Patient Harm: Lessons from Manufacturing's Quest for Zero Defects

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Lessons from Manufactring

Based on the best available research, it is estimated that one in ten patients admitted to hospitals in developed countries will be unintentionally the victim of an error. This is an unacceptable level. Think of the outcry if a commercial product, transport sector or public service was harming people on this scale. Healthcare services may be a much more complex and essentially life-critical activity, but still a few percentage points' improvement is not the need, but rather a few orders of magnitude, reducing patient errors from 1 in 10 to 1 in 1,000, or even better 10,000.

Though awareness of patient safety and activity levels have improved since 2001 when the danger flag was first raised by the CMO, the figures have been slow to respond. The hard truth is that fundamentally poor patient safety is an endemic problem that does not respond to simple, singular fixes. The introduction of a newer technology here or a revised procedure there is not enough. It is a stubborn, complex, systemic issue that is deep-rooted in healthcare's nature, history, systems, complexity, structures, processes and culture. Wisdom is needed to know how to create a fundamental breakthrough in patient safety levels.

There are valuable lessons to be learnt here from parallels with the forced transformation of quality performance amongst western manufacturing industry in the 1980's ad 90's in response to the 'invasion' of Japanese competition and the spread of globalisation. The attack started on the UK in the age of foremen, clocking on, unions, the dole queue, strikes, end-of-line quality inspectors and Friday cars. With a cosy national market factory scrap levels of typically 5% had been previously acceptable and product returns and repairs under warranty of 2% the norm. The Japanese however started to rapidly gain significant market share with cheaper and better quality products such as watches, videos, camera film, cars and motorcycles, and they were measuring quality not in percentages but in parts per million (ppm). The message was clear to the more alert parts of UK manufacturing: change or die.

The revolution in manufacturing quality and efficiency that then occurred is still going on at a global level. It has proceeded under various names but most notably first under 'Total Quality' and then 'Lean Manufacturing'. Total Quality was never just about quality. The idea was much bigger than that. Total Quality was about overall manufacturing excellence; a virtuous circle of better quality, less scrap and rework, reduced inspection and production costs, cheaper and better products, increased market share, company growth and more profits to invest in improving quality again. Lean went beyond Total Quality and became a holistic revolution; a paradigm shift. Lean helped a factory to transform itself as a whole, with each aspect of change needing to be aligned. It required a complementary change in purpose, objectives, processes, technology, flow, control, systems, organisation, job roles, performance measures, quality, cost, reliability, spirit, culture, motivation and teamwork.

It is important to recognise that Lean was certainly not just about improving the technical aspects of manufacturing systems such as process streamlining, reducing changeover times, quality control, process capability, kanban and smoothing material flow. It was just as much about the human and social aspects of work. It changed the purpose and objectives of manufacturing staff, inspiring them to achieve excellence through the ever-distant goals of right-first-time, just-in-time, zero-defect and batch-of-one production. It also required a cultural change, transforming production lines into cellular teams, supervisors and foremen into team leaders, and even the task of tidying-up into adopting the 'right attitudes' of the 5 Ss.

It is recognised amongst many of those that travelled the journey in those years that the application of specific improvement tools and techniques applied piecemeal are not enough on their own to effect a fundamental transformation in quality performance and manufacturing excellence. In-process quality controls, poke yoke, standardised operations, SPC, Six Sigma, visual Management, Kaizen and Quality Circles, all look attractive, and are relatively quick and easy to apply individually to local processes in isolation. However they are only the means of implementing component parts of an overall quality and excellence programme. If factories just see Total Quality or Lean as a set of tools, and do not have a holistic systemic vision and strategy, they will only achieve patchy and disappointing results.

Well what was achieved? The most responsive of companies gradually became able to match that of the Japanese. Following a further period of rapid globalisation, leading UK companies have gone on to build up distributed manufacturing and supply networks competing on a world-wide level. Delivered quality of 20 ppm is now normal (0.002% customer problems) and the current call is for individual process capabilities of 6 sigma (99.9999998% pass rates). This transformation was made up of change on thousands of manufacturing sites through a shift in the attitudes and behaviours of more than a million people. Each was a team journey taking years of effort. Many did not come through the journey, but closed or were bought out. A lot of manufacturing shipped itself out to cheaper countries in order to compete on cost as well as quality….. but that's another storey for another day.

The major lesson for the NHS from the Total Quality and Lean revolution is that quality was not treated by the successful as a component issue. Endemic poor quality is a symptom of overall poor organisational health. Likewise the root to fundamentally improving patient safety is not just to address the local issues in a piecemeal, tool-based way; that will only make a marginal difference, a few percentage points of improvement. Progress will remain inadequate, patchy and unsustained. A transformation in health service excellence at the 'whole system' level is required, and that means aligned changes at multiple-levels of organisation in strategy, objectives, structures, measures, leadership, culture and teamwork. A 'whole system' perspective must be taken if the required transformation is to be achieved and thousands of patient lives protected.

Applying these Lessons

So how can we apply these lessons from manufacturing into the complex reality of modern healthcare systems? Healthcare is by its nature a very different 'whole system' to that of Manufacturing. It involves relational, human services where every patient has a unique bundle of needs. The core of the work can involve achieving a combined physical, mental and spiritual transformations for patients. Processes are non-linear, extended over time, and unpredictable. Processes can't be standardised and demand can't be deliberately smoothed. Therefore the same specific practical approaches and tools required for quality improvement in manufacturing will not directly apply, and may only be useful in part when looking at the higher volume, more factory-like patient procedures.

Building on the woder 'whole systems' lessons above, Tricordant propose that a combined top-down and bottom-up 'whole systems' approach is needed to trigger a significant transformation in patient safety:

- **Top-down**: Senior clinicians and healthcare managers need to take the lead in changing hearts and minds about patient safety. They need to 'walk the talk' by deliberately finding public opportunities to demonstrate that no level of patient harm is acceptable. Their behaviours need to demonstrate this belief. They also need to promote a 'whole systems' perspective of the root causes of poor patient safety, and to seek 'whole system' solutions to create productive, responsive and safe services.

- **Bottom-up**: Front-line teams need to be equipped and empowered to tackle patient harm at a local 'whole systems' level. The attributes required are:
    - Multi-disciplinary local teams on a human scale
    - Responsible for a significant patient transformation(s) within patient pathway(s)
    - 'Owning' the whole unit of work
    - Empowered to plan the service, deliver the transformation and improve the process
    - Equipped with whole systems and lean quality tools
    - With a designated team leader linking the team to the wider organisation
    - With appropriate, simple outcome-based performance measures including patient harm
    - With shared values around teamwork and compassionate patient care.

Tricordant have developed an approach to launching such front-line teams for NHS Trusts. 'Whole Systems rapid Improvement Events' are a structured, planned process for working with stakeholders from local clinical service areas over a 6 week period to initiate the above bottom-up approach. The top-down journey must be underway as well for success. The combination of both sets are powerful.

Conclusion

Lessons from manufacturing reveal the 'whole systems' approach needed to transforming patient safety within healthcare. A combined top-down and bottom-up 'whole systems' approach is needed. The good news is that improving patient safety and saving patient lives is bound up with simultaneously improving patient service, reducing lead-times and reducing costs. It is not a choice between what matters; productivity, 18 weeks, patient choice. In the end it's all about excellence, about creating, continuously learning and improving healthcare services. Get it right as a whole and the whole will start to come right.