



Saving pulps and parts of pulps; slow and steady progress

I qualified from a London dental school where our clinical work was recorded in a 'ticket book'. This reveals the huge number of tasks I completed compared with most current dental curricula; in my case 312 amalgam and composite restorations and 28 crowns. I only carried out two fissure seals, indicating the extensive nature of the caries we managed then, at the dawn of today's minimal intervention approaches. Pertinent to this special issue is a teacher writing 'small exposure – Dycal' about the fourth cavity I restored, but still giving me a 'good' grade. Not much further into my student career another pulp exposure reared its ugly head. I was made to recite Black's Principles of cavity preparation to the Professor, but having reviewed the radiographs he thought that anyone would hit the pulp in that tooth. I should not feel bad, I could recite Black faultlessly and I was awarded another good grade. This was a progressive attitude from my supervisors, at a time when pulps were considered vulnerable and many dental practitioners regarded an exposed pulp as a doomed organ. With some teachers we could transition from pulp exposure to pulpectomy and root canal filling with little discussion. There was never a queue of students looking for a suitable root canal to prepare and fill, a problem reported by many dental schools today.

We can take an even more conservative approach now, approaching the pulp very closely or exposing it, observing tissue conditions with a microscope and treating what we see with remarkable success. The paper in this issue by Dr Bogen¹ is controversial; developed from a protocol published in 2008², it now goes further, advocating vital pulp therapy for symptomatic, asymptomatic, reversible and irreversible pulpitis. The challenge today may

be more one of disease classification and accurate diagnosis than of materials and their application, as mentioned in two related publications this year^{3,4}.

The following papers in this issue⁵⁻⁹ make clear the massive advances over the last few decades in our management and the materials used to treat pulp-nigh caries lesions, actual pulp exposures and otherwise compromised teeth often with immature roots. Hard-setting calcium hydroxide preparations like Dycal are no longer the materials of choice. It seems likely that there will be a decline in root canal treatments in favour of complete pulpotomy for an increasing number of teeth, including molars. This more conservative approach will be used even for an increasing number of teeth that present with symptoms. The handling and placement of mineral trioxide aggregate (MTA) became a third-year teaching exercise in the simulation clinic in New Zealand's only dental school in 2003. In a survey of dentists there published in 2015¹⁰, 95% of respondents considered direct pulp capping to be successful or very successful. For 16 years the material and its relatives have been taught and recognised as superior, but their uptake has been slow. While 42% of respondents believed MTA provided the best outcome (followed by calcium hydroxide at 27.4%) it was used by only 30%, and calcium hydroxide by nearly 37% of clinicians. Cost, handling and potential tooth discolouration were barriers to the use of MTA.

Adoption of new things can be a lengthy process. In the medical literature it has been shown that an average of 17 years passes before the results of research become part of daily clinical practice. In dentistry, this is the time it took for Brånemark's osseointegration principle to

progress from the first titanium implants in an edentulous patient to a major North American conference presentation. To quote Heraclitus, 'There is nothing permanent except change'. But good things take time.



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