

IN BRIEF

- Dental graduates now have a restricted number of orthodontic skills on qualification as defined by the GDC's revised *First Five Years*.
- The alignment of the undergraduate orthodontic curriculum at Newcastle with the *First Five Years* is described.
- The course aims are to provide: an understanding of orthodontics; the ability to assess a patient's orthodontic care and refer appropriately; and the ability to make safe any orthodontic appliance.
- It is important that VT trainers and GDPs realise these redefined outcomes for the new graduate, and appreciate what their abilities are with regard to orthodontic care.

Undergraduate orthodontic teaching in the new millennium – the Newcastle model

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This paper identifies the main factors which have influenced the nature of the undergraduate orthodontic curriculum presently taught at Newcastle University. It also outlines the philosophy that underpins the teaching, states the professional aims of the tutors and spells out the clinical objectives set for the students.

INTRODUCTION

Regrettably there has never been an agreed national consensus of opinion about what, if any, orthodontics should be taught to undergraduate dental students. It is perhaps therefore not too surprising that the standard of orthodontic treatment provided by most GDPs is unsatisfactory and sometimes even detrimental to the dental well being of their hapless patients.¹

This unfortunate situation is exacerbated by the often inappropriate or non-referral of patients in need of specialist attention. The overall picture is further clouded by the uneven take up of the services available across the country.² Whilst recognising the predicament, prescribing a satisfactory solution is made even more difficult by both the progressive reduction in the overall number of academic tutors and the loss of valuable teaching time to other interdepartmental disciplines.³

In a welcome though belated effort to try and unify the provision of appropriate

undergraduate training, the 2001 meeting of the University Teachers Group of the British Orthodontic Committee, took the view that all undergraduate dental students should receive a recognised level of tuition in orthodontics. It was proposed that the GDC's review should include a revised so-called 'paragraph 95'⁴ in 2001. In the second edition⁵ this is now paragraph 82, stating that all dental students ought to be able to recognise and describe the developing occlusion and malocclusion and be able to make an orthodontic assessment for the purpose of identifying and describing any manifest and developing malocclusions – whilst recognising the significance, timing and likely outcome of such interventions.

Furthermore, during their training, undergraduate students should not only see but also assist in the fitting of all types of orthodontic appliance, and be competent to manage those problems associated with a mixed dentition where interceptive treatment is desirable.

Taking cognisance of the opinions expressed by tutors contributing to the ongoing UK debate on the matter, and in a determined effort to standardise and improve the level of undergraduate tuition provided at Newcastle University, the resident teaching staff have recently appraised and subsequently revised the orthodontic curriculum. This change was initiated in 2001 during the period of finalisation and

publication of the second edition of the *First Five Years*⁵ and implemented in 2002/3. It is expected that further iterative development will continue as discussions on the level of orthodontic knowledge required at graduation continue. Staff at Newcastle feel that our current undergraduate course reflects the content and spirit of both the second edition of the *First Five Years*⁵ and those of the University Teachers Group of the British Orthodontic Society. This paper is to help inform general dental practitioners and vocational trainers of how undergraduate orthodontic education is developing and the level of orthodontic knowledge and skill that can be expected of a new graduate.

At the outset, more emphasis is given to formally clarifying the overall teaching philosophy of the orthodontic department within the dental school, and emphasising the general aims of the course as well as the specific measurable objectives set for the students as defined by the GDC.⁵ These aspirations may be briefly stated as follows:

Philosophy

The Newcastle undergraduate orthodontic course is based on the premise that newly qualified dentists should be able to assess the general orthodontic needs of every patient. They should also be able to recognise and describe manifest and developing malocclusions. In addition they should also be able to undertake a limited number of

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relatively simple interceptive procedures in which they are competent, whilst recognising those cases that should be referred for specialist treatment.

We see the undergraduate course as a 'hands-on' introduction to orthodontics, which forms a small but valuable part of the overall dental education of students, and not as a highly structured training programme in the discipline. That we believe to be within the postgraduate domain.

It is therefore our intention to engender an initial interest in orthodontics, and dispel any lingering mystique about the discipline. This is achieved by exposing the undergraduate students to a variety of simple orthodontic appliances and practices, and helping them to understand when and what treatment may be needed, and what final results represent an acceptable outcome. We also wish to encourage the continued development of basic orthodontic skills by GDPs as part of a career-long learning process.

General aims

Our overall objective is to produce safe and effective dentists, by providing students with a knowledge and understanding of a number of basic orthodontic strategies by which some malocclusions may be rectified. These competencies and procedures include the following:

1. The ability to identify and assess the need for orthodontic treatment, the insight to prescribe the optimal timing of an appropriate intervention, and the willingness to refer those patients requiring specialist attention to an appropriate provider.
2. The development of a limited number of basic skills in appliance treatment that, with guidance, the graduate student should be able to deliver successfully to his/her patients. These include the ability to design, fit and monitor appropriate removable appliances to correct a posterior cross bite or a single tooth in anterior cross bite, and the wherewithal to provide removable space maintainers as required.
3. To enable a newly qualified GDP to confidently dispense emergency treatment for a damaged or displaced orthodontic appliance as well as providing effective routine dental care whenever an appliance is in place.

Specific objectives

By the end of the basic introductory orthodontic course students demonstrate their ability to:

1. Provide an initial orthodontic diagnosis of the patient, including the correct use of the Index of Orthodontic Treatment Need (IOTN).

2. Design, construct, fit, monitor and adjust appropriate removable appliances to correct a posterior cross bite or a single tooth in anterior cross bite.
3. Provide removable space maintainers, if and as required.
4. Realise the limitations of orthodontic treatment and recognise what constitutes the minimal acceptable outcome of such treatment.
5. Appreciate when specialist expertise is desirable and the willingness and know-how to refer patients accordingly.
6. Explain and discuss the nature of any proposed orthodontic treatment with the patient (and parents) concerned.
7. Dispense emergency treatment for a damaged or displaced orthodontic appliance, as well as providing effective routine dental care wherever an appliance is already in place.

Undergraduate curriculum

To achieve the above aims and objectives, the Newcastle course is integrated vertically and horizontally within the curriculum, beginning with facial and dental anatomy in the first year, cranio-facial development, occlusion and dental materials in the second year. This provides the theoretical basis for later clinical teaching.

The clinical years (third, fourth and fifth) are focused on the need to provide adequate and appropriate laboratory and clinical experience, which are specifically designed to deliver a series of supervised 'hands-on' problem-based learning experiences. Third and fourth year lecture and seminar programs develop the students' knowledge of basic strategies of orthodontic management. The fifth year develops their assessment skills allowing them to begin to outline provisional treatment plans.

The course progressively develops and increases the undergraduate's knowledge, insight and practical experience.

TIMETABLE

First year

A lecture, practical and seminar course on dental anatomy and embryology with teaching input by orthodontic teachers to illustrate clinical relevance.

Second year

A lecture and seminar course on cranio-facial development, occlusion and dento-facial abnormalities, including a practical course on cephalometrics in relation to development and growth. Orthodontic teachers have a significant teaching input in placing clinical understanding of theoretical knowledge. The dental materials course pro-

vides a theoretical and practical basis for orthodontic materials (adhesives, impression materials, metals) and their choice.

Third year (First clinical year)

A laboratory-based course designed to develop manual dexterity and introduce the skills involved in designing and constructing various types of removable and simple fixed appliances. Clinical seminars on impression taking for study models and fitting of removable appliances (a removable appliance is constructed by the student from the student's impression for themselves for the clinical seminar on fitting of a removable appliance). A lecture based course begins on orthodontic management.

Fourth year

As well as the ongoing lecture-based course designed to further extend the students' knowledge, a seminar programme is provided. This is essentially a problem-based approach using specifically selected cases to illustrate common orthodontic conditions, problems and their resolution. This experience provides the student with the knowledge and understanding of a number of basic strategies for treating different forms of malocclusion. During the fourth year students are also introduced to the end-results of a number of actual cases. This allows them to develop an understanding of the treatment modalities required in specific cases and an appreciation of what constitutes an acceptable treatment outcome.

In addition, students complete the first part of a two year longitudinal study of a limited number of patients (a minimum of three). This hands-on care gives students practice in using removable, functional and simple fixed appliances under the direct supervision of a senior orthodontic specialist. Each student is given the opportunity to provide longitudinal treatment with the three main types of appliance. Fixed appliances are limited to single arch or sectional appliances to provide experience of placing brackets and adjusting and changing arch-wire. With regards to this latter activity the students more or less fulfil the role of an 'orthodontic auxiliary'.

Fifth (final) year

Continuation and completion of the two year longitudinal study cases started in year four. Students also have monthly diagnostic seminars, in which they assess new orthodontic patients (from the hospital orthodontic waiting list), request radiographs where appropriate and take study models. The student then has two weeks in which to prepare a diagnosis and treatment plan. These are subsequently presented at a seminar before a

peer-group and tutor. After discussing the possible strategies and their respective implications, a final treatment plan is agreed. The student (under supervision) presents this to the patient and their parents.

Obviously, we need to assess whether or not we are achieving our outcomes and we use a combination of conventional exams – written and clinical *vivas* to assess students' knowledge and ability to undertake an assessment diagnosis and treatment plan. The clinical skills are assessed on clinic by continual clinical assessment. In addition the students must undertake a number of competency assessments⁶ before being allowed to progress to finals. In orthodontics they have to show competence in: taking study models; the

fit/adjustment of an orthodontic appliance; in undertaking an orthodontic assessment, provisional diagnosis and treatment plan and in being able to present and discuss it with the patient. In addition the students complete clinical portfolios which form part of a formal case presentation in the penultimate term of the final year. This allows students and clinical tutors to assess their clinical experience and encourages the student to reflect upon their clinical experience.

It is our declared intention and certainly our hope that, by clearly stating the purpose, desired outcomes and nature of the course, teaching staff may be kept on track, students held more accountable for their achievements, and VT/GPT trainers persuaded to adopt more realistic

expectations regarding the orthodontic capabilities of recently qualified and relatively inexperienced young dentists.

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