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Te Hautaka o ngaa Akongaa Rongoaa

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framework for medical student consent

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a service evaluation of patient satisfaction

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a glimpse into New Zealand's legislation

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Coming to consensus:

developing a framework for medical student consent

Prof. Alan Merry
Head of School of Medicine
The University of Auckland

Dr Philipa Malpas
Senior Lecturer in Clinical Medical Ethics
The University of Auckland

Assoc. Prof. Warwick Bagg
Head of the Medical Programme
The University of Auckland

Consent is a fundamental part of medical practice.[1] In New Zealand the Code of Health and Disability Services Consumers' Rights enshrines in law the right to informed consent. This right is underpinned by ethical considerations, which reflect the importance of valuing and respecting the choices made by autonomous individuals in determining what is important to them regarding their medical care.[2] This includes the right to know who will be involved in providing that care, and in what way, including having access to their confidential information.

Medical students are an integral, legitimate, and important part of the medical team. They need to be involved with the care of patients if they are to learn, and to become the doctors of New Zealand in the future. One of the things they need to learn is the importance of respect for their patients, in general and specifically in respect of consent. The influence of role models, and the so called "hidden curriculum",[2,3] is strong, and will substantially determine the type of doctors that will be caring for us, as New Zealanders, in the future.

Our opinion, albeit anecdotal, is that the vast majority of the clinicians who teach medical students in New Zealand are excellent role models. Unfortunately, a few appear to fall short of the mark. Medical students at the University of Auckland, have written about their experiences with patients[5] and some of the ethical challenges they have faced during their preceding months of learning in clinical environments.[6] A number have identified situations where they considered that practices failed to meet acceptable ethical standards, and consent was often the central ethical issue.

The nature of students' clinical interactions with patients varies greatly within an apprenticeship model of training. They may simply be observers, for example as part of the team accompanying a consultant on a ward round. Sometimes they will be involved in the operating room, perhaps scrubbed and assisting a surgeon, or perhaps learning to manage a patient's airway under the supervision of an anaesthetist. Ideally they will have met the patient prior to surgery (in the ward or in the theatre suite), who will have given consent (at least verbally) for the student to be involved in the procedure, but at times this may be impractical. If the appropriate consent has been given to the clinicians responsible for the patients care, this will suffice. But what should be done about the "interesting" patient in the operating room next door who provides a great opportunity for learning, but who has not given consent to anyone for a student to be involved in his or her care, and is now anaesthetised? Is it acceptable under these circumstances for a student to observe? To assist? To undertake an intimate examination?

To be clear, the answer is emphatically and definitely not in the last of these examples, and in the strict interpretaton of the Code, arguably not in any of them. Lest it be thought that this is the only potentially tricky situation that arises, consider patients in intensive care units on ventilators, babies on paediatric wards, patients being visited at home in primary care, patients recieving bad or embarrassing news - how and when should consent be obtained for students to be present and involved in a way that is sensitive and leaves open a genuine opportunity for the patient to decline? And conversely, how are medical students to learn if the burden of obtaining consent for them to do so is too onerous?

Concern over these difficult questions led to a meeting in 2011 between senior staff and the then Health and Disability Commissioner, Mr Ron Paterson. This meeting probably raised more questions than it answered – it became increasingly obvious that the settings in which questions of consent for the involvement of medical students in patients' care could arise are varied and complex. A paper was taken to a meeting of the Chief Medical Officers (CMOs) of the District Health Boards, who welcomed a national initiative to develop consensus and provide clarity and guidance for clinical staff and medical students about how these issues ought in fact to be handled in New Zealand. In due course a working group was formed that included representatives from the CMOs, the University of Otago, The University of Auckland, The New Zealand Medical Students' Association, and the Medical Council of New Zealand. An extensive process of consultation and consensus building followed. Discussion was detailed and prolonged. There was no agenda to set standards, simply to interpret the standards already pertaining in New Zealand and apply them in a practical way to an indicative range of possible scenarios in which students might become involved in patient care, or at least in observing patients or reading patients notes, viewing X-rays or interpreting the results of other investigations.

All the authors shared the belief that most patients are willing to facilitate the training of students and that the process of obtaining consent should be proportionate to the proposed involvement of the students. Generic measures on the part of hospitals (by way of signage and information sheets, for example) are one way in which the whole process can and should be facilitated. At the same time, all the authors also shared the belief that the opportunity to learn is a privilege, and that the generosity of patients in this respect ought unquestionably to be acknowledged and respected.

An advanced draft was shared with the current HDC, and the feedback from his office taken into consideration. The views of patient advocacy groups, and the NZ Medical Association were also sought.

The result of this process appears in this edition of the Journal. It is a consensus statement from the people listed as authors, and as such it has been carefully, sometimes almost pedantically, crafted. Reaching agreement

on detail proved more difficult than one might expect. It is one thing to say that everyone agreed in the principle that informed consent should be obtained in this context, quite another to pin down what that should actually involve, as a minimum, in each particular scenario that was considered. If these questions were easy to answer, arguably the document would not have been needed.

Have we got it right? To some extent the answer to that question is that expectations in relation to informed consent are not static and continue to evolve. Our impression, in light of a recent editorial in the BMJ,[7] is that New Zealand is somewhat in advance of the UK in this evolution. We have certainly come a long way since the times of the Cartwright enquiry[8] – as we needed to. To our knowledge this is the first ever effort to develop a national consensus on how consent should be obtained for the involvement of medical students in the care of patients. There may be important situations that we have not thought of, and there may be recommendations in the document that are either unworkable, or too permissive (the point that New Zealand has legal requirements in this context should not be missed). A revision is planned after a year, so feedback is welcomed. In the meantime, we hope the document will prove of value to medical students and their teachers - and therefore to patients in New Zealand, which is what really matters.

[Ed] This editorial draws from an original article, to be published in the New Zealand Medical Journal later this month.

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ARTICLE : CASE REPORT

Prevalence of Staphylococcus Aureus colonisation and skin conditions in Otago school children

Hanneke Lewthwaite
Fifth Year Medical Student
Faculty of Medicine
The University of Otago

Dr. Heather Brooks
Senior Lecturer in Microbiology
Department of Microbiology and Immunology
The University of Otago

Dr. Patricia Priest
Senior Lecturer in Public Health
Department of Social and Preventative Medicine
The University of Otago

Hanneke Lewthwaite is currently studying at Dunedin School of Medicine, and is in her fifth year. She has interests in global health, infectious disease, and women and children's health.

INTRODUCTION

The incidence of hospitalisation for serious skin infections in children in New Zealand almost doubled between 1990 to 2007, making this an important health priority.[1] *Cunliffe* reported that 'without some knowledge of the incidence of a pathogenic micro-organism in the healthy body it is difficult to assess the significance of the organism when found in diseased tissues',[2] and so in order to understand the drivers behind this increased rate of hospitalisation, further investigation is needed in the healthy population. Direct or indirect contact with S. aureus may be followed by a period of asymptomatic colonisation, which may then lead to tissue invasion or contamination of damaged tissue.[3] It is unclear whether the high admission rates in NZ purely reflect a high community prevalence of low-grade infection or carriage, or alternatively are due to a higher proportion of infections that require hospitalisation.[4] However, to date very little evidence has been gathered regarding the prevalence of Staphylococcus aureus carriage and occurrence of low-grade skin infection by S. aureus, and we found no evidence of such research in South Island communities.

BRIEF REVIEW OF STAPHYLOCOCCUS AUREUS EPIDEMIOLOGY IN LITERATURE

International studies show an average nasal carriage prevalence of 27%, derived from a wide variety of healthy populations.[5] Only one known study has been carried out in New Zealand concerning the carriage rates of S. aureus in healthy individuals, estimating 18% (95% CI 14-22) nasal carriage amongst adults.[3] S. aureus prospers in the vestibulum nasi region, compared to other carriage sites,[6] and despite antibiotic treatment to eradicate S. aureus from the body, nasal carriage tends to persist.[7] Carriers remain reservoirs for its spread in the community.[8] A study in Tairawhiti (Gisborne, NZ) showed there were 14 primary care cases of skin condition for every one hospitalisation,[4] it seems reasonable to assume a larger burden of low-severity infections which remain hidden from primary care.

The aim of this study was to measure the prevalence of S. aureus carriage, and to contribute to current understanding of the burden of skin conditions, in Otago school children.

METHODS

Sample selection:

Sample collection was carried out in November 2013 at an intermediate school in Otago with a role of 283 students. All students currently enrolled in the school were eligible to participate provided the informed consent of both students and caregivers was given. Questionnaires were sent to homes, using tracked number identification to maintain anonymity.

Data collection:

The questionnaire included;

- Demographic information
- History of skin conditions ever/in the last year/currently (eczema, dermatitis, trauma, or any other condition that might predispose to infection)[6]
- Barriers and access to health care (including time, work, cost, attitudes)
- Psychosocial impacts of skin conditions (experiences of bullying, teasing, pain, or time off school as a result of skin infection)
- Space to draw and comment on sites of previous skin conditions
- Barriers and access to health care (including time, work, cost, attitudes)

Specimen Collection:

Children were swabbed by one of the investigators (HL). A sterile swab was rubbed across the antecubital fossa. Nasal swabs were taken from the nasal ostium in both nostrils. Labelled samples were stored in ice, and transported in Amie's medium, to be processed within 5 hours.

Specimen Processing:

Samples were cultured in mannitol salt enrichment broth by incubating aerobically for 24 hours at 35±2°C. Turbid broths were streaked onto mannitol salt agar (MSA). MSA plates were incubated over 24 hours, and observed for colour change. Plates that were not positive after one day were re-incubated for a further 24 hours. Positive isolates were stored at 4°C overnight. Positive MSA colonies showing yellow colour change were identified using standard microbiological tests (gram stain, tube and slide coagulase, DNAse production). Samples with conflicting results were

identified by MALDI-TOF (matrix-assisted laser desorption/ionisation time of flight mass spectrometry).

Analysis:

Questionnaire data were managed and analysed using Epi Info 7. Categories were as in Table 1. Low income groups were $0-20,000, $20-35,000 and $35-70,000. The middle income group was those in the $70-100,000 bracket, and the high income group was $100,000 or more. "Skin conditions in the last year" included all reported cases of skin conditions from any category now or in the last year. The outcome used in the main analysis was total carriage (either nasal or elbow is positive). The proportion of participants with different characteristics, experience of skin conditions, and colonisation were tabulated and confidence intervals calculated using Epi-Info 7. The prevalence of colonisation in different groups was tabulated and RR and associated confidence intervals calculated.

Ethics Approval:

Prior to beginning the study we obtained consent from the school Board of Trustees, and approval from the Otago University Ethics Committee (reference 12/280).

RESULTS

From a school of 280 pupils, 59 (21%) returned the questionnaire and consent forms, 3 of which were illegible. Two students were absent on the swab dates, resulting in a final sample of 54 (19%) pupils.

Table 1 shows participant characteristics. Female students' parents were 50% more likely than males' to return the questionnaire and give consent for the swab procedure (23% compared to 15.3%). Maori and Pacific students were both underrepresented in the sample.

Table 2 shows the parents' reports of participants' skin conditions; 11.1% reported ever being diagnosed with cellulitis at some point. The highest frequency skin condition reported was "itchy lumps or spots" with 26 students ever experiencing this (48%, CI 34.3-62.2). This was followed by "dry, flaky or scaly patches" with 15 reports.

The most commonly mentioned sites of infection were the face/head, antecubital and popliteal fossae, each reported 6 times. 5/54 (9.3%) children reported ever being teased for a skin condition.

As shown in Table 3, the total prevalence of S. aureus carriage was 28/54 (51.9%, 95% CI 37.8-65.7), based on a positive result at either site. Colonisation prevalence in the nasal vestibule was much higher at 25/54 (46.4%, 95% CI 32.6-60.4) when compared with elbow-colonised students, 8/54 (14.8%, 95% CI 6.6-27.1) (Table 4). One student was found to be colonised with nasal MRSA.

Table 4 shows the results of the analysis of carriage prevalence by characteristics of the students. Boys were more than twice as likely as girls to carry S. aureus.

Table 5 shows parent reports of skin conditions by colonisation status (total colonisation). Colonised children were 2.3 (95% CI 1.1-5.1) times as likely to have been taken to a doctor, although 0.7 (95% CI 0.4-1.6) times as likely to have been bought non-prescription medicines compared with non-colonised participants. Children in the colonised group were 2.8 (95% CI 0.6-12.6) times as likely to have taken time off school due to a skin condition.

DISCUSSION

Key Findings:

Just over half (51.9%, 95%CI 37.8-65.7) of our sample of Oamaru school children were colonised with S. aureus. This is higher than other estimates of child colonisation[5,7] and than New Zealand estimates of colonisation in adults,[3] although the latter is consistent with other studies showing that children have higher carriage rates than adults.[2] A very high colonisation prevalence such as we found could be due to the frequent close contact

Variable	Sample population n (%)
Age of student	
11	12 (22.2)
12	26 (48.2)
13	16 (29.6)
Gender of student	
Male	22 (40.7)
Female	32 (59.3)
Ethnicity of student (non-exclusive)	
New Zealand European	52 (96.3)
Maori	1 (1.9)
Pacific	0 (0.0)
Other	4 (7.4)
Family income (NZD)	
Low income	21 (39.0)
Middle income	14 (25.9)
High income	16 (29.6)
Not specified	3 (5.6)
Occupants per bedroom	
≤1	20 (37.0)
1.1 - ≤1.5	30 (55.6)
1.6 - ≤2	4 (7.4)
Highest held qualification of household members	
None	1 (1.9)
School Qualification	20 (37.1)
Post-school Qualification	31 (57.4)
Parent-rated home hygiene practices of family	
Very Good/Excellent Hygiene	35 (64.9)
Fair/Good Hygiene	18 (33.4)
Average Hygiene	0 (0)
Poor Hygiene	0 (0)

Table 1. Characteristics of responders to skin infection questionnaire

Condition	Now n (%, 95% CI)	In the last year n (%, 95% CI)	Ever n (%, 95% CI)
Sore red lumps or spots	6 (11.1, 4.2-22.6)	8 (14.8, 6.6-27.1)	9 (16.7, 7.9-29.3)
Itchy lumps or spots	12 (22.2, 12.0-35.6)	13 (24.1, 13.5-37.6)	26 (48.2, 34.3-62.2)
Boils	0 (0)	1 (1.9, 0.05-9.9)	9 (16.7, 7.9-29.3)
Dry, flaky or scaly patches	5 (9.26, 3.1-20.3)	6 (11.1, 4.2-22.6)	15 (27.8, 16.5-41.6)
Red, swollen areas	2 (3.7, 0.5-12.8)	3 (5.6, 1.2-15.4)	8 (14.8, 6.6-27.1)
Crusty, oozing areas	2 (3.7, 0.5-12.8)	4 (7.4, 2.1-17.9)	14 (25.9, 15.0-39.7)
Eczema*	0 (0)	1 (1.9, 0.05-9.9)	6 (11.1, 4.2-22.6)
Dermatitis*	2 (3.7, 0.5-12.8)	5 (9.26, 3.1-20.3)	7 (13.0, 5.4-24.9)
Cellulitis*	0 (0)	0 (0)	6 (11.1, 4.2-22.6)
Skin Abscess	0 (0)	0 (0)	5 (9.26, 3.1-20.3)
Students reporting at least one of the above skin conditions	21	30	44

* Diagnosed by a doctor

Table 2. Self-reported experience of skin conditions from questionnaire

among school children, allowing exchange of microflora.[9]

We also found that males in the sample were more likely to be colonised, consistent with other studies.[3,5] Students colonised at either nose or elbow were 2.32 (95% CI 1.06-5.07) times as likely to have visited a doctor due to a skin condition in the past. While none of our participants were classed as living in crowded homes (>2 occupants per bedroom)[14], we did find increasing colonisation prevalence with increasing occupants per bedroom, consistent with overcrowding being a well-documented risk factor for skin infection.[12,13] Since 14% of Otago children live in crowded homes,[14] if our sample had included children living in crowded homes, we would expect them to have higher prevalence of carriage.

Strengths:

This small study was designed to provide estimates of S. aureus colonisation that could be used in the design of larger prevalence studies. Standard methods of swabbing[10,11] were used by a single investigator, ensuring consistency, and standard culture techniques were used.

Limitations:

Our small sample size means we lack power to detect statistically significant relationships with many demographic and health variables. The response rate was low, and participating families were relatively wealthy, potentially biassing our estimate of the prevalence of colonisation, although we did not show significant differences in colonisation by income category.

Because of time restrictions we were not able to measure carriage over time, so our results may overestimate carriage due to inclusion of intermittent carriers.

Anectodatal feedback suggested that the paperwork required for ensuring informed consent hindered the involvement of some parents, particularly those who did not read English. Time restrictions meant we were unable to employ translators to improve community involvement from all areas; this was an important omission in the design of this study.

FUTURE FOCUS

Reducing New Zealand's high rate of morbidity due to serious skin infections should be a priority. Studies such as this, of the normal skin microlora in a community setting, are important to inform our understanding the mechanisms behind skin pathology and infection, including carriage and transmission. In New Zealand there is a need for larger, more community-comprehensive studies. This study provides a good basis for informing the design of such a study, which should measure difference in carriage prevalence in different regions of New Zealand. Further studies should be designed and presented in a way that is more accessible to all parents and children and, if possible, translated into languages which are prominently spoken in the community involved.

Sample site	n (%, 95% CI)
Nasal colonised	25 (46.4, 32.6-60.4)
Inner elbow colonised	8 (14.8, 6.6-27.1)
Exclusive colonisation at inner elbow	3 (5.6, 1.2-15.4)
Exclusive Nasal colonisation	20 (37.0, 24.3-51.3)
Total Carriage (either site positive)	28 (51.9,37.8-65.7)
Nasal MRSA	1 (1.9, 0.05-9.9)
Inner elbow MRSA	0 (0, 0-7.9)

Table 3. Positive results for Staphylococcus aureus colonisation

Characteristic	Prevalence of colonisation n (%, 95% CI)*	Relative risk (95% CI)
Gender of student		
Female colonised	11/32 (34.4, 18.6-53.2)	1.0
Male colonised	17/22 (77.3, 54.6-92.2)	2.3 (1.3-3.8)
Family income		
Low Income (below median)	14/21 (66.7, 43.0-85.4)	1.0
Middle Income (median)	5/14 (35.7, 12.8-64.9)	0.5 (0.3-1.1)
High Income (above median)	8/16 (50.0, 24.7-75.4)	0.8 (0.4-1.3)
Occupants per bedroom		
≤ 1	7/20 (35, 15,.4-59.2)	1.0
≥1-1.5	18/30 (60, 40.6-77.4)	1.7 (0.9-3.3)
≥1.5-2	3/4 (75, 19.4-99.4)	2.1 (0.9-4.9)
Highest-held parent qualification		
High School Qualification or below	9/21 (42.9, 21.8-66.0)	1.0
Post-School Qualification	17/31 (54.8, 36.0-72.7)	1.2 (0.7-2.2)
Self-reported hygiene practices		
Very Good/Excellent Hygiene	15/35 (42.9, 26.3-60.7)	1.0
Fair/Good Hygiene	12/18 (66.7, 41.0-86.7)	1.6 (0.9-2.6)
History of any skin condition in the last year		
No reported skin condition	13/24 (54.2,32.8-74.5)	1.0
Self-reported skin condition (boils/lumps/dry, flaky, or swollen areas/itchy lumps/cellulitis/skin abscess/dermatitis etc.)	15/30 (50, 31.3-68.7)	0.9 (0.5-1.7)
History of prescribed medicines or antibiotics		
No prescription medications	23/49 (46.9, 32.5, 61.7)	1.0
Prescription MEDS/ABX for skin condition	5/5 (100)	2.1 (1.6-2.9)

*Not all categories include total 54 respondents due to non-response for some variables.

Table 4. Colonised prevalence by demographic and health characteristics

	Total n (% sample)	Non-colonised	Colonised	Relative risk colonised vs. non-colonised (95% CI)
Took child to doctor	21 (38.9)	6/26 (23.1, 9.0-43.7)	15/28 (53.6, 33.4-72.5)	2.32 (1.1-5.1)
Parent bought non-prescription medicines	18 (33.3)	10/26 (38.5, 20.2-59.4)	8/28 (28.6, 13.2-48.7)	0.7 (0.4-1.6)
Child took time of school due to condition	8 (14.8)	2/26 (21.4, 8.3-41.0)	6/28 (7.7, 1.0-25)	2.8 (0.6-12.6)
Skin condition significant pain	5 (9.3)	1/26 (3.9, 0.1-19.6)	4/28 (14.3, 4.0-32.7)	3.7 (0.4-12.5)
Child experienced teasing due to condition	5 (9.3)	2/26 (21.4, 8.3-41.0)	3/28 (10.7, 2.3-28.2)	1.4 (0.3-7.7)

Table 5. Parent-reported consequences of skin conditions

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Service evaluation of patient satisfaction for antenatal diabetes education in Christchurch Women's Hospital, New Zealand

Sabrina Raj Kapur
Final Year Medical Student
The University of Leeds

Dr Ruth Hughes
Consultant Physician
Department of Obstetrics and Gynecology
Christchurch Women's Hospital

Sabrina Kapur is a final year medical student at the University of Leeds, UK. She spent six weeks undertaking an elective project under the supervision of Dr Ruth Hughes (Consultant Physician) at Christchurch Women's Hospital. Whilst studying Medicine, she has completed a BSc in Women's Health with Basic Medical Sciences at King's College London. Sabrina has an interest in travelling and is looking forward to visiting New Zealand again in the near future.

ABSTRACT

Gestational diabetes (GDM) is a condition routinely screened for in New Zealand. Recent research has shown that increasing levels of maternal hyperglycaemia correlate linearly with adverse outcomes of the pregnancy. Subsequently, there have been proposals by the International Association of Diabetes and Pregnancy Study Groups to change the diagnostic criteria for gestational diabetes to identify more women at risk of complications due to hyperglycaemia. This will involve lowering the current diagnostic threshold for GDM. Maternal diabetes education is currently offered on a one-to-one basis at Christchurch Women's Hospital. If diagnostic criteria for GDM are changed and more women who are at risk are identified, the demand for diabetes education will increase. In this situation, group education would be a more efficient method of education than the current two-hour individual sessions patients receive. We performed an evaluation of patient satisfaction of current antenatal diabetes care in Christchurch Women's Hospital and gathered patient opinions on possible future group education. Selected participants were interviewed and findings were grouped according to themes. Overall, the participants were highly satisfied with the education services provided and the majority of them would prefer one-to-one education to group sessions. In the future, group sessions may be acceptable for patients as several women did express an interest in group education. This would help to address the expected increase service demand.

INTRODUCTION

Worldwide, one in 10 pregnancies is associated with diabetes and of these, 90% are gestational diabetes (GDM).[1] Gestational diabetes is defined as 'any degree of glucose intolerance with onset or first recognition during pregnancy'.[2]

Currently in New Zealand, all pregnant women are offered screening for GDM between 24-28 weeks gestation. The Hyperglycaemia and Adverse Pregnancy Outcomes (HAPO) study in 20083 was established to investigate adverse effects of pregnancy and correlate them to levels of glucose intolerance and overt diabetes. The study demonstrated that with increasing levels of hyperglycaemia in pregnancy, there was an increased frequency of foetal macrosomia, clinical neonatal hypoglycaemia and delivery related complications.[3] Increasing levels of maternal hyperglycaemia also lead to predispositions to impaired glucose tolerance, obesity and type 2 diabetes in both mother and neonate later in life.[1] Following the publication of this study, the International Association of Diabetes and Pregnancy Study Groups (IADPSG) collated opinions of several groups to propose changes internationally to the diagnostic criteria for GDM.

Internationally practices vary widely when screening for and diagnosing GDM. The current diagnostic criteria for GDM are arbitrary figures; glucose tolerance in pregnancy is a continuum.[3] Currently in New Zealand, a diagnosis of GDM is made when the fasting blood glucose sample is 5.5 mmol/l or above, or when the blood sample taken two hours after the oral glucose tolerance test (OGTT) is 9.0 mmol/l or above. However, the IADPSG are proposing GDM to be diagnosed if the fasting blood glucose sample is 5.1 mmol/l or above or the two hour post OGTT blood sample is 8.5 mmol/l or above (see table 1). By lowering the threshold for the diagnosis of GDM in line with IADPSG guidelines, more women with hyperglycaemia during pregnancy will be identified and therefore treated.

Oral glucose tolerance test (OGTT) (Current diagnostic test)	New proposed test
Patient fasts for at least 12 hours	Patient fasts for at least 12 hours
Fasting blood glucose sample taken	Fasting blood glucose sample taken
75g glucose load given	75g glucose load given
Blood glucose sample taken 2 hours later	Blood glucose sample taken 2 hours later
If fasting blood sample is 5.5 mmol/l or above and/or 2 hour blood sample is 9.0 mmol/l or above woman is diagnosed with GDM	If fasting blood sample is 5.1 mmol/l or above, 1 hour blood sample is 10.0 or above and/or 2 hour blood sample is 8.5 mmol/l or above woman is diagnosed with GDM

Table 1: Current and proposed diagnostic method and criteria[4,5]

Changes to diagnostic criteria will reduce complications during delivery thereby decreasing morbidity and long term healthcare costs.[6,7] However, there are likely to be problems with service provision. Lower thresholds for the diagnosis of GDM will result in a two to three-fold increase in the number of women diagnosed consequently increasing the workload of maternal-foetal medicine teams.[6,7] New methods may need to be implemented to achieve a higher level of care for these patients in an already stretched system.[6]

New Zealand is not yet moving to the new diagnostic criteria. Irrespective of this, the numbers of women being diagnosed with GDM are steadily increasing and new models of care need to be explored.[8]

For long term conditions such as diabetes, patient education is important in maintaining good control.[9] In the non-pregnant population, there is good evidence that diabetes education impacts positively on health and psychosocial outcomes.[10,11] Currently at Christchurch Women's Hospital, all women diagnosed with GDM are invited for an individual diabetes education session; this involves a one hour consultation with the diabetes midwives followed by a one hour session with the dieticians. Mensing and colleagues found that group education is an efficient and cost-effective alternative to individual education.[9] *Rickheim et al.*[12] compared the effectiveness of group versus individual diabetes education (in the non-pregnant population). They found that group education was similarly effective at providing adequate glycaemic control as individual education. Therefore, as the efficacy of both methods is similar, it may be possible to use group education sessions to teach patients about diabetes.

The aim of this study was to perform a service evaluation of the services currently available for diabetes education at Christchurch Women's Hospital. In addition to this, we looked at patient opinions on the hypothetical acceptability of group education sessions in addition to individual education sessions.

METHODS

This study was conducted in Christchurch Women's Hospital, New Zealand. Of around 5,000 deliveries here per year, approximately 5% are affected by GDM.[13] Diabetes education is offered to all women diagnosed with GDM.

Based on previous studies, the number needed to interview was 12-20 women. *Guest et al.*[14] showed that in qualitative research, data saturation is achieved after the first 12 interviews. *Thorogood and Green*[15] found that after 20 interviews with specific questions there were no new points identified. Thirteen women with newly diagnosed GDM who were attending diabetes education sessions at the time of recruitment were invited to take part in the project. These women were selected at random. All 13 women consented to being interviewed. The interviews and therefore data collection was achieved over a four-week period from 28th July to 29th August 2014.

A set of pre-prepared questions was asked to every patient (see appendix 1). The interview consisted of open-ended questions. The researcher wrote the questions which aimed to address the following: the level of knowledge women had regarding GDM before their diagnosis and in what way the sessions had enhanced their knowledge; the opinions on services currently provided, with specific attention to the individual diabetes education and dietician sessions; which part of the sessions patients found most useful; and finally the opinions on the introduction of group sessions. Interviews were carried out on a one-to-one basis in a private room immediately after the initial diabetes education session. The interviews were not recorded but the researcher took notes. All interviews were carried out in English, although English was not the first language for three of the women interviewed. Of the 13 women interviewed, four women had GDM in a previous pregnancy, which had been managed with diet, metformin or insulin. These women still attended the diabetes education session. According to the New Zealand National Ethics Advisory Committee, no formal ethics review is required.

RESULTS

The main findings from the questionnaire were grouped into themes. Within each question, sub-themes were identified which have been highlighted below. These were all direct quotes from the interviews and some responses fit into more than one theme.

Response to diagnosis:

There was an almost unanimous response of being 'shocked' or 'surprised' when women were asked how they felt when they were told they had GDM. This applied to women of all ethnicities. Furthermore, having had GDM in a previous pregnancy did not affect this response. For some women, their midwives and doctors had already spoken to them about the possibility of developing GDM in the pregnancy and so these women were expecting the diagnosis. Despite having received pre-warning, there were women who reacted very badly to the news in the education sessions and felt guilty about the diagnosis.

SURPRISE, 6/13 WOMEN:

I had gestational diabetes last time but in this pregnancy I have not been eating cakes or sweet things or anything'

UPSET, 4/13 WOMEN:

'I have been dreading the session, I felt really depressed when I found out'
'I was gutted'

FEAR, 3/13 WOMEN:

'I felt panicked and scared. I thought, "What am I going to do now?"'
'I felt scared and upset'
'I felt scared and was thinking, "Will my baby grow", and, "Will I need to have a Caesarean section"'

GUILT/SELF BLAME, 2/13 WOMEN:

'My first response to being told I had gestational diabetes was that I must have a really bad diet'

APPENDIX 1

PATIENT DEMOGRAPHICS

Age
Ethnicity
Previous GDM (and management)
Family history of diabetes

PATIENT SATISFACTION QUESTIONS

How did you feel when you found out you had gestational diabetes?
Did you have much prior knowledge about it before you were told?
What do you think of the services offered here?
In particular what do you think of the education session and the dietician session individually?
What do you think was the most important part or thing you learnt from today?
Can you think of anything that needs to be improved?

GROUP SESSIONS

What are your opinions on group sessions instead of individual sessions? They would have two to three women all learning together with the diabetes educators and followed up with individual one to one sessions. Do you think you would go if offered?

Most useful aspects of education sessions:

The diet education session stood out in the results as the most important part of the education sessions among participants, followed by the session on testing blood sugars. Some women identified themes within these hour-long sessions as the most important aspects.

Diet education session, 5/13 women:

'I learnt about cutting breakfast into half, learning to tweak diet in the morning'

'The advice about what to eat, the future and keeping healthy was useful'

'I have made a lot of changes already and it was nice that the dietician acknowledged that'

'The session made me feel more at ease'

'The diet session was common sense, but useful to have it explained'

'The information about glucose and carbohydrates was good; I didn't understand it before'

'I thought I would need a stricter diet'

'It was really good because it highlighted different food options and showed which brands were good to buy'

Testing blood sugars, 3/13 women:

'The best part was learning how to use the meter'

'Learning how and when to test was the most important part'

'Being shown how to use the meter was important. She made me feel more comfortable about testing'

Improved level of understanding, 6/13 women:

'I feel more relaxed now'

'It helped not to feel too alarmed'

'I had a really bad experience in my last pregnancy and when I got the phone call last week I felt depressed. Now I fully understand what it means to have diabetes. I am happy; I'm not in the danger zone yet but I can do stuff to prevent it'

'I was reassured that this was about my placenta and the pregnancy, not that I was being a bad mother'

Asking questions, 1/13 women:

The best thing was being able to ask questions'

Written information, 1/13 women:

To further help women for whom English is not their first language, DVDs and written material in different languages were provided.

'Everything is backed up by little information booklets'

'The best thing was going away with lots of [written] information'

'The most important part from the session was the pamphlet from the dietician. It has so much information in it, it is all broken down easily and tells you exactly what you can and can't eat plus gives you different food ideas which is really helpful'

Improvements to be made:

Improvements, 2/13 women:

'The length of appointment time is difficult with arranging childcare'

'The only problem is parking'

Overall opinions on services:

The individual educators (diabetes midwives and dietician), 4/13 women:

We felt we were in safe hands'

'They care about the women'

'Explanations are good and are pitched at the right level for me'

'They have improved since last time…they have supported me more through this pregnancy'

Team environment, 2/13 women:

'Clear communication was present in the team'

'Everyone knows their roles'

Group sessions:

Support for group sessions, 10/13 women:

'Group sessions would be a good thing. Lots of people would learn. It's a good way to meet other women with diabetes…see what they struggle with and how they cope…share information…give and receive ideas…'

'I would go to a group session. People might ask something that you don't think of. There is the feeling of togetherness with other women. It would be a good social occasion and made even better if they provided food that we could eat there!'

'I wouldn't mind a group session as long as it is not too big'

'The dietician session would be fun in a group'

Support for both options, 4/13 women:

'I would go depending on timings. I have young children so would need to work around that'

'I would have done it in the first pregnancy. Not now because I have already done it all before. I know it all and it's easier this time round'

'I would go to a group depending on what topics were going to be covered'

'It might work for some people but I wouldn't go'

'It's a good idea but I would prefer one-on-one'

Preference of individual sessions, 3/14 women:

'Individual sessions would be better because you are given an appointment time. My husband wants to come and it can be arranged to fit us both'

'It is more helpful to have one on one teaching because I had lots of questions about the meter'

'I would get annoyed by other people's questions in a group situation'

DISCUSSION

This study was set out to evaluate patient satisfaction in the antenatal diabetes clinic at Christchurch Women's Hospital. It was also designed to gauge the opinion on moving from the current two-hour individual sessions towards group education sessions. The rationale for this was that we are anticipating an increase in demand for these services.

Response to diagnosis:

For the majority of women, the diagnosis of GDM was an unwelcome surprise. Although not all women explicitly referred to the health and impact of GDM on their children, this was their underlying concern. All women wanted to ensure a healthy and successful pregnancy and so engaged in the education sessions, tested blood sugar levels six times a day, and made dramatic changes to their diets where necessary.

Most useful aspects of education sessions:

The majority of women identified the dietician session as the most useful aspect of the education session. Written information was highlighted as a positive part of the services, especially for women who found that there was too much information given during the sessions.

Improvements to be made:

One area that a participant thought could be improved was the appointment length. Administration staff can be made aware of this and work with patients to ensure that appointment times suit childcare and personal requirements. Another area of improvement highlighted was car parking; this is currently a problem in Christchurch and is in the process of being resolved.

Overall opinions on services:

The feedback received for the education sessions as a whole was very positive. Therefore it is understandable that many women are unwilling to see a change in the services. Women found the information given was pitched at the right level, questions were answered and the sessions left participants more informed than before. Many women felt apprehensive and scared before the education sessions but found that their fears were allayed by the staff and subsequently felt more relaxed. The information gained meant that women felt less 'shocked', 'panicked' and 'worried' than when they were first given the diagnosis. Despite differences in women's prior knowledge of diabetes, all women gained some benefit and new information from the individual sessions.

Group sessions:

In spite of positive comments about group sessions, only six women (less than half of the group interviewed) said they would attend a group session. Therefore, although the majority of women acknowledged benefits of group education, many women said it was better suited to other people. It may be useful to share positive feedback from other women who have participated in groups or start with very small group sizes so it is less daunting.

Some women, for whom English is their second language, considered group sessions a good idea, but felt they would struggle with understanding in a group. If there are enough women in this category, groups with interpreters could be set up for same language groups. This should continue to be backed up with written and visual information in the language most suited to the patient.

Other women thought that it would be difficult to tailor group education sessions to suit the individual needs of the women attending. If groups only contained two to three women per session, this may not be a problem.

There was a difference in opinion for women with an increased understanding of GDM; some healthcare professionals who were participants in the study or women who have had diabetes education before felt they would gain little benefit from a group education session as there would be little new information offered. However, another healthcare professional thought a group would be a good way to meet other women and share experiences of GDM.

Limitations:

A visiting student who was introduced at the beginning of each education session carried out interviews. It was clear that the researcher was a member of the team so it is unlikely that women would have felt comfortable to discuss any faults with the system or educators. To ensure honest opinions are received, an anonymous written questionnaire can be offered in addition to interviews.

This work is purely qualitative and no statistical testing has been done because no numerical measurements of patient satisfaction were made. Future work may be helped by the use of psychometric scales, which will quantify patient opinions on services.

Conclusion:

It was found that women were very happy with the services provided at Christchurch Women's Hospital for antenatal diabetes education. All women had positive feedback about the education sessions, the educators and the support they received.

The feedback received for the individual education sessions is very positive and so it is understandable that many women are unwilling to see a change in the services. However, with the increased number of women who will need diabetes education in the next few years and the current capacity of the diabetes education team, a change is likely to be required.

It has been useful to collect information on patient opinions of group sessions and this can be used to plan group education sessions for women who displayed some resistance. It will be vital to demonstrate that group sessions will be made personal, as this is often the factor that women do not want to lose by attending a group.

The next step will be to find women who would be willing to try a group session and set up a program for this followed by a similar patient satisfaction survey. This would then allow improvements to be made so that over time the group education sessions would appeal to a wide range of women (hopefully all), which would make the workload more manageable as increasingly more women require diabetes education during pregnancy.

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Management options for severe aortic stenosis in non-surgical candidate patients

Karen Park
Medical Registrar
Taranaki Base Hospital

Karen Park is a PGY3 Registrar in Taranaki Base Hospital. She submitted this manuscript during her final year at medical school. Her long term interest lies in cardiac anaesthesia and cardiovascular intensive care medicine.

CASE REPORT

Mrs JH is a 90 year old NZ European female with severe aortic stenosis (AS), who has had eight admissions in the previous twelve months with cardiogenic syncope, preceded by dyspnoea and palpitations on mild exertion. During this admission, she complained of dyspnoea on minimal exertion, but denied any chest pain. She was previously declined aortic valve replacement given her high surgical risk with a EuroSCORE II of 14, putting her estimated surgical mortality at 41.69%.

Other significant medical history includes three non-ST-elevation myocardial infarctions in the last twelve months; paroxysmal atrial fibrillation (warfarin was discontinued recently following frequent falls), hypothyroidism, type II diabetes, stage III chronic kidney disease secondary to diabetes and multiple transient ischaemic attacks. Her regular medications include aspirin 100mg, omeprazole 20mg, levothyroxine 50mcg and frusemide 60mg.

Mrs JH was independent until recently, and has moved in with her son due to increasing difficulty with daily activities of living. She is a non-smoker and does not drink alcohol.

Her physical examination was normal apart from a slow-rising carotid pulse and 4/6 ejection systolic murmur accentuated on expiration, loudest at the left sternal edge and radiating up to the carotids. There was no paradoxical splitting of the second heart sound. Sitting and standing blood pressure (BP) showed a small systolic drop of 10mmHg (from 130 to 120mmHg).

Her blood tests were all unremarkable apart from raised creatinine of 136µmol/L, which was reflective of her chronic renal impairment. An echocardiogram in July 2012 showed severe calcific AS with mean gradient of 75mmHg and aortic valve area of 0.5cm^2; there was also moderate concentric left ventricular (LV) hypertrophy. She had normal LV size and function and an LV ejection fraction (LVEF) of 50-55%.

DISCUSSION: NON-SURGICAL MANAGEMENT OF CRITICAL AS

Calcific aortic stenosis typically occurs in the elderly, and is predominantly characterised by calcification of the valve, causing a reduction in leaflet motion and effective valve area.[1] Recent understanding of the underlying pathophysiology suggests that calcification is driven by active inflammation similar to that of atherosclerosis.[2] Although AS is usually silent with a long latent period, when symptoms of angina, syncope, or heart failure develop, its prognosis changes dramatically. The average survival of symptomatic AS is two to three years. Severity of AS is defined by valve anatomy and haemodynamics found on echocardiographic studies. The American College of Cardiology and the American Heart Association joint guidelines in 2014 state that the prognosis is poor once a peak aortic valve velocity of >4 m per second, corresponding to a mean aortic valve gradient >40 mm Hg or an aortic valve area of <1.0 cm^2 is reached.

In these patients, aortic valve replacement (AVR) has well-documented symptomatic and survival benefits.[1] However, despite this clear evidence, many patients being elderly, either refuse surgery for various reasons or are declined surgery due to multiple co-morbidities.[3] For these patients, the overarching principle of treatment should be enhancing quality of life rather than prolonging life span. Therefore, long-term palliative medical management should be put in place to address their significant debilitation.

There are a number of medical management options available for inoperable AS, ranging from medication therapy, balloon aortic valvuloplasty, and most recently introduced transcatheter aortic valve replacement.

MEDICATIONS

Although there is no effective medical treatment available for calcific AS, the recent advancements in the understanding of its aetiology has allowed researchers to explore the potential benefits of lipid lowering therapy in slowing down the progression of disease. Despite early promising results from retrospective studies, a randomised controlled trial studying the efficacy of Atorvastatin 80mg in moderate to severe AS (with average AVA of 1.01cm^2) showed no significant reduction in disease progression.[4] A major trial looking at combined Simvastatin and Ezetimibe also did not demonstrate much difference in outcome.[5] Conversely, Moura and co-workers found that patients with mild to moderate AS (with average AVA of 1.23cm^2) treated with Rosuvastatin 20mg had significantly reduced rate of disease progression.[6] Following on from these conflicting studies, Carabello and Paulous concluded that if statins were to be considered at all, they must be given early for mild AS.[2] Also, a recent meta-analysis concluded that currently available data does not support the use of statins to improve outcomes and to reduce disease progression in non-rheumatic calcific aortic valve stenosis.[7] This means that Mrs JH is unlikely to benefit from statins, especially in her advanced disease state.

Although the evidence is scarce, there is general consensus among clinicians to optimise loading conditions. This includes antihypertensive treatment and maintenance of euvolaemic status with the aim of reducing the afterload by vasodilatation and thereby reducing the workload on the ventricle. However, this should be closely monitored to prevent systemic hypotension by excessive vasodilation.[2] In the presence of fixed cardiac output due to AS, reduced afterload may well cause significant hypotension

such that organ perfusion is compromised.[2] Therefore, angiotensin-converting enzyme (ACE) inhibitors are often avoided in patients with severe AS,[8] which should only be introduced under careful supervision of selected inpatients.[9] Furthermore, the use of beta-blockers is also avoided as this could potentially pose the danger of reducing transaortic gradient by its negative inotropic effect.[2] After carefully selecting pharmacological therapies for these patients, they should also be advised to watch for any signs of decompensation by fluid restriction, reduction of sodium intake, and daily weighs.

BALLOON AORTIC VALVULOPLASTY (BAV)

BAV is a non-surgical invasive procedure performed in order to improve left ventricular outflow. It involves passing a catheter balloon percutaneously through a narrow diseased valve to dilate and break the leaflet calcifications. Although it does not have an associated survival benefit, it serves a palliative role with symptomatic improvement and lower rates of hospitalisation.[10] Furthermore, a subsequent BAV procedure (often performed six to twelve months post initial procedure) has been described to prolong symptom-free survival.[10] Therefore, in patients who have a prohibitive surgical risk, BAV can still be performed as a short-term palliative procedure to improve their quality of life.

In the majority of patients, recurrent hospitalisation is one of the major issues which has a significantly negative impact on their quality of life, let alone a huge burden on limited hospital resources. A study conducted in Auckland City Hospital demonstrated a statistically significant reduction in the number of cardiac-related hospital admissions six months after BAV.[10] This study showed that over three-quarters of the participants had no hospital admission in the six months following BAV. Therefore, Mrs JH could be considered as a suitable candidate for BAV which may improve her symptoms and potentially reduce the likelihood of future hospitalisations.

When making an informed decision, it is important that Mrs JH is aware of potential risks and benefits of any intervention. When Sack and colleagues assessed the efficacy of BAV in the elderly, they suggested that LV dysfunction was the strongest predictor of post-procedure mortality.[3] Mean survival was significantly lower for patients with a LVEF of less than 35%. High serum creatinine level (greater than 200μmol/L) was also an independent predictor of mortality. Given that her LVEF is 50-55% and her creatinine level is below the 'unfavourable' range, one could argue that she has a relatively low risk of complications from BAV. Therefore, as the benefit of BAV outweighs its risk, this could be recommended as palliative treatment for Mrs JH.

TRANSCATHETER AORTIC VALVE REPLACEMENT (TAVR)

TAVR is a new procedure first introduced in 2002. It involves inserting a bioprosthetic valve percutaneously through a catheter and implanting it within the diseased native aortic valve.[11] Many studies show a mortality as well as morbidity benefit demonstrated by TAVR compared to standard medical therapy, including BAV. Of these, the PARTNER trial is considered a pioneer study which has shown significant benefit in the group that was not fit to undergo major open cardiac surgery.

In this multi-centre randomised controlled trial, 358 participants of a mean age of 83 years were randomised into TAVR and standard therapy group which consisted of maximisation of medications and BAV.[11] The study demonstrated that TAVR markedly reduced both the rate of death from any cause and from cardiovascular causes, as well as reducing the rate of repeat hospitalisations. It was also associated with a significant reduction of breathlessness on minimal exertion and at rest. This would mean that Mrs JH is likely to benefit from the procedure. However, she had previously refused AVR with the view that she does not want any major procedures or operations given her old age. Despite her family willing to consider TAVR (even as a private procedure should she be declined for one), she refused TAVR as she considered this as a major procedure with significant risk and potential adverse events.

CONCLUSION

After exploring various management options for inoperable AS, it was concluded that Mrs JH would benefit from maximisation of standard medical therapy, BAV and TAVR. For her, it is most realistic that she would consider BAV as a next step of treatment which has a relatively low risk profile.

It is interesting to note that a recent study looking at the short-term efficacy of BAV in inoperable patients suggested that BAV has the potential to facilitate progress to TAVR in those who are technically suitable.[12] Therefore, it may serve as a bridge to TAVR which has a survival and symptomatic benefit, with decreased hospitalisations. However, before deciding on any treatment option, it is important that the potential risks and benefits of such an intervention are explained in detail to the patient to ensure that we are responding to the patient's expectations and goals.

The findings of this case history were discussed with the consultant physician and the medical team, and were then further discussed with the patient and her son. She was referred to outpatient cardiology for consideration of palliative BAV.

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Spinal cord infarction

Dr. Manaf Aljishi
Medical Registrar
Capital and Coast District Health Board
Wellington

Dr. David Abernethy
Neurologist
Capital and Coast District Health Board
Wellington

Dr Manaf Aljishi is a PGY4 medical registrar at Wellington and Lower Hutt hospitals. He submitted this manuscript when he was a PGY3 house officer. He has an interest in acute general medicine.

Dr David Abernethy is a senior lecturer in neurology at the University of Otago, Wellington, and a clinical neurologist at Wellington Hospital.

ABSTRACT

Spinal cord infarction is a relatively rare but potentially devastating condition, where part of the spinal cord gets infarcted secondary to an interruption to its blood supply. The literature on this topic does not correlate with the increasing prevalence and importance of this condition. Using a case example to illustrate the clinical problem, this article aims to provide an overview of the anatomic basis, clinical presentation, pathophysiology and diagnostic approach to this condition. A brief discussion of the management principles is also included.

CASE VIGNETTE

A 74-year-old lady, with no previous medical history, was admitted to the hospital following a sudden onset of central chest pain radiating posteriorly, associated with nausea. Her systolic blood pressure (BP) was noted to be persistently >250mmHg. A serial troponin level was stable. An urgent CT angiography showed an extensive aortic dissection beginning just distal to the left subclavian artery and extending into the right iliac artery.

She was admitted to the Intensive care unit for intravenous control of BP. Progressively over days, she started to report severe pain and feeling of 'pins and needles' in her back, legs and buttocks, which then developed into almost a complete paralysis of her lower limbs. A repeat CT angiogram showed no extension of her type B dissection. On examination by a neurologist, she had bilateral profound flaccid leg weakness from hip flexion (i.e. L2-3) down, with sensory loss on levels below L3 on the right and L2 on the left. She also lost control of bowel and bladder function.

The clinical diagnosis was an anterior spinal cord infarction. An imaging of the spine was not done because the diagnosis was clear from the context and clinical findings. She spent over a month and a half in the acute hospital and then in the rehabilitation ward. Unfortunately, not much recovery was gained. Upon discharge, she was immobile, wheelchair bound and was subsequently discharged to a nursing unit.

INTRODUCTION

Spinal cord infarction (SCI) is a relatively rare but devastating condition, where part of the spinal cord gets infarcted secondary to an interruption to its blood supply. SCI or spinal stroke comprises only around 1% of all strokes.[1] Therefore, the literature written about SCI is much less than that about strokes, and hence the true prevalence in the general population is not known. However, just like strokes affecting the brain, SCI can leave the patient with variable neurological deficit, from minor weakness to paraplegia or quadriplegia, depending on the level that is involved and the severity of the infarction. Other deficits include bladder and/or bowel dysfunction and chronic back pain at the level of the infarction.[2] The recovery of function is variable, depending on the duration, severity and location of the infarction, as well as the presence of collateral blood supply. Furthermore, there is an increasing awareness about the condition partly due to the increasing prevalence of vascular disease and its operations as well as the increasing availability of advanced diagnostic imaging modalities. This review will briefly outline the anatomic basis for SCI, with a correlation to its clinical presentations, aetiologies, diagnostic approach and management principles.

SPINAL CORD FUNCTIONAL AND VASCULAR ANATOMY

In order to understand the causes of SCI, a good understanding of the vascular anatomy of the spinal cord is necessary because the resultant deficit in SCI usually matches a vascular territory in the cord. However, it is also possible that a diffuse hypoperfusion affects multiple watershed territories. The cord has highly complex and variable vascular anatomy among different individuals, however general principles still apply to the majority of patients.[3]

The spinal cord has segmental ventral (motor) and dorsal (sensory) roots that unite close to the cord to form 31 paired spinal nerves carrying afferent and efferent nerve fibres. Motor axons have their cell bodies in ventral horns of the central grey matter. Central processes of sensory neurons enter the dorsal cord. Light touch, vibration and proprioception afferents ascend rostrally in the dorsal column on the same side. Fibres carrying coarse touch, temperature and pressure sensations cross the central grey matter to the anterolateral spinothalamic tract, on the opposite side of the cord. The descending tracts that are most relevant to symptoms and clinical diagnosis of spinal cord lesions are the lateral corticospinal tract, which carries motor fibres to the ventral horns for voluntary movement, and the subjacent autonomic pathway for bladder control[4] (figure 1).

The spinal cord is supplied mainly by three arteries; one anterior spinal artery (ASA) and two (less well-defined) posterior spinal arteries (PSA). All three arteries branch off from the vertebral arteries, just before they merge to form the basilar artery, at the level of brainstem, right where the spinal cord starts. The 3 arteries run alongside the spinal cord: ASA anteriorly and the 2 PSAs posteriorly. At each level, the ASA supplies the anterior two thirds of cord, and the PSA pairs supply the rest. The three arteries finally anastomose at the conus medullaris, where the spinal cord

finishes, usually at the level of L1 or L2 vertebra.[5] Importantly, the ASA supplies the spinothalamic and lateral corticospinal tracts, whereas the PSAs supply the dorsal horn and column.

Along its course, the spinal cord also receives radicular arteries. These arteries supply the nerve roots exiting the spinal cord. These arteries also feed the ASA and hence the spinal cord. At the cervical level, the radiculomedullary arteries originate from the vertebral arteries to supply the top part of the spinal cord. From the level of aorta down, they originate from the intercostal arteries or the aorta itself.[6] These arteries enter the spinal canal through the neuroforamina (figure 2).

Since the intercostal arteries are mainly in the thoracic region, the thoracic spinal cord is particularly dependent on these arteries, making it the most vulnerable in acute aortic pathologies.[7] The largest and most clinically significant radiculomedullary artery is the artery of Adamkiewicz, which is the main supplier of the lumbo-sacral spinal cord. The level of this artery is variable, but it most commonly arises at the level of 8th to 12th intercostal arteries in 62-75% of patients.[8]

CLINICAL FEATURES

There are two SCI vascular syndromes described based on which spinal artery is affected; anterior and posterior spinal artery syndromes. Anterior spinal artery syndrome (ASA) is by far the most common syndrome, partly because the ASA gets direct feeding from the aorta, whose pathologies are the most common cause of SCI. It tends to be severe because it supplies the anterior two thirds of the cord and is a single artery, which explains why the symptoms of the ASA syndromes are bilateral. Based on the neuroanatomy described above, the ASA syndrome would cause an abrupt onset of bilateral weakness, areflexia for reflexes whose connections pass through the infarcted region, and pain and temperature sensory deficits while sparing proprioception and vibration.[9, 10] Other symptoms include sexual dysfunction, bladder and/or bowel dysfunction and autonomic dysfunction, manifesting as retention of urine followed by overflow incontinence, unstable blood pressure, and paralytic ileus.[9, 11]

Because of the nature of the usual triggers that interrupt the blood supply, SCI onset is usually abrupt, but can be subacute, evolving over hours to a few days, as in the presented case. Just like traumatic spinal cord injuries, it initially manifests as a flaccid weakness, usually with extensor plantars that evolves over days to weeks to more chronic upper motor neuron signs: spasticity, exaggerated reflexes and clonus.

The deficits depend on the level that is affected. It can involve only lower limbs if the thoraco-lumar region is affected, or all limbs if cervical region is affected. There is also typically a sensory level, which is best demonstrated by a pin prick test. However, it usually occurs a few segments below the actual spinal level, because of decussation of the spinothalamic tract over several segments. Table (1).

Lesions above C3 segment can compromise spontaneous respiration due to a loss of diaphragmatic innervation. Orthostatic control of blood pressure can be lost if the lesion is above T5, the origin of the greater splanchnic nerve,[12] which supplies the sympathetic innervation to the adrenal medulla to stimulate catecholamine release. This sympathetic neurohumoral diminution makes patients prone to postural hypotension in the acute phase, accompanied by symptoms related to diminished cerebral perfusion, including lightheadedness, syncope, tinnitus, facial pallor and blurred vision.[13] Over time, the spinal cord tissue undergoes neuroplastic changes, which result from interruption in the autonomic relaying of the afferent signals to the brain and loss of cortical inhibitory signals to the spinal reflex. This results in an exaggerated sympathetic spinal reflex to the afferent signals, called autonomic dysreflexia. This is particularly relevant in cervical and high thoracic lesions. It is characterised by very severe hypertension, with systolic BP reaching up to 300mmHg, and can be accompanied by headache, sweating, chest tightness, bradycardia and blurred vision.[14, 15] Dysreflexia symptoms can be triggered by a range of stimuli, particularly from visceral distention (usually from a full bladder or bowel), pressure sores, urinary catheterisation, urinary tract infection, cytoscopy, ejaculation and surgical procedures.[15]

This usually causes a great deal of discomfort and compromise to the patient's quality of life. if untreated, autonomic dysreflexia can lead to serious consequences, including intracranial haemorrhage, retinal detachment, seizures, cardiac arrhythmias, and death. Having said that, some paralympic athletes with spinal cord lesions intentionally induce it before their competitions to boost their performance, necessitating medical examinations before their competitions.[15]

Other less common syndromes include posterior spinal artery syndrome and Brown-Séquard syndrome. Posterior spinal artery syndrome is rarely encountered in clinical practice. Because there are two PSAs, this syndrome tends to be unilateral and less severe. Based on the functional neuroanatomy, it makes sense that this syndrome leads to ipsilateral loss of light touch, vibration and proprioception, while mostly sparing the motor function.[10] Brown-Séquard syndrome is caused by the lateral hemisection of spinal cord. It causes ipsilateral loss of motor function and tactile discrimination, vibratory, and position sensation, and contralateral loss of pain and temperature sensation. It is usually caused by a trauma, such as a gunshot or puncture wound, but it has been reported to occur following aortic surgeries.[16]

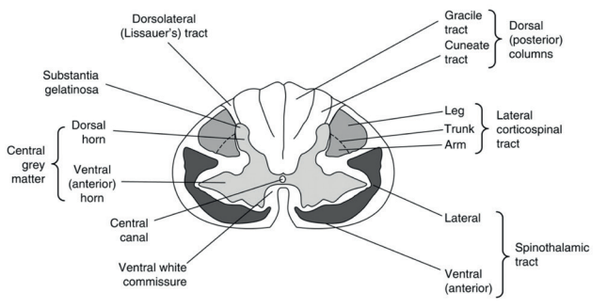

Figure 1: Mid-cervical spinal cord sectional anatomy. [25]

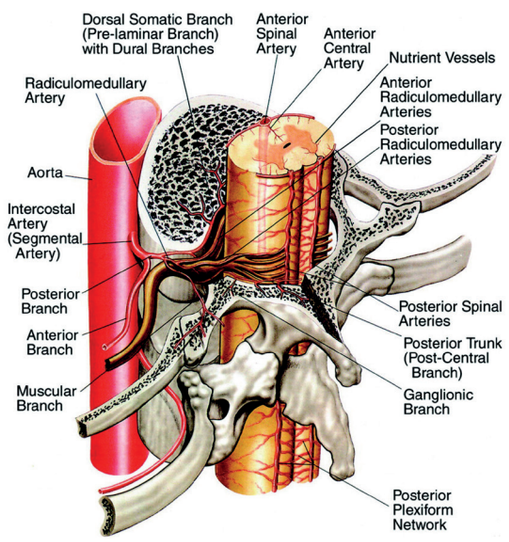

Figure 2: Spinal anatomy and associated structures. [27]

Level of Infarction	Clinical Features
Cervical	Bilateral lower and possibly some upper (depending on level) limb weakness Bilateral loss of pain and temperature sensation in upper and lower limbs If lesion above C3, compromise of spontaneous respiration Autonomic dysreflexia, autonomic dysregulation and sphincter dysfunction
Thoracic	Bilateral lower limb weakness Bilateral loss of pain and temperature sensation in lower limbs If lesion above T5, autonomic Dysreflexia with autonomic dysfunction Sphincter dysfunction
Lumbar	Bilateral lower limb weakness Bilateral loss of pain and temperature sensation in lower limbs Sphincter dysfunction

Table 1: Summary of Clinical Features Associated with Levels of Anterior Spinal Cord Infarction.

CAUSES OF SCI

There are so many reported causes for SCI, and so it is easier to think about most of them according to the pathophysiology of the infarction. When it comes to causes of SCI, it is not much different from stroke in the cardiovascular differential diagnosis: cardiogenic thromboembolism (e.g. atrial fibrillation, infective endocarditis), spinal artery atherosclerosis, global (e.g. circulatory failure) or regional ischaemia (e.g. aortic injury, arteriovenous malformation, epidural haematoma), vasculitis (e.g. polyarteritis nodosa), compressive lesions (e.g. disc prolapse) and hypercoagulability.

Aortic pathology is the most common cause of SCI. Acute aortic events, such as aortic dissection, trauma, thrombosis and aneurysm rupture can compromise the blood flow to the spinal arteries, by either reduced circulating blood volume or direct event extension involving the spinal arteries. There have been cases where asymptomatic abdominal aortic aneurysm presents as a SCI by an embolic mechanism.[17] Aortic surgery and repair, whether open or endovascular, are known to be highly associated with SCI (11% of aortic surgeries, according to some estimates 18). This is partly explained by the presence of a period of generalised diminished perfusion during aortic cross-clamping and/or aortic surgical instrumentation. The aortic cross-clamping causes hypertension proximal to the clamping, but this is followed by sudden hypotension upon releasing the clamp, which leads to low spinal perfusion.[19] Emboli dislodged by the procedure are also a likely cause. Non-aortic surgery, especially spine surgery,[11, 20] is also reported to cause SCI.

Direct occlusion of the spinal arteries is a less common aetiology for SCI. This is usually due to atherosclerotic lesions, embolic events, vasculitis or thrombophilia. Systemic hypoperfusion has been reported to cause SCI, however SCI can be less concerning compared to their underlying illness. This association has been illustrated in a post-mortem retrospective case series, where 46% of patients who died after a global ischaemic event (i.e. cardiac arrest or severe hypotension) were found to have ischaemic myelopathy.[21]

DIAGNOSIS AND IMAGING

Diagnosis is usually suspected based on the abrupt onset and pattern of symptoms and findings. The aetiology is usually inferred from the clinical context. However, other similar conditions, such as cord compression, multiple sclerosis, and myelitis have to be excluded. History of malignancy and back pain should raise suspicion of compressive myelopathy from spinal metastases, while additional neurological deficits not related to spinal pathology or inflammatory cerebrospinal fluid analysis raise suspicion of multi-focal disease (i.e. multiple sclerosis) and myelitis, respectively. Other conditions that can mimic anterior cord syndrome are anterior radiation myelitis and anterior intervertebral disc herniation, both of which can be suspected from the history and the imaging.

Imaging is used to confirm diagnosis and infer the aetiology if not clear. The imaging modality of choice for spinal cord ischaemia is MRI. However, as for brain imaging, MRI can be normal in the acute phase and usually evolves to show spinal cord swelling and high T2 signal after several days.[22] When interpreting spinal MRI and relating the lesion to its level, it is important to remember that the spinal cord is shorter than the vertebral column, as it finishes at L1 – L2. Below this level, the vertebral column contains only lumbosacral spinal nerves contained in a thick fibrous strand (the cauda equine), which runs down to the coccyx. In general, there is little difference between the spinal and vertebral levels in the upper levels, whereas in the lower thoracic and lumbar region, the spinal nerves have to travel down multiple levels to reach their corresponding neuroforaminae.

CT or MR angiography can be helpful in identifying the underlying vascular problem (e.g. atherosclerosis, arterio-venous malformation, aneurysms, occlusions). This can be particularly useful if a surgical repair can be offered. It also aids identification of artery of Adamkiewicz prior to aortic surgery to avoid intraoperative spinal ischaemia.[23]

MANAGEMENT

Management largely depends on the underlying cause for the infarction. Quick corrective surgery is needed if acute aortic event, vascular compression, malformation or bleed (haematomyelia) start to cause spinal ischaemia. In the event of global hypoperfusion, maintaining adequate blood pressure to maintain spinal perfusion is crucial, especially if there are vascular atherosclerotic lesions. Antiplatelet therapy may be needed to prevent vascular occlusions or embolism. Corticosteroids may be used in cases of vasculitis or aortitis.

The management strategy should be tailored to the patient's specific neurologic deficits and should begin right after the infarction. After controlling the underlying cause (e.g. aortic dissection, hypoperfusion), measures are targeted at alleviating the symptoms and preventing further complications while rehabilitating the patient to regain as much function as possible. In the acute phase, patients are prone to complications including pneumonia, urinary tract infections, deep vein thrombosis, pulmonary embolism, pressure sores and neurogenic shock. Effective clinical and nursing cares should focus on monitoring for and treating these complications.

These patients should be placed in specialised spinal rehabilitation units equipped with resources to deal with common issues such as bladder and bowel dysfunction, limb weakness or paralysis, limb spasticity and contractures, infections, skin care and psychological sequelae.[24] Autonomic dysreflexia can be prevented by avoidance of the triggers and using α-adrenergic blocking antihypertensive agents. Acute treatment of dysreflexia is by sitting the patient upright, removing the trigger and controlling the hypertension using fast-acting antihypertensive agent.[25] Spasticity is a big concern in these patients because it leads to contracture and severe complications, such as permanent loss of limb function and joint mobility, skin pressure areas, pain and uncomfortable postures. It can be minimized by passive stretch exercises and oral medications, such as GABA agonists (e.g. Baclofen, Benzodiazepines) and calcium release blockers (e.g. Dantrolene).[26]

Multi-disciplinary involvement with these patients is crucial to their recovery and to achieve the rehabilitation goals. These include physical and occupational therapists to improve their power, balance, function and adaptive skills. The psychological decline leads to demotivation and further loss of function. Hence, clinical psychologists are essential part of the multi-disciplinary team. The social worker's role is vital in facilitating social support, housing alterations, and finding suitable nursing homes for these patients in the community when needed. The long-term goal should be toward increasing the potential of the patient's residual function as well as facilitating a supportive environment. This might mean, in some cases, a residential level of care, although some patients regain some degree of independence and function after an intensive rehabilitation programme. The patient described

in the case did not experience significant improvement in mobility and remained wheelchair bound. Most of the recovery occurs in the first days to weeks following the event, and hence her prospects of further long-term recovery are limited. This highlights the variability of severity of deficits, patient's progression and prognosis after SCI.

CONCLUSION

Spinal cord infarction is a potentially devastating condition caused by an interruption to the spinal blood supply, usually through aortic events or surgeries. The usual presentation is of an anterior spinal artery syndrome, where there is bilateral loss of motor function and pain and temperature sensation below the affected spinal level. If the diagnosis is not evident clinically, spinal MRI is the diagnostic modality of choice to confirm diagnosis. Management involves preventive and acutely controlling the underlying vascular event. Multi-disciplinary team in a rehabilitation ward is sometimes to maximize the recovery of the patient.

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A child as a live organ donor?

A glimpse into New Zealand's legislation

Nur Mohd Lufti
Final Year Medical Student
School of Medicine
The University of Auckland

Nur Mohd Lutfi is a final year medical student at The University of Auckland with particular interest in emergency and internal medicine. She also enjoys volunteering and was involved in Teddy Bear Hospital and rural school visits.

Organ transplant is a surgical procedure that aims to implant healthy organs from live or deceased donors into patients with organ dysfunction or failure. In New Zealand, the first kidney transplant was successfully done in 1965 at Auckland City Hospital and currently an average of 57 kidney transplant operations involving live donors were performed each year.[1] At the moment, the minimum age for live kidney donation is 18 years old.[2] But if the needs arise, is this country constitutionally ready to deal with live organ donation from someone younger? Does New Zealand have adequate legal protection over both the 'child' donor and recipient? This article attempts to answer this by discussing the medico-legal issues illustrated in two such cases in America, Hart v Brown and Curran v Bosze.

CASE 1: HART V BROWN (1972)[3]

In Hart v Brown, 7 year-old Kathleen Hart suffered a life-threatening kidney disease. The treatment options then were either lifelong dialysis or a kidney transplant in which the latter, according to physicians, could provide better outcome. The child's parents offered their kidneys for the transplant but it was Margaret, her identical twin sister, who would be the most compatible donor.

However, the transplant surgeons refused to perform the operation and the hospital refused the use of its facilities without the court's consent to the transplant. The twin's parents then sought a declaratory judgement to permit them to consent to a kidney transplant from one daughter to her twin sister.

The court took into account the testimony from a psychiatrist, who testified that the donor had strong identification to her twin sister, and also a testimony from a clergyman, who stated that the decision of the parents and the child donor was morally and ethically sound. Also, the donor's court-appointed guardians ad litem gave their consent to the procedure.

The court then granted the parents' request to consent to a kidney transplant from Margaret to Kathleen. In this case, the donation was viewed as in the child donor's best interest. If the expected successful results are achieved, the donor would also greatly benefit emotionally because she was believed to be better off in a family that was happy than in a family that was distressed. Furthermore, if the recipient were to die from her illness, then that was viewed as a very great loss to the donor instead because of their close relationship.

Gaining consent from the child donor was also an issue. In this case however, the court allowed the parents to consent to the transplant instead of their child after thorough investigation of their motivation and reasoning through the participation of a clergyman, a psychiatrist, the child donor's guardian ad litem and the recipient's guardian ad litem.

CASE 2: CURRAN V BOSZE (1990)[4]

This case involved a father of twins requesting the court to allow the twins to undergo a compatibility blood test. The father also requested the court to allow the twins to undergo a bone marrow transplant for the twin's half-brother, Jean Pierre Bosze who is suffering from a life-threatening acute undifferentiated leukaemia. Jean Pierre and the twins are the children of Mr Bosze but they have different mothers. Ms Curran is the mother of the 3-and-a-half year old twins and she refused consent to both the blood test and the bone marrow transplant. She believed that it was not in the best interest of her children to do so despite the blood test being minimally invasive.

In desperation, Mr Bosze filed an emergency petition. Mr Bosze and the guardian ad litem for Jean Pierre argued that the doctrine of substituted judgement should be applied in this case, which requires a surrogate decision maker to attempt to establish what decision the patient would make if the patient were competent to do so. The application of the doctrine was objected by Ms Curran and the guardian ad litem for the twins because they believe that it was impossible to clearly and convincingly produce evidence whether or not the twins would consent to the operation should the twins have the competency of an adult.

The court was sympathetic with Jean Pierre but since it could not be established that both procedures would be in the best interest of the twins and also failure of consent from the mother, the emergency petition by Mr. Bosze was rejected.

Both cases were brought to the attention of the courts because they were minors who were deemed to not be as competent as adults in making judgements about risk taking and avoiding self-harm. Organ transplant is an invasive operation which carries some risks to the donor, such as risks of general anaesthesia or excessive bleeding, and does not provide any medical benefit aside from possible psychological gain.

Nevertheless, the case reports did not highlight the donor children's view of the situation perhaps because they were too young. However, suppose the donor children were a bit older, have their own opinion of what they would do in the situation, would they have the right to voice out their own opinion? And would their opinions affect the verdict?

CHILDREN'S RIGHTS: NATIONALLY AND GLOBALLY

There are a number of legislations that aim to protect the welfare of children in New Zealand namely the Children's Commissioner Act 2003, the Children, Young Persons and Their Families Act 1989, the Guardianship Act 1968, the Education Act 1989 and the New Zealand Bill of Rights Act 1990 among others.[6]

Globally, The United Nations Convention on the Rights of the Child (UNROC) is an international human rights treaty that sets out a child's civil, political, economic, social, health and cultural rights.[7] It is a legally-binding Convention as nations that ratified it are bound to it by international law. New Zealand had ratified the Convention in 1993 with some reservations.

In New Zealand, the Children's Commissioner and his or her staff, under the Children's Commissioner Act 2003, are working with the Government to implement UNROC. Section 3(c) of the Act states that one of the purposes of the Act is "to confer additional functions and powers on the Commissioner to give better effect in New Zealand to the United Nations Convention on the Rights of the Child".[8]

The UNROC has a total of 54 Articles. Article 1 of the Convention defines a child as "Every human being below the age of eighteen years unless under the law applicable to the child, majority is attained earlier".[7] Therefore in adopting the Convention, the international community recognised that people under 18 years of age often need special protection and care that adults do not. This article will look into some of the relevant articles in the Convention regarding the care and protection of a child in becoming an organ donor.

Article 3(1) of the Convention recognises the need to put a child's best interest as the topmost priority:

> **Article 3(1)**
>
> "In all actions concerning children … the best interests of the child shall be a primary consideration."

This means that in every proposed case of organ donation by children, a thorough check on the motivation and reasoning behind the use of a child donor needs to be undertaken. Only after careful consideration and successful identification of the child's best interest should the transplant be approved. This is especially important to ensure that the child is not subjected to exploitation, which is also set out in Article 36. As a general rule, children should always be protected from any activity that takes advantage of them or could harm their welfare and development.[7]

> **Article 36**
>
> "States Parties shall protect the child against all other forms of exploitation prejudicial to any aspects of the child's welfare."

In making the decision whether or not to donate organs, a child often relies on parents to help them and this is respected by the Convention in Article 5 which states:[7]

> **Article 5**
>
> "States Parties shall respect the responsibilities, rights and duties of parents or, where applicable, the members of the extended family or community as provided for by local custom, legal guardians or other persons legally responsible for the child, to provide, in a manner consistent with the evolving capacities of the child, appropriate direction and guidance in the exercise by the child of the rights recognised in the present Convention."

On the other hand, if the child has his or her own opinion regarding any aspect of the proposed organ donation, Article 12(1) states that the child has the rights to let her parents and the transplant team know of that opinion, and that the child's opinion should be taken into consideration in any decision-making, though it still depends on the age and maturity of the child. Article 12(2) further stresses the importance of listening to the child's view by ensuring that the child should be provided the chance to be heard.[7]

> **Article 12**
>
> (1)"States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child."
>
> (2) "For this purpose, the child shall in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting the child…"

Moreover, the Children, Young Persons and Their Families Act 1989 offers care and protection to children that may be considered as similar to the UNROC but are more representative of the New Zealand culture particularly Maori's strong family culture. For example, Section 5 of the Act states that family members should take part in making decisions that could affect the child which is quite similar to Article 5 of the Convention; parents could provide appropriate direction and guidance to the child in making a decision.[9]

> **Section 5: Principles to be applied in exercise of powers conferred by this Act**
>
> Subject to section 6, any court which, or person who, exercises any power conferred by or under this Act shall be guided by the following principles:
>
> (a) the principle that, wherever possible, a child's or young person's family, whanau, hapu, iwi, and family group should participate in the making of decisions affecting that child or young person, and accordingly that, wherever possible, regard should be had to the views of that family, whanau, hapu, iwi, and family group:
>
> (b) the principle that, wherever possible, the relationship between a child or young person and his or her family, whanau, hapu, iwi, and family group should be maintained and strengthened.

Dealing directly with the issue of organ transplant and donation is the Human Tissue Act 2008, as the Act includes "whole human organs" (Section 7 (4) (b)) in its definition of 'human tissue'. In addition, the interpretation of the word 'use' in Section 6(c) includes the use of that tissue in carrying out a health-care procedure (for example, the administration or transplantation of that tissue).[10] Nevertheless, there is no specific section in the Act that outlines the regulations regarding whole organ donation, especially the issue of minimum age and ability to consent.

However, it is interesting to note that Section 26 of the Human Tissue Act 2008 states that a person who is 16 years old or older is entitled to be assumed as capable.[10] Does this mean that a child above the age of 16 could be assumed as capable of consenting to organ donation? This could be the case since Section 36 of the Care of Children Act 2004 appears to be in agreement with it.[11]

Section 36: Consent to procedures generally

A consent, or refusal to consent, to any of the following, if given by a child of or over the age of 16 years, has effect as if the child were of full age:

(a) Any donation of blood by the child:

(b) Any medical, surgical, or dental treatment or procedure (including a blood transfusion, which, in this section, has the meaning given to it by section 37(1)) to be carried out on the child for the child's benefit by a person professionally qualified to carry it out.

ETHICAL ISSUES

Informed Consent:

Consent may be defined as 'granting someone the permission to do something that they otherwise would not have the rights to do so'.[12] Perhaps a more holistic approach to consent, particularly in the medical setting, is informed consent which would include the need for the consent to be made after knowing what action or treatment the consent is given to, having access to related information, being assisted in the process of understanding, knowing the potential danger and risks of the action and having enough time to decide. The consent must also be made voluntarily, without coercion or pressure.[13]

It is acknowledged that a child's state of mental development is not the same as adults. This puts children in a vulnerable state because they have a much limited capability to understand the treatment procedures and to weigh its potential risks.[13] Hence, providing informed consent to a child is therefore much more complicated than to an adult. However, as a child gets older and more mature, the capability of understanding complex information increases and so do their capability to weigh risks and options. The child should be encouraged to give his or her opinion and have that opinion respected, as stated in Article 12 of the UNROC.[7] A child is said to be Gillick competent and can give consent provided that he or she has 'sufficient understanding and intelligence to enable to understand fully what is proposed'.[13]

Best Interest:

It is important to remember that the decisions made during childhood may have significant impact on the child's present and future. Therefore, it is very important to make sure that the child is treated to favour his or her best interests. It requires the decision maker (for example, parents deciding for their child) to consider both the current and future interests of the proposed child organ donor, and then decide the best course of action. In organ donation, physical harm is inflicted upon the child donor in benefit of another person, but to what extent is this permissible?

UNROC did not precisely define what constitutes as 'best interest' of the child although the term is being used many times in the Convention. Granted it is difficult to describe and draw a line as to what is in the best interest of a child. Often it depends on a lot of individual circumstances, such as the age and the level of maturity of the child and the child's environment.

In the Curran case4, three critical factors were found necessary by the court to determine the best interest of the child: (1) the consenting parent must have been informed of the risks and the benefits of the procedure; (2) there must have been emotional support available to the child from his or her caretakers; and (3) there must have been an existing, close relationship between the donor and recipient. Given these circumstances, the court found that there was insufficient evidence of close personal relationship between the children and hence compatibility testing and bone marrow donation was not deemed to be in the child donors' best interest.[4]

On the other hand, in Hart v Brown,[3] it was decided that the transplant of kidney from a child to her twin sister was in the donor's best interest. If the transplant operation was not done and the sick twin dies from the disease, the negative psychological impact on the healthy twin is deemed to be more damaging than the risk of the operation since they both had a close relationship. However, this can be debated.

CONCLUSION

Organ donation by a child is a complex issue and should be dealt delicately with parents or guardians having the duty to care and protect their children. Hence, in making the decision regarding organ donation, the child should be guided and assisted in the best possible way and the final judgement should always be in the child donor's best interest. New Zealand may be inexperienced in the field of live organ donation by children but it is reassuring to know that some basic legal structures surrounding it are already present.

DISCLAIMER

This article represents the view of the author only and does not constitute the full analysis of the New Zealand legislations nor their interpretation.

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If in doubt – take leave

Daphne Cohen
House Officer
MidCentral District Health Board
Palmerston North

Daphne Cohen is a PGY1 house officer at MidCentral DHB. She has lived and studied in most of NZ's major cities and managed to pick up a PGDip in Bioethics along the way. Her major interests include General Medicine, social justice, and brunch. She also has amazing hair. She is this year's blogger for the NZMSA First Year blog.
Find more at http://www.nzmsa.org.nz/category/thefirstyear/

There are a lot of hard things about the first year as a doctor. Mostly it's not the medicine itself, but the job – getting used to how the hospital is run, learning to read your consultant's mind, dealing with the long days, the early starts and the late finishes. Whether it's horrible nightmares about the hospital or finding that your mid-week alcohol consumption is just slooowly creeping up (don't worry, I'm still under the recommended weekly limit), it seems like around about this time of year everyone is struggling. Facebook posts become a lot less inspiring and tend to feature more crying, despair and/or anger. It doesn't help that the weather is getting cold and wet either.

General Surgery seems to be the worst run for making people cry, wonder why they did medicine in the first place and generally doubt their competence, but it can happen in any run. When (not if) it does happen it can seem overwhelming, but the good news is that most people manage to make it through without collapsing into a pathetic heap. Here are a few tips:

Take leave:

I'm writing this post after a two week trip to the US, including a week on Maui doing nothing but lying on the beach and drinking Mai Tais – it was amazing, and I definitely needed it. Compared to many other professions we get a lot of leave and a pretty decent salary, so use it! Try and take some leave every run and more in the difficult ones if necessary. Just remember that you need to complete at least 10 weeks of every 13 week run to get registration – so don't take more than three weeks (15 days) off including sick leave. If you do nothing else on this list, take leave.

Talk to people:

You may be the strong silent type, but trust me it helps to talk to someone. It can be your flatmates, family members, non-med friends or co-workers. Some of the most cathartic venting I've had has been over a glass of wine with other PGY1s – they've been there and they get it, plus you can provide a sympathetic ear for their own rants. You can also talk to your intern supervisor, registrar or consultant if you're struggling and need help – they are a great resource.

Exercise, meditation, sleep, socialising etc:

All that good stuff. You've had lectures on it and read about it in the various wellbeing guides – it really works. Do it. Prevention is better than cure, and if you can get into a habit of exercise or meditation, find a sleep schedule that lets you compensate for the long days, and make time for your friends and family you will find it much easier to cope with the stress. You need to prioritise yourself once in a while.

The NZMSA produces a great guide with lots of advice for improving wellbeing. You might not feel like you need it right now, but hold on to it.

In the dark moments that may await you in the future, just remember: you are not a bad doctor. Yes, you're young and inexperienced. You will make mistakes, but they won't be serious ones (unless you're spectacularly unlucky). You made it through six years of med school, you passed all those exams and assessments, and you did all that study and work.

You got this.

Final year exams – the Otago experience

Cory Malbon
Final Year Medical Student
Faculty of Medicine
The University of Otago

Cory Malbon is a final year medical student in Dunedin. He is keen on the outdoors and travelling to warm countries with great food. He enjoys teaching and is happy to help out.

Fifth year exams come on your radar early in your pre-clinical years when you hear about their fabled existence and the anecdotal levels of knowledge needed just to gain a pass. They represent the final climb of medical school and once passed, herald demi-doctor status.

This article is written in the immediate post-exam period whilst the tips and tricks I picked up are still entrenched in my mind and the patterns of eponymous syndromes still ring small bells in the back of my cluttered mind. In no way do I stand to financially benefit from any of the resources I referenced and I am not affiliated with any of them as far as I know. This is also written as my own personal opinion and I agree there are many more options/resources to study from.

MCQS:

In Dunedin, we have 220 MCQ single best answer questions sat over two days with all sections of the course examinable in this format. These questions range from basic science and clinical knowledge, to diagnosis and management on a variety of conditions. Therefore, it is not advisable to study in-depth on non-high yield topics and focus instead on breadth of knowledge and in-depth on common conditions identified by your respective schools of medicine.

Studying for the MCQs required time and a plethora of different resources. My main resources were as follows:

Get Through Medical School: 1100 SBAs/BOFs and EMQs

- Great for covering most areas of medicine and especially good for passing endof-run exams
- Helps to guide study well and good for checking you have understood the major diseases and treatment options.

BMJ OnExamination's Question bank online

- Good to learn/revise public health and the eponymous syndromes from.
- More in-depth knowledge learning in this resource. Helpful to see what percentage you are getting right and whether you are at level you expect to be at.

PasTest's Online Question Bank

- Heard that this is great from those who used it.
- Apparently is very applicable and covers more topics than BMJ's OnExamination.

500 Single Best Answers in Medicine

- Incredibly good chapters on each specialty whether to prep for the run or to improve/revise your knowledge across specialty specific questions.

Any material (notes/lecture slides) from the faculty

- These are always the best educational resource and usually reflect the questions that will be asked. REMEMBER that your Consultants are the ones that set the questions and they may give many hints (not that you'll need them).

OSCES:

There are 10 seven minute OSCE Stations with three explanation, three examination and four history taking stations. The OSCE is responsible for 60% of the overall pass mark and to pass a student must pass at least one examination, one history and one explanation station.

To pass the OSCE, you need to get out and meet patients and examine them as much as you can. Get your seniors to watch you do this so they can pick up your faults and remind what you missed. Make sure you don't pre-read the notes so the mystery of the diagnosis still remains for you. Patients also often don't have any idea what investigation or treatment is about to be done to them and this is your opportunity to explain the process to them.

Another necessary part of practice is an OSCE group (Start this as early as possible). It is much more than being able to power through numerous possible exams, history and explanation scenarios. It is also a forum to bring up questions and discuss difficult topics or concepts you may struggle with. The best book I have come across for preparing and practicing is: Talley and O'Connor's Clinical Examination, as it clearly explains both the examination process and the interpretation of common clinical findings. It also includes key tables and photos to present the information well for the visual learners. Remember to smile, build rapport and if you have no idea what they are asking about, stick to your structure – It will help you out of many difficult situations.

GENERAL TIPS

Exams such as these require knowledge over many subject areas, all of which you have been taught at different times over a lengthy period. My tip is to track your study progress and keep a checklist of what you have revised

and what you haven't. What I've done is split my checklist into learned and tested. This way you can learn the knowledge first and then test yourself using one of the earlier-named resources. If you do well enough you can tick it off, and may need to revisit it just before the exam to revise the high-yield points. This is especially handy a week before exams when there is no class. You can split your day into a-third of doing questions, a-third doing OSCES and the final third discussing or quizzing mates on their weaknesses and vice versa. This is perfect for someone like myself who is horrible at learning lists, as I find it sticks much better and is also fun with others.

Clinical workload is something to be wary about coming into exams and plan your study around this. Note when your busier runs are scheduled in the year; and if they are later, plan your study a bit earlier so that you have enough time on the wards in the final runs and for personal study. This may be difficult because at the end-of-year study is foremost on your mind, remember that the run is for you to learn on and you wont need to revise it so close to exams.

FINAL TIP

Know what you are strong at and where your weakness lies. The aim is to not focus too much in your strong areas and neglect the others, but being reasonably knowledgeable across a broad range of topics. This is after all the most you may ever know about all of medicine generally.

Wellbeing is something to factor right in there above study. I find sleeping, exercising and social time or non-study time to be high on my list in adjunct to studying. Sleep is useful for many reasons- relaxation, re-energisation, resetting my brain and reinforcing concepts that wouldn't click into my head the night before. Exercising is mainly for the endorphins and combating those kilos of chocolate consumed, but for those of you keen enough, textbooks can fit onto treadmills and exercycles these days. Non-study time is all for mental health. Face it, you can't survive without friends and the outside world, so it's best to not ignore them. Meet up and discuss things. Relax in their company.

The final word is: Keep healthy, look after yourselves and remember; it's only another test!

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The Acceptance of Death & Dying

Carmen Chan
4th Year Medical Student
School of Medicine
The University of Auckland

Carmen Chan is a 4th year medical student at Auckland City Hospital. She has a particular interest in exploring the human experience and in climbing mountains. Along with a broad interest in global health, she is busy trying to work out the functional role of a doctor and currently sits as an executive member at the New Zealand Medical Students Association.

I am a fourth year medical student. This afternoon was my eighth day interning at the hospital. Dressed up in blue slacks and a printed blouse, I am 'assigned' a patient every morning to interview and examine. Each morning as I trot to the wards, I still take a deep breath before walking in. I still get nervous at meeting new people. Why? Every experience is a leap. Every jump behind the ward curtains a sudden transportation into the world of a patient. New to the ways of sickness and suffering, I am often not sure how to react. I am swept by the degree of human suffering that I see, moved by the human experience, the pain that is treated behind hospital walls.

The case that I am about to talk about was different. How? Well when a patient is sick, we often see them struggle. By this, I mean that there is often a sense of physical or psychological discomfort. Perhaps what we often note a subtle sense of strain - a desire, or want that comes with the underlying struggle to ward off the contracted illness as they fight for better health. What happens then, when we meet someone who has accepted the imminent? This afternoon, I met somebody who had come to terms with their death, and through this way chose a different way to live.

The atmosphere was surreal. She had simply sat there on the bed - a small thin body tucked in by a hospital blanket raised up against the mattress. As I approached, lucid blue eyes opened and gazed at me from behind wired metal frames. I smile and offer my hand: 'Hello, my name is Carmen Chan. I'm a fourth year medical student from the University of Auckland. Would it be alright if I ask you little bit about what's brought you to hospital and also with your permission, perform an examination on you?' Her eyes light up and she gives me a warm smile. She assents and we begin the interview.

It took me two hours. This was my first experience of talking to a person who had 'come to terms' with their death, it was the first time that I had examined the eaten body of a person who knew that she was going to die. The experience was both liminal and moving. I am a medical student. I have spent over half of my tertiary life studying about how to answer the question of 'how to save a life'. That afternoon however, I was left without words.

How does one seek their death?

I was given an analogy from a psychiatrist last week that the brain was 'like a city'. That if we survived long enough, our bodies would too be ravaged by the metastases of cancer, and subject to the plaques of dementia. It seems that increasingly as medical interventions improve, perspective turns not towards only prolonging life, but choosing just exactly how our 'Walls of Jericho' will crumble.

This woman was in an immense amount of chronic pain from the metastasis of her cancer and yet, right from the discovery and onset of her disease eight years ago, she had intentionally decided not to seek medical intervention. She had accepted that the developing cancer was a 'natural course of life' and over the course of eight years, continued to live and watch it grow throughout her body. From right breast to leftbreast it metastasized, from left breast to the cervical grew, and as it ate away her tissue, harsh nodules changed and altered the contours of her skin. It was not until November last year that she elected to take pain medication when she experienced the onset of chest pain and fatigue.

As a medical student, I found the tale of 'non action' very difficult to ingest. I wanted to know 'the facts' and barrage her with questions– what medical interventions and treatments had she tried? Radiation? Chemotherapy? Resection? Surely she had taken some medications to stave off the progression of cancer? What was her 'past medical history' and things that she had done to 'fight off' this disease? Was it fear of establishing a malignant diagnosis? How can one find the suspicious indications of a cancer (nodule in the breast) and choose to do nothing? For a period of time, her answers made me feel somewhat frustrated. I felt wholly helpless as a training healthcare professional not being able to provide 'interventions' for her condition, for her physical pain.

There are several aspects of this interaction that have left me mulling. One was the concept of the physical examination, and the second was the pre-imposed concept that all dying patients were intrinsically 'suffering'. How much of my own pre-conceptions were clouding my objective lens? After all, she had said was that she was 'already at peace'. What did the patient really want? Unlike me, she had already embraced the concept of death.

The purpose of examining a patient is to elicit further information to enable us to form a diagnosis. From there, we are taught to design a treatment plan that has the intended effect of alleviating the patient of their malady. What then happens when the patient is on the road to death? How does one auscultate the heart of a dying woman, percuss at the walls of struggling lungs, gaze into the eyes of one who knows and accepts that they too would soon end? What was the point? I was reluctant to ask her to sit up, and engage in movements that might cause her pain. Yet to my surprise, as much as I was hesitant to perform the procedures, she was almost as insistent that I examine her. I still remember her smiling as she completed the movements of the neurological exam.

This experience makes me wonder over the role that we play as 'doctor'. Dr Abraham Verghese an infectious disease physician discusses the role of the physician and the 'power of the human touch' and sitting back from this experience, I wonder whether this concept has an element of veracity. One of the greatest onuses of dying is the burden of loneliness. No one else can join us along for the journey…but perhaps as a healthcare professional

unable to offer medical intervention, what I can do as a training doctor is to 'be present'. I can still listen, I can examine, I can demonstrate that for the brief period of time that I am with a person that I am wholly there for the benefit of their care. After all, at the end of the day, that is what I am supposed to be there for.

> *"You matter because you are you. You matter to the last moment of your life, and we will do all we can, not only to help you die peacefully, but also to live until you die."*
>
> – Dame Cicely Saunders

This experience has reminded me that at the end of the realms of the medical road map lies the welfare of a patient. This patient is a Person - An individual with their own hopes, dreams and story. Each Person has their own perspective on how they choose their death, and as a doctor, it is not my role to judge. Each person comes to peace in their own way and ultimately, like many people, what they want for that brief, liminal moment of examination is somebody to care. What a patient chooses is up to them.

I have spent the past few weeks so entrenched in learning the interviewing structure, note writing and presentation skills that such aspect of practice had been sheathed until the stacks of case histories. Why else had I decided to enter medical school? I was reminded from this case that as a clinician, it is still of importance to be fully 'present' for a patient - To consider their 'ideas, concerns and expectations' along with their medical history. We are there to care. Despite our studies to become a clinician, perhaps it's important to remember that.

"Death, Be Not Proud" by John Donne (1633)

Death, be not proud, though some have called thee
Mighty and dreadful, for thou art not so;
For those whom thou think'st thou dost overthrow
Die not, poor Death, nor yet canst thou kill me.
From rest and sleep, which but thy pictures be,
Much pleasure; then from thee much more must flow,
And soonest our best men with thee do go,
Rest of their bones, and soul's delivery.
Thou art slave to fate, chance, kings, and desperate men,
And dost with poison, war, and sickness dwell;
And poppy or charms can make us sleep as well
And better than thy stroke; why swell'st thou then?
One short sleep past, we wake eternally,
And death shall be no more; Death, thou shalt die.

New Zealand Medical Student Association president

Interview with Elizabeth Berryman

What inspired you to study Medicine?

When I was 9 years old I read a book called 'J. Hudson Taylor: Founder of the China Inland Mission', it was a story of a Medical Doctor who changed the lives of millions in the late 1800s. At the same time there was a fictional TV show called 'Dr Quinn Medicine Woman' and between the graphic stories of Dr. Taylor and the passionate narratives of Dr. Quinn, I became focused on helping others less fortunate. My 'heros' inspired me to be a doctor, however through a series of events, at age 17, I actually started nursing training at AUT. As a 20 year old new graduate I worked in Emergency Care at North Shore Hospital before working in the Outback of Australia and then in Whanau Ora at Te Puna Hauora o Te Pai Whenua. I remained fascinated by medicine and deeply inquisitive.

I completed my Masters in Advanced Nursing and my internship as a Nurse Practitioner. However there were very few jobs available- actually no jobs available – so I worked as a practice manager of a small clinic in Albany, as a way to generate funding for a position as a Nurse Practitioner. I was frustrated by inefficiencies of the health system and passionate about the experience of Whanau Ora. A good friend of mine took me aside and said, "okay what do you really want to do?"

"I want to make the most difference that I can for people who are in need and the way I see to do that is through policy development." So there I was, 25 years old, applying for medical school. I took the 'scenic' route to get into medical school but I don't regret one minute of my nursing career at all. It gave me a lot of insight and empathy, which motivates me now in my studies as a 4th year student here in Dunedin.

Why did you apply for the role in NZMSA?

In my 2nd year of Medicine I was so impressed by the Otago University Medical Student Association (OUMSA). I was blown away that a student organisation could be so well organised, so motivated to help the future of New Zealand doctors. This was immensely encouraging. I watched in awe of how the leaders were so passionate and hard working for the cause – for no money and no reward! As a 3rd year I wanted to be involved, so

I put my name forward for OUMSA and was elected President in 2014. As the OUMSA President I became involved with NZMSA. Although it is difficult as a student to sometimes see the work that NZMSA does as an exec member, I was impressed at these students who were tirelessly working behind the scenes making small and big changes on medical education, health workforce and advocacy and much more. I wanted to help continue the good work NZMSA was doing. So with my modest management experience, I decided to use those skills to serve NZMSA as President.

Being the President of NZMSA and doing Medical School how do you manage 'busyness' and 'stress'?

It is a constant battle! A few things that have helped me are effective time management and scheduling time for yourself, by scheduling in regular breaks and holidays, months in advance. I suffer from an inability to say 'no' to things. I am currently working on how to 'focus' my time more effectively using a priority system. I use techniques such as mindfulness and prayer, which helps me keep the big picture in mind. I make the most of my break and read books with helpful strategies such as Steven Coveys 7 Habits of Highly Effective People and leadership books by John C. Maxwell. But it is a struggle and one that I have to work on everyday – having good friends and fellow medical students are wonderful supports! Also a loving husband who has supported me through the last 3 years of Medical School chaos, I could not do it without his constant encouragement.

Over 2014 and 2015 you worked on a team collaborating with the Australian Medical Student Association on a policy for Mental Health and Wellbeing. What do you think Wellbeing means for you?

Wellbeing –to be 'well' or happy with ones life is totally personal. It means different things to different people. Our past experiences, our culture, our expectations or pressure from family or self are all very individual. I am interested in finding out more about what makes people resilient. There are always going to be tough times in our lives, there will always be those Medical School Progress tests and exams! Loved ones unfortunately pass away, relationships come and go and patients can pass away unexpectedly. What is it about those people who are able to work through these issues and come out stronger, compared to others who struggle. I would love to study both spectrums and see what are the common themes and factors for medical students that help with the development of resilience during times of potential 'poor wellbeing'. One idea that research suggests is the use of peer mentoring. There was a pilot project in 2014 in Otago between 2nd and 3rd year students, with an overwhelmingly positive response. I am keen to see more of these student driven programmes implemented during medical school training to improve wellbeing.

What advice do you have for other Medical Students who wish to develop their leadership skills, or have an area of passion that they would like to do something about?

Just do it. Get a plan, get some supportive friends or family, and take that scary first step. Don't care what other people might think of you, do what you care about. Find what moves you, what makes you angry; then do it 110% and don't ever give up.

NZMSA

The New Zealand Medical Student Association (NZMSA) has had a very busy and productive start to 2015. From our handover Face-to-Face meeting in Nov 2014 the Executive Board have been proactive and innovative in their approach to the issues Medical Students face. A fresh new approach as been taken, which involves the review of the NZMSA strategic plan which has involved a organisational structure review and focusing on only 10 core issues and 10 wider health advocacy issues.

Our Mission Statement - "To Unite, Empower and Represent New Zealand Medical Students". There has also been a restructuring of some of the NZMSA events and programmes and a new approach to partnerships and internal operations. Focusing on the core needs of New Zealand Medical Students we are pruning some areas of NZMSA to allow for fresh growth. We are concentrating on fixing some organisational issues, improving teamwork and communication between NZMSA exec and team members, and a huge emphasis on involvement with NZMSA members on a personal level.

Innovation and creative ideas have been exciting and we are already seeing some new growth in places we didn't expect. Also making sure that the things that we do are done to the best of our ability – 'less is more' approach making sure that each event, programme, advocacy issue, internal operation is dealt with in a professional and appropriate manner and with an attitude of excellence and precision.

"To Unite, Empower and Represent New Zealand Medical Students"

INFORMATION FOR AUTHORS

GENERAL INFORMATION

The Editors of the New Zealand Medical Student Journal aim to support medical student development, be a forum for opinions and discussion, and publish the educational writing of medical students. To this end, the Journal accepts submissions in the form of original research articles, academic review articles, feature articles including case reports and conference reports, book reviews and letters. The Journal commits to rigorous peer review and freedom from commercial influence.

FORMAT REQUIREMENTS

Use Microsoft Word
Include figures, legends and tables
Save as a word document (*.doc)
Photographs are to be included as separate files

TYPES OF SUBMISSION

Original research articles	(<3000 words)
Academic review articles	(<3000 words)
Feature articles	(<3000 words)
Case reports	(<1500 words)
Book/app reviews	(<700 words)
Letters	(<500 words)

CRITERIA FOR SUBMISSION

Submissions are of interest to medical students
Written approval from research supervisors is required
Author's email address for correspondence is necessary
Short blurbs about authors should be included
Completed article coversheet, available from:
http://www.nzmsj.com/

STYLE

The British Medical Journal house style is to be followed.
This is available at:
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All submissions will be subedited for spelling, grammar and clarity. They will then be sent for expert reviews. Authors will be required to revise their articles during this process.

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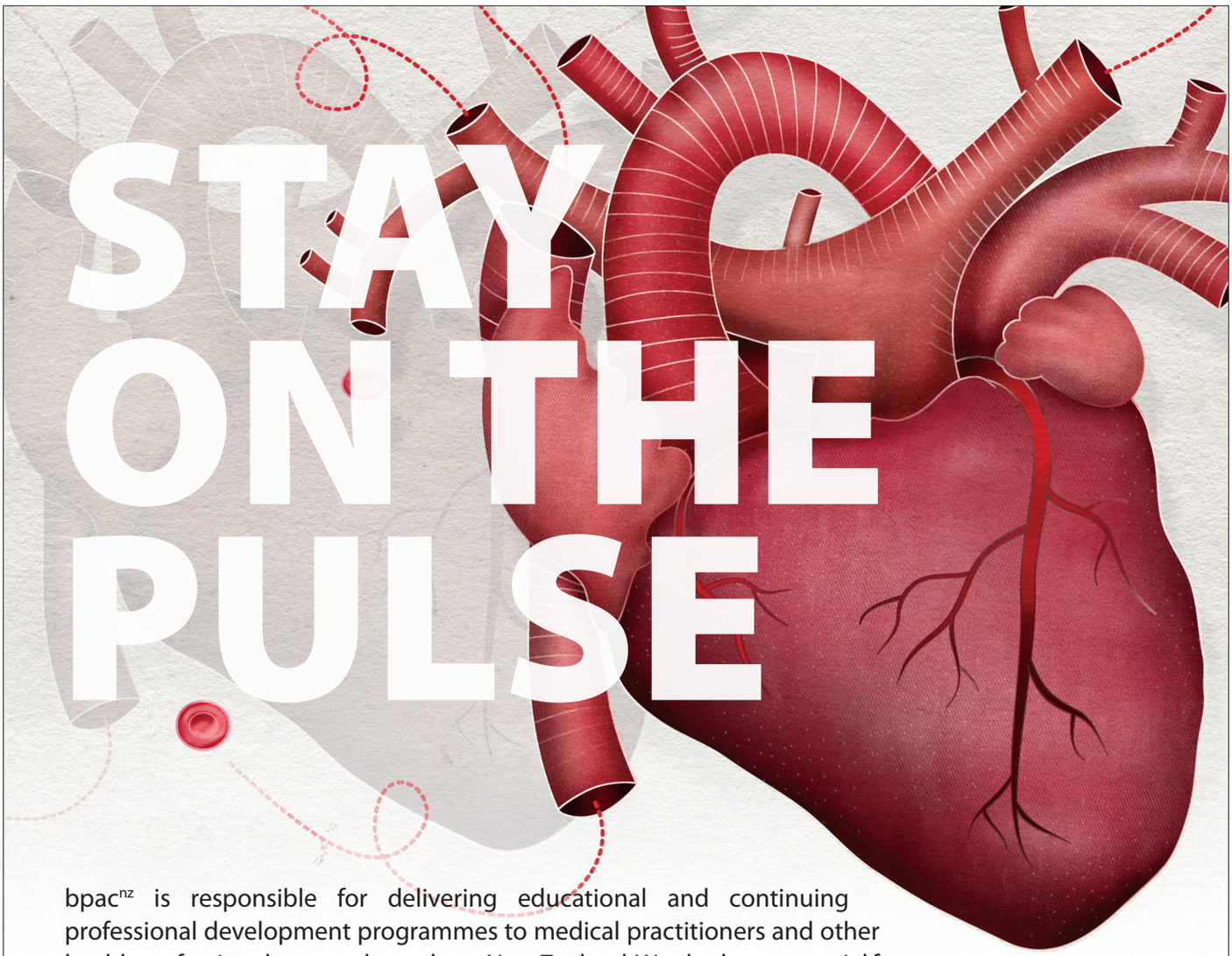

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