



THE MEDICAL MYRIAD

VOLUME 1 | MEDICINE AND DENTISTRY

Packed full of:

- Q&A's
- Days in the Life of Healthcare Professionals
- Medical News Updates
- Disease Awareness Articles
- Snippets from Aspiring Medics
- Book, Podcast and Video Recommendations...and much more!

PREPARED AND WRITTEN BY
SHREYA VERMA AND
GABRIELLA YEJU KIM



Q&A

WRITTEN BY FORMER HEAD
GIRL AND OHS ALUMNA
NISHA HARE, IN HER SIXTH
YEAR AT OXFORD UNIVERSITY

Q: Why did you choose to study medicine?

A: It's a bit of a cliché, but I both really liked science and I wanted to help people! I'd always found the human body fascinating, and had previously considered a career in biomedical research - but I realised I also wanted the day to day challenge and satisfaction of helping people by applying that knowledge. Additionally, it's a secure and well paid job, which aligned with my other life goals.

Q: Has the coronavirus pandemic moulded your views on medicine?

A: On the one hand, the pandemic has highlighted how important the role I signed up to do 5 years ago is and always will be in society. It's nice to know that even in a global pandemic, you'll never be unemployed! However, seeing colleagues in our hospital become seriously ill and even sadly pass away has brought home to me the personal risk healthcare workers expose themselves to in order to care for their patients. It has been a sobering but also reaffirming experience. I certainly don't regret my decision to enter medicine.

Q: What is the structure of the medicine course at Oxford like?

A: Some medical schools (mainly Oxford and Cambridge) have a 'traditional' style course where we do 3 years of science and then 3 years of clinical which is clearly demarcated, others have clinical involvement from the start and blend the two throughout (problem based learning/PBL style courses) while others are more in the middle (integrated courses). I can only speak for my experience of a 'traditional style' medical school, so if that doesn't sound like the style for you, it would be worth asking Dr Strobel to put you in touch with people at different medical schools to get an idea of what that's like.

The first three years of the Oxford course are the Preclinical years, which is essentially like doing a biomedical science degree with lectures, lab practicals and tutorials. There is very little patient contact or discussion of clinical medicine at all, so if you don't enjoy basic biology this is not for you! However, if you enjoy the science behind medicine and are happy to wait three years before touching another human, a traditional course is really fun. The tutorial system at Oxford (having weekly classes with only 3-6 students where you discuss a topic in lots of detail) really pushes you and you also do an extended practical lab project in third year.

However, I found the Oxford course very demanding - the workload is incredibly intense at times and there were certainly times when I thought hard about whether I really wanted to do medicine, and I was very keen on it from the start. There are also a lot of exams... So I would say if you are not 100% certain you want to do medicine, Oxford might be too much. I can't speak for other medical schools, which will all be intense, but I imagine not quite as intense on workload.

The second half of the 6 year course at Oxford is Clinical school, where you are based in hospitals and have a combination of lectures, teaching and being on the wards seeing patients. It's very satisfying to apply the knowledge you've learned, meet lots of patients and learn new skills on a day to day basis and feel a bit closer to the job you'll (hopefully!) be doing in a few years time. However, the downsides are quite intense hours and lots of exams, so if you struggle with the pressure of regular exams, this is worth bearing in mind.

Q: How did you cope with the workload at med school?

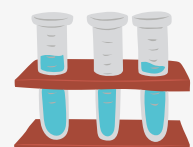
Not always very well! Medicine is a tough degree, and while I have got better at coping with the workload I still do struggle at times.

My best advice is to get to know yourself - try different learning methods (e.g. flashcards, spaced repetition software, mind maps, notes, talking out loud) and see which work best for you, as not everyone learns in the same way. My other top tip is learn to plan realistically. I have often fallen into the trap of planning a stupidly ambitious revision timetable, and then relentlessly punishing myself mentally for not being able to follow it, which is obviously ridiculous! Now I try to be realistic in my planning, building in catch up slots and time for relaxation and hobbies, so that the time I do spend working is most efficient.

Q: Which A levels did you take and how were they beneficial for your application to university?

A: I did Maths, Further Maths, Biology, Chemistry and Physics (AS only). Most medical schools require Biology and Chemistry, and Oxford also requires maths (for some reason), so those had to be included for sure, and I enjoyed all of those.

Further maths I did as a bit of a challenge for myself - and it was really quite challenging! It was a lot of hard work but in hindsight all the struggling was good practice for medical school.



Q

Physics wasn't really my cup of tea, but the BMAT (medical admissions test used at Oxford, Cambridge, most of the London Universities and several others) includes AS standard physics knowledge, so I did it for AS to give myself the best chance at that.

Q:What advice would you give in terms of the application process?

A: In a single word - preparation. Despite what universities may tell you about the BMAT or any admission test, including the UKCAT, it can be prepared for by using materials such as practice books.

In terms of personal statements, for medicine they should include 4 components - if you nail these, it should be enough to get you an interview. Firstly, explain your motivation to do medicine.

Secondly, demonstrate your interest in medicine - this can be anything from discussing books and lectures, to projects and EPQs!

Thirdly, demonstrate some experience of medicine - all applicants need some work experience and volunteering. Most importantly, you must not only explain what work experience/ volunteering you've done, but also reflect on what it taught you, such as skills you learned, and how it changed your understanding of medicine.

And finally, a personal statement should tell the interviewers a little bit about who you are, such as your hobbies and extracurricular activities. This not only shows you are an interesting and multidimensional person who will be fun to teach, but also that you have the time management and organisational skills to juggle multiple commitments, as you will need to do as a junior doctor.

interviews vary between different universities, with some adopting a traditional 'panel' approach and others adopting a 'Multiple Mini Interview (MMI)' approach in which you do lots of short stations.

Always research how the universities you are applying to conduct their interviews, and speak to a student who has interviewed there before. The key then is to practice talking about yourself and medicine out loud - which sounds very simple, but is surprisingly difficult in practice! Moreover, while it is good to have a think about how you would answer common questions such as why you want to do medicine, be wary of rote learning answers as that can come across as very robotic! Finally, if you're asked a difficult question, don't jump straight to the answer; most interviewers aren't looking for you to get the right answer - what they want is whether you can approach a problem logically.

LUPUS AWARENESS

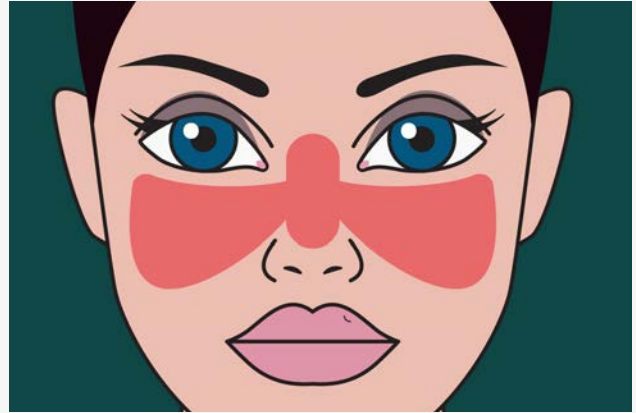
WRITTEN BY YEAR 12 STUDENT SHREYA VERMA

50,000 people in the UK currently have Lupus, which is 1 in a 1000, making this disease fairly rare amongst our population.

Common symptoms of Lupus include fever, fatigue, joint pain, shortness of breath and multiple others. One of the most common visual signs of the disease is a butterfly shaped rash on the face, covering the bridge of the nose and the cheeks. The resemblance of this to a wolf's bite gives Lupus, meaning 'wolf' in Latin, its name.

Lupus is an autoimmune disease, meaning that it occurs when our white blood cells attack our own tissues and cells as the immune system loses its ability to differentiate between healthy cells and foreign pathogens. However, unlike Psoriasis, for example, which is a skin specific autoimmune disease; Lupus can attack several organs, ranging from the kidneys to the lungs at any time, making the disease extremely unpredictable.

Nine out of ten of those who live with Lupus are women, and although the exact reason why this is isn't known; the fact that most women are diagnosed with Lupus during their



reproductive years tells us that female hormones play a part. Research has shown that high levels of oestrogen, from birth control for example, contributes to increasing the risk of Lupus.

This, however, cannot be seen as a cause, as in general only women who are genetically susceptible to Lupus can get the disease. Overall, both genetics and the environment, have to be involved. Consequently, a study was carried out to monitor the disease at a genetic level. Scientists observed the presence of Lupus-susceptibility genes in DNA samples of both men and women with Lupus and it was discovered that men require a greater number of Lupus-susceptibility genes to trigger the disease than women do. Hence, fewer changes or mutations are necessary for Lupus to be activated in women, making it more likely to occur in women than men.

A DAY IN THE LIFE OF AN ANAESTHETIST

WRITTEN BY CONSULTANT ANAESTHETIST DR FIONA RATCLIFFE

A day in the life of an anaesthetist is always an adventure. No day is the same, patients are all different and present unanticipated challenges. If you think that anaesthetists never have to talk to patients, since they are anaesthetised, well you are completely wrong!

On arriving at the hospital, I firstly visit my patients for theatre. The patients are understandably very anxious. They entirely trust your skill as the anaesthetist to support them in their journey through surgery and recovery. I discuss with them their medical history and plan the appropriate anaesthetic. Sometimes we do not need to give an anaesthetic, but just numb the operating site with local anaesthetic. I then go to the operating theatres for the Team Meeting and the whole operating team composed of surgeons, nurses and the anaesthetist discuss the day's operating list and any potential problems. We send for the first patient and while preparing

their anaesthetic, I chat to them in order to keep them calm.

During the operations, I am sitting at the head of the operating table monitoring and recording many readings from my patient, recorded on my anaesthetic monitor, to ensure my patient is asleep, stable and comfortable. I give fluid or even blood to the patient depending on the surgical operation. At the end of the operation, I wake up the patient and make sure that they are not in pain and if necessary give more pain-killing medications.

I have even spent days anaesthetising on a charity hospital ship in West Africa. Anaesthetics and surgery transgresses all continents and is practiced similarly all over the world. Hence, a day in anaesthetics provides the opportunity to travel and work in different places all over the world. The breadth of variety in your anaesthetic day can be from working in the maternity hospital delivering babies, working in intensive care units, specialising in anaesthetics for children and working in developing countries.

Needless to say, the day can never start until I have had at least 2 decent cups of coffee, and if the surgeon cannot find me for the team meeting, he knows that I am in the coffee queue!

WHY MEDICINE?

WRITTEN BY YEAR 12 STUDENT MILLA MACANOVIĆ

I aspire to study medicine at university and become a doctor as it's an intellectually stimulating career that can help me to have a positive impact on society and make a difference in the world. I have a love for people and I am fascinated by the human body. For me, learning about how the human body works and what causes it not to work is very interesting, as I find it incredible how our body is adapted to carrying out so many different functions. I enjoy problem solving which is a key part of medicine, and you also get to learn new things all the time, which seems very refreshing.

Medicine as a career is extremely satisfactory for someone who loves science, as not only do you get to help people and make a difference, you also get to work with your favourite subjects in a rewarding and analytical way. I remember when I was growing up, my mum, who is a nephrologist, used to show me cards and letters from her patients thanking her and telling her how much of an impact she had in their lives. I think this is part of the reason why I'm so inspired to do medicine - I have seen first hand how you can use your knowledge and understanding of the human body to change someone's life and make a difference. Hence, I would love to study medicine at university and become a doctor as it encompasses all of the things that I enjoy.

BOOK RECOMMENDATION

EVERYTHING THAT MAKES US HUMAN BY JAY JAYAMOCHAN

This incredible series of documented paediatric brain surgeries is written by Dr Jay Jayamohan, who is currently the paediatric brain surgeon at the John Radcliffe Hospital in Oxford. His gripping stories address his experiences with the most vulnerable of our kind - babies, which triggers a range of emotions in the reader, but nevertheless a significant level of respect for the surgeon.



MEDICAL NEWS:



TOPIC: CORONA CHROMOSOMES

A variant found in a region on chromosome 3 relates to developing an intense form of COVID-19, and was discovered by observing the genome of those hospitalised with the illness in comparison to those who tested positive but didn't develop severe symptoms. Interestingly, similar variants were observed in the genome of Neanderthals from southern Europe, but when the DNA of Neanderthals from southern Serbia was looked into, this was not the case. Although factors such as age and health conditions are also involved, it is said that those with the variant in their genes are three times more likely to require mechanical ventilation due to coronavirus. Moreover, research has found that the frequency of this difference in chromosome 3 varies throughout regions of the world, which could factor genes in to how coronavirus has progressed in different countries. For example, 50% of the south Asian population has this variant in their genome, whereas in east Asia it isn't common at all.

TOPIC: EFFECTS OF DECISION MAKING ON SEROTONIN AND DOPAMINE

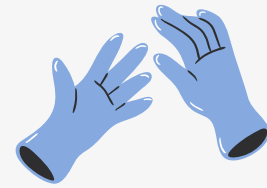
To study fluctuations of the well-known 'happy hormones' dopamine and serotonin during decision making, the team, led by Read Montague, a neuroscientist at Virginia Tech, approached five people who were set to have brain surgery for Parkinsons. During their brain surgeries, each of the volunteers were shown different decision-making tasks of varying difficulties so that differences in dopamine and serotonin could be observed.

To monitor the chemicals, a microelectrode was used, which has the ability to take ten measurements per second, and so is much more accurate than less invasive methods that are commonly used, such as PET scans which only take one measurement per minute. Furthermore, the results showed that although serotonin levels increase when harder decisions have to be made, dopamine levels decrease. Hence, the distinction between the two hormones, with dopamine typically being released when the brain experiences a form of pleasure, as a reward, and serotonin to help promote positive feelings, is clear.



A WEEK OF WORK EXPERIENCE AT A PRIVATE DENTIST

WRITTEN BY YEAR 12 STUDENT GABRIELLA KIM



During the pandemic, I was given an incredible opportunity to undertake work experience at an implant and root canal specialist at Yeonsan Hanro Dentist in South Korea.

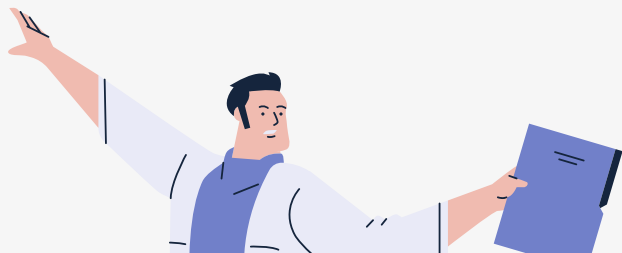
Observing both the dentist and the nurses, I was able to get a realistic prospect about what it was really like to become a dentist. Not only did I learn about the common difficulties presented, but also many insights which I hadn't seen as a patient. One thing that you don't realise when you are at the dentist for an appointment is that everyone around you is also as nervous as you are or even worse and this feeling can easily put stress on the dentist. Patience is key as a dentist. Additionally, another difficulty I saw when treating a patient was that the dentists need to bend their backs and necks for a long period of time, which can eventually cause discomfort around that area. From this I found that it was really important for dentists to keep their body in good posture and conditions.

One of the most important and difficult parts about being a dentist is dealing with each patient and explaining to them the treatment process so that they can understand what's going to happen next, but also to keep them calm. Observing the doctor, I thought about the qualities needed to become a wonderful dentist: kindness, ability to communicate with patients, persuasion, judgment, confidence, delicacy, meticulousness, experience and knowledge.

After my experience, I thought - is dentistry suitable for me? Is this profession the right choice for me? Even though there were parts of dentistry that looked challenging, overall, I felt that the whole experience left me with a mostly positive view on dentistry. The professional equipment and tools they use, the x-ray diagnosis process, and the sense of accomplishment after treating a patient all seemed to be something that I would genuinely want to do in the future. I also felt that in South Korea the value of the dental profession was greater, as they treat all age groups to benefit everyone.

A TYPICAL DAY AS A DENTIST

WRITTEN BY DR DANNY WATTS BDS (HONS) BSC (HONS)



Dentistry is a unique profession in that it combines a knowledge of biology and materials science with intricate practical skill where margins of error are often on the millimetre scale. Throw in a healthy dose of social skills to manage the emotions and expectations of (often anxious) people, and it becomes a challenging yet very rewarding career.

In true self-sycophantic fashion, I've been asked to write an account of how I became a dentist and what an "average" day entails. Growing up, I always wanted to be a research scientist and my first degree was, in fact, in Neuroscience. I found the theory enthralling but the lab setting wasn't as alluring as I'd imagined, and so I decided to venture into dentistry. I took the graduate-entry accelerated four-year dental undergraduate course. University is what you make of it; you can

choose to be a die-hard party-animal or a reclusive nerd. I think some middle ground is healthy. I won numerous national dental awards from societies such as the British Society of Periodontology, the British Endodontic Society and British Society of Prosthodontics. Upon graduating, I worked within a hospital setting as a Dental Core Trainee to hone my skills in different disciplines before working in NHS and private general practices. I now keep up to date with the latest innovations and procedures by attending courses.

An average day is always very varied in general practice. As a general dentist, you are a gatekeeper for all patients, and are expected to have a good knowledge of the various specialities within dentistry. Thus, an average day could entail several check-ups, peppered with various treatments ranging from simple fillings to complex root canal treatments or extractions. This variety always keeps the day interesting. Patients, too, vary from being very relaxed to extremely anxious. Managing and helping people to get comfortable in a dental setting is always a joy to see. It's also very common to see "emergency patients" during the day. These are patients who have developed a dental problem and often need on-the-spot treatment.

The ability to give local anaesthetic and immediately get somebody out of the pain is one of the most underrated, yet rewarding, aspects of dentistry – there aren't many other jobs where you can do this.

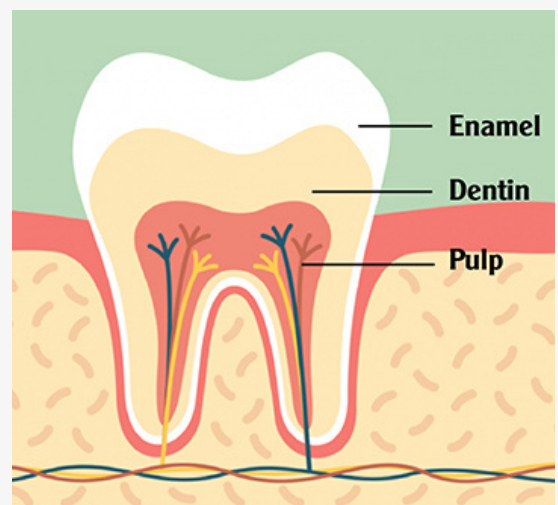
Overall, dentistry is a great career and I'm glad I chose it. It's hard work combining scientific knowledge, practical dexterity and people management, but it's equally rewarding!

DENTAL NEWS:

TOPIC: AN ALZHEIMER DRUG USED TO REGROW A DAMAGED TOOTH

Studies at King's College London (KCL) suggest that a damaged tooth can be regrown by using an Alzheimer drug, and scientists say that this could be a solution to significantly reduce the need for fillings.

A damaged or infected tooth can expose the soft inner pulp, which is the structure inside the tooth that contains nerves and blood vessels, and this can lead to further infections. When this happens a hard material called dentine will attempt to bridge the gap and seal off the pulp and this is efficient in small areas of damage. However, when the hole becomes too large, artificial cement known as the filling must be inserted or the tooth will be lost.



Scientists have found that the Alzheimer drug, Tideglusib, can boost this natural repair mechanism. Previously, this drug had been trialled for the treatment of neurological disorders including Alzheimer's. Tideglusib works by stimulating stem cells, which can turn into any type of tissue in the body, already present in the pulp to create new dentine. Researchers at KCL applied this drug and a substance called glycogen synthase kinase to a tooth and a biodegradable sponge made from collagen and found that as the sponge degraded, it was replaced by dentine.

This new method encourages natural tooth repair and could eliminate all the issues of a failed filling, providing a more natural solution for patients.

MANY THANKS TO:

- DR REGARDSOE FOR HER GUIDANCE IN PUTTING THE MAGAZINE TOGETHER
- DR FIONA RATCLIFFE FOR HER LIVELY ACCOUNT OF A DAY IN HER LIFE
- DR DANNY WATTS FOR HIS INSIGHTFUL DAY IN THE LIFE OF A DENTIST ARTICLE
- NISHA HARE FOR HER INFORMATIVE ANSWERS TO OUR QUESTIONS
- MILLA MACANOVIĆ FOR HER INSPIRING ARTICLE ON WHY SHE WANTS TO STUDY MEDICINE
- MRS POUNTNEY FOR PUBLISHING OUR MAGAZINE

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