The teaching of dentistry

When I enrolled as a student in the Faculty of Dental Science in 1949 I knew very little about dentistry, let alone the teaching of dentists, apart from my own experience as a patient needing drilling and filling. Although World War II had been over for four years, there were still shortages of materials and equipment, and during my five-year course we used foot-driven drills for part of the time and ex-army, belt-driven electric engines for the remainder. This changed in 1952 when the college's treatment clinic was refurbished with all-electric motors, and with chairs and units designed to be easily moved to the new dental hospital that was in the planning stages.

This was an era in which extraction was often the preferred treatment for decayed teeth, and the more aesthetically pleasing acrylic resin was replacing vulcanite (vulcanised rubber) as a material for dentures. Gold was still relatively cheap, and as a filling material was generally preferred over dental amalgam (a silver-tin-mercury mix). Local anaesthesia was in transition from cocaine and novocaine to more effective agents such as xylocaine. General anaesthesia was often used with difficult patients, and the need for adequate oxygenation during these procedures was slowly being recognised. Tooth-coloured materials were only semi-permanent, while the longer-lasting fused porcelain crowns were much more expensive. Preventive dentistry was in its infancy, and the need to preserve remaining tooth structure during tooth preparation was not considered of great importance.

In the mid-1950s the introduction of the air-rotor high-speed drill made the task of tooth preparation for restoration much faster and less painful for patients. Other innovations included elastic-type impression materials; better understanding of the growth and development of the head, mouth and jaws, leading to better orthodontic care; and use of antibiotics to counter infections in the oral cavity and surrounding tissues—which in turn enabled more extensive surgical procedures to correct growth abnormalities. In the late 1960s the first truly adhesive restorative materials appeared on the market, along with acid-etching of enamel to retain tooth-coloured restorative materials. These were at first chemically activated and often fast-setting, making manipulation difficult. Today we have materials that remain soft until hardened by exposure to bright light.

Cat. 186 ***5th year students, main conservative clinic, Australian College of Dentistry, Dental Hospital of Melbourne, Spring Street***, 1958, photograph, image 51.7 × 38.4 cm. HFADM 3811, Henry Forman Atkinson Dental Museum, University of Melbourne.
Bottom left: fifth-year dentistry student Miss Rimma Kalinin, with nurse Lynette Denny, behind; top left: demonstrator Dr Harry 'Mac' MacIntosh; top centre: student David Barkla.

Other significant developments include a change in the dental unit to enable patients to lie down and dentists to work seated rather than standing. This facilitated four-handed dentistry, with the dental assistant seated on the opposite side, helping with suction and delivering materials. With this came a need for brighter lighting without blinding the patient—hence the need for eye protection. Alongside these changes, dentists started using magnification in delicate work, and operating microscopes were introduced for better endodontic treatment (root fillings).

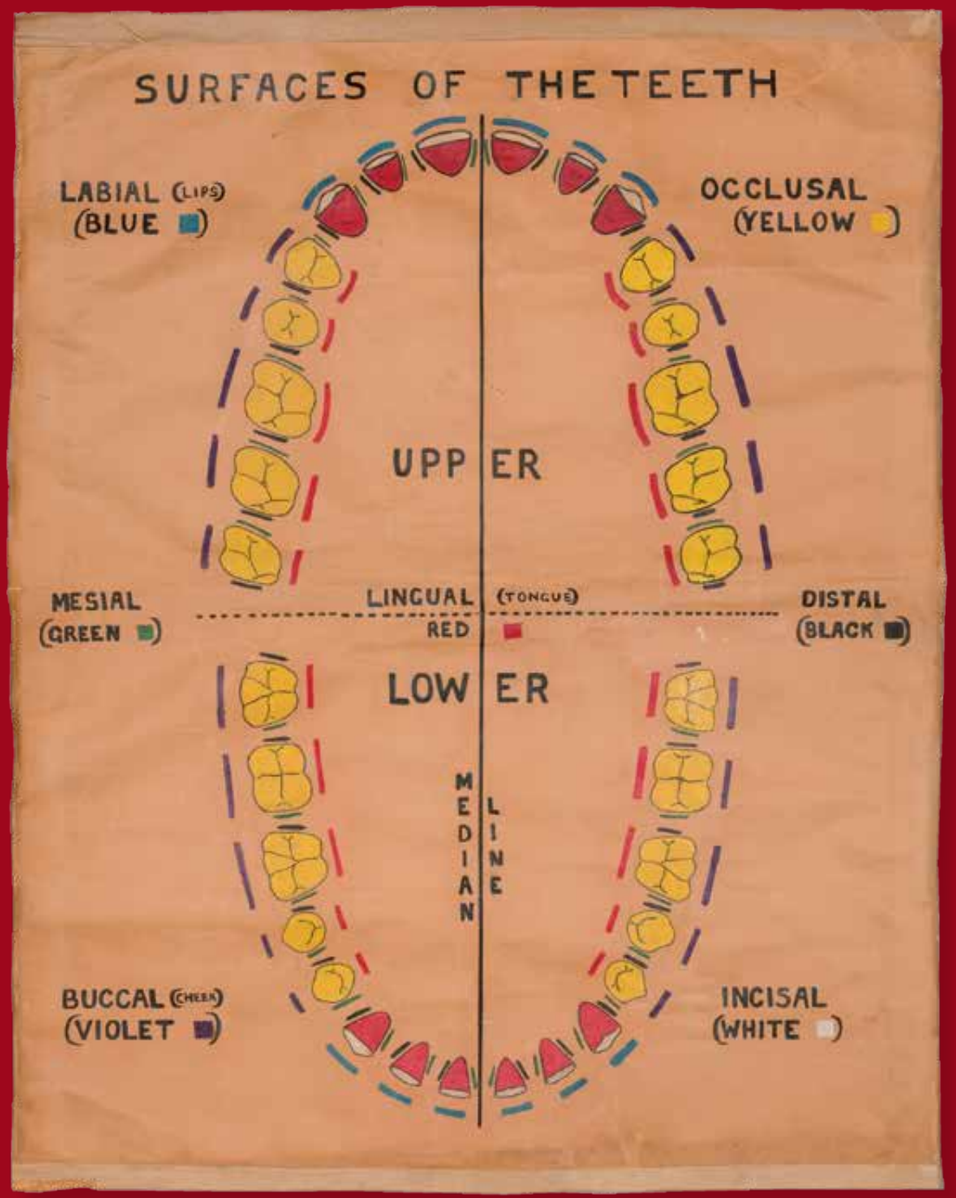
X-rays have long played an important part in dental care. There have been many improvements over the past 50 or so years: faster films that greatly reduce exposure to radiation and, more recently, digital receptors for making images of dental structures. Three-dimensional imaging techniques—CT (computed tomography), CBCT (cone-beam computed tomography) and MRI (magnetic resonance imaging)—are now used extensively in diagnosis and treatment planning in many fields of dentistry. One of the more successful innovations over the past 30 years has been titanium-based implants for replacing missing teeth. Used with various forms of computer-aided design and manufacture, and more recently with 3-D printing, these enable tooth restorations to be fabricated in a matter of minutes rather than days. Taking impressions has also been simplified by 3-D digital imaging. The last three decades have brought further improvements in materials, while adhesive dentistry has made feasible the preservation of sound tooth structure.

What has all this done for dental teaching? Much of our education involves one-to-one supervision and instruction, or small-group teaching. Lectures are being used less, or are supplemented by computer technology, allowing each student to progress at his or her own pace. The tedious task of making Kodachrome slides and movies has been supplanted by digital photography with video recording and playback. Indeed, every student has a mobile phone fitted with a camera, so that recording their work is a routine procedure. In addition, most students have a tablet or laptop computer on which to store and recall their lecture notes and other instructions.

What of the student population studying dentistry? The biggest change has been the large increase in the number of women students, and now the presence of many full-fee-paying overseas students.

Other major influences on the teaching and practice of dentistry stem from stronger emphasis on preventing tooth decay. This was greatly assisted by the introduction of fluoridation of water supplies, and the use of fluoride-containing toothpastes.

Charles Harold Down (1890–1965), 'Surfaces of the teeth', from Cat. 112, **Teaching aids: drawings**, 1920–38, ink and pastel on paper, each sheet 117.0 × 90.0 cm. HFADM 1997, Henry Forman Atkinson Dental Museum, University of Melbourne.



Unfortunately, some communities have taken more than 60 years to accept the simple and cheap preventive measure of water fluoridation.

The dental workforce has changed with the introduction of dental therapists and dental hygienists since the 1970s. These auxiliary professionals work under a dentist's supervision to treat gum disease and carry out simple restorative procedures in younger patients. Dental prosthetists provide dentures for many patients who lack some or all their teeth.

The dental curriculum has become crowded as each discipline seeks more time in the five-day week. Fortunately there is a move for senior-year students to practise general dentistry, but this is limited by the availability of suitable patients. Under the 'Melbourne Model' introduced to dentistry in 2011, all dental students at the University of Melbourne are now graduates in science or biomedical science before commencing their four-year Doctor of Dental Surgery course. Victoria's second dental school, at La Trobe University, offers a more conventional five-year degree. It will be interesting to compare the abilities of graduates as they move into the workforce.

Dental specialties have only received full legal recognition since the early 1970s, when a new *Dental Act* split dentistry from the *Medical Act*. Since then, the various state-level dental registration boards have been replaced by the Australian Health Practitioners Regulation Agency, a single registering body covering all dental health professionals as well as many other health service providers. Continuing professional development has been made compulsory, with a minimum of 60 hours required over each three-year cycle to maintain registration to practise.

Many dentists work in group practices, as well as in public dental clinics and hospitals. Advertising is now permitted, providing it is not deceptive or misleading. Some private health insurers have set up their own clinics, or have contracted dentists to their preferred-provider schemes. All these changes have affected how dentistry is being taught. It is pleasing to see that many dentists wish to further their studies and obtain a higher qualification in one of the several specialties. Research has always been an important component of the Melbourne dental curriculum, and since about 1969 has been a compulsory subject in the BDSc and now DDS courses. Melbourne has a strong record in research by its graduates over the past half-century.

Associate Professor John Harcourt OAM