# In-patient operating exposure for dental undergraduates: a valuable experience?

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**IN BRIEF**

- Examines the utility of observing in-patient oral and maxillofacial (OMFS) operating for undergraduates.
- Provisionally explores any relationships between observation of a procedure and perceived comfort in explaining procedure in lay person terms
- Identifies improvements that are possible in undergraduate exposure to OMFS in-patient operating lists.

EDUCATION

The General Dental Council, the Association of Dental Education in Europe and the Association of British Academic Oral and Maxillofacial Surgeons have all issued syllabuses suggesting undergraduate dental students should gain experience of oral and maxillofacial in-patient operating. **Aim** To examine whether final year dental students in a UK dental school had observed, and were comfortable providing an explanation of, oral and maxillofacial in-patient operating. **Materials and methods** Students at Newcastle University's School of Dental Sciences have block allocations to in-patient operating (16 half-day sessions). A questionnaire was distributed to the whole of the final year (n = 78) at the end of these allocations examining different aspects of their exposure to in-patient operating. **Results** A response rate of 81% (n = 63) was achieved. Those responding reported that they had seen a wide variety of surgery. The most common procedural group that had not been observed was orthognathic surgery (n = 33, 52%). There was no correlation ($p > 0.05$) between total number of procedural groups observed and total number of procedural groups that students were confident to explain, although there were significant correlations ($p < 0.05$) between having observed specific operations and having the confidence to explain them. The students felt that the block allocations were beneficial (n = 46, 63%) and offered a variety of free-text reasons for this. Only a minority (n = 24, 38%) had been actively involved in the surgery they had observed, the majority of those individuals having undertaken some suturing (n = 11). **Conclusions** Students perceive allocations to oral and maxillofacial in-patient operating as beneficial for a variety of reasons. The relationship between having observed a procedure and the individual's perceived ability to explain it appears to be complex. It is difficult to achieve consistent exposure throughout a large year group of undergraduate students, but more targeted learning may be of benefit.

## INTRODUCTION

The General Dental Council,[1,2] the Association of Dental Education in Europe,[3] and the Association of British Academic Oral and Maxillofacial Surgeons[4] have all issued syllabuses suggesting dental undergraduates should gain experience of oral and maxillofacial in-patient operating. The main groups of operations performed for oral and maxillofacial in-patients are trauma, orthognathic, salivary gland, and oncology surgery.

The rationale for the need to observe oral and maxillofacial operating is not made explicit in *The first five years*,[2] although one assumes it is so undergraduates have a broad understanding of the remit of oral and maxillofacial surgery (OMFS). This would then enable them to:

- Provide helpful information to any of their patients who were undergoing oral and maxillofacial procedures
- Understand their potential role in the pre- and postoperative phases.

There is no existing evidence detailing dental undergraduate exposure to OMFS. Exposure is better documented among medical undergraduates,[5–15] but the available data is still limited. Within the confines of the dental undergraduate curriculum there is no guarantee that it is possible for all undergraduates to gain experience in all types of operative procedure.

The aim of this study was therefore, to examine what dental undergraduates observe in oral and maxillofacial in-patient operating and how confident they now feel explaining the common OMFS procedures.

## METHODS

Undergraduates at Newcastle University's School of Dental Sciences have block allocations to in-patient operating (16 half-day sessions). These sessions are distributed over three hospitals: Sunderland Royal Hospital, Newcastle General Hospital and Newcastle Freeman Hospital. They are designed to satisfy the syllabuses issued by the General Dental Council, the Association of Dental Education in Europe and the Association of British Academic Oral and Maxillofacial Surgeons. The exposure to OMFS procedures is not standardised. Undergraduates may observe operations performed as part of a normal NHS surgical list. The areas of OMFS seen, therefore, may vary greatly between undergraduates, as may their experience with regards to possibly scrubbing up and the teaching

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they receive from the operating surgeon. Undergraduates were exposed to a variety of different surgeons all of whom may have had varying degrees of interest and skills in education. Thus, there is likely to be an element of bias in the results with a more positive outcome from the undergraduates that were exposed to a more effective educational experience centred around their surgical observation.

An anonymous paper questionnaire was distributed to all dental graduates at the end of their final year in 2009 (n = 78). The questionnaire is shown in Figure 1 and examines different aspects of their exposure to maxillofacial in-patient operating. A variety of response formats were used: Likert, dichotomous and free text. The questionnaire is subjective in nature as it enquires about the individual's perceived ability to explain OMFS procedures in a clear and correct manner, rather than measuring their actual ability to do so.

Responses were voluntary and data from the questionnaires were entered into SPSS version 17 (SPSS, Chicago, USA) for statistical analysis. Simple descriptive statistics and Spearman's rho were calculated.

## RESULTS

A response rate of 81% (n = 63) was achieved. Those responding reported that they had seen a wide variety of surgery. The most common procedural group from OMFS that had not been observed was orthognathic surgery (n = 33, 52%).

Figure 2 shows undergraduate responses to the Likert based questions (1a, 5, 6b and 7) regarding how beneficial different aspects of the OMFS allocations were.

Responses to the free text questions (1b and 4b) were varied, but recurring qualitative themes were that the allocations were beneficial because undergraduates observed a wide range of surgery (1b) and that procedures performed included assisting, suturing and extractions (4b).

Table 1 shows the Spearman's rho correlations between having observed a procedure and having confidence to explain it to a patient in layperson's terms. Significant correlations ($p < 0.05$) were also found between different procedures within the same OMFS procedural grouping. These were between being confident in explaining:

- Le Fort fracture and orbit blow-out

| Question | | | Response type |
|---|---|---|---|
| 1a | I felt my OMFS attachments were beneficial | | Likert scale |
| 1b | If you felt they were beneficial, why was this? | | Free text |
| 2a | Were there any differences between attachments? | | Dichotomous |
| 2b | If so, what were they? | | Free text |
| 3 | Of the procedures below, please indicate:<br>a) those you have observed<br>b) those that you would be confident to give a basic explanation of to a patient you were referring for surgery | | Dichotomous |
| | Trauma | Orbital/zygomatic fracture ORIF | |
| | | Mandible fracture ORIF | |
| | | Le Fort fracture | |
| | Orthognatic | Sagittal split or vertical subsigmoid osteotomy | |
| | | Le Fort osteotomy | |
| | Salivary gland | Submandibular gland removal | |
| | | Parotidectomy | |
| | Oncology | Neck dissection | |
| | | Laser excision | |
| | | Free/local flap repair | |
| 4a | Did you do any operating under GA during your allocations? | | Dichotomous |
| 4b | If so, what procedure(s) did you perform? | | Free text |
| 5 | I felt the multidisciplinary head and neck clinics for oral cancer were beneficial | | Likert scale |
| 6a | Did you do any on-call shadowing on your allocations? | | Dichotomous |
| 6b | I feel shadowing the SHO out of hours on-call was or would be beneficial | | Likert scale |
| 7 | I feel that a whole week (am and pm) allocation would be beneficial | | Likert scale |

**Fig. 1 Abbreviated version of the questionnaire used in the study**

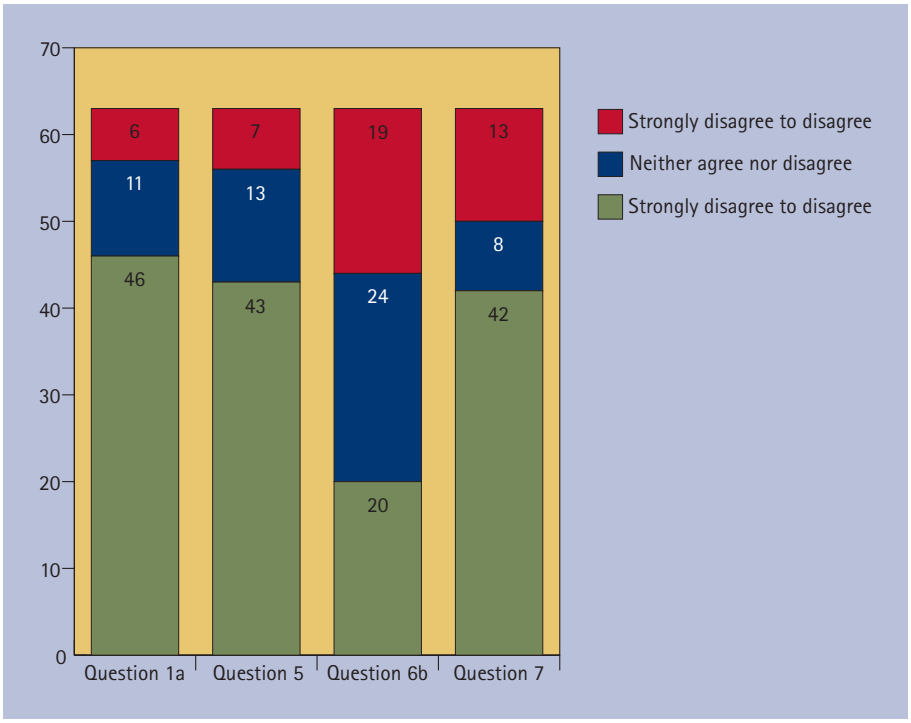


**Fig. 2 Frequency of collapsed responses to questions 1a, 5, 6b and 7**

**Table 1 Spearman's rho correlations between procedures observed and confidence in explaining the procedures**

| Procedural group | Operation | % observed | % confident | Spearman's rho coefficient (r) |
|---|---|---|---|---|
| Trauma | Orbital/zygomatic fracture ORIF | 70 | 62 | 0.197 |
| | Mandible fracture ORIF | 81 | 78 | 0.065 |
| | Le Fort fracture | 29 | 29 | 0.139 |
| Orthognathic | Sagittal split/vertical subsigmoid osteotomy | 41 | 38 | 0.338** |
| | Le Fort osteotomy | 22 | 29 | 0.592** |
| Salivary gland | Submandibular gland removal | 44 | 37 | 0.317* |
| | Parotidectomy | 44 | 57 | 0.516** |
| Oncology | Neck dissection | 89 | 46 | 0.023 |
| | Laser excision | 59 | 52 | 0.492** |
| | Free/local flap repair | 49 | 33 | 0.247 |

Key: ** p<0.01; * p<0.05

- Parotidectomy and submandibular gland removal
- Neck dissection and laser excision
- Neck dissection and free/local flap repair
- Sagittal split and Le Fort osteotomy.

## DISCUSSION

All procedures had positive correlations between having been observed by an undergraduate and the undergraduate then having the confidence to then explain them. This may be evidence that exposure to the procedures is beneficial, or it may be incidental and other areas of the dental curriculum may have contributed to student confidence, for example didactic teaching or self-study.

The three most frequently observed procedures: neck dissection, mandible fracture open reduction internal fixation (ORIF) and orbital/zygomatic fracture ORIF, were not significantly positively correlated with confidence to explain them. This may suggest that more than just simply observing the procedures is required for students to achieve confidence and understanding. There may also be differences in the teaching of orthognathic and salivary gland surgery in comparison to trauma and oncology, or perhaps greater interest and motivation to learn about particular procedures. Greater interest in particular procedures, or differences in teaching/teacher, may also be the reason behind some of the discrepancies between numbers of students confident to explain the procedure and numbers who have observed the procedure. For instance greater numbers of students were confident to explain Le Fort osteotomies and parotidectomies than the number who had observed the procedure.

The increased complexity and morbidity of some procedures such as neck dissection may also contribute to a reduced undergraduate understanding. However, this would not explain why undergraduates are not confident explaining mandible fracture ORIF, which is a relatively simple procedure. It may be that more familiar areas of the dental curriculum such as orthodontics and facial development are potentiating better OMFS understanding in related areas such as orthognathic surgery, while students have less background knowledge to fall back on for trauma and oncology as they appear later in the curriculum.

Students generally felt that the attachments were beneficial, but 8% did not. Some students felt that a lack of defined educational outcomes and objectives left them unmotivated about participating in the allocations. Objectives need to be validated and perhaps some form of assessment for this area of the course could provide some educational direction and test knowledge gained.[5] Many also found the attachments did not stimulate their interest as there was minimal practical involvement, which is in stark contrast to the clinical work carried out in the majority of the dentistry course.

Existing evidence from studies regarding medical undergraduate surgical exposure suggests it has limited benefit and many point to the learning environment within surgery as a source of dissatisfaction. Undergraduates found that they were often unable to view a procedure and that there was infrequent staff-student interaction, whether this was peri-operative explanation or post-operative debriefing.[6] Surgeons, however, have a conflict of interest and may see providing a service of care to patients as more important than teaching undergraduates due to the limited time available.[6,7] There may also be less financial incentive for a surgeon to dedicate the necessary amount of time required to teach properly.[7,8] Delivery of patient care may therefore be prioritised at the expense of education.[9] Limited undergraduate practical participation in this environment may also mean that interest is not stimulated,[10] but ultimately as the surgeon takes responsibility for any operating errors, if they are not comfortable letting an undergraduate assist then that is their decision.[11]

It is very difficult to standardise undergraduate OMFS exposure in their allocations at three different hospitals. A varied experience is provided through the wide range of in-patient operating.[11,12] Some standardisation is achieved by using the same hospitals throughout, on the same days, with the same surgeons. However, it is a National Health Service that undergraduates observe and every case is going to be different.[5,12] It is essentially luck as to whether the undergraduate exposure is of interest and concurrent with their reading material. This short, random and unpredictable exposure to a diverse range of patients has little effect on pattern recognition and resultant knowledge gained.[5] This could explain why not all procedures have a significant positive correlation between being observed and undergraduates being confident in explaining them in our study. A few dental undergraduates are not experiencing some procedure types at all and therefore cannot be expected to be confident in these. Similarly, Ladak *et al.* found that over 50% of medical undergraduates fail to see 50% of surgical procedure types at least once.[11] One might argue, however, that undergraduates should still gain sufficient knowledge from their didactic teaching in order to be confident in explaining a procedure.

The allocations are perceived to be of benefit to most of the undergraduates responding. They make for a more diverse undergraduate course and by exposing undergraduates to maxillofacial surgery, enough interest may be generated for them to decide to pursue surgery as a career.[10,13]

Newcastle University introduces its OMFS allocations in the final two years of the dentistry course. This is ideal as undergraduates are able to contextualise the procedures once they have baseline knowledge. For example knowledge of anatomy can be applied. Good recognition of what is natural anatomy and what is disease will reduce inappropriate referrals to surgeons and wastage of resources.[14,15] Being able to observe a procedure from start to finish and witness its risks, benefits and morbidities in order to treat a condition, better informs the undergraduates. Knowledge that is gained and then utilised in a practical environment is better retained, whereas passive knowledge gained in lectures alone is lost fast.[8,16] Active participation by the undergraduate whether assisting in procedures or interacting with staff reinforces this principle.[11,16] This format of learning draws from aspects of problem-based learning (PBL) where a problem is worked through from start to finish in order to find a solution to that problem through further learning. Many have found PBL to be the most effective format of teaching and learning.[8,16]

Undergraduates often gain more from interactions with staff than from the clinical setting itself and a surgeon needs to explain, question and give feedback to undergraduates about a procedure for teaching to be effective.[13,16,17] If a surgeon finds this difficult due to time constraints, senior house officers can assist. They are often viewed as less intimidating and more approachable than surgeons and also have substantial knowledge about the procedures. Financial resources, however, do need to be better allocated in order to educate undergraduates and reward NHS staff for doing so.[7,8] Time should also be set aside for effective teaching. There is great value in debriefing after a procedure and providing feedback, which will encourage undergraduates to engage in reflection, helping them to develop a professional attitude to their experience.[6,8,13] By virtue of the *ad hoc* logistics of the rotations, undergraduates were exposed to a variety of surgeons with varying degrees of interest and skills in education. It is therefore likely that there will be an element of bias with a more positive outcome from the undergraduates that were exposed to a more effective educational experience centred on their surgical observation.

This is a retrospective study and the data were drawn from a relatively small student sample size. The study's nature may have introduced retrospective bias of students' experiences of OMFS procedures and record inaccurate accounts. The data may have been more accurate if the questionnaires were completed at the end of each allocation. Part of the questionnaire data also relies upon opinion, thus confidence in OMFS understanding is self-perceived, subjective and not an accurate predictor of ability in practice. Objective assessment of student understanding would provide better data. By having to complete some sort of assessment or logbook, reflection upon learning and understanding can be ensured, as many undergraduates are not motivated to do so otherwise.[18] One assessment option that may be applicable to this situation is a mini-CEX (case examination) that assesses their abilities in explaining procedures to patients conducted after their block allocations. The mini-CEX could be focused around a discussion with a mock patient who the student is intending on referring from general dental practice for a potential maxillofacial procedure. This type of assessment may then lend itself to multicentre testing to inform policy on the benefits of this type of teaching similar to that recently conducted with suturing skills.[19] The assessment should probably not be focused on informed consent as 'it is always best for the person actually treating the patient to seek the patient's consent', or at least the individual concerned should be trained to take consent for that procedure or be capable of conducting the procedure.[20]

Governing bodies view it as necessary for dentists to be knowledgeable about maxillofacial OMFS procedures and therefore surgical in-patient allocations do serve a purpose. Early recognition of a patient's need for maxillofacial surgery can be of enormous benefit to their patients, particularly with regards to oral cancer screening and survival rates.[15] Dentists need to be able to perform a role around this where they can reassure the patient, tell them what to expect and treat them post-operatively.

## CONCLUSION

Students perceive allocations to oral and maxillofacial in-patient operating as beneficial for a variety of reasons. The relationship between having observed a procedure and the individual's perceived ability to explain it appears to be complex. There are positive correlations for some procedures, but not all. This points to other factors such as pre-existing knowledge and teaching within this environment that contribute to understanding as well. It is difficult to achieve consistent exposure throughout a large year group of undergraduate students observing a sometimes unpredictable working service.

Although the patient lists cannot be regulated, more structured and targeted learning may be possible if the allocations were orientated around an assessment or logbook. Undergraduates could then reflect on their observations, ensuring one of each type of OMFS procedure is observed. By introducing structured seminars in the five key areas, both before and after exposure to the theatre environment, clearer learning outcomes could be identified to provide more directed foci for learning, which would also resolve any discrepancies in undergraduate experience. However, the seminars would have to be consistent between centres. Issues discussed regarding interactions with staff and the teaching received within the theatre environment also need to be investigated further and addressed to make for more effective allocation. The obvious constraint here is the priority of patient care.


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