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Trevor Burke

Marginal gains in dentistry?

Readers who have had contacts with big business will be aware of the concept of Six Sigma. This was invented at Motorola in 1986 and adopted by many companies, most famously by Jack Welch at General Electric. The concept aims to eliminate error in the manufacturing process. For example, in a complex manufacturing process, such as in an aircraft engine, only one part needs to be defective for the whole engine not to work. Unwanted variation spells disaster, so statistical methodologies are used to eliminate this. A company that has achieved Six Sigma has a 99.997% success rate, which means 3.4 errors per million opportunities to make a mistake.¹

Matthew Syed's book *Black Box Thinking*² should be prescribed reading for all dental students and practising clinicians, as it addresses, among other topics, 'The Logic of Failure', 'The Blame Game' and 'Cognitive Dissonance'. However, it was the section on 'Marginal Gains' that caught my eye. In this, Matthew describes a Six Sigma-like aim for improvement in the Team Sky professional cycling team. Their manager developed an approach whereby, if one breaks a big goal into small parts, and then improves on each of these (even if minimally), then this would facilitate a massive increase when all are put together.

Might it be possible to apply the concepts of Six Sigma and marginal gains to dentistry? In restorative dentistry, indeed in all aspects of dentistry, clinical techniques generally involve a number of stages. If clinicians can improve each stage marginally, might the end product be more than marginally better? If I ensure that I have etched the enamel when using a so-called self-etch or Universal bonding agent, the margins of the restoration that I placed will look better (ie will have accumulated less stain) at five years³ and patients will not complain about suboptimal appearance. If I ensure that the impression that I take for a lower denture extends just that little bit further, the denture will have better support and patient comfort will be optimized.

Regarding oral surgery, having recently listened to a great lecture by Tara Renton at the *Dental Update* Study Day, post-op pain after removing a wisdom tooth will be reduced by small but significant steps including, pre-operative management of the patient's expectations, consent outside the dental chair (where the patient can hear and retain what is said to them), smart infiltration dentistry, which in the main provides optimal intra-operative pain control, careful handling of the tissues and by prescribing NSAIDs pre-operatively. Add to that 'homecheck' for patients in order to provide reassurance. For dental implants, may I suggest that such treatment is prosthodontically driven, and the use of stents may provide that marginal gain in location of the implant.

Of course, success also depends upon carrying out the correct treatment and not having a premature failure of one aspect of treatment, as per Six Sigma. The use of materials with research to back them up, rather than own label ones which don't,⁴ should help minimize failure. The first dentine-bonding agent that I used had five bottles, and they weren't even numbered! If I made a mistake with one, the complete process would be ruined. If we could achieve a marginal improvement in our isolation, bonding (or base placement – if you still do that) and restoration placement – in increments for example for a non-bulk-fill posterior composite and avoiding overpreparation of the tooth – who knows how much longer the restoration might survive. Extrapolate that to the NHS and fewer restorations would require premature replacement, with a significant saving to the exchequer. It's all about doing the little things right. Saying 'it'll do' won't do!

References

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