

## ORIGINAL RESEARCH

# The Need for Plastic Surgery in the Medical Undergraduate Curriculum

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**Introduction:** Plastic surgery is a unique and varied specialty encompassing many spheres and offering solutions to problems that other specialties cannot. The ability to refer patients to this specialty depends upon physicians understanding its remit. Our study was designed to assess junior doctors' knowledge and understanding of the problems that plastic surgeons deal with and to assess if they could make safe referrals when presented with common clinical problems.

**Method:** 50 Foundation Year 1 doctors were surveyed to assess their knowledge and management of clinical problems, and to ascertain their direct experience in different surgical specialties including plastic surgery.

**Results:** 30% (15/50) doctors had spent time in a plastic surgery department as an undergraduate and they had a greater understanding of common clinical problems that plastic surgeons deal with, scoring 8.8/15 correct answers (range 3–14) compared to 2.7/15 correct answers (range 0–6) for those who had not ( $p = 0.0001$ ). These doctors who had spent time in plastic surgery units also performed better on managing common clinical problems with a safe referral to a specialty other than plastic surgery that could also manage said problem.

**Conclusions:** Doctors, who spend time in a plastic surgery department as an undergraduate, have greater understanding of clinical problems that plastic surgeons deal with. They also demonstrated safer referrals to other appropriate specialties. Key concepts of plastic surgery must be included in the undergraduate curriculum to improve education and patient safety; failure to do so, may disadvantage or potentially harm patients.

**Keywords:** Plastic Surgery; Undergraduate; curriculum; subspecialty

## Introduction

Plastic surgery is a well-established surgical discipline that encompasses great variety and multiple subspecialties, that may be broadly divided into aesthetic surgery, burns, reconstructive surgery (itself subdivided into hand surgery, breast reconstruction, lower limb and head and neck cancer management), and skin cancer.

First-world plastic surgery surgical training focuses on reconstructive skills and soft tissue handling, to equip plastic surgeons with the ability to handle a wide array of hard and soft tissue defects, using, for instance, an armamentarium of tissue flaps. The service provided by plastic surgical units is unique and valuable, but the last decade or so has seen traditional sectors of this specialty being increasingly adopted by other specialties. For example, dermatologists are surgically managing a large percentage of skin cancers [10], general breast surgeons are doing

more pedicled flap reconstructions [1], maxillofacial surgeons are undertaking more microsurgery [2], and orthopaedic hand surgeons are managing the spectrum of hand pathology. Also, as is commonly occurring and established in many countries around the world, aesthetic surgery is increasingly being performed by Non-Plastic Surgery doctors from a wide variety of specialties and training (e.g. Max Fax, ENT, Ophthalmology, General).

This change in boundaries combined with regular media portrayal of plastic surgery as a superficial indulgence for the wealthy, has seen an erosion in the true understanding of plastic 'surgery' amongst healthcare professionals and the public [3] coupled with a decline in referrals to the specialty. Not only does this harm our specialty but it may also harm patients who are being denied unique solutions that may not be considered or offered by other specialties.

Accordingly, we decided to evaluate the knowledge of junior doctors and their answers regarding the referral of specific surgical problems to appropriate specialties. The aim of this study was to demonstrate the importance of plastic surgery being an integral component of the undergraduate curriculum, and the need to ensure the preservation of

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this unique specialty to, ultimately, provide effective, safe service to patients.

## Methods

Two-part, anonymized questionnaires were given to 50 Foundation Year 1 (FY1) doctors at teaching hospitals in Scotland and in Central London. Questionnaires were distributed within 3 months of the FY1 doctors having commenced foundation training. None of the doctors surveyed had postgraduate working experience in plastic surgery. When 50 questionnaires had been completed no further questionnaires were handed out. Part one (**Figure 1**) tested the doctor's ability to make referrals to the appropriate specialty, and part two (**Figure 2**) questioned the doctor's experience in plastic surgery and other specialties during the undergraduate programme.

For the purposes of analysis, as this study was assessing the understanding of plastic surgery amongst these doctors, we ignored any questions regarding referral to other specialities. Doctors were verbally advised to give as many correct answers as possible, including multiple specialities for each question. Answers were considered:

- 1) negative (referred incorrectly to a specialty that does not deal with the problem)
- 2) safe (referred to any specialty including plastic surgery or another specialty that may manage the problem)
- 3) positive (referred appropriately and specifically to plastic surgery)

For instance a referral of a melanoma to a dermatologist was classified as "safe", but the same referral to a plastic surgeon was classified as "positive and safe".

Statistics were analysed using SPSS Chicago 2015.

## Results

50 foundation doctors who graduated from 14 different medical schools completed the questionnaire. 30% (15/50) had spent time in a plastic surgery department as a medical student, ranging from 1 to 4 weeks, either through the standard curriculum or via an elective placement.

Initially we compared the answers to Part 1 of the questionnaire, between those who had spent time in plastic surgery with those who had not. Firstly, we were evaluating the understanding of plastic surgery as a specialty, and therefore assessing referral specifically to plastic surgery. Of the 15 questions related to Plastic Surgery, the 15 doctors who had been exposed to this specialty had a mean score of 59% (8.8/15; range 3–14). In comparison, those who had not been exposed to plastic surgery as an undergraduate ( $n = 35$ ), scored a mean of 18% (2.7/15; range 0–6) (unpaired  $t$  test  $p = 0.0001$  95%; CI:  $-7.36$  to  $-4.87$ ).

Secondly, by looking at the referrals relating to plastic surgery, we assessed the number of 'safe' referrals, for example, a patient with a changing mole being referred to plastic surgery or dermatology. Doctors who had undergraduate experience of plastic surgery achieved an average

of 82% (12.3/15; range 9–15) compared to an average of 53.3% (8/15; range 4–12) for those without such experience (unpaired  $t$  test  $p = 0.0001$  95% CI:  $-5.57$  to  $-3.10$ ).

When reviewing safe referrals, the best score was for the scenario involving the cleft palate child, where 49/50 doctors knew which specialties to refer to, and the worst score was for the scenario involving facial palsy where only 10% ( $n = 5$ ) of doctors knew to whom to refer the patient.

## Discussion

In our study cohort, 70% (35/50) had no clinical experience within a plastic surgery department upon graduation from medical school. Whilst our cohort is admittedly limited (50 doctors working in three regions) and may, consequently, not be wholly representative of UK medical school graduates, this research does offer some important findings.

Some of the doctors surveyed encountered plastic surgery through teaching, others accessed it via self-selected elective and project placements. There is varied exposure of medical students to plastic surgery departments through the different medical schools within the UK. On surveying our colleagues from elsewhere in the EU, we also see a varied pattern. Two colleagues from Italy experienced lectures from plastic surgeons through the curriculum, however a colleague from Spain and Poland did not experience any plastic surgery via the curriculum. We also appreciate, that similar to the UK, practises may vary within these countries in different universities.

Doctors who had no experience of plastic surgery as an undergraduate performed worse with knowing which appropriate specialty, certain conditions should be referred to, in comparison with doctors who had spent time in a plastic surgery department. Although the questions were biased towards plastic surgical conditions, they are common patient conditions that doctors shall encounter in their career, particularly in emergency medicine and in general practice.

It is not uncommon in subspecialty clinics (e.g. 'Facial palsy clinic') to meet some patients who have had to educate their GPs on where they should be referred to. Such patients have inevitably discovered the appropriate subspecialty through personal research via online fora and websites. Importantly, this demonstrates that exposure to plastic surgery is in the best interests of patients, and is not just self-serving, i.e. not only in the interest of the specialty. It is important that all doctors, especially those who refer for tertiary management, have a good understanding of what and to where, to send their patients.

Patients should feel confident that their treating physician has a solid grasp of managing acute problems. It is obvious that spending time in any specialty, particularly as a junior doctor, helps to develop an understanding of conditions that are managed by each respective specialty; and the appropriate level of urgency for such referrals. However, niche specialties often have practical limitations in the number of junior doctors that can rotate into and gain exposure in those fields. Therefore, we agree with Burd et al's suggestion of becoming more involved in undergraduate education so that the core tenets of plastic surgery, including burns, are incorporated within

Problem	Surgical Specialty (Possible answers)
1. A patient whose leg has acutely become pale, pulseless and painful.	Vascular
2. A patient with a one-year history of progressive swelling of the parotid gland.	ENT, Maxillofacial, Plastics.
3. A patient with a one-month history of an ulcer on the tongue.	Maxillofacial, Plastics.
4. A patient whose voice has become hoarse for 4 weeks.	ENT, Maxillofacial
5. A patient with a traumatic wound where a significant amount of skin has been peeled-off from the limb.	Plastics
6. A patient with an itchy multi-coloured mole growing on their chest, with uneven edges.	Dermatology, Plastics
7. A patient with a rapidly spreading, greying skin infection.	General surgery, Orthopaedics, Plastics.
8. A patient with a swollen hand following punching a mouth.	Orthopaedics, Plastics.
9. A patient suffering from hyperhidrosis requiring definitive treatment.	General Surgery, Plastics.
10. A patient desiring breast reconstruction 4 years following a mastectomy.	General breast surgery, Plastics.
11. A carpenter who had sliced off his thumb.	Hand surgery (whether plastics or specifically orthopaedic hand surgery).
12. A patient with a facial palsy secondary to facial trauma/ previous surgery.	ENT, Maxillofacial, Plastics.
13. A patient for whom, following an operation, surgeons are unable to close the wound.	Plastics
14. An elderly woman who has fallen over and sustained a large pre-tibial haematoma.	Orthopaedics, Plastics.
15. A patient who had sudden-onset loin pain and hypotension, associated with temporary loss of consciousness.	Vascular surgery
16. A patient with a deep burn to the arm.	Burns (usually plastics, but sometimes general surgery).
17. A patient with non-resolving haematuria despite two weeks of antibiotics.	Urology
18. A patient requiring venous access for long-term dialysis.	Vascular surgery
19. A patient passing air and faeces in their urine	General surgery (colorectal)
20. A patient with an abscess under the armpits.	General surgery, Plastics.
21. A patient with a 1-2cm wide skin cancer on the eyelid	Ocuplastic ophthalmology, Surgical dermatology, Plastics
22. A patient with worsening paralysis following head trauma	Neurosurgery
23. A child with a cleft palate	Maxillofacial, Plastics.

**Figure 1:** Page 1 of questionnaire.

curricula [3, 4]. Core curricula in medical schools are augmented by student electives, and plastic surgeons should be involved in their design, in order to highlight and clarify the range of services that may be offered. Fortunately, plastic surgery is a versatile specialty with cross over to other surgical specialties. Therefore, like Ng stated, we

propose that relevant plastic surgery teaching be incorporated alongside related surgical specialties (e.g. teaching breast reconstruction with breast surgery, hand surgery and lower limb reconstruction with trauma and orthopaedics, burns with emergency medicine, skin cancer management with dermatology, etc.), in order to maximise

Surgical Specialty	Exposure (Weeks)
ENT	
Max-facs	
Neurosurgery	
Ophthalmology	
Plastics	
Vascular	
Urology	

**Figure 2:** Page 2 of questionnaire.

learning opportunities [3]. This can be accomplished by way of lectures, teaching tutorials and where available clinical placements.

Previous publications [5–9] have submitted questionnaires to medical students attending plastic surgery study days in their own free time and have shown improved understanding of our specialty with time devoted to it. The subject of our paper is different to these and seeks to focus on the importance of plastic surgery in the undergraduate curriculum, not purely to attract doctors to this specialty, but to improve patient care by increasing the knowledge of general practitioners and other referring doctors who may have no career interest in working in our specialty, but whom shall encounter numerous patients who shall benefit from timely referral to plastic surgery unit.

### Conclusion

Plastic surgery is a uniquely important specialty that offers a broad range of services and surgical skill-sets. If referring doctors do not know what we are capable of, patients could suffer due to a lack of appropriate onward referrals. A potentially sound way to improve this is through undergraduate education and exposure. In the interest of patient safety and care, plastic surgery should be an integral component of the undergraduate medical curriculum, where appropriate Plastic surgeons should be involved in lecture based and small group teaching in associated topics within the curriculum.

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The authors have no competing interests to declare.

### Author Contributions

- BR study design, data collection and analysis, writing manuscript.
- CJ study design, data collection and analysis, revising manuscript.

- NS study design, data collection and analysis, revising manuscript.
- BC study design, revision manuscript.

### Guarantor

Bernard Robertson is the guarantor.

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