

The British Student
Doctor Journal

BSDJ

VOLUME 1, No.2
30 June 2017
ISSN 2514-3174
bsdj.org.uk



Advanced Necrotising Enterocolitis

How well are we
managing them?



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Journal DOI

10.18573/issn.2514-3174

Issue DOI

10.18573/n.2017.10170

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Cardiff University Press

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Editorial

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No conflicts of interest to declare

THE ETHICS OF PUBLISHING

We are delighted to present to you the second issue of *The British Student Doctor*. In the six months since our launch at the end of January, we have received many high-quality submissions and great interest from medical students across the country to become peer reviewers. This enthusiasm for the project is very encouraging, and demonstrates the importance of providing this platform to medical students to develop their knowledge and skills in evidence-based medicine.

In this second issue, we are publishing our first piece of original research. In *'Epidemiology and outcomes of advanced necrotising enterocolitis'*, Charlotte Maden, a fourth year medical student at Cardiff University, investigates factors associated with this serious paediatric illness, and how these affect methods of management and mortality outcomes. Necrotising enterocolitis is a common emergency condition affecting neonates, which can have life threatening implications. This study could offer a valuable contribution for the management of this severe disease, both locally and internationally.

In the *Reflections* section of the journal, Aadil Sheikh, a student at the University of Birmingham, describes his experiences of attempting a medical elective in Israel. He intended to explore the health implications of the polarising conflict between Israel and Palestine, for Israeli Arabs, Palestinians of Jerusalem, and patients referred from the West Bank and Gaza. He argues that, through its altruistic values, medicine can be a *"bridge for peace"*, bringing together Israelis and Palestinians for the mutual goal of improving healthcare.

We are also pleased to publish an editorial on *"Why mindfulness matters in medical education"* by Dr Craig Hassed, an Associate Professor of the Department of General Practice at Monash University in Australia. He has been instrumental in the introduction of innovative training methods into medical training and has authored 10 books on this subject; as well as featuring regularly in the media to speak on holistic medicine and medical ethics. Equipping medical students with the appropriate life skills to maintain their wellbeing is an area of huge interest globally. The strengthening evidence base of mindfulness is proving its value as a vital tool in the training of both students and doctors.

The final article in this issue of *The British Student Doctor*, is a response from Professor Kamila Hawthorne, Vice-Chair (Professional Development) of the Royal College of General Practitioners and Chris Bull, to the article published in our last issue by Dr Peter Edwards, *"Why I am pursuing a career in general practice"*. This is the first article of correspondence that we are publishing in the journal, and we hope to encourage more responses in the future, as discourse is vital for the scientific process. This point is discussed in more depth by our *Correspondence* Section Editors in their editorial *"Conversation is essential in publishing"*.

After the hard work of putting a manuscript through the peer review process, for both

editor and authors, it is highly rewarding to see the final article in print. However, publication is the culmination of the diligence of all those involved in the editorial process. If there is misconduct at any stage during this process, then the result is a breakdown of trust in the scientific method. Probity is a core value that the General Medical Council expects from all medical students as future doctors. As it states in *Good Medical Practice* (2013): “You must be honest in financial and commercial dealings with patients, employers, insurers and other organisations or individuals”. (1)

A particular, but repeated concern, that we have faced during the development of this issue, is the submission then subsequent withdrawal of manuscripts made to the journal. This is a serious issue, as each submission that we receive to *The British Student Doctor* is reviewed by two external reviewers, two Section Editors, two Editors-in-Chief and a member of the journal’s faculty board. This editorial work is provided voluntarily without financial recompense, in order to further evidence-based medicine. Therefore, submitting a manuscript to the journal without the good intention of accepting an offer for publication, is an unacceptable waste of editorial resources. It is also unethical to submit a manuscript to multiple journals simultaneously, or to publish multiple similar articles, otherwise known as “*salami-slicing*”. When an author submits a manuscript to *The British Student Doctor*, they are entering into a contractual agreement that assigns the copyright for the work to the journal for the purposes of publication. It is unacceptable to break this contract without sufficient reason.

In any case of suspected academic misconduct, the policy of *The British Student Doctor* is to follow the Committee on Publication Ethics’ (COPE) guidelines. The first stage is to request an explanation from the authors, and if this explanation is unsatisfactory, then further action may include contacting the respective institution or employer of the individuals involved. (2)

Whilst this has been a serious issue that we have faced, it is also important to note that the majority of authors have conducted themselves in a highly professional manner. The diligence and professionalism of all those involved in the publication process is a requisite for high-quality scientific research and academic debate.

Ultimately, developing a solid foundation of publication ethics at an early stage, will contribute to professionalism in all aspects of your career, including as future clinicians. Most importantly, probity, transparency and reliability, are vital for safe patient care.

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Accepted for Publication:
15.06.2017

WHY MINDFULNESS MATTERS IN MEDICAL EDUCATION

INTRODUCTION

Mindfulness can be described as a generic life-skill that has an endless number of applications. It is both a form of meditation and a way of living. It involves the training of present-moment attention and also the attitude with which we pay attention – one of curiosity, acceptance, openness and compassion. Historically, the ‘soft’ subject of mindfulness or meditation was marginalised as just a ‘relaxation exercise’ and would not have been seen as an integral part of medical education with its strong emphasis on learning the ‘hard’ biomedical sciences and producing ‘battle-hardened’ future medical practitioners. But for good reason that perception is changing. This article will briefly outline why mindfulness is now increasingly seen as a necessary and integral part of training the modern medical practitioner.

Mindfulness in medical education

At Monash University in Australia, mindfulness has been integrated as a part of the curriculum since 1992 (1) on a small scale, and on a larger scale since 2002, being the first medical school in the world to integrate it as core, examinable curriculum. (2) The main emphasis at Monash was in the first year of medicine – primarily for student wellbeing with secondary benefits for future clinical and communication skills. The other medical school to integrate mindfulness early was at Rochester in the United States, where it was taught later in the curriculum with the main emphasis on clinical skills and decision-making. (3)

The applications of mindfulness

The number of studies on the impact of mindfulness-based approaches has increased exponentially over recent years and without that it would not have gained wide acceptance in university curricula. Table 1 (4) categorises some of the major fields of interest. With depression overtaking heart disease as the greatest non-fatal burden of disease in developed countries, it was the studies in the early two-thousands on the role of mindfulness-based cognitive therapy (MBCT) in preventing the relapse of depression (5) that was the single biggest catalyst for the growth of interest in mindfulness more generally. In some areas, such as depression, there are now dozens of studies. (6,7) In other areas there are far fewer and often times smaller or less rigorous studies, but what is there looks promising and begs further research. (8) The studies vary from exploring the role of mindfulness for mental health and addiction, (9,10) chronic pain, (11) infertility, (12) epigenetics, (13) psychoneuroimmunology (14) and telomere research. (15) It is important for the modern doctor to be aware of evidence-based non-drug therapies for managing medical and psychological conditions such as mindfulness-based approaches. An individual doctor may or may not wish to personally deliver mindfulness-based therapies but they should as a minimum know about them and know when to refer patients to suitably trained practitioners.

Because of the wide range of applications and ever-broadening evidence-base there is much debate about whether mindfulness should be seen as a panacea. The answer to that question is probably yes and no. Yes, in that, like physical exercise, it is a basic human need and it can be adjunctive for a wide number of conditions. No, in that, like physical exercise, not everyone will be interested in it or be ready to learn about it. Mindfulness takes application and perseverance, it is sometimes uncomfortable, it can be poorly taught, and it can be inappropriately applied raising the risk of potential harm. So the quality of instruction is a vital issue.

Mindfulness for training the medical student and practitioner

It is well documented that medical students and doctors are at greater risk of stress, burnout, depression and drug and alcohol addiction than the general population. One Australian study followed every three months the levels of burnout and mental illness in interns throughout the first year of their working life. Of great concern, it found that 75 percent of interns had burnout by eight months and 73 percent had a diagnosable mental illness (mostly depression and/or anxiety) on at least one occasion. (16) This points to a major deficiency in how we train doctors to be prepared for such a demanding job, especially considering that a depressed doctor makes more than six times as many medication and prescribing problems as a non-depressed doctor. (17)

Since a landmark paper by Krasner, Epstein et al. in JAMA in 2009, (18) studies have shown that mindfulness can enhance the wellbeing of medical practitioners, at the same time as reducing burnout and increasing work engagement and empathy. (19) At Monash University, we found that for our students it is associated with significantly enhanced student mental health even during high-stress assessment periods of the semester (20), and greater self-care. (21)

Studies have shown that mindfulness can improve memory and learning in university students (22) and help them to cope with exam anxiety. (23) It also seems to improve mental flexibility and problem-solving, (24) as well as reducing clinical errors, and the cognitive biases commonly found behind diagnostic errors. (25,26) These skills have become increasingly important as the modern workplace becomes ever more complex. The negative impacts of poor doctor mental health, haste, distraction and complex multitasking increase the number of clinical errors; to the extent that it is the third most common cause of death in the United States. (27) Having vigilant and self-aware doctors is not just important for doctor wellbeing but is vital for patient safety.

Mindfulness – in the sense of more present and aware medical practitioners – is also associated with greater emotional intelligence, communication skills, rapport and more satisfied patients. (28,29) One of the common symptoms of burnout is depersonalisation and so it is important as to how mindfulness fosters greater compassion, (30) at the same time as reducing vicarious stress and carer fatigue. (31,32)

Free online mindfulness course

There is not the space here to go into the rationale for mindfulness in greater depth, but if students are interested to learn the basics of how to practice mindfulness, then this free online course developed by Monash University and housed on the UK's FutureLearn platform may be of interest. (33)

CONCLUSION

In conclusion, mindfulness is a simple generic skill that can be easily integrated into medical education and practice. In an already packed medical curricula some argue that there is not the available curriculum time to include mindfulness but, considering its wide-ranging benefits for medical students, doctors and patients, it is actually far harder to make a rational case against its inclusion in the training of the modern, job-ready medical practitioner.

Table 1: The applications of mindfulness

- Mental health: E.g. therapeutic application for depression, anxiety, panic disorder, stress, emotional regulation, addiction, sleep problems, eating disorders, psychosis, ADHD, autism, reduced burnout, greater resilience...
- Neuroscience: E.g. structural and functional changes in the brain, stimulation of neurogenesis, possible prevention of dementia and cognitive decline, down-regulating the amygdala, improved executive functioning and working memory, reduced default mental activity, improved self-monitoring and cognitive control, improved perception of sensory input...
- Clinical: E.g. therapeutic applications for pain management, symptom control, coping with chronic illness (e.g. cancer and MS), metabolic and hormonal benefits (e.g. reduced allostatic load, cortisol), facilitating lifestyle change (e.g. weight management, smoking cessation), improved immunity (e.g. improved resistance, reduced inflammation), enhanced fertility, improved genetic function and repair, slower ageing as measured by telomeres...
- Performance: E.g. sport, academic, leadership qualities, mental flexibility and problem solving, decision-making, sunk-cost bias...
- Education: E.g. improved problem-solving, executive functioning and working memory, better focus, less behavioural problems, fostering growth mindsets, resilience...
- Relationships: E.g. greater emotional intelligence and empathy, improved communication, reduced vicarious stress and carer burnout...

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Accepted for Publication: 13.06.17

REFERENCES**CONVERSATION IS ESSENTIAL IN PUBLISHING**

Correspondence, is an important section of *The British Student Doctor*. Discussion is vital in academia, not only because it encourages additional insight, but as it also allows for the critique and post-publication peer review of research work, which is an essential component of the scientific process. Additionally, by introducing novel ideas and perspectives, letters to the editor have the potential to highlight currently overlooked issues or innovations at an early stage. *Correspondence* aims to provide students with the platform to engage in discourse, and we warmly welcome your contributions. Submissions to the *Correspondence* section are invited regardless of research background. As such, this section of the journal is an ideal starting point for those with little or no previous publishing experience. Experienced authors, also, are encouraged to share knowledge and insight with readers; many of whom are in their formative years of medical education. Exposure to such insight at this stage has the potential to influence a lifelong career.

In this issue, *Correspondence* includes a response from the Royal College of General Practitioners (RCGP) to Peter Edwards' article '*Why I am pursuing a career in general practice*', which was published in our inaugural January issue. (1) This piece highlights how response to articles provide readers with further information about past publications. Building on Dr Edwards' original article, the RCGP elaborates on current uncertainty facing general practice. Despite the critical importance of GPs in bolstering an increasingly challenged NHS, students wishing to enter the profession face stigma from peers and colleagues from other medical specialties. The RCGP address this, offering an alternative perspective; deconstructing stigma around general practice and sharing their vision of how to create an ideal educational environment, which encourages informed career decisions. This discourse between the RCGP, representing professional training and engagement, and Peter Edwards, an aspiring GP, is a valuable dynamic. *Correspondence* is the vehicle to express different sides of a story, assembling a more complete picture to further educate and inform.

The BSDJ accepts two types of correspondence: peer-review responses to recently published BSDJ articles, and short letters to the editor commenting on a novel or current topic that is important and relevant to medical students. Encompassed within this are descriptions of research or innovation at an early stage of development.

Submissions to the correspondence section are limited to 500 words and five references. To learn more about how you can contribute to *Correspondence*, please visit the BSDJ website (bsdj.org.uk) for our [author guidelines](#).

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<http://dx.doi.org/10.18573/j.2017.10123>

Epidemiology and outcomes of advanced necrotising enterocolitis

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No conflicts of interest to declare

Accepted for Publication:

28.04.2017

ABSTRACT

Background: A life-threatening gastrointestinal emergency, necrotising enterocolitis (NEC) presents commonly in neonates. It may be medically or surgically managed. The demographics of NEC patients in the University Hospital of Wales (UHW) and their long-term outcomes are largely unknown.

Aims: To investigate factors associated with NEC, including methods of management, and correlate these with outcomes (mortality/discharge).

Methods: A retrospective service evaluation comparing inborn and outborn infants diagnosed with NEC during a 5-year period, who were admitted to the Neonatal Intensive Care Unit (NICU), UHW. The Vermont-Oxford Network (VON) criteria determined the confirmed cases and the data was collected from the 'BadgerNet' database and IMPAX image viewer.

Results: All infants with poor outcomes (mortality) were preterm. Most were born by emergency caesarean, had low APGAR scores and birth weights <1kg. There was a significant difference in the volume of feeds at diagnosis between the inborn and outborn cohort ($p < 0.01$) and between those who died and those with better outcomes ($p < 0.05$).

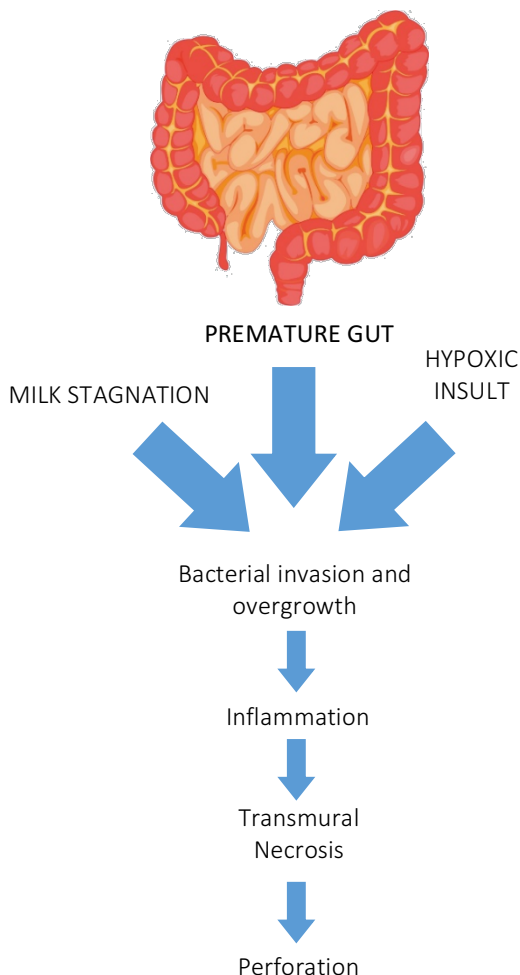
Discussion: Most infants in UHW with NEC require surgical input, but surgery alone does not correlate directly with higher mortality. Low gestation/birthweight and larger volume of feeds at diagnosis are high contributors. Further research will expand the database and permit follow-up of the cohort post-discharge.

BACKGROUND



Necrotizing enterocolitis (NEC) is one of the most common and serious gastrointestinal emergencies of the newborn, especially the premature. Pathologically, it involves ischaemic necrosis of the bowel mucosa, inflammation, invasion of bacteria and perforation.

Figure 1- Pathophysiology of NEC



A premature bowel (with its increased permeability and immature host defences) predisposes an infant to NEC. Milk stagnation and hypoxic insults pre and/or perinatally are also thought to contribute. (2)

The disease occurs in around 1 in a 1000 live births. (3) Incidence decreases with increasing gestational age and birth weight, affecting near 10% of very low birth weight infants i.e. those <1500g. (4-6) There is currently little data regarding the incidence of NEC in Wales.

Also associated with an increased risk of NEC are low APGAR scores. Created by the anaesthetist Virginia Apgar, the one minute APGAR score was used to quickly determine whether an infant required resuscitation at birth. Years later, a five-minute score was added to assess subsequent response to interventions. (7)

The score assesses heart rate, respiratory effort, tone, irritability and colour, each of which is scored from 0-2. A score of 7 or more is considered reassuring.

Despite advances regarding early recognition and aggressive treatment, NEC still has poor outcomes. (8) Mortality has been quoted around 15-30%. (9)

On average, NEC presents in the first few weeks of life, with the later diagnoses occurring most commonly in the premature, after the commencement of first feeds. (10) There are many management options available, depending on the individual and surgical preference, but little agreement between paediatric surgeons as to the best approach. (11) Surgical management is usually reserved for the most serious cases (unless the patient is unstable) and is imperative in NEC-related bowel perforation. Bowel resections with the creation of a stoma are commonly performed, but the extent of resection and reversibility of stoma varies between patients.

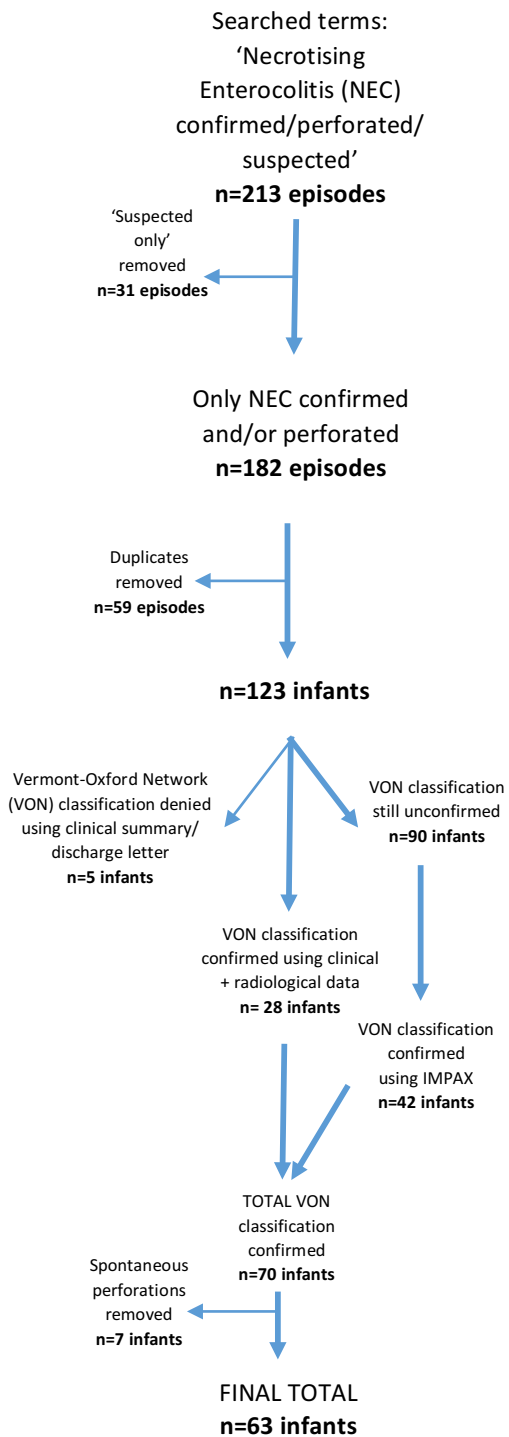
There is no doubt, however, that NEC requires significant medical and surgical input and can lead to long-term morbidity including, strictures, short-bowel syndrome, and neurodevelopmental delay. (12-15)

It is important that information about the outcomes of NEC is gathered so that improvements in the current follow-up of these patients are made and effective counselling can be offered to parents. Investigating how these patients are managed in UHW allows for future comparison with the methods in recent surgical studies and the UK Neonatal Collaborative Necrotising Enterocolitis (UKNC-NEC) Study which includes only data from England. (16,17)

METHODOLOGY

See Figure 2 for a diagrammatic representation of the methodology.

Figure 2- Step-by-step methodology



Research was primarily carried out using ‘BadgerNet’, the electronic neonatal medical records database established in 2011 and IMPAX, the digital radiology imaging system. It did not require ethical approval. The Vermont-Oxford Network (VON) criteria determined the confirmed cases.

1. The search began with the following parameters:

- a. Date of birth: Jan 1st 2011-Dec 31st 2015
- b. Care location: UHW
- c. Recorded NEC episodes: suspected, confirmed and perforated

This produced a list of 213 infants whom had recorded episodes of NEC. Using Microsoft Excel, the following information was collated for each patient:

- a. Hospital identification number
- b. Initials
- c. Gender
- d. Date of birth
- e. Date of admission
- f. Gestation
- g. Birth weight
- h. Inborn (UHW) / Outborn (other hospital)

2. A definite diagnosis of NEC was required to be made, therefore 'suspected only' NEC cases were excluded. For the remaining infants, further parameters were investigated:

- i. Admitting hospital
- j. Date and time of discharge
- k. Place to be discharged to
- l. Outcome (home, hospital, died)
- m. Place of birth (hospital, home, non-NHS location)
- n. Birth location (labour ward, obstetric theatre, main theatre, home, birth center, ambulance, unknown)
- o. Onset of labour (none, induced, spontaneous, unknown)
- p. Method of delivery (elective caesarean section, emergency caesarean section (not) in labour, vaginal spontaneous, vaginal forceps assisted, unknown)
- q. Single or multiple pregnancy (single, multiple)
- r. Prenatal concerns (e.g. pregnancy-induced hypertension (PET), premature/prolonged rupture of



membranes, foetal abnormality, twin-to-twin transfusion etc.)

- s. APGAR score at 1,5,10 and 20 mins (1-10, unknown)
- t. Resuscitation (stimulation, positioning managing airways, oxygen, suction (for meconium), face mask IPPV/CPAP, intubation, curosurf, cardiac compressions, sodium bicarbonate, adrenaline, none, unknown)

3. After duplicates were removed from the 2 patient lists, 123 infants remained. They were all first presentations. (Figure 2).

4. As the nature of the patient’s NEC diagnosis was at the discretion of the inputting doctors, a further method was required to determine true cases of NEC. Therefore, the universally accepted Vermont-Oxford Network definition of NEC was used (Table 1). (18)

Table 1- VON criteria (1 of clinical plus 1 of radiological)

	CLINICAL		
	1. Bilious gastric aspirate or emesis	2. Abdominal distension	3. Blood in stool (no fissure)
	RADIOLOGICAL		
	4. Pneumatosis intestinalis	5. Hepato-biliary gas	6. Pneumo-peritoneum

Above X-Ray image courtesy of RadsWiki

From discharge letters and summaries, a list of 28 Vermont-Oxford Network (VON) classification confirmed cases and 90 still querying confirmation was obtained.

5. 5 infants were also removed from the list. These were inputted onto the system as being confirmed or perforated but their discharge letters denied this. They may have been inputted as such by mistake. The VON classification requires specific plain radiograph details. As these are not always commented on in the patient notes, it was necessary for them to be accessed manually, via the IMPAX radiology database. Any available abdominal and/or chest radiograph was screened.

6. A further 42 infants to the initial 28 were added via this method. (Total: 70 infants).

It was important that the outcomes of the inborn and outborn infants could be compared. Therefore, the list of true cases was correlated with the initial information regarding place of birth

and admitting hospital. There were 21 infants with NEC born in UHW, 46 born in another hospital and 3 home births.

For this list of 70, parameters were then investigated including:

- a. Date of 1st episode
- b. Age at diagnosis (days since birth)
- c. Gestational age
- d. Birth Weight
- e. Intrauterine growth restriction (IUGR) (Y, N)
- f. Prenatal IUGR/ PET/Doppler concerns (IUGR, PET, absent end diastolic flow (AEDF), reversed end diastolic flow (REDF), atrio-ventricular septal defect (AVSD))
- g. Maternal steroids (Y, N)
- h. Feed start date
- i. Date full feeds achieved
- j. Type of feed up until diagnosis (expressed breast milk (EBM), formula, EBM + formula, unknown, other, nil)
- k. All feeds
- l. TPN start date
- m. Blood transfusions (up to 1 week prior to diagnosis) (Y, N, unknown)
- n. Patent Ductus Arteriosus (PDA) treatment (Hydrocortisone, Ibuprofen etc.)
- o. Probiotics (Y, N, unknown)
- p. Sepsis (Y, N, suspected, unknown)
- q. Bowel length resected (cm) (1-9, 10-19, 20-29, 30-39, 40-49, 50+, unknown)
- r. Ileocaecal (IC) valve resection (Y, N, unknown)
- s. Lines up to diagnosis (umbilical arterial catheter (UAC), umbilical venous catheter (UVC), percutaneous central line (PCL), hickman line, nil)
- t. Bowel perforation (NEC only) (Y, N, unknown)
- u. Management (Medical, Surgical, Both)

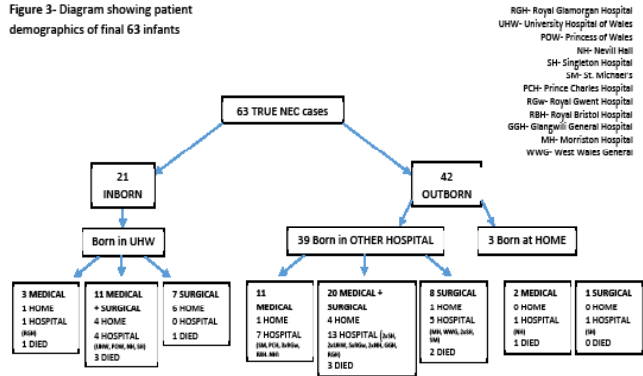
Note that medical management includes supportive care (cardio-respiratory support, discontinuation of enteral feeds, decompression, total parenteral nutrition, fluids etc.), antibiotic therapy and close laboratory/radiological monitoring.

The data was obtained from discharge letters, summaries and the daily care charts.

7. At this stage a further 7 infants were removed as they were

flagged up as non-NEC or spontaneous perforation (non-NEC). (Total: 63 infants, Figure 3).

Figure 3- Diagram showing patient demographics of final 63 infants



The data was then analysed. Most comparisons were to be made between two separate groups displaying Gaussian distributions e.g. inborn vs outborn, died vs survived, medical vs surgical management etc. Therefore, a two-sample non-paired t test (using GraphPad Prism 7) was applied to identify p values and statistical significance. For the analysis of contingency tables, a Chi-squared test was used.

RESULTS

For the following data analyses, the 3 home births were excluded to diminish confounding factors (n=60).

Outcomes (Mortality)

There were significantly more surgical patients than medical in both inborn and outborn groups (Table 2). Out of the surgically managed infants, there was 19.6% mortality (Table 3). This was not statistically different from the mortality of the medical group (p = 0.478, 95% CI [-15.80, 40.30]).

Of the infants whom had recorded bowel resections, death during stay at UHW was low in only 3 infants out of 26.

This suggests that there are factors which have a greater effect on mortality than surgical procedure alone.

Prenatal Parameters

Interestingly, all of the infants who died were born preterm. (Table 4) 4 were very preterm (28 to <32 weeks) and 9 extremely preterm (<28 weeks). (19) In addition, nearly 80% had birth weights under 1kg (Table 5). (20,21)

The majority of infants had abnormally low APGAR scores at 1

minute, (7) and 31% of infants who died still had at low scores at 5 minutes, a proven association with increased risk of NEC. (22)

By far the most common delivery for the infants who died was an emergency caesarean (not in labour). For all other infants there was an equal number of vaginal and caesarean births. There were also 13% more prenatal concerns in the group who died; 38.5% (died) vs 25.5% (survived).

Table 2- Outcomes of all medical and surgical patients

	Inborn	Outborn
Management	Medical (3) Surgical (18)	Medical (11) Surgical (28)
Surgical Outcome	Hospital (4) Home (10) Died (4)	Hospital (18) Home (5) Died (5)
Total Outcome	Hospital (5) Home (11) Died (5)	Hospital (25) Home (6) Died (8)

Table 3- Surgical vs Medical Outcomes

	Surgical	Medical	Total
Died	9	4	13
Survived	37	10	47
Total	46	14	60

Postnatal Parameters

A significant factor in the development of NEC is the volume and type of feeds at the time of NEC diagnosis. (23)

The mean volume of feeds was 79.1ml for inborns and 173.2 ml for outborns (Figure 4, Table 6). This difference was statistically significant (P<0.01, 95% CI [16.975 to 185.633]).

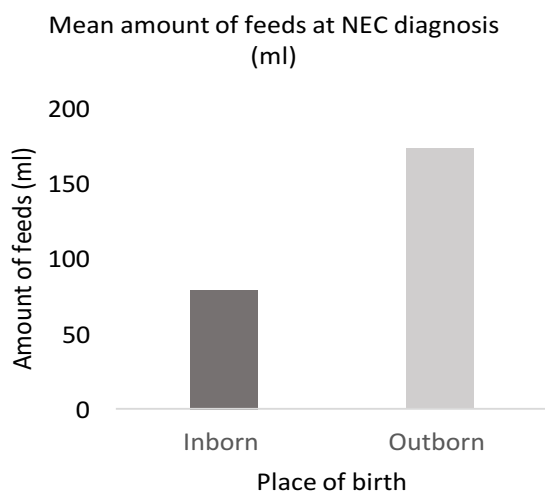
The inborn infants who were exclusively breast fed up until their diagnosis also did better as 7/9 of them were discharged home.

There was also a statistically significant difference in feed volume between the outcome groups ($p < 0.05$, 95% CI [15.492 to 198.706]). The mean volume of feeds at diagnosis in the infants who died was 200.6ml; 107.1 more than the infants with better outcomes.

The mean age of surgery for all infants (and also for the group with poorer outcomes) was 36 days (Table 6). The most common surgical procedure overall was bowel resection with ileostomy and mucus fistula formation. There was no significant difference in outcomes between the ileocaecal valve resection and non-resection groups ($p = 0.913$, 95% CI [-46.492 to 26.730]).

The infants who died were diagnosed on average at 33 days, significantly different ($p < 0.05$, 95% CI [1.69 TO 32.65]) from the infants who went home (diagnosis around 16 days). This poor outcome may be attributable to a larger volume of feeds achieved in these infants.

Figure 4- Distribution of Volume of Feeds at Diagnosis



DISCUSSION

Summary of findings

It appears that a low gestation and low birthweight are both contributors to mortality (Table 4). In fact, when evaluating the whole cohort of infants, over a quarter of infants with birth weights under 1000g died. These findings correlate with current literature.

One of the most important factors contributing to outcome was volume of feeds. There was a significant difference in the inborn and outborn cohort, the inborn cohort being given smaller amounts. In addition, exclusive breast feeding seems to correlate

with a better outcome.

Due to the grossly higher volume of feeds in the group who died, it can be concluded that those who received larger volume of feeds developed more serious NEC. These findings emulate the current literature, which identifies duration and advancement of feeds as risk factors and recognises that cases of NEC are often found to be fully fed significantly earlier than non-NEC controls. (23) However, delaying feeds soon after birth may actually be counterproductive as enteral feeding is necessary for gastrointestinal tract maturation. (24) There are few randomised control trials that discuss the optimum rate of feed advancement. (25) Although the correct amount of feeds varies on a case-by-case basis, many have called for standardised feeding regimens to minimize cases of NEC. (26)

In terms of management, the majority of patients who died had had some surgical input (70%), but surgical technique does not directly correlate with a high mortality. There are many factors that could have influenced mortality, including a pre-existing morbid state.

Reported mortality figures from NEC vary in the literature but, in line with this study's findings, current research suggests a mortality in the region of 15-30%. (27) The mortality of the low birth weight infants (<1500g) in this cohort was 26% (13/50). This is slightly lower than the UK Neonatal Collaborative Necrotising Enterocolitis Study, which quotes a mortality of around 30-50% in low birth weight infants. (17)

Limitations

Due to the nature of data collection, the list of confirmed cases is by no means exhaustive. The use of the VON classification was imperative in ensuring that all patients were subjected to the same inclusion criteria. It is a well-tested classification system but, by its nature, is more likely to identify the more advanced and/or severe NEC cases. (18) Clinical notes prior to UHW admission for the outborn babies were scarce, another reason for limited data.

Given the small sample size of this study the results have limited reliability. Studies identified in systematic reviews involve numbers of participants ranging from a few hundred to around 2000, with the very low birth weight infants making up the smallest proportion of participants. (26) However, the findings mirror those of larger studies; the importance of standardised feeding regimes and the protective use of breast milk are documented in Cochrane reviews. (28-29) Additionally, there are no current Cochrane reviews that appear to support any surgical intervention over another.

One important distinction to be made is between spontaneous and NEC-related intestinal perforation. (26) Clinical judgement was used to exclude the spontaneous cases, a method with limited reliability.

Finally, the exclusively medically managed cohort should be interpreted with caution as some babies may have had too advanced disease to be considered for surgical procedures.

Data collection presented unforeseen challenges; differing and/or unidentifiable hospital numbers and surname changes were frequent. All documentation was therefore cross-referenced, a time-consuming process. In addition, many infants had numerous admissions, so care was taken to ensure only first presentations were recorded.

Significance and generalisability

Although a small set of data, the data collected will be useful for the creation of a UHW NEC database. It will enable the unit to more accurately assess the management of their patients and most importantly, improve long term outcomes.

It is reassuring to see that the protective use of exclusive breast milk in small quantities has already been adopted in UHW, more so than perhaps other hospitals.

CONCLUSION

In conclusion, there are many factors involved in the outcome of NEC. Surgery is not a curative step and medical treatment is the mainstay. It is therefore of paramount importance that both surgical and medical parameters are investigated in future studies, as in this.

The project has highlighted a difference in feeding regimes between local centres as well as strengthened the evidence of a link between low gestation and birthweight and mortality. It has also revealed previously unknown demographical information, including the fact that all babies to be treated for NEC were premature.

Future goals are to continue to expand and spread awareness of the database. In addition, to assess long term outcomes, the surviving NEC patients may be followed up with parental questionnaires and/or clinic visits.

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Table 4- Prenatal Parameters Inborn vs Outborn deaths

		Sex	Gestational Age (weeks)	Birth Weight (g)	IUGR	Prenatal concerns?	Maternal Steroids?	Details of delivery	APGAR score at 1 min	APGAR score at 5 mins
Inborn	1	M	27	790	Y	PET	Y	Emergency caesarean- not in labour	5	8
	2	M	31	1040	Y	AVSD	Y	Emergency caesarean- not in labour	5	5
	3	M	26	940	N	N	Y	Vaginal- spontaneous	8	9
	4	M	25	610	N	PET	Y	Emergency caesarean- not in labour	3	6
	5	M	31	1240	N	N	Y	Emergency caesarean- in labour (Twin 1)	5	8
Outborn	1	M	24	590	N	N	Y	Emergency caesarean- not in labour	3	5
	2	F	25	650	N	N	N	Vaginal- spontaneous	unknown	unknown
	3	F	26	700	T-T	REDF	Y	Emergency caesarean- not in labour (Twin 2)	3	8
	4	F	26	780	N	N	Y	Emergency caesarean- in labour	5	7
	5	F	25	750	N	N	Y	Vaginal- spontaneous	8	10
	6	M	29	960	N	N	Y	Emergency caesarean- in labour	unknown	unknown
	7	M	25	700	N	unknown	Y	Vaginal- spontaneous	4	6
	8	F	31	1260	Y	IUGR	Y	Unknown	8	9

T-T- Twin-to-twin transfusion, PET- Pre-eclamptic Toxaemia (Hypertension), AVSD- Atrioventricular Septal Defect, REDF- Reversed End Diastolic Flow, IUGR- Intrauterine Growth Restriction

Table 6 – Postnatal Parameters Inborn Vs Outborn Deaths

		Age at diagnosis (days)	Age at Surgery (days since birth)	Volume of feeds at NEC (ml)	Blood transfusions (<1 week prior to NEC)?	PDA treatment ?	Probiotics ?	Details	Management
Inborn	1	34	N/A	128	N	N	N		Medical
	2	35	N/A	11	Y	Hy	N	Duodenal and oesophageal atresias, tracheoesophageal fistula	Surgical (Duodeno-duodenostomy)
	3	24	38	216	Y	Hy	N	Perforation, necrotic bowel, sepsis	Surgical (Laparotomy, resection Inc. ileocaecal valve, colostomy, drain)
	4	60	62	240	N	N	Y	Necrotic bowel, adhesions	Surgical (Laparotomy, small bowel resection, jejunostomy, mucus fistula, drain)
Outborn	5	17	17 (drain)	198	Y	Hy	Y	Perforation	Surgical (Drain)
	1	103	N/A	420	N	N	N		Medical
	2	11	11 (drain)	0	N	Ib+ Hy	N	Perforation	Surgical (Drain)
	3	31	51	unknown	unknown	N	N	Bilateral inguinal herniae, dilated bowel	Surgical (Laparotomy, appendicostomy, cecostomy, herniotomy, right hemicolectomy, Bishop Koup anastomosis)
	4	31	32	100	N	N	N	Necrotic bowel	Surgical (Laparotomy, ileostomy)
	5	31	32	unknown	unknown	N	N	NEC totalis	Surgical (Laparotomy)
	6	3	3	unknown	N	N	N	?Small bowel obstruction, necrotic bowel	Surgical (Laparotomy)
	7	47	N/A	unknown	unknown	N	N	Hepatic calcifications	Medical
8	7	N/A	102	unknown	N	N	Perforation	Medical	

Hy- Hydrocortisone Ib- Ibuprofen

The need for aviation and space medicine within the United Kingdom undergraduate medical curriculum

DISCUSSION

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No conflicts of interest to declare.

Accepted for Publication: 10.05.17

ABSTRACT

'Aviation and Space Medicine' (ASM) has recently been introduced as a General Medical Council (GMC) approved specialty in the United Kingdom. This reflects its growing importance in the public, industry and healthcare sectors. Currently, medical school involvement in ASM is minimal at best. An undergraduate medical curriculum devoid of ASM will leave medical students oblivious to both the existence and importance of this discipline. Having introduced ASM as its own distinct speciality, it is now vital to place an emphasis on ensuring current and future medical students are informed, inspired and prepared to pursue careers in this exciting, novel and unique field of medicine.

Why do astronauts grow taller in space? How do we perform CPR in microgravity? Why did the crew aboard Skylab see white lights and beams with closed eyes? Does any of this even matter? Yes. Space medicine is a subspecialty concerned with human physiological and psychological response to the unique, hostile and peculiar environment that is outer space. However, the science falling under the space medicine research ‘umbrella’ has provided much benefit to life on Earth – and in particular, to human health and welfare. With British astronaut Tim Peake becoming a household name and the parliamentary approval of the new specialty of ‘Aviation and Space Medicine’ (ASM), (1) it is safe to say that scientific interest in space medicine in the United Kingdom has significantly increased. This represents an ideal time to firmly incorporate space medicine into the UK medical curriculum. In this article, we aim to briefly summarise the growing importance of ASM in healthcare and society, as well as underlining the need to incorporate this discipline into the UK undergraduate medical curriculum.

Although the marriage between space and medicine may initially appear unusual, the study of the multisystem impact of space has significantly contributed to various advancements within multiple medical specialities. The experience of microgravity, intense inertial forces and radiation exposure, coupled with the loss of circadian rhythm in a confined setting, has enhanced our understanding of various disease processes from osteoporosis (2) to vision impairment/intracranial pressure (VIIP) syndrome. (3) VIIP syndrome is a relatively new topic of interest to Space Medicine specialists, introduced after 60% of long-duration crewmembers (aboard the International Space Station or Mir Space Station) reported deterioration in vision. (4) It is hypothesised that microgravity-induced fluid shifts result in intracranial venous congestion, which have produced recognised pathological changes from flattening of the globe to papilledema. (4) The high priority NASA has placed on understanding VIIP syndrome will likely result in novel approaches that can benefit patients on Earth. For example, the design of a reliable non-invasive means of measuring intracranial pressure (ICP) and the development of subsequent countermeasures for astronauts taking part in long-duration flights, will undoubtedly benefit the millions worldwide with conditions such as hydrocephalus and idiopathic intracranial hypertension. Thus, patients will simultaneously benefit from the developments that aim to protect crewmembers from visual impairment in microgravity.

Space Medicine has already resulted in numerous medical spinoffs arising from the space program, which have benefited diverse patient groups. A special foam used to cushion astronauts during lift-off is now used as a means to prevent pressure ulcers in nursing homes – and has in fact become the huge consumer product we popularly know as ‘memory foam’. (5) Another example is functional electrical stimulation (FES), which can help regenerate purposeful movement to muscles following prolonged paralysis. (6) This served as a component of Christopher Reeve’s own physiotherapy. (6) It is clear that space medicine has much to offer diverse patient groups – and it will likely continue to extend its applicability to the wider public. ‘Space tourism’ is a concept predicted to become a reality within the next few decades, predominately owing to the work of private companies such as Virgin Galactic. And within current astronaut corps, it is often quoted that approximately 10% are physicians. (7) Thus, it can be confidently said that space and medicine are very much

interconnected specialities, collectively offering considerable benefit even for those who would rather keep their feet firmly on the ground.

Increased interest in this distinct discipline is perhaps best demonstrated by the recent introduction of ASM as a new specialty. The Joint Royal Colleges of Physicians Training Board (JRCPTB) has supported its development since 2008, alongside the British Army, Royal Air Force and European Space Agency (ESA). (8) The JRCPTB have now finalised the ASM curriculum. (9) It is fully funded by organisations involved in aerospace and aviation. (1) While the space industry is still growing in the UK, doctors trained in this specialty will have much to offer the British aviation sector in the meantime. In 2014, 238 million air passengers travelled to, or from, the UK. (10) These numbers will rise exponentially in the coming years, which naturally require more doctors distinctly trained in ASM to regulate the suitability of pilots, aircrew and passengers to fly. Even commercial flights present a physiologic stress that must be considered, particularly in the elderly and individuals with chronic cardiovascular and respiratory conditions. Thus, the new ASM specialty programme does not exclusively aim to train doctors for a possible ‘Mars One’ mission in the next decade, but primarily to manage the increasing demand for the Aviation sector to continue to maintain a high level of flight safety.

The presence of a GMC-approved ASM specialty training programme will serve to inspire further enthusiasm amongst UK medical students. Prior to this, dedicated students who expressed a passion for ASM would find it problematic to convert this into a career – unless they sought opportunities abroad. This meant a financial and intellectual drain for the NHS. Current undergraduate exposure to ASM within the medical curriculum involves limited places in intercalated BScs, which are 1-year courses that allow students to obtain a greater understanding of a particular area of interest within the broad umbrella of medicine. For example, University College London (UCL) offer a ‘*Space Medicine and Extreme Environment Physiology*’ module limited to 50 students exclusively at UCL. (11) It is indeed competitive, reflecting the great interest in ASM amongst undergraduate medical students, yet a simultaneous lack of opportunities to get involved. Other options to gain exposure into ASM lie outside the curriculum itself, in the form of relatively few self-funded conferences, summer schools, out-reach programmes or competitions run by institutions such as the ESA or extremely competitive electives to NASA.

Given that ASM is now a GMC-approved specialty, medical schools should at least endeavour to offer optional modules within their curricula to provide an early exposure to inspire their students. Understandably, however, this may prove difficult given the already saturated medical school syllabus. A good example to illustrate this is dermatology. Approximately 12.4% of General Practice consultations involve dermatological problems. (12) However, a 2009 audit of the dermatological content of UK undergraduate curricula showed that some students have little exposure to dermatology during their time in medical school, and key topics such as the recognition of life-threatening meningococcal septicaemia seem to be omitted from the curricula of 9 medical schools. (13) If medical schools are struggling to cover vital topics within their syllabus, it will inevitably be incredibly difficult to justify ASM as a permanent fixture within their curricula. Furthermore, as ASM is a multi-system

speciality, it would only be of real benefit to introduce it in the later stages of medical school – but of course, the focus here is predominantly on Final Examinations and preparing to be a Foundation Year 1 Doctor. Thus, incorporating ASM into medical schools is a challenge, but it should – at the very least – exist as an option for the interested student.

ASM offers a novel perspective for understanding human physiology and health, and its direct multi-speciality clinical relevance has brought about much excitement for many doctors. It truly represents a unique opportunity for academics in all fields of medicine. Fortunately, the UK government has clearly recognised the need for a distinct speciality programme focusing just on ASM, which complements the rapid growth of the aviation and space industry in recent years. It is now time for medical schools to ensure their curriculum reflects this.

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A few seconds now could mean an hour in the future

DISCUSSION

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No conflicts of interest to declare

Accepted for Publication:

06.03.2017

ABSTRACT

We are in a critical period in our country's history. The UK has recently been gripped by an unprecedented scale of strikes and demonstrations by junior doctors. Naturally, this reflects a state of discontent amongst the medical profession, with many feeling undervalued and unrepresented. Ultimately, tired staff working unsociable hours could compromise patient care. On top of this, what about a doctor's welfare? What indeed will become of the European Working Time Directive (EWTD), following the UK's secession from the EU? It is perhaps unsurprising that our profession is associated with high rates of burn-out.

Our article takes you to the year 2026: a time where there exists the concept of Doctor's Protected Mealtime (DPM). This refers to an hour during the working day where doctors are free to partake in a leisure activity of their choice – on top of lunch, if they wish. Some may choose to learn a musical instrument, others yoga. Some may enact a renaissance of pursuing past hobbies, which were sacrificed to the rigors of medicine. Indeed, the list is endless and limited only by the individual's imagination. We acknowledge that patient care should always be the utmost priority. Hence, doctors on-call would be exempt from DPM, for example. We also consider whether DPM may lead to some loss of professional duties and miscommunication between healthcare professionals. While our idea may appear to be in the realms of fantasy, our aim is not to discuss its logistics. It is instead to stimulate discussion on doctors' welfare. Medicine embodies a noble pursuit, but one where there may be little respite from its demands. DPM is merely one possible idea that could safeguard the welfare of both current and future medical professionals.

It's the year 2026, and the sun is shining brightly over Britain. Now a specialist registrar, you finish your morning ward round and delegate duties for the rest of the team to complete for the afternoon. As for your afternoon, no doubt you'll be heading to the outpatient department, or perhaps to theatre. However, there's a twist - because, having grabbed a quick bite from the canteen, you casually stride towards a nearby tennis court.

Wait - did you say *tennis*? Who has time for that? This is but one example of Doctor's Protected Mealtime (DPM). A scheme where doctors have an hour during the day to catch up with activities of their choice. Tennis is just one possibility, and some of your future colleagues chose yoga, others meditation, music, or running. The list is inexhaustible, as it's more than just an "enlightened lunch hour".

What inspired this utopian idea? In many hospitals, patients are given protected times for meals. During this time, non-urgent clinical work ceases (1) which, from having spoken to patients ourselves, boosts their well-being and helps them to find solace during a stressful situation. So, with this in mind, why not consider the equivalent for stressed medical staff? These are men and women who wake up to make a positive difference to patients, their families and their communities - even at a time where morale is low. A time where many feel like unsung heroes, despite their labours.

In this time of great change, where the NHS must evolve for its own survival, we often hear about the stresses placed on services. However, we should also consider the stresses placed on doctors. With so many expectations upon them, depression is estimated to affect 10-20% of doctors, with a higher suicide risk than the general public. (2) Moreover, a recent large-scale survey of junior doctors showed that, while job satisfaction is high, lower scores were reported for perceived leisure time. (3) In 2013, the Royal College of Physicians highlighted that 10,383 healthcare professionals left the NHS due to low satisfaction with work-life balance. (4) Then, in 2016, a survey by the General Medical Council (GMC) of over 50,000 junior doctors found that 43.2% rated their daytime workload as "very heavy" or "heavy". (5) On top of this, since the referendum to leave European Union, what will happen to the European Working Time Directive and its impact on leisure time?

Therefore, DPM could have a great impact on welfare, and it may not be in the realms of fantasy. Many corporate organisations offer perks for their employees, including "fun-days". (6) These presumably help to foster team-building, relations between staff and to celebrate successes. Beyond DPM, simple measures could be introduced on the 'shop floor', as it were, to improve daily morale. This includes promoting transparent communication, fostering a

team spirit and providing a safe environment for employees. (7)

However, much could be achieved by an hour enshrined in national policy for doctors to protect themselves from the rigors of their job. Indeed, we believe that it can be argued that a career in medicine may lead to the demise of one's extra-curricular passions. Ironically, it was these passions that deemed an individual "well-rounded" and suitable for acceptance to medical school in the first place. In fact, the principle of DPM is essentially implemented by medical schools: during pre-clinical years, we coveted Wednesday afternoons, where extra-curricular activities were rejoiced in the bold or the mundane - perhaps a means to protect and engender student wellbeing. Moreover, it helped provide that certain roundedness, which is so desirable for employers. So why has this concept not followed through to the NHS, the UK's single largest employer? Interestingly, the notion of protected hours for doctors is already under consideration. In the past few months, a new junior doctors' education contract has been reported in Wales, which includes protected time for education during the week. (8-9) Therefore, if something as crucial as education can be protected, then why not the same for welfare and morale?

Whilst possibly a plausible idea, the benefits of DPM must be balanced with its potential flaws. Inevitably, doctors on-call and in the emergency department would be exempt from DPM. This would be in the interest of patient safety, which should not be compromised by the scheme. Likewise, while DPM would be a possible option for doctors, it would not be an absolute right. This could include urgent duties arising on the ward, such as taking bloods from an acutely deteriorating patient or perhaps discussing a patient's status with their family. Hence, it would be the doctor's daily professional judgement whether to partake in DPM. Underpinning our duties is the GMC's guidance on *Good Medical Practice*. (10) In the absence of adequate cover, DPM may compromise several tenets of our profession, such as safe handover of patients and teamwork.

As such, one aim of DPM is to alleviate the pressures faced by individual doctors, which could also be achieved through medical education. Naturally, great emphasis is placed on clinical acumen and patient safety. But there is perhaps scope to increase the time devoted towards future FY1s in coping effectively with time and energy demands, through improving awareness of hospital logistics. For example, while students may be aware of indications for x-rays, they may not be well versed in physically ordering such investigations. Another proposed method to tackle doctors' welfare may be resilience training in medical school. However, the term 'resilience' is hard to define, something which the GMC

recognises, but suggests involves people feeling supported and able to ask for help. (11) It has also been suggested that underpinning resilience is “*dynamic thriving with full engagement*” in the individual’s environment. This is as opposed to simply coping with the rigors of the job, (12) which DPM could unintentionally promote.

One could even ask: would DPM address the underlying reasons for high workload, such as improving or retaining staff levels? If effectively given an hour off, this may not incentivise doctors to identify areas of improvement for service provision. It also raises the issue of a slippery slope. With a protected hour for leisure, would there then be a demand for additional time allocated for teaching? Similarly, patient care thoroughly depends on the interdependence between doctors and the rest of the multidisciplinary team. Thus, if doctors are granted DPM, one could also argue a parallel scheme for all allied health professionals. Logistically, this could pose communication difficulties, if staff of different disciplines are not available for longer periods. We recognise the current financial strains on the NHS and thus any new scheme implemented must account for this. However, considering that morale and productivity are linked, this might be an instance where a few extra pounds spent on welfare could lead to long-term savings as a result of increased efficiency and retention of staff.

In January 2017, the NHS was said to be facing a “*humanitarian crisis*” by the British Red Cross. (13) Although a strong statement, it highlights the ever-growing disparity between patient demand and service provision. In such times, while there could be made a moral argument against DPM, it raises the question of how we should balance the welfare of the individual with professional responsibilities. Whereas DPM is an innovative concept, broader considerations must be accounted for if any lasting impact is to be made. One proposed measure to alleviate burdens on secondary care includes greater availability of general practitioners through out-of-hours, especially over the weekend. However, a recent British Journal of General Practice survey found that, out of 881,183 patients, 80.9% reported no problems with current opening times. (14) This suggests that most patients find no need for this measure. As such, the question remains whether this option would alleviate the stress on secondary care. If successful, while such a measure could protect secondary care doctors, it would endanger the welfare of primary care physicians, who are already under great service pressures. Instead, could better patient education regarding what ailments need medical attention and when remedy these demands? This could negate the need for DPM.

To conclude, rather than debating the logistics behind DPM, we wish to encourage debate on its underlying ethics. That is, to what

extent should doctors sacrifice their hobbies and past-times in the name of profession? No one denies that the patient is our top priority – their good health is both our aspiration and inspiration. However, should our welfare matter more than an hour of lost productivity? Medicine is more than hitting targets. It should defend health, defend welfare and provide equal opportunities where everyone is listened to. It should be a profession in which doctors are protected from the emotional, physical and psychological costs that their noble pursuit inflicts. This can be achieved by changes not only within our profession, but also through a concerted effort by the public, media and politicians.

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Bridging the gap: an insight into dentistry

EDUCATION

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No conflicts of interest to declare

Accepted for Publication:
26.04.17

ABSTRACT

Summary

Dental and medical care are closely interlinked since certain clinical oral manifestations can provide a useful insight into underlying systemic diseases. With recent research highlighting unique 'two-way' relationships between systemic and oral disease processes, it is paramount medical students are aware of these. Medical school curricula scarcely cover oral disease and oral examination; the purpose of this article is to provide a foundation for further learning. A clear focus has been made on four key aspects: the core dental team, oral lesions, dental disease and oral manifestations of systemic drugs.

Relevance to medical students

Examination of the oral cavity forms an element of the wider physical exam. Hence, an appreciation for dentistry will place medical students in a more confident position knowing that they have an understanding of oral abnormalities. This will not only encourage improved diagnoses but discourage false referrals, making a positive impact on patient care and management.

Take home messages

Medicine and dentistry have a firm place in the primary health sector as patients share their health concerns with both their general medical practitioner and their general dental practitioner. Patient care can be greatly enhanced if a closer relationship between the two professions is fostered. This educational piece places a step in that direction by presenting to the reader an insight into the multifaceted speciality of dentistry.

INTRODUCTION

Dental health can have a profound impact on the physical and emotional wellbeing of a patient. As such, dentistry is much more than the ‘pearly smiles’ portrayed in recent media. In many ways, the oral cavity can be seen as a “*window on the body*” (1), where oral changes can reflect underlying systemic illnesses, so a thorough oral examination may help medical practitioners confirm their diagnosis. (1) However, a recent study highlighted that 89% of medical students felt their training in the examination of the oral cavity was inadequate. (2) Furthermore, as a holistic approach to patient care is seen as the ideal, it makes sense that medical students have a working knowledge of dentistry. In their career, they are likely to encounter patients complaining of oral problems and having a basic knowledge of how to manage them will prove to be invaluable. This article aims to provide an initial insight into the world of dentistry.

THE DENTAL TEAM

As with medical care, dental care is delivered through a team approach (see figure 1). All members are equally important and must communicate effectively to ensure quality patient care. (3,4)

ORAL LESIONS

There is an array of lesions which present in the oral cavity, all differing in their clinical presentation. Whilst some may remain benign, some have the potential to turn malignant and can have a significant effect on a patient’s life. (5) Figure 2 illustrates a range of lesions and their common clinical presentations.

White patch lesions can be the result of necrotic epithelium, debris or fungi collecting on the oral mucosal surface. (6) However, in some cases such as frictional keratosis, the white appearance can be attributed to an increase in keratinization. (6,7) This increase is brought about by recurrent mucosal trauma. (6,7) Trauma is not the sole reason as to why white patch lesions may develop. Further causes include neoplasia, immune related disease (e.g. lichen planus) and infection (e.g. candidosis). (6-9) Candida is ubiquitous as part of the normal oral microflora, however, its proliferation is generally the result of an underlying illness or antibiotic/steroid therapy. (7,10) Lichenoid reactions clinically resemble lichen planus (figure 3) and are brought about by systemic disease or a reaction to drugs and metals (such as amalgam). (8) Once the aggravating agent is removed, the reaction usually subsides. (8)

Erythematous lesions, like white patch lesions, also have many causes. Erosive lichen planus has a similar autoimmune aetiology to lichen planus however, here it presents as a painful lesion which is characterised by red patches. (8,11) Contact hypersensitivity

reactions are allergic reactions to materials used in dentistry such as amalgam, latex and anaesthetics. (12) The location of the erythematous patch usually corresponds to the site of exposure. (7) Erythematous candidosis is the term given when a candidal infection results in visible red areas on the oral mucosa in the absence of white plaque. (13) Taking a smear of the site can often indicate the presence of candida and the condition may itself be an indication of immunosuppression. (7,13)

Ulcerations of the oral mucosa are usually painful and they vary in severity and cause. Trauma to the oral mucosa results in a deep localised ulcer. (7) Conditions such as acute necrotizing ulcerative gingivitis (ANUG) which is thought to be caused by anaerobic bacteria and potentiated by factors such as stress and smoking, result in widespread ulceration affecting the gingivae. (14)

White patch lesions or erythematous lesions that cannot be rubbed off or characterised as a specific disease are termed leukoplakia or erythroplakia, respectively. (15) This subgroup of lesions has an increased malignant conversion rate and should be biopsied when detected. (6) Squamous cell carcinomas (figure 4) (SCC’s) are the sixth most prevalent cancer worldwide and vary massively in their clinical presentation. (5) Heavy alcohol and tobacco consumption are key risk factors in the onset of SCCs and patients presenting with both are at a heightened risk. (16) Prognosis of SCCs are significantly improved with early diagnosis; although, their often-painless presentation may make this difficult. (15)

INSIGHT INTO DENTAL DISEASE

Dental caries

Although preventable, dental caries is a common progressive disease of the dental hard tissues, that can lead to pain and tooth loss if not managed appropriately. (17,18) Bacteria exist in symbiotic biofilms that form on the outermost surface of teeth. (17) When these bacteria metabolise dietary carbohydrates, acids are formed as a by-product. (18) These acids can cause demineralisation and cavitation of the tooth surface. (17,18) Saliva acts as a natural buffer, which aids remineralisation. (19) Treatment options include working with the patient to improve oral hygiene, dietary advice, fluoride use and where necessary, restoring existing carious cavities. (19)

Apical Periodontitis

Apical periodontitis is the acute or chronic inflammation of the periapical tissues which surround the apex of the tooth. (20) It usually follows untreated carious lesions which approach the pulp allowing the egression of bacteria periapically. (20) This is the main cause but other causes such as trauma can produce a similar situation. (20) Patients presenting with apical periodontitis may

complain of a severe dull throbbing pain in the affected region, tenderness when biting and fever. (21) Root canal therapy is the treatment of choice and aims to resolve periapical inflammation through the removal of infected and necrotic pulpal tissue, but not all teeth can be saved and extractions may be required. (21)

Periodontal Disease (PD)

Although PD encompasses a range of disorders that affect the periodontium (a group of tissues which provide support to the teeth), the term commonly refers to gingivitis and periodontitis. (22) These are both inflammatory disorders brought about by a response to bacterial substrates from dental plaque. (22) Gingivitis is highly prevalent affecting many adults worldwide. (22) It is a reversible condition characterised by erythematous and swollen gingivae (gums) that bleed on brushing and is related entirely to plaque accumulation around the gingival tissues. (23) If allowed to progress it can result in a chronic irreversible condition where there is degradation of the periodontal tissues. (23) This is known as periodontitis and in severe stages can result in tooth loss. (22) Usually chronic periodontitis affects older patients, but in some individuals the disease is seen at a much younger age and is termed 'aggressive periodontitis'. (23)

Smoking, diabetes, medications affecting salivary flow, genetics, stress and immunocompromised states are all risk factors for periodontitis. (24) A bi-directional relationship between diabetes and periodontitis exists. (25) Studies show that hyperglycaemia can result in an increase in pro-inflammatory cytokines which can aggravate periodontitis and conversely, periodontal pathogens have been shown to increase insulin resistance. (26) It has been suggested that all patients with poorly controlled diabetes are referred for a periodontal examination. (24) Other bidirectional relationships with osteoporosis, respiratory and cardiovascular diseases also exist. (26)

The management of periodontal diseases involve improving the patient's oral hygiene and removal of supra- and sub-gingival calcified deposits. (27)

ORAL MANIFESTATIONS OF SYSTEMIC DRUGS

In an age where an increasing number of patients are being prescribed medications, knowledge of their side effects is crucial.

Medication Related Osteonecrosis of the Jaw (MRONJ)

Bisphosphonates inhibit osteoclast function during periods of high bone turnover in disease states such as osteoporosis, Paget's disease and bone metastases. (28) MRONJ is a complication of

bisphosphonate therapy (usually after dento-alveolar surgery) affecting normal bone turnover, characterised by areas of exposed, necrotic jaw bone. (29) Patients may present with pain, gingival ulceration and in advance stages, bone fracture. (28) Although emphasis is placed on preventing MRONJ, management involves frequent antimicrobial rinses and systemic antibiotics. (30) In severe cases, surgical intervention such as bone resection may be used. (30)

Drug Induced Gingival Hyperplasia

Three classes of drugs are associated with gingival hyperplasia (gingival overgrowth): anticonvulsants (e.g. Phenytoin), immunosuppressants (e.g. Cyclosporine) and calcium channel blockers (e.g. Nifedipine). (31) In a susceptible individual, gingival hyperplasia (figure 5) becomes clinically visible after 3 months from starting the medication. (32) Speech, aesthetics and mobility of teeth are all affected. (31) Minimising plaque levels, surgical intervention, tooth debridement and considering alternative medications are all treatment options. (33)

Xerostomia

Whilst it is widely acknowledged that many medications can lead to xerostomia (dry mouth), head and neck radiotherapy and disease states such as anxiety, depression, HIV and systemic disease such as diabetes and Sjögren's syndrome can also potentiate the condition. (34) Patients suffering from xerostomia will often experience eating and speech difficulties, taste disturbance, burning sensations and oral pain. (35) Furthermore, as the buffering effect of saliva is removed, the patient becomes more susceptible to dental caries. (36) Treatment for xerostomia aims to alleviate symptoms. Patients are advised to suck on sugar free sweets, use artificial saliva substitutes, drink more water and avoid dry foods. (36)

CONCLUSION

Although this article provides an insight into dentistry, it is by no means exhaustive. What has been covered should equip medical students with an appreciation of key areas in dentistry that they may encounter during their medical career. We hope that readers build upon this framework and develop their knowledge throughout their careers of lifelong learning. Medicine and dentistry go hand in hand and collaboration between members of both professions will result in the successful management of patients.

Acknowledgements:

We would like to thank Professor Alan Gilmour for his ongoing support, and Professor Michael Lewis for providing us with clinical photographs.

FIGURES

THE CORE DENTAL TEAM	
Dentists	Typically, the first clinical contact for patients. They diagnose, manage and prevent a range of oral problems.
Dental nurses	Assist dentists chairside and are essential for patient care, infection control and administrative tasks.
Dental hygienists	Focus on the improvement and maintenance of a patient's oral health. Through educating and delivering regular treatment they play a vital role in combating periodontal disease.
Dental therapists	Extending on the role of a dental hygienist, dental therapists can also undertake simple restorative procedures (e.g. placing temporary dressings and simple fillings) and extract primary teeth.
Dental technicians	Responsible for the fabrication of dental prosthesis under the prescription of a dentist.

Figure 1 (table): Summary of the Core Dental Team. (4)

	DIFFERENTIAL DIAGNOSIS	CLINICAL PRESENTATIONS
White patch	Candidosis	<ul style="list-style-type: none"> • Creamy white or yellow patches • May rub off (if at junction of the hard & soft palates)/ may not (if at the corner of the mouth)
	Lichen planus (LP)	<ul style="list-style-type: none"> • Symmetrical and bilateral • Often white striae on cheeks or tongue
	Lichenoid reactions	<ul style="list-style-type: none"> • Appearance resembles LP • Presents asymmetrically
	Frictional keratosis	<ul style="list-style-type: none"> • White lesion which may appear thick and corrugated • Often presenting on the cheeks/lateral margins of the tongue
	Leukoplakia	<ul style="list-style-type: none"> • White patch of unknown cause • Cannot be wiped off
	Squamous cell carcinoma (SCC)	<ul style="list-style-type: none"> • Varying presentations • Commonly on the tongue/retromolar region/ floor of the mouth
Erythema	Erosive lichen planus	<ul style="list-style-type: none"> • Red patch lesion • With/without white striae
	Erythematous candidosis	<ul style="list-style-type: none"> • Painful red areas • Common on the palatal mucosa
	Contact hypersensitivity reactions	<ul style="list-style-type: none"> • Red patches • Potentially presenting with vesiculation
	Erythroplakia	<ul style="list-style-type: none"> • Red patch of unknown cause • Cannot be wiped off
	Squamous cell carcinoma (SCC)	<ul style="list-style-type: none"> • Varying presentations • Commonly on the tongue/retromolar region/floor of the mouth
Ulceration	Traumatic ulceration	<ul style="list-style-type: none"> • Single localized ulcer
	Acute necrotizing ulcerative gingivitis (ANUG)	<ul style="list-style-type: none"> • Painful ulceration at gingival margin • With halitosis
	Squamous cell carcinoma (SCC)	<ul style="list-style-type: none"> • Varying presentations • Commonly on the tongue/retromolar region/floor of the mouth

Figure 2 (table): Summary of Specific Oral Lesions. (5-16)



Figure 3 (photograph): Lichen Planus – photograph courtesy of Professor M A O Lewis, Cardiff University

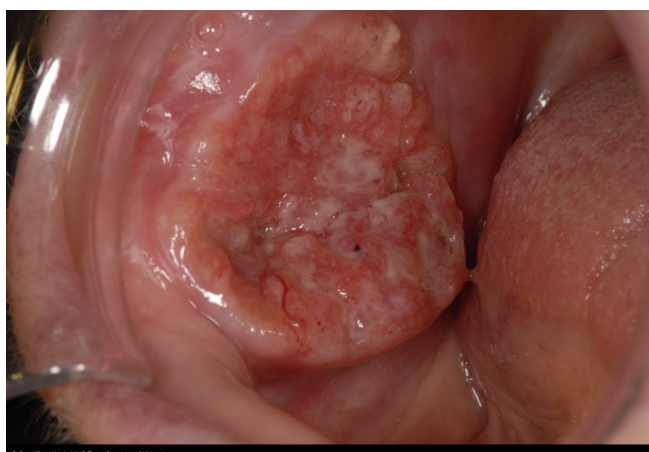


Figure 4 (photograph): Squamous Cell Carcinoma – photograph courtesy of Professor M A O Lewis, Cardiff



Figure 5 (photograph): Gingival Hyperplasia – photograph courtesy of Professor M A O Lewis, Cardiff University

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General Medical Council refusal to grant provisional registration - reasons, prevention and what to do if it happens

EDUCATION

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No conflicts of interest to declare

Accepted for Publication:
12.06.17

ABSTRACT

Summary

The General Medical Council has refused provisional registration to UK medical graduates 30 times between 2010 and 2016. The reasons given for refusal were lack of insight (29/30, 97%), lack of remediation (29/30, 97%), probity concerns (18/30, 60%), and health (11/30, 37%). In the only case that did not involve both lack of insight and lack of remediation, there were serious concerns about the applicant's health. This article explains the processes that lead to registration refusal, and offers advice about how to prevent refusal and how to respond to refusal. Thus far, 16 of the 30 have re-applied, and 13 were successful in gaining provisional registration.

Relevance

Medical students need to be aware that even if their medical school has permitted graduation, and even if a student has been found to be fit to practise by a university committee, the GMC may decide that the student has failed to demonstrate fitness to practise. This will lead to a refusal to grant provisional registration, which at the very least will set back an individual's career by 12 months.

Take home messages

Lack of insight and the resulting failure to change behaviour and demonstrate remediation risk loss of a career. It is imperative that students respond to advice and warnings. Students may not realise that it is not just the seriousness of problem behaviours but their response to advice that determines how a medical school will decide what action to take.

Students at UK medical schools rightly assume that passing finals and getting an offer of a place on the Foundation Programme are the main obstacles to be overcome before starting work as a doctor. Many are unaware of two additional hurdles. The first is that the General Medical Council (GMC) will not permit universities to graduate a medical student where there are unresolved concerns about fitness to practise (FTP). The other is that even when a university has permitted graduation, thereby confirming it considers the graduate fit to practise, the GMC nevertheless makes its own independent decisions about FTP, and has the power to refuse to grant provisional registration. From 2010 to 2016, the GMC has refused provisional registration to UK graduates on 30 occasions. Such decisions will prevent the doctor joining the Foundation Programme.

Whilst those who are refused provisional registration can appeal against the decision, and can reapply, because entry to the Foundation Programme can only occur in August, a registration refusal will set back a newly qualified doctor's career by at least 12 months. The GMC publishes information each year on FTP matters arising during the process of application for provisional registration, and data from the most recent report has been used in this article. (1)

IMPORTANT ASPECTS OF THE APPLICATION PROCESS AND ITS TIMING

When medical students apply to the GMC for provisional registration, they complete two declarations. One relates to their character and conduct (for example disclosing convictions or having had to attend a disciplinary or FTP Committee) and the other concerns their health. The GMC visits every UK medical school every autumn to run an event for final year medical students. As well as performing an identity check, the GMC team provide an overview of the registration application process, emphasising the importance of early disclosure of any FTP issues. By the end of April, or earlier where the medical school has already shared information with the GMC about students with more serious or complex FTP issues, students receive an invitation and instructions from the GMC on how to apply. Applications that are received late risk the possibility that the GMC is unable to make a decision before the commencement of the Foundation Programme on the 1st August, which will delay the doctor's career by 12 months. To avoid this happening, the GMC make great efforts (including close liaison with medical schools) to encourage early application, particularly where a student has one or more disclosures to make.

Of those applications that include one or more positive FTP and/or health declarations, about 80% can be processed and approved on the basis of the information that has been provided. About 20% of applications trigger an investigation by the GMC

Registration Investigation Team. When this occurs, the applicant is informed, and:

(i) In the case of an FTP declaration

The applicant is asked to write a detailed statement explaining the circumstances that led to the conviction/caution/warning/disciplinary proceedings/FTP proceedings, and explaining how the student's actions might be regarded in the light of the GMC's guidance "*Good Medical Practice*". (2) The applicant is also asked to provide documentation confirming the details of the incident/incidents, any action taken by the medical school, and details of any sanctions imposed and evidence of compliance. Also required is evidence that the matter(s) have been declared to the foundation school, a notice of any cautions/convictions or a recent criminal record (Disclosure 3 and Barring Service) check, and a minimum of two character references (that meet the GMC requirements as set out in their guidance).

(ii) In the case of a health declaration

The applicant is asked to complete a CX1 form, a questionnaire about the applicant's FTP and health matters, and provide the evidence requested on the form (very similar to the items listed above).

An applicant should obtain advice about the provision of this additional information, preferably from the applicant's medical defence society (not least because if this advice is not sought then the defence society may be unwilling to assist if the application is unsuccessful). It is also important that the possible reasons for refusal, and the importance of insight and remediation, all explained below, are borne in mind when preparing statements and completing the above documents.

Following the consideration of this additional information, the GMC may decide to grant provisional registration, it may ask for further information, or it may seek advice from a Registration Panel. If the latter occurs, the applicant is informed, and provided with a copy of all the information to be supplied to the Registration Panel. The applicant can submit any written representations or other documents for the GMC to consider. The aim is to give applicants 28 days' notice of referral to the Registration Panel. This period can be shortened with the applicant's consent. The Panel meets in private, and the GMC aims to provide a copy of the Panel's advice and the decision that has been made within 2 weeks of the Panel's meeting.

A key message is that the later the application is made, the greater the risk that the processes involved may prevent a decision being made until after the start of the foundation programme, thereby delaying the doctor's career by 12 months.

REASONS FOR PROVISIONAL REGISTRATION REFUSAL

Of 7295 applications for provisional registration received in 2016, 945 (12.9%) included declarations about one or more FTP issues, a proportion that has been gradually increasing since 2012. Of the 945 applicants that declared an issue, 764 (80.8%) applications were dealt with without further investigation, but the other 181 triggered an investigation. (1)

Of the 30 applicants who have been refused provisional registration, the reasons given for refusal were lack of insight (29/30, 97%), lack of remediation (29/30, 97%), probity concerns (18/30, 60%), and health (11/30, 37%). In the only case that did not involve lack of insight and lack of remediation, there were serious concerns about the applicant's health. (1)

The following are the types of situations in which provisional registration has been refused:

- new matters (e.g. criminal offence) occurring after graduation;
- matters (mostly criminal offences) of which the medical school was unaware
- student attended a university disciplinary committee but was not referred to the FTP Committee, but the GMC concluded that the applicant's FTP was impaired; and
- the university FTP Committee concluded that the student was fit to practise, but the GMC concluded that the applicant's FTP was impaired.

In relation to the latter category it is important to appreciate that the GMC are likely to have sight of additional information that is unavailable to the university, including any submissions made by the applicant (possibly accompanied by character references).

Lack of insight

Lack of insight is the unifying feature seen in a high proportion of student (and registrant) FTP cases. Insight means an individual's ability to recognise and understand what has been wrong with the person's behaviour. Lack of insight is severely disabling because if one cannot recognise what is wrong with one's actions then it is likely to be difficult or impossible to correct one's behaviour.

Insight on the part of the student is therefore crucially important. Insight can include:

- the ability to step back from the situation and consider it objectively;
- recognition of what went wrong;
- acceptance of the student's responsibilities at the time in question;

- an appreciation of what could and should have been done differently; and
- an understanding of how to act differently in the future to avoid a recurrence of similar problems.

Some examples of lack of insight shown by students are:

- a student who instead of creating patient logs, as required by the medical school, uploaded logs created by other students, pretending he was the author. When challenged the student admitted his actions, but claimed, based on an obscure research study, that all medical students plagiarise, the implication being that this is normal and acceptable behaviour;
- a student who falsified the signatures of three supervisors on placement assessment forms, and who when asked who was responsible for his actions blamed the medical school, which he said had provided insufficient warning that signature forgery was impermissible;
- a student who was caught shoplifting admitted the offence but made statements apparently trying to minimise the seriousness by emphasising the low value of the goods that were taken (chocolate worth under £5), the frequency with which shoplifting occurs, and the fact that the police were content just to issue a caution;
- a student who was told to examine a patient 4 hours after bronchoscopy under anaesthetic and check the blood pressure, but failed to do so, falsified the blood pressure results in the patient's medical records, and when asked by his supervisor he lied about his findings. In a written submission, the student admitted he had lied, but quoted NICE guidance which he claimed stated that a routine check of blood pressure more than 1 hours after bronchoscopy was not required, which even if true, could not possibly have justified his dishonesty;
- a student who refuses to apologise or accept mistakes; and
- a student who promises to correct behaviour but fails to take the necessary appropriate steps, or only does so when directly prompted.

A lack of insight, distancing of responsibility, or minimising the seriousness of problem behaviours are all likely to lead to a concern about a high risk of recurrence of the problem behaviour in the future.

Lack of remediation

Remediation is the action taken to remedy a situation. In a helpful metaphor from Kalet and Chou, who edited a recent textbook on remediation in medical education, (3) sailors make many course corrections and are constantly recalibrating their navigational

systems so as to ensure they arrive at the intended destination at the expected time. “*The metaphor suggests an aspirational reference point even though you are almost always off course. It also implies the need for exquisite awareness of your current location, your strengths, vulnerabilities and foibles, and an ability to collect and digest a wide array of information. Guidance – the sun, the stars, GPS, or a good mentor – is a must, particularly when navigating in unfamiliar waters*”. (3) Remediation for students is the act of facilitating a correction for trainees who started out on the journey towards becoming a doctor but have moved off course, risking ending up on the rocks.

Remediation is a particularly difficult topic for students whose behaviour has raised FTP concerns. Unlike the metaphor set out above, there is a lack of evidence as to methods that will or will not work, and for some behaviours, particularly dishonesty, there is a real doubt as to whether remediation is possible. It can be difficult to present convincing evidence that the behaviour was an exception or a one-time occurrence.

In addition, there may be concern as to whether a change is genuine or feigned, which is one reason why mere aspirations or promises to change will be less convincing than actual evidence that change has occurred. However the wide range of sanctions that exist in student FTP cases are in effect incentives (4) for students to demonstrate the values of cooperation, remorse, contrition, remediation and rehabilitation.

In the case of a student whose behaviour has caused FTP concerns, there are some key principles when considering remediation:

- a remediation is not possible without insight. The first step has to be to reflect on the actions and behaviours that caused concern and try and understand why these were deemed unacceptable in the first place.
- being referred to a student FTP Committee often means the student has not followed the regulations for their programme and the principles of GMC guidance “*Achieving good medical practice: guidance for medical students*” (5) and “*Good Medical Practice*”. (2) Students should look at those principles to see where their behaviour has departed from the guidance, and think what they could do to demonstrate remediation for those specific principles.
- there is a pressing need to co-operate with advice and guidance, an essential characteristic for all health professionals.
- if graduates have been refused provisional registration on the grounds of FTP, they should consider the reasons given for refusal and the actions that generated those concerns. Efforts towards remediation should be centred on these.

Each case is different, and the way in which a student can show they have remediated will depend on the specific circumstances. But regardless of the nature of the case, key elements are:

- providing evidence of reflection and self-assessment;
- sincere expressions of remorse, accompanied by evidence of actions to demonstrate that a real change for the better has occurred;
- providing evidence that one can improve by learning from mistakes; and
- providing evidence that measures have been put in place to prevent problem behaviours from recurring.

Options following registration refusal

The choice lies between appealing against the refusal (there is no published data, but appeals seem to be uncommon), re-applying (which can be done at any time) – of 16 re-applications thus far 13 have been successful, or abandoning medicine as a career. GMC refusal decision letters (which are only sent to the applicant and not to the medical school) make it plain that a new application will need to provide robust, objective evidence to show that the issue(s) that led to the current application being refused have been addressed.

Support and guidance for those who have been refused provisional registration

Graduates who have been refused provisional registration need guidance and support, but often they may find themselves in limbo. Medical schools may be disinclined to offer much support to someone who is no longer a student (and who may have caused the medical school many difficulties over a prolonged period). Furthermore, the infrequency of such events means that most medical schools are unlikely to have much experience dealing with such cases. However, there is much that a medical school can do, for example by helping to arrange shadowing in clinical settings. This can be important if the student is to be able to demonstrate change, and it is also important when re-applying for provisional registration to be able to provide evidence of continuing clinical exposure and prevent de-skilling. The medical defence organisations, if they agree to support the graduate (see footnote 1) may also have had little experience of dealing with provisional registration refusal, though they will have a great deal of experience of giving advice about remediation to registered doctors who are going through GMC FTP procedures.

The need to respond to advice and warnings

Failure to respond to advice and warnings is a major reason for referral of a student to an FTP Committee. Where failure to respond has persisted there is a real risk that the GMC will decline to grant provisional registration. Persistent unprofessional behaviour

if continued after graduation is unlikely to be compatible with a medical career. Students need to be advised at an early stage that failure to adhere to guidance may put their whole future career at risk.

Behaviour changes need to be documented and evidenced

A simple promise that there will be no further problems is unlikely to suffice. The student with a record of frequent non-attendance coupled with a failure to follow absence reporting requirements will need evidence that both problems have actually been overcome over a significant period of time. Students who repeatedly ignore emails and reminders, who persistently fail to deal with necessary paperwork in a timely fashion, or who keep failing to attend appointments with teaching and support (e.g. occupational health) staff will need to provide evidence, supplied by those who have had to deal with these problems in the past, that these difficulties have been overcome. Although the university and GMC processes for assessing FTP differ considerably, when making their decisions both will be looking for similar types of evidence that a student has overcome past problems.

CONCLUSIONS

The GMC has refused provisional registration to UK medical graduates 30 times between 2010 and 2016. 13 of the 16 re-applications have been successful in gaining provisional registration. Whilst the possibility of a successful re-application may be felt to be encouraging, this is offset by the delayed career progression in those who are successful. In addition, for the 50% whose careers are permanently terminated this represents a huge loss, to the individuals, the profession, the NHS and the public. The detection of very serious problems with professional behaviour in students not uncommonly occurs at a late stage. Earlier detection would be helpful. Most students arrive at university with glowing references and school reports of exemplary conduct and outstanding leadership qualities, and it would also be helpful to gain some understanding of why some medical students go on to behave in potentially career-ending unacceptable ways.

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¹ Unfortunately, defence organisations sometimes decline to support certain medical students or recently graduated doctors. It is often not appreciated that support from defence organisation is discretionary; this means they can refuse to provide support and are under no obligation to provide reasons.

Peace through health in the Middle East

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No conflicts of interest to declare

Accepted for Publication:
10.05.17

Natural disasters, failing exams and missed flights are known reasons for medical students to miss their elective. Another reason to add to that list is being deemed a 'threat to public security' by the host country of an elective placement.

The completion of my fourth year of medicine required writing a report on a clinical or research elective, which I chose to do in the Middle East. However, despite securing funding from the Jewish Medical Association to pursue a placement in paediatric oncology in an Israeli hospital, I was denied a visa to enter the country. The immigration officers were less concerned by my acceptance letters and bursary prize, but instead, questioned me on my alleged links to pro-Palestinian activists, links to Syria and fundraising activities for humanitarian charities back in the UK. After 6 hours of interrogation and detention, I was sent on the next flight back home.

The disappointment of not being able to pursue my elective lingered for a good few weeks after my deportation. Despite representations being made on my behalf by Conservative and Labour MPs, as well as the Jewish Medical Association, the Israeli embassy did not give an explanation regarding my refusal of entry.

My project would have explored the experiences of Israeli Arabs, Palestinians of Jerusalem, and patients referred from the West Bank and Gaza into the Hebrew University Hadassah Hospital. The Jewish Medical Association considered this a research question of vital importance, which aside from a few pieces of journalism, (1) has not yet been effectively addressed. It appears that a model of co-existence does exist in the wards of the hospital I was meant to work in, where Israeli and Arab patients are treated equally from a diverse group of healthcare

staff. (2) This was also considered an important topic because of the current trends of healthcare staff and facilities being targeted in conflict areas. (3) A positive example of cooperation in healthcare is much needed to showcase the importance of neutrality in the practice and service provision of medical care.

The Israeli-Palestinian conflict is deeply polarising, with divergent views on the source of strife across the political spectrum. But medicine is a discipline that has the potential to transcend the nature of the conflict. I was looking forward to examining the stories of the patients and staff who work at the facility, with the aim of providing a new avenue of how the medical profession can contribute towards the peace process. I wanted to shed light on how in spite of the atmosphere of destruction and divisions that do exist in that society, medicine through its values of altruism and compassion can be a bridge to bring peace. I was to be based in a paediatric oncology department, as the welfare of children is something that many people hold to heart even in the face of years of hatred and discord.

Moreover, the current global health paradigm is based on healthcare system strengthening and building partnerships. (4) Although the Lancet published a series on health in Palestine a few years ago, the information on patient referrals and transfer from the Palestinian Authority to Israeli hospitals was not discussed in depth. (5) In collaboration with my mentors at University of Birmingham, King's College London and Hebrew-University Hadassah Hospital, I was going to conduct focus interviews with the patients and healthcare staff regarding their experiences. Interfaith work as it stands is often based on religious unity, but the answers of my research could have shed light on how people of faith consider life to be sacred, at least in a hospital setting.

There is scope to strengthen the healthcare system of Palestine through not just the UN and NGO-led movements such as Medical Aid for Palestinians, but also collaboration with Israeli institutions, such as Hebrew-University Haddassah, to train staff as well as treat patients with complex conditions. A recognition of the co-operation between Israeli and Palestinian health systems has the potential to decrease delays at checkpoints for the citizens of the West Bank and Gaza seeking healthcare in the tertiary care centres in Jerusalem. The development of such partnerships between the health systems may in turn put pressure on the Israeli authorities to recognise the healthcare needs of patients as a priority. (6) To facilitate this, the medical profession worldwide should also highlight the issues with Israeli immigration policies on dealing with the entry of students and healthcare staff into the country, who come for humanitarian and academic purposes.

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No pasa nada: Reflections of Erasmus in Spain

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Accepted for Publication:
26.04.2017

After returning home from nine weeks in a Spanish hospital, it is difficult to tease out our main reflections on the whole experience. We could have focussed on so many different themes: coffee etiquette, the laidback 'no pasa nada' Spanish attitude, the language nuances or the benefits of a Mediterranean lifestyle. Instead, we will focus on the differences in doctor-patient relations, which we experienced during our Obstetrics, Gynaecology and Paediatrics placements in a Valencian district general hospital.

One of the first things you cannot help but notice is that all the doctors wear white coats. This was quite a novelty and, as medical students, it felt just like when we were children playing doctors and nurses all over again. The white coat serves as a symbol of status. The doctor is the professional and the patients have come to seek their advice. The traditional attitude of respecting the doctor's knowledge and ability, one that many older doctors feel nostalgic about in the UK, still partially exists in Spain. This paternalistic style can present a barrier to communication, as it can appear to be intimidating. However, in consultations, we found Spaniards to be much more direct in their language, speech and attitude with their doctors. They have come with a problem that they want fixed and the white coat does not daunt them – it seems to help them trust the doctor and allows them to differentiate them from other healthcare professionals. They prefer their doctors to look like doctors.

The other major difference is that all the patient's notes are kept electronically in the Spanish healthcare system. It is a foundation doctor's dream world, where clinic letters, GP notes and blood results can all be accessed at the click of a mouse. There is no endless

chasing of lost letters between primary and secondary care, or issues retrieving and viewing scans from a different health board. Electronic drug charts can catch prescription errors, and are updated remotely from the drug trolley and removes difficulties in interpreting illegible handwriting.

On a ward, this means the doctors do not write anything down when they are taking a history and examining the patient. They focus on what they are doing there and then, in that moment with the patient, instead of trying to multitask. The downside is that they then have to remember the full consultation in order to transcribe the notes later on. As they are familiar with this method, the staff seemed to encounter few problems.

In clinics, the computer can be more of a barrier, as doctors often work from an electronic template, meaning questions are extremely closed and in quick succession. Open questions were used infrequently in Spain to prevent time consuming histories, as the patients expected the doctors to tease out the relevant information. Patients did not seem to mind this grilling style and are much less hesitant about interrupting the doctor if they think they might have missed something out. This meant that despite reliance on closed questioning, the consultations are still very patient led and elicit most of the relevant information. It is easy to see how patients could feel unable to divulge sensitive information, as there is much less opportunity for this in a consultation with no open questions. This did not appear to be a problem for most Spaniards, as they are generally direct and unashamed about sensitive or intimate issues. Despite having no concrete models of how to elicit the patient's ideas, concerns and expectations, the patients tended to leave the room feeling reassured that they had been thoroughly questioned.

Continuing on this theme, there is no introduction, role explanation, or 'hello my name is...'. It just seems a little ridiculous to the Spanish – they know who the doctor is, why they are there, and the patient's identity is usually apparent, as the doctor has most likely just shouted their name out into the waiting room. Similarly, often no attempt is made to establish a rapport with the patient by making small talk, as it is recognised that this is a professional encounter between a service user and service professional. The doctor has more expertise and experience with which they advise the patient accordingly, and the patient is more concerned with this than the doctor's opinions on the weather. Both parties have this shared expectation, which is why the paternalistic model works to an extent. Interestingly, at the end of the consultation patients usually receive a printed copy of the doctor's notes. We felt that this meant the patients were very well informed about their health and it reduced confusion between what was discussed in different

consultations.

It made us question whether in attempting to perfect our communication skills through workshops, acronyms, standard empathetic statements and studying body language, we have forgotten that a consultation is essentially just a conversation. It is a two-way discussion, between a knowledgeable professional and a service user in need of help. Have we become too rehearsed? Too analytical? It is certainly something we will be more aware of in the future.

One of the main reasons we think that this style works is a result of Spanish nature – the same attitude adopted with a British patient would get a completely different response and would probably be perceived as rude. Furthermore, sometimes we felt that a softer touch was needed with particular patients. This seemed to depend on the individual doctor – some could adapt to the patient's needs, and others could not – or even worse, did not.

To attempt to conclude on such a fantastic experience, our Erasmus placement has allowed us to evaluate our own practices. The electronic systems greatly reduce the administrative workload of the doctors, resulting in more contact time with patients, better inter-service communication and less frustrated staff. While initially a bit of a shock, we appreciated the direct attitude of the Spaniards and the clarity of situations this produces. Despite the cultural differences, staff in both systems continually strive to produce the best outcomes for their patients. Mostly though, we learnt just how difficult it is to navigate a healthcare system, whether as a professional or patient, in a second language.

Response to: "Why I am pursuing a career in general practice"

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No conflicts of interest to declare

Accepted for Publication:
06.03.2017

The Royal College of General Practitioners is delighted to see the article by Peter Edwards on his vocational choice of a career in general practice 'Why I am pursuing a career in general practice'. (1) It is an engaging, informative, and articulate account, of not only the concerns, but also the immense opportunities facing students and foundation doctors considering a future career in general practice.

Students and foundation doctors have the ability to shape the future of general practice, especially at a time when the profession faces significant problems in workforce and funding resources. We have a significant challenge ahead of us in attracting, engaging, and educating the future general practice workforce, but it is also accepted that a strong base in general practice will be the cornerstone of a healthy National Health Service. With an ageing population, more people with multiple morbidities, and the movement of health and social care services from secondary care to primary care, there is no better time to consider a career in general practice - you will be very fulfilled, and very busy! Indeed, Simon Stevens, the Chief Executive of NHS England, has said very clearly that the NHS cannot survive without GPs.

Students and foundation doctors as a result are under significant pressure of work and assessments, which in turn shapes their experiences and their expectations. Most medical schools still allocate relatively few weeks of clinical placement in general practice, limiting exposure to the specialty and to its role models. It is becoming increasingly evident that general practice faces severe stigma and

negativity from established medical colleagues – as Peter Edwards also relates. Such negativity has a significant impact upon the attitudes, behaviours and perceptions of students and foundation doctors towards general practice and it is vital that we address these concerns head-on.

Creating the ideal educational environment for students and foundation doctors to experience all medical specialties with an open mind and the ability to make informed and educated career decisions that are in their best interest is a significant priority for the RCGP. General practice teaching needs to be clearly signposted and embedded in the scientific principles and practice of general practice, showing students what an intellectually rich and stimulating career choice it can be. Inspiring the GPs of tomorrow will be determined by our ability to successfully nurture positive student dispositions towards the profession. It is imperative that students and foundation doctors are supported to make informed career decisions, having gained positive general practice exposure, and access to an accurate and informed picture of the current and future general practice landscape. They also need a chance to meet good role models, of whom there are plenty in general practice. A recent study of Cambridge medical students and foundation doctors found that following increased exposure to general practice there was a threefold increase in applications to general practice specialty training!

A career in general practice is intellectually and medically challenging, diverse and fulfilling. The opportunities offered by a future career in general practice have never looked more exciting and as a profession we have a duty to make sure that all aspiring medical students and foundation doctors are aware of the wealth of opportunities attributed to general practice. The RCGP will do all it can to ensure that many more, like Peter, decide that a career in general practice is for them.

As a student or foundation doctor you can become a member of the RCGP for free, with loads of great benefits – for more information email students@rcgp.org.uk or visit <http://www.rcgp.org.uk/membership> to sign-up today.

The RCGP also wishes to commend the work of *The British Student Doctor Journal* (BSDJ), in particular its student-led approach. The College through its recent Student Engagement Strategy hopes to create vibrant and engaging pupil, student, and Foundation Year - led networks, campaigns, events, and activities – ensuring our engagement activities always remain relevant and responsive to the needs and interests of pupils, students, and Foundation Year

doctors. We wish the BSDJ the very best going forward.

Kamila Hawthorne, Vice-Chair (Professional Development), RCGP

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<http://dx.doi.org/10.18573/j.2017.10123>

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