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Citation for final published version:

Atkin, Philip A. 2019. Human disease/clinical medical sciences for dentistry in early-years dental graduates: Transition from undergraduate study to clinical practice. *European Journal of Dental Education* 23 (2) , pp. 199-203. 10.1111/eje.12420 file

Publishers page: <http://dx.doi.org/10.1111/eje.12420> <<http://dx.doi.org/10.1111/eje.12420>>

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## **Introduction**

The Association for Dental Education in Europe (ADEE) and the UK General Dental Council (GDC) both describe the education and training required to produce a safe and competent dental graduate in their curricula<sup>1,2</sup>. Additionally, the Committee of Postgraduate Dental Deans and Directors (COPDEND) published a Curriculum for UK Foundation Programme Training<sup>3</sup>. In all these documents there are descriptions of the broad requirements to obtain and understand a comprehensive medical history, with the intention of allowing the dental graduate to prescribe, and to treatment plan restorative, surgical and other treatments with patient safety at the core.

In the UK, the GDC has for many years published recommendations as to the content of a dental curriculum, on which dental schools base their teaching course. From the 1980s and onwards successive editions of Recommendations Concerning the Dental Curriculum<sup>4</sup> were published for dental schools to reference in developing their undergraduate curricula. By the time of the publication of The First Five Years<sup>5</sup> in 1997, the GDC were increasingly specific about whom, how and where the subject of what came to be known as human disease/clinical medical sciences for dentistry (HD/CMSD) should be delivered. In 2011 with the publication of Preparing for Practice<sup>6</sup> the GDC changed tack and began to simply describe the outcomes to be achieved, rather than the means by which they were to be acquired. This loss of clear direction prompted a group of teachers of HD/CMSD from the UK and Ireland to devise and publish a more detailed curriculum<sup>7</sup>, to act as a reference for dental schools and to help inform and continue to develop an undergraduate HD/CMSD course.

In addition to recognising the need to produce safe dental practitioners for the populations they serve, the dental regulators in the UK sought to develop dental specialists who could better manage patients with more complex medical and other treatment needs and in 2008 a specialist list in Special Care Dentistry was introduced. However, successive UK government publications from the Office for National Statistics have identified changing population demographics, and that as time goes by, the population in the UK is getting older with now 18% aged 65 years and over and 2.4% aged 85 years

and over<sup>8</sup>. It is therefore essential that all dental practitioners, and especially general dental practitioners (GDPs) who may see the widest spectrum of the population, need to be competent in managing all patients presenting to their clinics and surgeries. Dental undergraduate students have been shown to recognise the need for education and training in HD/CMSD in general and as a foundation for special care dentistry<sup>9</sup>. More recently the UK and Ireland group of teachers of HD/CMSD convened a symposium to look at how HD/CMSD has developed in recent years, and how it may continue to evolve within dental schools, producing a paper summarising their findings<sup>10</sup>. In 2013, Greenwood and colleagues<sup>11</sup> looked at recent dental graduates' experience and management of medical emergencies in dental practice following undergraduate training in HD/CMSD. However, there is little in the literature looking at recent dental graduates' attitudes towards, and understanding of, how their undergraduate training in HD/CMSD translates to the broader safe, competent and confident medical management of patients, including those with chronic disease or disability, as newly-qualified, independent, dental practitioners.

In the UK there are programmes for newly-graduated dentists to carry out their first year in general dental practice in a supported environment, in an approved training practice, with an approved trainer. Postgraduate dental deaneries support these foundation dental programmes and help to develop young dentists according to the principles described in the document, A Curriculum for UK Dental Foundation Programme Training<sup>3</sup>.

### **Materials and methods**

The study was supported by the postgraduate Dental Dean/Director and Associate Dean for Dental Foundation Training, and approved by the Cardiff University Academic Unit of Postgraduate Medical and Dental Education research ethics committee.

Final year dental students are the largest group applying to foundation dental programmes and can choose to apply to all the dental deaneries across the UK for their first dental practice posts. In Wales there are six programmes for Foundation Dentists (FDs) with between nine and twelve FDs on each

programme, giving a total of sixty-eight FDs in total. The FDs who took part in this study are graduates of twelve of the sixteen undergraduate dental degree programmes in the UK and came from all the four constituent nations of the UK. The study group also represented graduates from the longer-established, traditional dental schools, as well as the more recently established dental schools and graduate-entry degree programmes. The study group can be said to be representative of the graduating dentists in the UK.

The questionnaire was paper-based and covered 2 sides of A4 paper, accompanied by a separate page describing the purpose of the study and the ethical approval received. For ease of completion and with the aim of increasing response rates, the majority of questions had tick boxes, yes/no options (or similar) and Likert-style responses<sup>12,13</sup>. In addition, there were free-text boxes to allow clarification or explanation of responses where needed.

The questionnaire was distributed to the training programme directors of the six FD programmes across Wales and then administered to FDs for completion at one of the regular study days between January and March 2018. The aim of capturing the views of FDs at approximately the mid-point of the year programme, when they would be relying on their knowledge and training of HD/CMSD from their undergraduate programme, i.e. before they had refreshed and updated this knowledge with continuing education.

## **Results**

The questionnaires were completed by 66 of the possible 68 foundation dentists giving a response rate of 97% and 65 of the 66 FDs (98%) graduated in 2017, prior to starting their FD training in September 2017. One FD graduated in 2016. None of the FDs had worked as dentists prior to joining a dental foundation programme. Fourteen FDs (21%) were graduates of non-dental degree courses prior to starting their undergraduate dental studies and eight of the fourteen FDs (12%) came from dedicated graduate-entry dental degree courses. Two FDs (3%) undertook intercalated degrees during their undergraduate dental studies.

In relation to the HD/CMSD teaching the FDs received as part of their undergraduate curriculum, all reported that they contained elements of pathological mechanisms (inflammation, neoplasia, immunity etc.) and clinical disease as applied to body systems (respiratory disease: asthma; COPD and cardiovascular disease: arrhythmia; hypertension etc.). Regarding clinical attachments, 49 FDs (74%) reported having these, with the majority being in medicine and in surgery, and a minority in emergency medicine departments. Sixty-two FDs (94%) reported having practical hands-on teaching in their HD/CMSD courses.

Most of the FDs reported their HD/CMSD courses were delivered over 2 years or 3 years in the undergraduate curriculum. The two-year courses were most commonly delivered in years 2 and 3 (of a typical 5-year dental undergraduate course) and the three-year courses were most commonly delivered in years 1 to 3. When asked about the timing of the HD/CMSD teaching in their courses, 60 (90%) felt they were about right, but 3 (5%) thought the course was too early (in years 2-3, and 3-4), and 3 (5%) thought it was delivered too late (in years 2-3, 2-4, and 4-5). The courses were predominantly delivered as lectures (55 FDs, 83%) although other modes of delivery included plenaries, small group and problem-based learning (PBL). Eleven (17%) FDs had no lectures in their HD/CMSD courses and for these PBL was the predominant mode of delivery (8 FDs, 12%).

When asked about who delivered their HD/CMSD courses, 27 (41%) FDs reported teaching from predominantly dental staff, 28 (42%) FDs reported teaching from predominantly medical staff and the remaining 11 (17%) FDs said teaching was evenly delivered from both. 72% of FDs felt that the teaching was appropriate for dental undergraduate students and 95% felt that teaching from dental staff provided the best links to clinical dentistry.

In relation to assessment, 80% of FDs reported having a separate formal summative assessment of the HD/CMSD teaching, and the remainder reported that HD/CMSD was assessed in combination with other curriculum topics in summative examinations. Seventy-five percent reported having some form of practical assessment in HD/CMSD, most often regarding management of medical emergencies.

The remainder of the questionnaire asked FDs about their attitudes and understanding of HD/CMSD in relation to clinical practice. The results are shown in tables 1 to 3.

Table 1 shows that most FDs are very confident, or reasonably confident (73% combined) that the teaching from their HD/CMSD courses has prepared them for safe independent practice and also that most think that patients do not realise that they have had teaching in HD/CMSD topics as an undergraduate (no, probably/no, definitely = 43%)

Table 2 relates to how the FDs feel their teaching in HD/CMSD has prepared them for independent practice in relation to understanding medical conditions and patients' medications. 86% strongly agree/agree that they are able to understand the medical histories patients give them and 85% strongly agree/agree that they can understand the relevance of the drugs patients list on their medical histories.

Table 3 relates to how FDs feel their understanding of patients' medical history prepares them for prescribing medications and planning restorative or surgical treatments. 91% strongly agree/agree that they understand how the patients' medical history affects dental prescribing. 82% strongly agree/agree that they understand how a patient's medical history may affect proposed restorative treatment plans, and 86% strongly agree/agree how a patient's medical history may affect proposed surgical treatments.

## **Discussion**

In this study, all but one of the sample group of FDs had graduated from their dental undergraduate course immediately prior to starting their dental foundation training programmes. This was a mixed group of FDs who trained in all areas of the UK and featured dental graduates from long-established traditional dental schools including graduate-entrants, and dentists from more recently established graduate-entry only dental courses. The FDs accounts of their HD/CMSD courses were positive with most of the opinion that their teaching was delivered at an appropriate time in the undergraduate

course and was appropriate for dental undergraduates whether delivered by medical or dental staff. Most FDs described separate summative assessments for HD/CMSD in their examination schedules. The FD participants were from programmes across Wales, but since they represented 12 of the 16 dental undergraduate schools in the UK, there is no reason to suppose these questionnaire responses would be any different from foundation dental programmes across the UK.

## **Conclusions**

This study shows that the HD/CMSD teaching delivered in dental schools across the UK prepares new dental graduates for independent safe management of all their patients, including those with chronic disease or disability, and gives a solid foundation to prepare them for changes in population demographics such as an increasingly aged population with the associated medical morbidities and complexities this brings.

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