to a flourishing society. Through sharing what we learn, collaborating with others and building people's skills and knowledge, we aim to make a difference and contribute to a healthier population.

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ISBN: 978-1-906461-87-4

Registered charity number: 286967

Registered company number: 1714937

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