ISSN 0041-6193

THE ULSTER MEDICAL JOURNAL

Volume 85 (2) May 2016

The Ulster Medical Journal

The journal of the Ulster Medical Society. First published in 1932.

Successor to the Transactions of the Ulster Medical Society (1862-1929), and the
Transactions of the Belfast Clinical and Pathological Society (1854-1860)

Statement: The Ulster Medical Journal is an international general medical journal with contributions on all areas of medical and surgical specialties relevant to a general medical readership. It retains a focus on material relevant to the health of the Northern Ireland population.

Disclaimer: The Ulster Medical Journal is owned and published by The Ulster Medical Society, itself founded in 1862 by the amalgamation of the Belfast Medical Society (founded 1806) and the Belfast Clinical and Pathological Society (founded 1853). The owner grants editorial freedom to the Editor of the Ulster Medical Journal. The Ulster Medical Journal follows guidelines on editorial independence produced by the World Association of Medical Editors, and the code of good practice of the Committee On Publication Ethics.

The journal is published in January, May and September, by the Ulster Medical Society, and typeset and printed in the UK by Dorman and Sons Ltd, Belfast. See inside back pages for institutional and personal subscriptions.

Contact Details: All enquiries on submissions, subscriptions, permissions and advertising to the Editorial Office, The Ulster Medical Journal, Whitla Medical Building, 97 Lisburn Road, Belfast BT9 7BL. United Kingdom.
T/ F: +44 (0) 28 9097 5780 **E:** umj@qub.ac.uk **W:** http://www.ums.ac.uk/journal.html

Ulster Med J 2016;**85(2):**69-70

Editorial

Following a Physician's Footsteps in Flanders: The Centenary of the Somme

FORMATION OF THE 36TH (ULSTER) DIVISION

In 1914, political tensions were running high in Ireland. The Liberal government in Westminster had promised home rule but this was resisted by the Conservatives and Unionists. Nationalists and Unionists formed armed volunteer militia and civil war seemed imminent.

When war broke out in Europe, internal tensions eased (for a while) and large numbers of the Ulster volunteers joined up. Permission was granted for them to form their own Division in Kitchener's New Army, the 36th (Ulster) Division. Recruitment and training took some time so it was October 1915 before the Division was deployed in France.[1]

The Ulster Division comprised 3 Brigades (107th, 108th and 109th) of 4 battalions. Each battalion was made up of 1000 men and 36 officers. There were also various support companies such as engineers and logistics. [1]

MEDICAL CARE IN WORLD WAR I

The Royal Army Medical Corps supplied one Field Ambulance unit (a Boer War innovation) in support of each Brigade. The role of the Field Ambulance was to evacuate and treat casualties but major injuries were only definitively treated in the Casualty Clearing Stations or Base Hospitals well behind the front. Each Field Ambulance had 10 officers and 240 men divided into 3 sections which in turn were divided into stretcher bearer and tented sections. Of note, there were only 32 stretcher bearers for each battalion. [1,2]

There were 7 motor ambulances attached to each Field Ambulance – those belonging to the 36th Division were a particular source of pride as they were funded by various towns in Ulster whose names were inscribed on the coachwork. Each ambulance could hold 12 seated or 4 lying casualties! [1,2]

Fig 1. A soldier has his wounds dressed. Image credit: The Somme Association.

The difficulty for the wounded soldier was, of course, getting from No-man's land back to effective help.

The first link in the chain was the Regimental Aid Post, manned by the Regimental Medical Officer (RMO) and some stretcher bearers. This was usually sited in the 3rd trench behind the front line. The wounded either walked there or were carried by comrades. Wounds would be dressed and a drink of water and cigarette offered! (Figure 1)[1,2]

Casualties were then moved to the Advanced Dressing Station (ADS) about a mile back from the front by stretcher, hand cart or in Thiepval wood during the Somme, by a light tramway.[1,2] The following is a quote from an Ulster Division orderly at an ADS during the Somme:

The doctor tried to look over each patient as soon as he arrived… the dead was left to one side. The ones there was no hope for was put in a tent and morphia and cigarettes was all that was used in there. It was a terrible thing to light a cigarette for a soldier and see him die before he finished it. All we did was redress a wound if he needed it and if somebody needed a bit of tidying up we did that as well. The only operations that was done regular like was taking off an arm or a leg or stitching up wounds. [1]

The next step was transfer to the Field Ambulance HQ by motor ambulance – some major surgery could be performed there but for those in need of advanced care, a further trip to a Casualty Clearing Station was required by train or motor ambulance. These were large, well equipped units sited near railway lines. Today, their former location often corresponds with large war cemeteries.

BATTLE OF THE SOMME

For one week prior to "zero hour", artillery shelled the fortified German positions at the Schwaben redoubt opposite the 36th. What wasn't known then was that shrapnel shells don't cut barbed wire and that a high percentage of the high explosive shells aimed at the German fortifications, machine gun nests and dug-outs didn't explode.

The Ulster Division went over the top just before 0730 hrs on the 1st July 1916 and despite suffering enormous casualties overcoming intact barbed wire and German defenses, achieved its objectives and occupied the German trenches.

Unfortunately, the neighbouring divisions on either side failed to advance so that the 36th were raked by machine-gun fire from both flanks and German defenders came back through their own trench network on both sides. Communication with British HQ was minimal so the opportunity to reinforce the success of the 36th was wasted. Eventually, they had to pull back with further loss of life. Out of an effective strength of about 10000 or so, there were 5104 casualties on the 1st July with 2069 deaths. The Division won 4 Victoria Crosses that day out of 9 across all 17 divisions involved in the battle. [1,2]

DR FRANK MONTGOMERY

The RMO at the Regimental Aid Post of the 109th Brigade was 24-year old Dr Frank Percivale Montgomery from Lower Crescent in South Belfast. Frank had graduated in Summer 1915 and was a distinguished Irish international rugby full-back prior to the war. During the initial bombardment and the first few days of the battle, he retrieved many wounded men from the front lines and No-man's land whilst under fire (RMOs had a high attrition rate) and was awarded the Military Cross. [2] It is sobering to think that in today's terms he was a Foundation Year 1 doctor!

Later in the war, he helped pioneer the use of portable X-ray equipment and on his return to Belfast became a Consultant Radiologist with a special interest in Radiotherapy. The original Purdysburn Fever Hospital was renamed Montgomery House in his honour before finally becoming Belvoir Park Hospital in the 1960s. [2,3]

He was knighted for his services to the NHS in 1953 and chose as his motto "Lux ex umbra" which he interpreted as "knowledge from shadows" – an apt choice for a Radiologist! He died at the age of 80 in 1972. [2,3]

REFLECTION

Before writing this piece, I knew a little about the tremendous loss of life during the Somme. What I didn't appreciate medically was the long route taken by so many of the wounded before receiving life-saving interventions. So what progress has Ulster made in 100 years? Very shortly, we will be recruiting young men and women to staff our own Air Ambulance that will potentially bring life-saving interventions to those who need it or evacuate them quickly to a base hospital. I'm sure Frank Montgomery would approve.

John Purvis, Hon. Editor

ACKNOWLEDGEMENTS:

The inspiration for this article came from reading Patrick Montgomery's account of his father, Frank Montgomery's experiences during World War I (reference 2 below). I strongly recommend that anyone interested in this area should read it.

I am grateful to Mr. Matthew Gamble of the Somme Association for providing me with medical pictures from World War I.

REFERENCES

1. Orr, Philip. *The Road to the Somme (2nd edition)*. Blackstaff Press, Belfast, 2008.
2. Montgomery, Patrick. *Following Father's Footsteps in Flanders*. Nicholson & Bass Ltd, Belfast, 2005
3. Obituary Notices: Sir Frank P Montgomery. *BMJ* Sep 9 1972; **3(5827)**: 650.

EDITOR'S NOTE

On behalf of the Ulster Medical Journal, I would like to pay tribute to our Editorial Assistant, Mrs. Marie Murphy, who retired from her post recently. For 12 years, Marie has created order out of chaos in the UMJ office and made each new Editor feel most welcome. I know my predecessors, Barry and Patrick, will join me in wishing Marie a long and peaceful retirement. You will be missed.

ULSTER MEDICAL SOCIETY PROGRAMME OF LECTURES: AUTUMN 2016

Presidential theme: "Medical Myths and Legends"

October 2016

Thursday 6th October 8.00pm, North Lecture Theatre, Medical Biology Centre, Lisburn Road, Belfast.
PRESIDENTIAL ADDRESS. President Professor Patrick J Morrison CBE MD DSc.

Thursday 20th October, Postgraduate Centre, Belfast City Hospital. Buffet 1pm; Talks 2-4pm (final times TBC).
JUNIOR DOCTORS PRIZE FORUM / RESEARCH OPPORTUNITIES SYMPOSIUM

November 2016

Thursday 10th November 8.00pm, Whitla Medical Building Seminar Rooms 3 & 4, Lisburn Road, Belfast.
JOINT MEETING WITH THE ULSTER SOCIETY FOR THE HISTORY OF MEDICINE
THE GARY LOVE LECTURE

Thursday 24th November Buffet 5.00 pm, Lecture 5.30pm, Postgraduate Centre, Belfast City Hospital
JOINT MEETING WITH BELFAST CITY HOSPITAL MEDICAL STAFF
2016 BELFAST CITY HOSPITAL LECTURE

December 2016

Thursday 1st December 8.00 pm, North Lecture Theatre, Medical Biology Centre, Lisburn Road, Belfast
THE SIR THOMAS AND LADY EDITH DIXON LECTURE

Wednesday 7th December Buffet 5.30 pm, Lecture 6.00 pm, Centre for Medical and Dental Education and Training, Altnagelvin Area Hospital.
THE DESMOND WHYTE MEMORIAL LECTURE

Ulster Med J 2016;**85(2):**71-75

Review

Infographics: Healthcare Communication for the Digital Age

McCrorie AD[1], Donnelly C[2], McGlade KJ[1]

Accepted: 21st January 2016
Provenance: internally peer-reviewed.

Key words: infographic; digital; data visualisation; graphic communication

SUMMARY

Infographics are an innovative and engaging method of visually communicating information in a colourful and concise manner. There has been substantial interest in their use within the commercial and health sectors.

Healthcare professionals already use infographics to communicate medical information to their patients. A firm grasp of health information enhances patients' decision-making capabilities and may improve the practitioner-patient relationship. Infographics can also be used at the population level for public health messages.

Because healthcare practitioners are likely to be consulted during their creation and use, this article aims to walk the reader through a number of different infographics in order to outline how they may be used to communicate healthcare information.

WHAT IS AN INFOGRAPHIC?

Infographics are an innovative and engaging method of visually communicating information in a colourful and concise manner. Evidence suggests that the representation of information in graphic format enhances our understanding and ability to make decisions[1].

The concept of presenting information in graphical format is not new. A number of early examples of data visualisation exist from the eighteenth century; most notably the depiction of the deck layout of the British slave ship *Brookes* in 1788[2]. This information poster (see figure 1) depicted views of the reprehensible living conditions suffered by slaves during their voyage to the colonies and was reproduced countless times by the abolitionist movement in Georgian Britain. The combination of text, images, and narrative arguably make this an early predecessor of the modern charticle, which is a type of infographic discussed later in this article.

Other noteworthy examples of data visualisation can be found in the nineteenth century. Florence Nightingale's graphical representation of causes of mortality amongst British forces fighting in the Crimean war illustrated forcefully that death from preventable disease outnumbered other causes including battle wounds[3]. This was achieved using a type of infographic called a polar area diagram, which is also discussed later in this article. Nightingale was incredibly successful at reaching her target audience whilst simultaneously triggering attitudinal change. These remain important aims in modern infographic design[4]. Another historical example of data visualisation came in the early twentieth century in the form of Otto Neurath's isotype picture language[5]. Neurath and his associates produced a vast library of communicative graphics addressing a variety of socio-political topics, many of which remain in use today. The philosophy of isotype picture language is elaborated upon during discussion of figure 3.

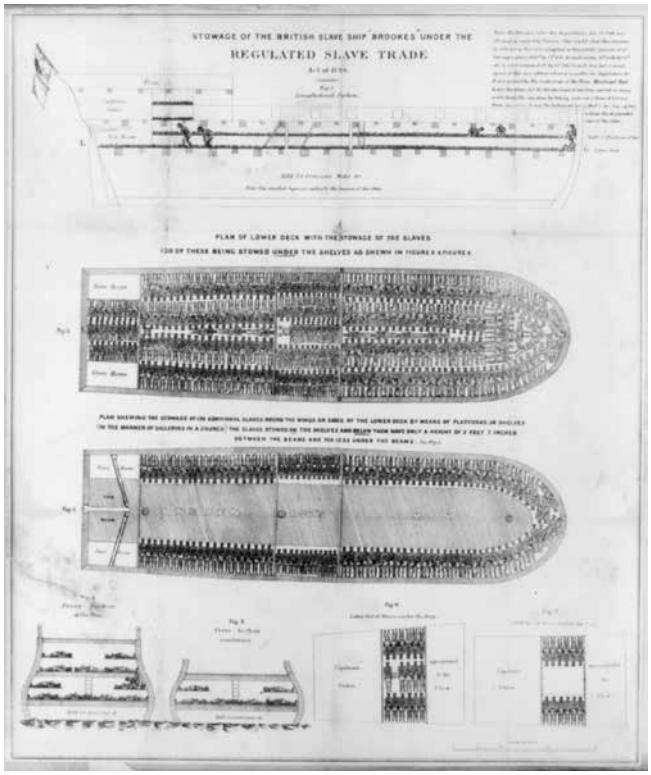


Fig 1. Stowage of the British slave ship Brookes under the regulated slave trade. Courtesy of the Library of Congress, LC-USZ62-34160[2]

1. School of Medicine, Dentistry & Biomedical Sciences, Queens University Belfast, Whitla Medical Building, 97 Lisburn Road, Belfast, BT9 7BL
2. N. Ireland Cancer Registry, Centre for Public Health, School of Medicine, Dentistry & Biomedical Sciences, Queens University Belfast, Mulhouse Building, Grosvenor Road, Belfast, BT12 6DP

amccrorie02@qub.ac.uk

Correspondence to Alan D McCrorie

Whereas Neurath principally designed his isotype language for people who had poor literacy or numeracy, the modern infographic is designed for quick assimilation to match the frenetic lives of a general public who are often unwilling or unable to spend time focusing on a piece of information long enough to understand it[6]. The commercial sector has enthusiastically taken up infographic design within the last decade or so as a means of communicating large quantities of otherwise difficult to assimilate information in a single easily understood and visually attractive product. There is evidence to suggest that an increasing demand for healthcare information exists, particularly amongst the 'baby boomer' generation who, as they age and develop greater risk of illness, are increasingly demanding access to good quality healthcare information in order to make decisions about their care[7], for example, breast screening, prostate specific antigen testing, and decisions surrounding the risk-reward ratio of statin usage.

Fig 2. Traffic light infographic adapted with permission from Arcia et al designed to communicate blood pressure results using a metaphor most members of the public will be familiar with[10]

Infographics may be designed for mass consumption as a digital or print resource, for instance, via social media or traditional mediums such as newspapers. Alternatively, they may be used as a means of communicating with the public on a smaller scale (e.g. as a poster within a general practice). The use of infographics on a one-to-one scale has also been explored. A recent article by Harvard Medical School Professor David P Steensma evaluated the potential role of infographics in counselling patients affected by myelodysplastic syndrome[8]. Steensma concluded that the representation of outcomes in picture format might be a useful aid when counselling some of his patients about treatment complications. We anticipate that other similarly complex medical or surgical conditions could also benefit from this visually orientated approach to counselling.

Furthermore, infographics can be used to overcome language barriers. Communicating with patients who do not speak English as their first language has become increasingly common in Northern Ireland due to changing trends in migration[9]. A research team from Columbia University investigated the efficacy of infographics as a primary care communicative tool in the Washington Heights neighbourhood of Northern Manhattan[10]. Residents of this neighbourhood are majority Latino and overwhelmingly from the Dominican Republic, where the primary language is Spanish. Researchers found that successful infographics are those in which viewers could form symbolic or colour analogies. For example, blood pressure was visually linked with a traffic light system. High blood pressure was shown as a 'red light', therefore informing the viewer of 'danger' or the need to 'stop', whilst the opposite was true of healthy blood pressures and the colour green. Mildly elevated blood pressures were shown in amber to highlight need for caution (see figure 2). Similar analogies will likely also work well for communicating other results such as HbA1c or blood cholesterol.

Five different types of infographics will be discussed within this article and we hope to demonstrate how they may be used to communicate a variety of healthcare information.

ISOTYPE ARRAYS

An isotype array represents increasing quantity as multiple identically sized graphics[5]. Isotype arrays are a useful means of negating the effects of framing bias, a type of bias that relates to which part of a sentence one decides to place emphasis upon[1]. For instance, it would be factually correct to state to patients that 90% of women within figure 3 were side effect free after treatment. However, because favourable outcomes are exclusively focused upon and the 10% of women experiencing side effects are not mentioned, evidence suggests many patients will be unable to make a fully informed decision about their care[1].

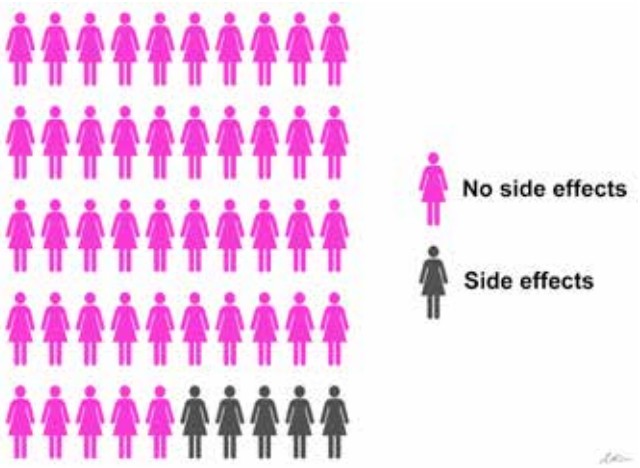


Fig 3. Isotype array infographics communicate part to whole relationship between positive and negative outcomes and may be suited to visualisation of dichotomous information such as risk-reward ratio of statin usage

Figure 3 shows fifty female icons, five of which are coloured grey to show how many women experience treatment induced side effects whilst the remainder are coloured pink

to demonstrate absence of side effects. Communicating this type of information with the aid of an isotype array allows viewers to judge their future risk by visualising positive *and* negative outcomes.

However, researchers found that a significant number of people who did not speak English as their first language had a tendency to misunderstand isotype arrays because they interpreted them too literally[10]. For instance, infographics advising on quantity of fruit to consume each week (with an apple icon depicting fruit) were interpreted to mean apples were the only fruit that should be eaten. Similarly, the presence of male or female stick figures may be mistaken as implying gender specific disease. Both can be addressed by clearly presenting context in infographic design and publication.

POLAR AREA DIAGRAMS

A polar area diagram (also known as a 'coxcomb graph') is a pie chart combined with some of the features of a stacked bar chart[11]. Unlike pie charts, where slices differ in angle and area but are equal in radius, each slice within a polar area diagram is equal in angle but different in area and radius. Individual slices are colourfully divided in a similar manner to stacked bars. Figure 4 represents fictional virology lab data for the year 2015.

Fig 4. Polar area diagram shows annual incidence of three viruses (A-C) within a fictional virology laboratory. *Each slice is equal in angle (30°) but differs in area and radius*

Each slice represents one month of the year and is therefore 30° (360/12). Slice area differs based upon total number of viruses diagnosed each month. Slices are broken down into three different types of viruses, which are always represented in the same order from virus A (innermost) to virus C (outermost). Slices advance in a clockwise direction as we progress through a calendar year.

Three pieces of information are contained within this infographic. Firstly, virus A has a year round incidence and remains the most common of the three viruses. Secondly, there are two annual peaks in incidence (summer and winter). Finally, whilst there is a spike in the incidence of virus B during winter months, it is virus C that increases in incidence during summer months. If a more precise comparison of viral incidence is desired, then this graphic would benefit from inclusion of an explanatory key equating slice area with a numerical value.

WORD CLOUDS

A word cloud is a method of visualising text in a colourful and eye catching manner. Words are clustered together and ranked in importance according to size, prominence, and colour. An earlier draft of this article was analysed for the most frequently used words and after removing conjunctive words like 'and' or 'but', a list of remaining words were used to produce figure 5. The importance of words such as 'infographic' and 'communicate' is emphasised by their size, location, and colour.

Fig 5. Word cloud infographic. The size, position, and colour of words communicate importance

Less prominent words are smaller and coloured differently. Therefore, there is a hierarchy of differently sized and coloured words to highlight the logical order readers should approach our word cloud. In the healthcare setting, word clouds can be used as a means of summarising and linking users to sections of text such as those found within public health documents or clinical guidelines. They may also be used online to link web users to parts of a website based upon previous popular search terms or content.

HUB AND SPOKE DIAGRAMS

These involve the depiction of a central 'hub' surrounded by branching 'spokes' that connects the central topic to a number of peripheral topics. This form of infographic has become a powerful communicative tool in the explanation of a range of scientific phenomenon[12]. Figure 6 illustrates the link between a fictional type of cancer and a number of aetiological factors.

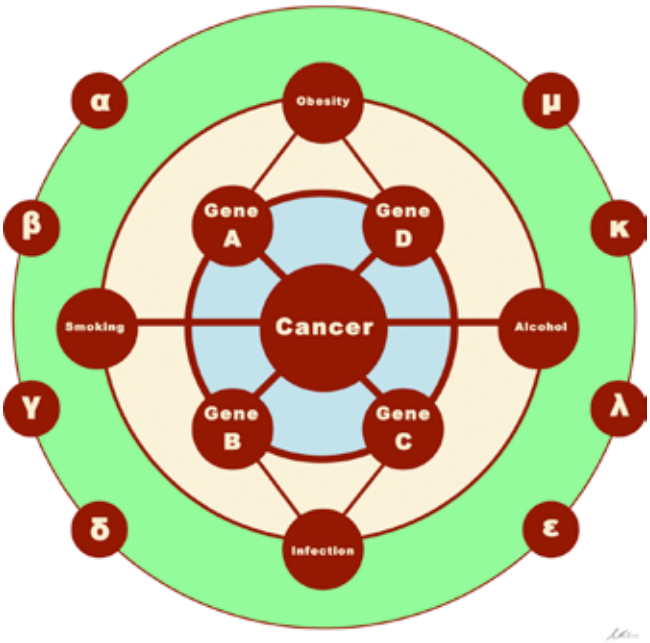


Fig 6. Hub and spoke diagrams involve a central 'hub' surrounded by a number of 'spokes' similar to a bicycle wheel. This infographic illustrates the relationship between a fictional cancer and a number of causative factors

Four short branching spokes surround the central hub 'cancer' linking it to four causative genes. These are the innermost, and by extension, most important risk factors for cancer in this diagram. Each individual gene is directly connected to cancer and capable of causing cancer in isolation. If we progress to the second layer from the central hub we can see two factors that are directly linked to the central hub ('smoking' and 'alcohol') whilst the other two are connected to genes found in the innermost layer ('obesity' and 'infection'). This is a method of representing direct vs. indirect causation. In this diagram smoking has the potential to directly cause cancer but infection will only lead to cancer in the presence of gene B or C (i.e. infection *is* connected to the central hub but only indirectly through other spokes).

The outermost layer of this diagram contains a number of letters of the Greek alphabet that do not have any attachment (direct or indirect) to the central hub. These are intended to represent risk factors that correlate with but do not cause cancer. This is probably one of the more difficult to understand infographics discussed within this article and, for this reason, it is primarily targeted at members of the public with an interest in healthcare science. However, with the aid of an accompanying text based explanation, hub and spoke diagrams could have a place in the visual explanation of multifactorial disease.

CHARTICLES

A charticle contains a combination of attractive colours, easily understood text, and key graphs or charts that aid in the delivery of a central message. They are excellent alternatives to traditional articles when it is anticipated that viewers may not have the time or patience to read and understand large quantities of text. Figure 7 is a charticle addressing the relationship between cancer and ageing. Colours are an important means of attracting viewers to the infographic and not only grab attention, but also alter mood and energy levels[13]. We found that pale colours worked best as a background whilst bold colours were suited to emphasising key pieces of information within the charticle. The key 'take home message' was purposefully placed centrally so as to draw the viewer's eye whilst information above and below gives additional detail for those interested.

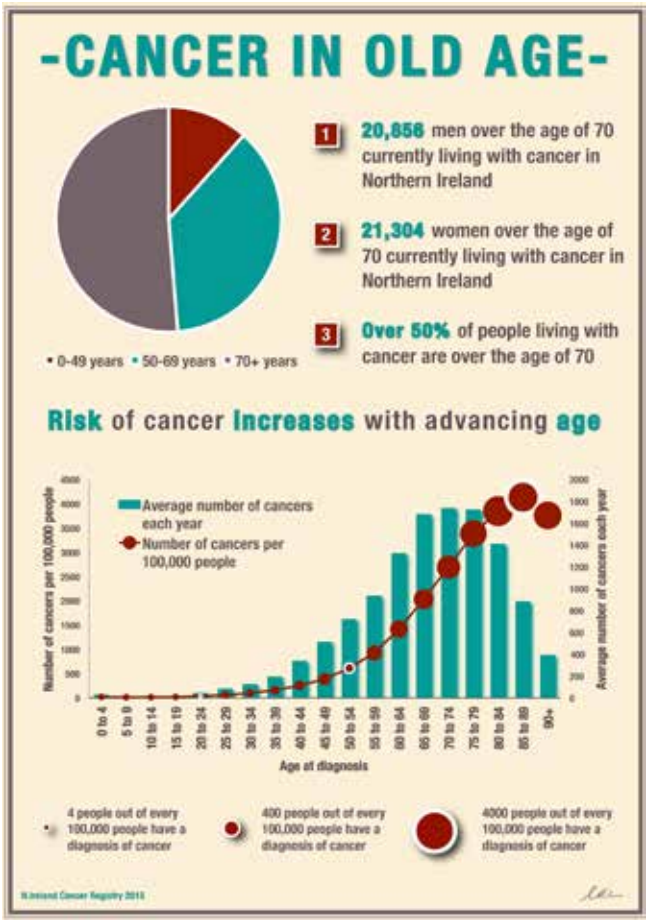


Fig 7. Charticle infographic outlines relationship between cancer risk and ageing using incidence and prevalence data from the N.Ireland Cancer Registry database

Psychological studies suggest that terms such as 'doubtful', 'probable', or 'likely' were inconsistently understood amongst the general public[14]. For this reason, such terms are avoided in this charticle. In addition, it is possible to inadvertently introduce bias into a statement via something called denominator neglect. This is a form of cognitive bias that influences the viewer's ability to correctly understand fractions by focusing attention on the wrong aspect of the ratio, for example mistakenly identifying 1 in 3 as being smaller than 2 in 6. It is recommended that where ratios are used, consistent denominators should be employed[15]. The denominator is maintained as 100,000 to allow for an unbiased comparison of cancer risk as we age.

Pie charts are familiar and acceptable to the general public[1].

Therefore, one is included in figure 7 to visually emphasise the fact that most people living with cancer in Northern Ireland are over the age of 70. A Pareto chart is also included. This type of graph combines bars and lines on a double axis grid in order to communicate two different data trends. In this example, we demonstrate that as the population of Northern Ireland ages there is a simultaneous dramatic increase in number of cancer cases diagnosed and number of people living with cancer between the ages of 40 and 80. An explanatory key below reveals the meaning of data point size by representing increased cancer incidence as increasingly large red circles.

CONCLUSION

Infographics are a useful and innovative means of communication with great potential for making medical information more accessible to the general public. Five different infographics have been discussed and we welcome constructive feedback or creative ideas from interested readers.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest. The N.Ireland Cancer Registry is funded by the Public Health Agency Northern Ireland. Infographics were produced using a combination of Microsoft Word 2011, Infographics Word Edition 1.1, and Adobe Photoshop CC 2015. The mention of named computer software is not intended as an endorsement of these products.

REFERENCES

1. Spiegelhalter D, Pearson M, Short I. Visualizing uncertainty about the future. *Science*. 2011; **333(6048)**: 1393-400
2. Plymouth Chapter of the Society for Effecting the Abolition of the Slave Trade. *Stowage of the British slave ship Brookes under the regulated slave trade act of 1788*. Etching. Plymouth: England; 1788. [Held in the Library of Congress, Prints & Photographs Reading Room. LC-USZ62-34160.] Available at: http://www.loc.gov/pictures/item/98504459/. Last accessed February 2016.
3. Nightingale F. Notes on matters affecting the health, efficiency, and hospital administration of the British Army: founded chiefly on the experience of the late war. London: Harrison; 1858. p. 310-311. Available at: https://archive.org/details/b20387118. Last accessed February 2016.
4. Berinato S. Visualizing Trouble. *Harv Bus Rev* 2013; **91(10)**: 146-147
5. Burke C, Kindel E, Walker S. Isotype: design and contexts 1925-1971. London: Hyphen Press; 2013.
6. Wes N. Advertising analytics 2.0. *Harv Bus Rev* 2013; **91(3)**: 60-8
7. LeRouge C, Van Slyke C, Seale D, Wright K. Baby boomers' adoption of consumer health technologies: survey on readiness and barriers. *J Med Internet Res*. 2014; **16(9)**: e200.
8. Steensma DP. Graphical representation of clinical outcomes for patients with myelodysplastic syndromes. *Leuk Lymphoma*. 2016;57(1):17-20.
9. Russell R. Migration in Northern Ireland: an update. Belfast: Northern Ireland Assembly Research and Information Service; 2012. NIAR 10-12 Research Paper 31/12. Available from: http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2012/general/3112.pdf. Last accessed March 2016.
10. Arcia A, Suero-Tejada N, Bales ME, Merrill JA, Yoon S, Woollen J, et al. Sometimes More is More: Iterative Participatory Design of Infographics for Engagement of Community Members with Varying Levels of Health Literacy. *J Am Med Inform Assoc*. 2015; 23(1): 174-83.
11. Magnello ME. Victorian statistical graphics and the iconography of Florence Nightingale's polar area graph. *BSHM Bull: Br Soc Hist Math*. 2012; **27(1)**: 13-7.
12. Macosko EZ, Pokala N, Feinberg EH, Chalasani SH, Butcher RA, Clardy J, *et al*. A hub-and-spoke circuit drives pheromone attraction and social behaviour in *C.elegans*. *Nature*. 2009; **458(7242)**: 1171-5.
13. Singh S. Impact of color on marketing. *Manag Decis*. 2006; **44(6)**: 783-9
14. Wallsten TS, Budescu DV, Rappaport A, Zwick R, Forsyth B. Measuring the vague meanings of probability terms. *J Exp Psychol Gen*. 1986; **155(4)**: 348-65
15. Lipkus IM. Numeric, verbal, and visual formats of conveying health risks: suggested best practices and future recommendations. *Med Decis Making*. 2007; **27(5)**: 696-713

    Please note, this was the original reference given by the author regarding "Communicating with patients who do not speak English as their first language has become increasingly common in Northern Ireland due to changing trends in migration[9]."

    The reference is exactly as NISRA recommend citations, unfortunately it doesn't provide access to the information as quoted by the author. The reference I've included is easily accessible and gives the same information, namely that Northern Ireland are undergoing changing trends in migration.

    Obviously it is up to you, but the following reference doesn't actually do the job of referencing the material, unless the author wants to give a more exact reference.

9. Northern Ireland Statistics and Research Agency, 2011 Census: Aggregate data (Northern Ireland) [computer file]. UK Data Service Census Support. Downloaded from: http://infuse.mimas.ac.uk. This information is licensed under the terms of the Open Government License [http://www.nationalarchives.gov.uk/doc/open-government-licence/version/2].

Ulster Med J 2016;**85(2):**76-79

Review

The Profession of Medicine and its Rivals

Michael Trimble

Accepted 18th January 2016
Provenance: internally reviewed

THE CONTEXT

> "In the next room you could hear the buzzers sounding. After about 20 minutes you could hear the men shouting for the nurse, "Nurse, nurse", and it just went on and on. And then very often it would be two people calling at the same time and then you would hear them crying, like shouting "Nurse" louder, and then you would hear them just crying, just sobbing, they would just sob and you just presumed that they had wet the bed. And then after they would sob, they seemed to then shout again for the nurse, and then it would go quiet..."[1]

This is not some abstract account of purposeful mistreatment in some far away land or long forgotten time. This is medicine in the 21st century as practiced in the UK in the Mid Staffordshire Trust. This is important because we, as a profession, let it happen. This was not just a nursing or management issue, there were doctors walking these wards, listening to these cries and doing nothing.

THE QUESTION

What then is the role of the profession in the 21st century? What does it mean to be a doctor? The question is not new. In *Republic,* Plato asks, "But tell me, your physician in the precise sense of whom you were just speaking, is he a money-maker, an earner of fees or a healer of the sick?" I hope that the events in Mid Staffordshire and the more recent debates about the appropriateness of industrial action by our junior colleagues provide some background and context as to why this question is as relevant today as then. I would first like to examine what is meant by the term *profession of medicine*. This will include reflection on the difference between profession and professionalism, discussion of the relationship between profession and ethics, and consideration of the foundations of our beliefs. Next I propose to explore some of the challenges to professional practice and finally to consider what has been called the secret of medical practice

THE PROFESSION OF MEDICINE

What does it mean to be a professional, or to have a profession? Sociologist Eliot Freidson has written extensively on professional occupations. He notes the historical derivation of the term and its relationship to roles and responsibilities within the medieval church and university.

> The word profession has a long history in all European languages with Latin roots. The oldest usage in English is today relatively uncommon *–profession* (and *profess*) as a declaration, avowal or expression of intention or purpose. This was the primary denotation of the word before the sixteenth century, originally connected with taking consecrated vows and stemming from the clerical foundation of the medieval university… implying religious and moral motives to dedicate oneself to a good end.[2]

Initially it referred to the university-educated occupations of divinity, law and medicine (surgery was excluded) and, less commonly, the gentlemanly occupation of the military.[3] It should be noted that the dedication to profession extended to the point of risking one's life. Whilst this may be obvious in the case of the soldier, think of the risks taken by the judge presiding over a Sicilian mafia trial, religious martyrs through the ages and, more recently, doctors in Sierra Leone.

Talcott Parsons highlights some of the perceived differences between the professions and the world of business, an altruistic motivation is noted for the professional.[4]

> The businessman has been thought of as egoistically pursuing his own self-interest regardless of the interest of others, while the professional man was altruistically serving the interest of others regardless of his own.[5]

A recent report from the Royal College of Physicians describes medicine as

> "a vocation in which a doctor's knowledge, clinical skill, and judgment are put in the service of protecting and restoring human well-being. This purpose is realised through a partnership between patient and doctor, one based on mutual respect, individual responsibility and appropriate accountability."[6]

In their report on professionalism for the King's Fund, Rebecca Rosen and Steve Dewar note the following features:

> A calling or vocation linked to public service and altruistic behavior.
>
> The observance of explicit standards and ethical codes.

Consultant in Acute & Internal Medicine, Belfast Health and Social CareTrust
michael.trimble@belfasttrust.hscni.net
Correspondence to Dr Michael Trimble.

> The ability to apply a body of specialist knowledge and skills.
>
> A high degree of self-regulation over professional membership and the content and organisation of work.[7]

American physician and philosopher Edmund Pellegrino makes a more personal statement harking back to older ideas of profession:

> In the presence of a patient in the peculiar state of vulnerable humanity which is illness, the health professional makes a "profession." He "declares aloud" that he has special knowledge and skills, that he can heal, or help, and that he will do so in the patient's interest, not his own.[8]

This view of *profession* contrasts starkly with the weaker, more modern idea of *professionalism* which can be applied to any business and even certain sports. For Pellegrino, the clinical encounter between an individual doctor and patient is the essence of the profession of medicine. It comprises three questions:

> What is wrong?
>
> What can be done?
>
> What should be done for this patient? [9]

S*hould* in the final question indicates that the practice of medicine is an inherently ethical endeavour. When we teach students about medical ethics we often focus on quandary ethics, e.g., euthanasia, abortion, stem cell therapy, etc. We should perhaps start with more quotidian, that is, every day, ethics[10]. When it comes to discussion of medical ethics we now all too readily rhyme off the four principles described by Beauchamp and Childress (autonomy, non-maleficience, beneficence, and justice) [11] as if it was as simple as solving an equation in algebra; if we can just find the appropriate values for each variable then we can solve the ethical dilemma. However Beauchamp and Childress themselves would acknowledge the complexity - the 7th edition of their *Principles of Biomedical Ethics* runs to almost 500 pages. They also acknowledge that moral norms, moral theories and the character of the clinician play a part. In truth, none of us approach this from a neutral standpoint. Whether consciously or not, we each have our own belief system which influences our thinking: For some it may be utilitarianism or consequentialism; for others the main driver will be a sense of duty and others still a commitment to a political ideology or religious faith[12]. Whilst for most common queries we may reach similar conclusions our underlying world views will, at some time, but against another. However, at this point I simply want you to reflect and consider your own position, as a secure foundation is important if we are to meet the challenges of modern practice. As much as having the right conceptual framework, we must exhibit the right behaviours. The importance of positive character traits or *virtues* is explored in depth by Pellegrino who lists the following as being core to the practice of medicine: fidelity to trust and promise, benevolence, effacement of self-interest, compassion and caring, intellectual honesty, justice and prudence.[13] Whilst so called *virtue ethics* have fallen out of fashion, it is worth noting that the General Medical Council (GMC) / Academy of Medical Royal Colleges consultation document on generic professional capabilities common to doctors again emphasises professional values and behaviours, e.g., honesty and integrity, maintaining trust, showing respect, courtesy, dignity and empathy for others, etc.[14]

CHALLENGES TO THE PROFESSION OF MEDICINE

Having outlined the essence of our professional commitment, I now wish to discuss four challenges to our profession. These are the market-place, managed care, burnout, and the pursuit of career over vocation.

Medicine & the Marketplace

In *Professionalism Reborn* Eliot Freidson, likens the delivery of health care to the market place. This may be the free market, where efficiency is determined by the minimization of the price of a particular good or service; the bureaucratic market, where the manager or executive is in command and quality is defined by formal rules and standards; or the professional market where health care workers are able to commit themselves to their work for the well-being of others.[15] Pellegrino notes that the model used to define healthcare affects the nature of the relationship between doctor and patient, and hence the professional obligation of the physician: If we follow a business model, then health care is a commodity and the patient the purchaser. If health care is a service then the relationship is one of contract and the duty of the doctor is to supply that service with due skill and attention. Pellegrino favours the concept that health care is a negotiated good and the relationship one of trust. [16] In the free market model money becomes the driving force behind the physician's practice and may lead to distorted priorities. To use a familiar quotation, 'The love of money is the root of all kinds of evil.'[17] As Plato asked, is a physician "a money-maker, an earner of fees or a healer of the sick?" So the market rivals profession.

Medicine & Managed Healthcare

Consider the effects of the subtle change from a healthcare system which provides the environment where care is delivered with the doctor/patient relationship paramount, to one where the patient is the client of a health care organisation, with the doctor functioning as an employee, a medical technician. In managed healthcare, Freidson's bureaucratic model, the targets of the organisation become the driver and may come between the doctor and his patient. One may paraphrase "But tell me, your physician of whom you were just speaking, is he a money-maker, an earner of fees or a healer of the sick...or an achiever of targets?" Mary Rorty et al describe some of the challenges faced by physicians working within institutional constraints, where

there may be conflicts between clinical and financial or strategic organisational priorities. We all experience *moral dilemmas*: when we must choose between incompatible courses of action, each of which has ethical justification, but the bureaucratic model may lead to *moral distress*. This arises when a doctor is clear about the ethical course of action but institutional constraints make it difficult to implement. Such distress may contribute to the next challenge: burnout.

Burnout

The problem of burnout among caregivers, medical and nursing staff is increasingly recognised and increasingly common. Fatigue, pressure, stretched resources and increasing demands can lead to the working day being a survival course with the workers focusing on just getting the job done and making it through the day. Such conditions lead to de-personalisation and lack of compassion. This appears to have been a contributing factor at the Mid Staffordshire Trust. Following the market may be a conscious choice, targets are clearly imposed, but burnout is insidious. The burned out doctor finds their ability to care impaired. Burnout too then is a rival to professional practice.

Career

You may question why pursuit of career is a threat to profession but consider how one views the practice of medicine. We would baulk at someone who viewed it merely as a job, as a means to make a living. We may respect someone who views it truly as a vocation - something they feel called to do, and we may admire one who makes it his profession but with career the focus is on self-advancement, on title, status and prestige. These things may be acquired but to make them our goal will lessen our focus on the good of the patient and will again lead to distorted priorities. So, pursuit of career rivals the profession of medicine.

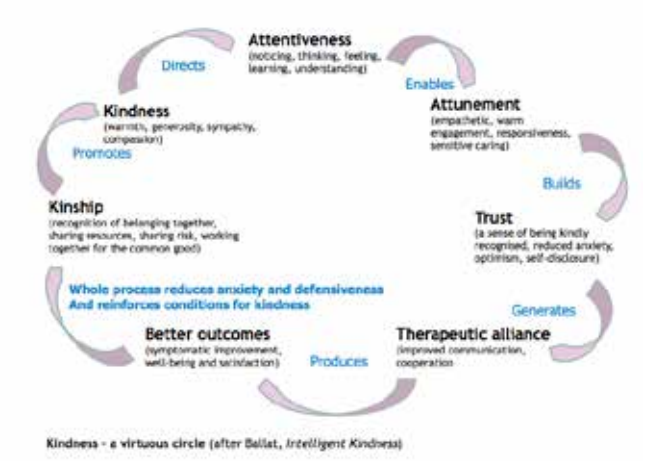
RESPONDING TO THE CHALLENGES

In their book *Intelligent Kindness*[18] John Ballatt and Penelope Campling provide an analysis of the basis of and need for compassion in health care systems. They recommend a virtuous circle of behaviour as summarised in the diagram below (Figure 1).

But this is not new. In an address to medical students, Frances W Peabody (1881-1927)

Professor of Medicine Harvard Medical School tells the secret of the profession of medicine.

> "Here, for instance, is a poor fellow who has just been jolted to the hospital in an ambulance. A string of questions about himself and his family have been fired at him, his valuables and even his clothes have been taken away from him, and he is wheeled into the ward on a truck, miserable, scared, defenseless and, in his nakedness, unable to run away. He is lifted into a bed, becomes conscious of the fact that he is the center of interest in the ward, wishes that he had stayed at home among friends, and just as he is beginning to take stock of his surroundings, finds that a thermometer is being stuck under his tongue. It is all strange and new, and he wonders what is going to happen next….
>
> Here is a worried, lonely, suffering man, and if you begin by approaching him with sympathy, tact, and consideration, you get his confidence and he becomes your patient."[19]



Kindness - a virtuous circle (after Ballat, *Intelligent Kindness*)

Fig 1.

This is a sober contrast with the experience described in the earlier quotations regarding care in Mid Staffordshire Trust. For Peabody, the secret of the care of the patient, and so of the profession of medicine, is in caring for the patient.

Students give many reasons for applying to medical school, including a desire to help people, a desire for gainful employment, a wish to give something to mankind and a desire to save lives[20]. The GMC webpage notes potential doctors can be "motivated by a sense of altruism, because of academic achievement in the sciences, or because of their admiration for relatives or family friends already working in the field." They also note that motivation may come from "the desire for a steady career, a healthy pay-packet and a respected status in society".[21] Regardless of our initial motivation, the profession we uphold requires that we focus on the good of the patient before us and encourage our students and trainees to do likewise.

Dr Who has been running on British television for over 50 years. In that time there have been twelve actors playing the Doctor. Each time the plot requires the Doctor to 'regenerate', there is great excitement among fans as to how the new actor will play the part. He has been played as a crotchety old man, as anxious and uncertain, arrogant and overbearing, heroic and kind. Hence, the burning question is "What sort of doctor will he be?" And that is, essentially, what I am asking: What sort of doctor are you?

REFERENCES

1 Francis R. Lessons from Stafford, Slide 15. London: 2013; Three Serjeants' Inn. Available from: http://www.kingsfund.org.uk/sites/

files/kf/field/field_document/robert-francis-kingsfund-feb13.pdf. Last accessed March 2016.

2 Freidson E. Professional powers: a study of the institutionalization of formal knowledge. Chicago: The University of Chicago Press; 1986. p. 21.

3 Freidson E. Professional powers: a study of the institutionalization of formal knowledge. *Chicago: The University of Chicago Press*; 1986. p. 22

4 Parsons T. The professions and social structure. *Social Forces*. 1939: **17(4)**; 457-67

5 Parsons T. The professions and social structure. *Social Forces*. 1939: **17(4)**; 458.

6 Royal College of Physicians. Doctors in society: medical professionalism in a changing world. London: Royal College of Physicians; 2005. Available from: https://cdn.shopify.com/s/files/1/0924/4392/files/doctors_in_society_reportweb.pdf?15745311214883953343. Last accessed March 2016.

7 Rosen R, Dewar S. On Being a doctor: redefining medical professionalism for better patient care. London: King's Fund; 2004. Available from: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/on-being-a-doctor-redefining-medical-professionalism-better-patient-care-rebecca-rosen-steve-dewar-kings-fund-1-november-2004.pdf. Last accessed March 2016.

8 Pellegrino ED, Thomasma DC. *A philosophical basis of medical practice: toward a philosophy and ethic of the healing profession*. Oxford: Oxford University Press; 1981. p. 210.

9 Pellegrino ED, Thomasma DC. *A philosophical basis of medical practice: toward a philosophy and ethic of the healing profession*. Oxford: Oxford University Press; 1981. p. 119.

10 The Free Dictionary. Definition of quotidian. Available from: www.thefreedictionary.com/quotidian. Last accessed March 2016.

11 Beauchamp TL, Childress JF. Principles of biomedical ethics. 5th ed. Oxford: Oxford University Press; 2001

12 Lewis CS. Mere Christianity. London: HarperCollins; 2002.

13 Pellegrino ED, Thomasma DC. The virtues in medical practice. Oxford: Oxford University Press; 1993

14 Developing a framework for generic professional capabilities: a professional consultation. London: General Medical Council; 2015. Available from: http://www.gmc-uk.org/Developing_a_framework_for_generic_professional_capabilities_form_English_writeable_final_distributed.pdf_61568131.pdf Last accessed March 2016.

15 Freidson E. Professionalism reborn: theory, prophecy and policy. Cambridge: Polity Press; 1994. p. 187-8.

16 Pellegrino ED, Thomasma DC. *For the patient's good: the restoration of beneficence in health care*, Oxford: Oxford University Press; 1988. p. 101.

17 Holy Bible. 1 Timothy, chapter 6 verse 10. BibleGateway. Available from: https://www.biblegateway.com/passage/?search=1+Timothy+6:10. Last accessed March 2016.

18 Ballatt J, Campling P. Intelligent Kindness: reforming the culture of healthcare. London: Royal College of Psychiatrists; 2011.

19 Peabody FW. The care of the patient. *JAMA.1927*; **88(12)**: 877-82.

20 McHarg J, Mattick K, Knight LV. Why people apply to medical school: implications for widening participation activities. *Med Educ*. 2007: **41(8)**; 815–21.

21 Working with doctors. Working for patients. London: General Medical Council. Available from: http://www.gmc-uk.org/information_for_you/23151.asp. Last accessed March 2016.

Ulster Med J 2016;**85(2):**80-82

Medicine Outside the Comfort Zone

Improving Psychiatric Care in Rural Zanzibar

David Purdy

Accepted: 1st December 2015
Provenance: Internally peer-reviewed

'The next patient has not eaten or spoken in over a week'. I had been working as a volunteer doctor in rural Zanzibar for over three months but still hadn't got used to the early morning ward rounds in the blistering heat. There was the usual mix of pneumonia, malaria and malnutrition but straight away you could tell this patient was different.

Fig 1. A local child with malnutrition in Makunduchi Hospital.

Despite its idyllic setting and thriving tourist industry, Zanzibar remains one of the world's poorest countries. Unsurprisingly, the public health system does not come close to meeting the countries needs with 1 in 12 children dying in infancy and a doctor:patient ratio of 1:20,000[1]. (figure 1)

In 2006 the UK based charity 'Health Improvement Project Zanzibar' (HIPZ) was established to try and combat this. An agreement was reached with the Ministry of Health that gave HIPZ direct control over the rural hospital at Makunduchi for 10 years. The model centres on sending volunteer doctors out for 6 month sabbaticals where they live and work alongside local staff, immerse themselves in the everyday workings of the hospital, identify weaknesses and try to improve things from the ground up.

In a few years Makunduchi has been transformed from a dilapidated building with no doctors or management into a fully staffed hospital with a new Primary Health Care Unit, Operating theatre and Maternity unit (figure 2). Local surgeons, anaesthetists and radiographers have been trained to care for the population and services like blood transfusion and ultrasound have been established. Most importantly, every change introduced is self-sustainable so that when the charity eventually withdraws things will not fall apart, a problem which has been seen time and again by NGOs in the developing world.

Fig 2. Twins born in the new maternity unit about to go home.

This model of an African government handing over control of a state hospital to a Western charity is the first of its kind. It has however proven to be very successful, so much so that in 2012 the President of Zanzibar requested that HIPZ repeat the process in the largest rural hospital on the island at Kivunge[2].

Knockbracken Hospital
Email: david_p88@hotmail.com
Correspondence to Dr David Purdy, CT 1 Psychiatry.

Mental health services have however typically lagged behind. Zanzibar has one Psychiatrist to manage a population of 1.25 million across 2 islands, with psychiatric care centralised to the former colonial asylum at Kidongo Chekundu in the Capital. It is a country where mental illness is poorly understood, stigmatised and feared[3].

Two years ago the charity set out to change this. In collaboration with Psychiatrists from Haukeland University Hospital Norway, a pilot scheme was established to improve Mental Health services in rural Zanzibar. It was noted that each hospital had a handful of 'Nurse Psychiatrists' working in general roles. These staff had already some basic Psychiatric training and many were interested in the opportunity to learn more. The ultimate goal, to operate as independent mental health professionals in the community.

Training was based on the WHO's *mhGAP Intervention Guide*, a hands-on approach for treating mental illness in resource poor countries. A new community clinic was also established in the HIPZ run hospital at Makunduchi to aid training and give structure to a previously chaotic system.

Lying on the bare mattress was a disheveled and malnourished woman in her forties, and at first glance she appeared to be in a coma. An elderly relative had set up camp on the floor beside the bed. The only thing I could ascertain in my broken Swahili that she had become progressively worse over the past few months. Observations were stable and physical examination was essentially normal, though she was completely unresponsive, even to pain. Her limbs moved easily when examined, though it was soon noted that after pressure was removed they remained in exactly the same position.

By the time I arrived in Zanzibar in October 2014, fresh out of FY2, the Nurse Psychiatrists had completed their training and had already begun to operate the clinic independently. It was largely agreed that things had been a success. However, on closer inspection a number of problems had arisen. There was no data to support any of the claims, we had no evidence that patients actually found the new system beneficial and, most importantly, the financial incentives and official recognition promised by the Government to the Nurses had never materialised, resulting in several dropping out of the programme.

It was clear that action was required to ensure the project's survival and sustainability.

First, I audited the clinic to see if the anecdotal evidence could be reproduced in figures. A sample of 100 patients was taken and several criteria measured, including diagnosis distribution, correct prescription and risk assessment. The results proved that the training had indeed been a success and that the Nurse Psychiatrists were operating at a high level. 100% of patients had an mhGAP recognised diagnosis, 93% were prescribed the correct medication and 94% had a Risk Assessment completed. However, the diagnosis distribution raised some concern. Two thirds of patients attending the clinic had a primary diagnosis of epilepsy (there is often little distinction between Neurology and Psychiatry in the Developing World) with proportionally very few attending with depression, anxiety, psychosis etc. This showed that the target population was still not being reached and highlighted the need for education and promotion of mental health in the community.

Next, I organised Zanzibar's first Patient Satisfaction Survey. 63 patients were interviewed as they attended the Psychiatric clinic, questions included their opinion on the service and what improvements they would like to see. Again the results were reassuring, 73% rated the clinic overall as 'Excellent' and 86% reported that they were always treated with respect and dignity. When asked for improvements popular responses included 'better drug availability', 'more clinics' and 'better education'. It also gave an interesting insight into local views on mental illness, with 30% reporting they felt stigmatised because of their condition.


o cha kuegesha gari

Dk. David Purdy kutoka HIPZ (kulia), akimkabidhi cheti muuguzi kutoka hospitali ya Cottege Makunduchi Pandu Kassim Khatib, baada ya kumaliza masomo ya mwaka mmoja katika fani ya uuguzi wa akili, hafla hiyo ilifanyika huko Cottege Makunduchi.(Picha na Ameir Khalid).

Fig 3. National Newspaper coverage of the Graduation Ceremony.

The patient was catatonic. We contacted the family and began to piece together a medical history. As a teenager she had begun to act strangely, withdrawing socially and reported hearing things that were not there. After years of attending local healers and witch doctors she eventually became unmanageable and was brought to Kidongo Chekundu where she was admitted and given medication. Her condition improved and for a long time she lived at home and worked in the village. However, government stock-outs of medication were common and her family could not afford the prices in the private pharmacies. Eventually she stopped taking medication altogether, she withdrew, stopped speaking and eventually stopped eating.

The most difficult part was of course using this information to make changes. The HIPZ model has always centred around sustainability, every improvement introduced must be able to stand independently when the charity eventually withdraws. However, in one of Africa's poorest countries getting financial backing from the government, particularly for mental health, is never easy.

Firstly, the hard work and achievement of the Nurse Psychiatrists had to be recognised. I designed and organised an exam and graduation ceremony in the hospital, ensuring it was attended by local government officials and the national press. The ceremony received a full page in the weekly newspaper (figure 3). I then organised a series of meetings with the Minister of Health. In them, all of the achievements of the new service were presented as well as the plans for the future and of course, the many potential opportunities for positive publicity to those who were attached to it. In the end, the Ministry agreed to provide both financial and political backing for the service as well as formally recognising the role of 'Psychiatric Nurse Specialist' for those who undertake the training. (figure 4)

I also used the new government support to introduce some immediate improvements to the service. Prior to my leaving, the number of clinics had doubled, an outreach service and education programme was introduced to local schools and primary health care centres and a fortnightly radio show was established.

I left Zanzibar in January 2015 but the new clinic has remained strong. The future is also hopeful, in September we made a successful pitch to Festival Medical Services and received a grant of over £12,000 specifically for Mental Health development. The main plan for 2016 is to replicate the model on a much larger scale on the North of the island. This will mean a further 190,000 people will have access to community psychiatric services.

As for the patient, we commenced her on Benzodiazepines and Haloperidol (atypical antipsychotics are still a long way off in Zanzibar) and within a couple of weeks she began to move, eat and eventually speak. She was discharged and given a follow up appointment at the new clinic. Unfortunately however she did not attend. Despite our progress, mental health continues to be treated with superstition and fear in Zanzibar. It is only by addressing this problem from every angle that we will be able to reach the most vulnerable.

Fig 4. Meeting at the Zanzabari Ministry of Health. 2nd from left - Dr. Mohammed Jiddawi (Permanent Secretary Health). Centre - Newly recognised Psychiatric Nurse Specialist, Pandu.

REFERENCES.

1. United Nations Development Programme. Human Development Initiative. *Tanzania human development report 2014. Economic transformation for human development.* Dar es Salaam, Tanzania: Economic and Social Research Foundation; 2015. Available at: http://hdr.undp.org/sites/default/files/thdr2014-main.pdf. Last accessed February 2016.

2. Chapman MS, Greville-Heygate F, Singer R, Rees J, MacDonagh R. Health Improvement Project Zanzibar: a new model of healthcare delivery. *Trends Urol Mens Health*. 2015; **6(5)**: 35-39.

3. Jenkins R, Mussa M, Haji SP, Haji MS, Salim A, Suleiman S. Developing and implementing mental health policy in Zanzibar, a low income country off the coast of East Africa. *Int J Ment Health Syst*. 2011; **5 6**:1-11.

Ulster Med J 2016;**85(2):**83-85

Clinical Paper

^{32}P in the treatment of myeloproliferative disorders

Sarah Lawless,[1] Mary Frances McMullin,[1,2,3] Robert Cuthbert,[1] Russell Houston[1,3]

Accepted: 7th December 2015
Provenance: externally peer-reviewed

ABSTRACT

^{32}P has been available for the treatment of myeloproliferative neoplasms (MPNs) for over seventy years. It was first used in 1938 by John H Lawrence in the treatment of polycythaemia and chronic leukaemias. With the introduction of agents such as hydroxycarbamide, interferon and anagrelide the role of ^{32}P has been diminished. Today, Polycythaemia Rubra Vera (PRV) and Essential Thrombocythaemia (ET) remain the only myeloproliferative conditions in which ^{32}P is indicated.

Materials and Methods We carried out a retrospective review of all patients who had received ^{32}P in Northern Ireland over a 24 year period. The time to successful response, duration of response, and associated complications were reviewed.

Results ^{32}P was successful in inducing remission in 90% of patients. This remission was sustained following one dose without the need for further therapy in 37% of cases. 47% required repeated doses. 26% required recommencement of alternative therapies. No cases of thrombosis, myelofibrosis or acute leukaemia were observed.

Discussion We conclude that ^{32}P is a well-tolerated and efficacious treatment option in the elderly. We discuss our results compared with previous work in this area. ^{32}P will continue to be offered to elderly patients in our practice.

Keywords: Polycythemia rubra vera, Essential Thrombocythemia, Radioactive phosphorous

^{32}P IN THE TREATMENT OF MYELOPROLIFERATIVE DISORDERS

^{32}P has been available for the treatment of myeloproliferative neoplasms for over seventy years. It was first used in 1938 by John H Lawrence to treat polycythaemia and chronic leukaemias[1,2]. Concerns were however raised over its leukaemogenic potential. It has become a therapeutic modality of the past for chronic leukaemias and with the introduction of other agents such as hydroxycarbamide and interferon in polycythaemia and anagrelide in essential thrombocythaemia, the role of ^{32}P has been diminished. Today, polycythaemia rubra vera (PRV) and essential thrombocythaemia (ET) remain the only myeloproliferative conditions in which ^{32}P is indicated[3,4].

We carried out a retrospective review of all patients who had received ^{32}P in Northern Ireland over a 24-year period.

All patients were under the care of a consultant haematologist. They were referred to a clinical oncologist to receive ^{32}P in a designated nuclear medicine unit. All patients received 185mq of ^{32}P.

METHODS

All patients who received ^{32}P were under the care of a clinical oncologist. A database with records of all patients treated with ^{32}P since 1988 is kept within the nuclear medicine unit of the Northern Ireland Cancer Centre and this was used to identify patients.

Patient characteristics were reviewed including age, diagnosis and previous treatments.

Response was defined as return of blood counts to normal (HCT <0.45 platelets <450x10^9/l). The time to successful response was reviewed along with the duration of response. Length of follow up was recorded and whether or not ^{32}P was required again. Case notes were reviewed for any signs of complications from ^{32}P.

RESULTS

A total of nineteen patients were identified as having received ^{32}P over a 24-year period (1988-2012). Eight men and eleven women were included. Of these 15 subjects suffered from ET and 4 from PRV.

The median age at the first dose of ^{32}P was 80 years with ages ranging from 68 to 90 years at first dose.

All patients had received treatment with hydroxycarbamide prior to referral for ^{32}P. This was generally stopped due to the development of leg ulcers or anaemia. Of the PRV patients busulfan had also been used in one patient. Myelobromol

[1] Department of Haematology, Belfast City Hospital, Belfast N. Ireland. [2] Queen's University Belfast, N. Ireland. [3] Centre for Cancer Research and Cell Biology, Queen's University, Belfast, N. Ireland.

E-mail: sarahh.lawless@belfasttrust.hscni.net

Correspondence to Dr Sarah Lawless

had also been used in one patient and all four had received venesection as a means of controlling haematocrit prior to referral for ^{32}P. Of the patients with ET, anagrelide had been used in three patients and myelobrommol had also been used in three patients. Two patients, one with ET and one with PRV, had both previously been treated with vorinostat within a clinical trial.

	Polycythemia rubra vera	Essential Thrombocythemia
Hydroxycarbamide	4	15
Anagrelide	0	3
Busulfan	1	0
Myelobromol	1	3
Vorinostat	1	1
Venesection	4	0

Fig 1. *Previous treatments prior to ^{32}P.*

^{32}P was successful in reducing counts to acceptable levels in all but 2 patients (89% response rate).

Time to response varied between 3 weeks to 8 weeks with a median time to response being five weeks.

Seven patients (37%) required only one dose of ^{32}P to achieve a successful response which, to date has been sustained. These patients have not required any further treatment. The longest duration of response to date in this group is 156 weeks.

However not all patients had a sustained response. In those that went on to relapse, the duration of response varied between 4 weeks to 20 weeks with the median response being 18 weeks. Eight of these patients went on to receive further ^{32}P. Therefore ^{32}P was given more than once in a total of 9 patients with 6 receiving it twice, 2 receiving it three times and one patient receiving it four times. Five patients (26%) required recommencement of alternative therapies.

Length of follow up varied from 7 months to 24 years, with a median follow up of 21 months.

None of the patients in this review who received ^{32}P experienced any adverse haematological effects, in particular there were no cases of myelofibrosis, thrombosis or progression to leukaemia. One patient was later diagnosed with renal cell carcinoma. No other carcinomas were diagnosed post treatment.

DISCUSSION

Myeloproliferative neoplasms (MPN) are a heterogeneous group of disorders characterized by cellular proliferation of one or more haematologic cell lines in the peripheral blood[5]. They were first recognised by William Dameshek in 1951 and include polycythaemia rubra vera (PRV) and essential thrombocythaemia (ET)[5].

^{32}P offers an alternative treatment option. It was first used in 1938 by John H Lawrence for the treatment of polycythaemia and chronic leukaemias[1]. It is a pure beta emitter with a half-life of 14.3days and is administered as an injection[2]. It was initially recognised through preliminary work in mice that a large proportion of the injected dose became rapidly localised within the bone marrow and a few days later in bone with smaller quantities seen in the liver, spleen and lymph nodes[6]. It acts by incorporation of the ^{32}P orthophosphate into the nuclei of rapidly proliferating and protein synthesising cells. It is also taken up by the hydroxyapatite moiety of bone crystals in cortical bone. Radiation protection for staff from a pure beta emitter is straightforward.

PRV is the most extensively studied of the MPNs treated with ^{32}P[2]. Following Lawrence's work in 1939, the most effective treatment of PRV included phlebotomies combined with ^{32}P[5]. Concern was however raised in 1948 that patients treated with ^{32}P may develop acute leukemia[2].

The Polycythaemia Vera Study Group (PVSG) was organized in 1967 to establish effective diagnostic criteria for polycythaemia rubra vera, to study the natural history of the disease and to define the optimal treatment[7]. Its first study compared ^{32}P, chlorambucil and phlebotomy in 431 patients in a randomised trial[2,5,7]. It was found that patients treated with chlorambucil carried an excessive risk of acute leukaemia, and therefore this arm was discontinued. Patients treated with phlebotomy alone showed a higher incidence of thrombosis in the first 3 years of treatment[5]. After 3 to 5 years of study, a considerable number of patients treated with ^{32}P or chlorambucil developed acute leukaemia, lymphoma and carcinomas of the gastrointestinal tract and skin, compared with those treated with phlebotomy alone[5]. Therefore, patients treated with phlebotomy alone had a better overall median survival of 13.9 years than patients treated with chlorambucil (8.9 years) or ^{32}P (11.8 years)[5,7].

However, rates of acute leukaemia of up to 14% in PRV patients have been reported, which may imply that acute leukaemia is the natural progression for some patients with PRV[3]. The incidence in randomised trials after ^{32}P alone is 2.5% to 15%[3].

The effectiveness of ^{32}P was also demonstrated by Balan *et al* who examined its use in 259 patients with PRV and ET over a 15 year period[8]. They found normalisation of counts in 50% patients after a single administration and in 73% after two treatments. With regards to complications; 5.5% developed myelofibrosis, 7.6% developed leukaemia, while other cancers were found in 9% of cases[8].

Randi *et al* also looked specifically at haematological complications post ^{32}P therapy[9]. Their review included 230 patients with MPNs. None of the patients with ET developed haematological complications. Of the PRV patients, 17% developed complications. Sixty percent of these were classified as minor complications such as transient anaemia or thrombocytopenia. Only 7% had major complications with acute leukaemia developing in 5%.

The use of ^{32}P alone or in combination with hydroxycarbamide has also been examined. Najean *et al* randomised 461 patients over the age of 65 to receive hydroxycarbamide or

no hydroxycarbamide after their first ^{32}P induced remission[10]. It was found that hydroxycarbamide significantly prolonged the duration of ^{32}P induced remission and reduced the annual mean dose received by a third. The rate of vascular complications was not decreased however. While the leukaemia risk was significantly increased, a significant excess of other carcinomas was also observed.

More recently Bjorkholm *et al* used data from population based registries in Sweden to conduct a large study examining to what extent cytoreductive therapies contribute to leukaemic and myelodysplastic transformation in patients with MPN[11]. While the focus of the study was on the effects of hydroxycarbamide, ^{32}P was also reviewed. The risk of AML/MDS transformation was strongly associated with high exposure of ^{32}P and alkylating agents. This equated to cumulative doses of 1,000MBq. Lower exposure to ^{32}P and alkylating agents was not associated with a significantly increased transformation risk. More importantly, 25% of patients with transformation to AML/MDS were never exposed to ^{32}P, hydroxycarbamide or alkylating agents. Furthermore, only 32% of patients with transformed disease were exposed to cumulative doses of ^{32}P and/or alkylating agents. The authors concluded that the risk of transformation to leukaemia or myelodysplasia is mainly associated with the disease itself, with exposure to cytoreductive agents of less importance. This study however may indicate a need for a threshold exposure to ^{32}P given the increased risk of transformation at higher doses.

Due to its increased risk of leukaemic transformation, the British Committee for Standards in Haematology advise that ^{32}P use should be limited to the elderly[3,4].

Our review has shown that ^{32}P was able to induce remission in 90% of cases, whilst 37% of cases required only one dose to provide a sustained remission to date. While some cases required repeated doses of ^{32}P, only 26% required to return to alternative treatments. No adverse haematological complications have been observed to date. Our review is limited by the small number of cases, and although the earliest treatment was in 1988, the median follow up time was 21 months, therefore longer follow up is required.

We recognise that there are many other treatment options in management of PRV and ET. Hydroxycarbamide and anagrelide are two of the commonest cytoreductive agents, however these drugs are not without side effects and limitations. Hydroxycarbamide, an oral anti-metabolite, is often first line in the treatment of PRV and ET, usually in combination with aspirin. It is however associated with nausea, skins rashes, leg ulceration and myelosuppression. Anagrelide hydrochloride is second line in those with high risk ET. It is a phosphodiesterase inhibitor which also blocks megakaryocyte differentiation and proliferation, however it may be associated with headache, dizziness, palpitations and diarrhoea. Anagrelide has also been associated with an increase in reticulin deposition in the bone marrow. The PT-1 trial by Harrison *et al*, which compared hydroxycarbamide and aspirin to anagrelide and aspirin in high risk ET patients clearly demonstrated higher rates of arterial thrombosis, major haemorrhage and transformation to myelofibrosis in the anagrelide arm[12].

Anagrelide is also associated with arrhythmias and cardiomyopathy and therefore may not be suitable for patients with cardiovascular disease, which is often more prevalent in the elderly.

These cytoreductive drugs require regular monitoring accompanied by regular blood counts and dose adjustments. Good compliance is required for these drugs to be effective.

From our review, we are able to conclude that ^{32}P is a well-tolerated and efficacious treatment option in the elderly. ^{32}P is cost effective and has the benefit of reducing the monitoring and adjustments needed when on cytoreductive agents. As it is given as an injection, compliance is measurable. It offers an alternative option to controlling blood counts when other cytoreductive methods are ineffective or limited due to their side-effect profile.

^{32}P will continue to be offered to elderly patients in our practice.

The authors declare no conflicts of interest.

REFERENCES

1. Lawrence JH. Nuclear physics and therapy: Preliminary report of a new method for the treatment of leukemia and polycythemia. *Radiology*. 1940; **52**:51-60.
2. Berlin NI. Treatment of the myeloproliferative disorders with ^{32}P. *Eur J Haematol* 2000:**65**:1-7.
3. McMullin MF *et al*. Guidelines for the diagnosis, investigation and management of polycythemia/erythrocytosis. *Brit J Haematol*.2005;**130**:174-195.
4. Harrison C, Bareford D, Butt N *et al*. Guidelines for the investigation and management of adults and children presenting with thrombocytosis. *Brit J Haematol*. 2010; **149**:352-375
5. Koopmans SM, van Marion AMW, Schouten HC. Myeloproliferative neoplasia: a review of clinical criteria and treatment. *Neth J Med*. 2012 May;**70(4)**:159-67.
6. Ledlie EM. Treatment of Polycythemia by ^{32}P. *Proc R Soc Med*. 1966 November; **59(11 Pt 1)**: 1095–1100.
7. Berk PD, Goldberg JD, Donovan PB *et al*. Therapeutic recommendations in polycythemia vera based on Polycythemia Vera Study Group protocols. *Semin Hematol*. 1986; **23(2)**:132-43.
8. Balan KK. Outcome of 259 patients with primary proliferative polycythemia and idiopathic thrombocythemia treated in a regional nuclear medicine department with phosphorus-32 – a 15 year review. *Brit J Radiol*. 1997; **70**: 1169-1173.
9. Randi *et al*. Haematological complications in polycythaemia vera and thrombocythaemia patients treated with radiophosphorous (32P). *Folia Haematol Int Mag Klin Morphol Blutforsch*. 1990; **117(3)**:461-7.
10. Najean Y, Rain JD. Treatment of Polycythemia Vera: Use of 32P Alone or in Combination With Maintenance Therapy Using Hydroxyurea in 461 Patients Greater Than 65 Years of Age. *Blood* 1997; **89**: 2319-2327.
11. Bjorkhokm *et al*. Treatment-related risk factors for transformation to acute myeloid leukaemia and myelodysplastic syndromes in myeloproliferative neoplasms. *Journal Clinical Oncology* 2011; **29(17)**:2410-5.
12. Harrison *et al*. Hydroxycarbamide compared with anagrelide in high risk essential thombocythaemia. *N Engl J Med* 2005; **353**:33-45.

Ulster Med J 2016;**85(2):**86-91

Clinical Paper

Orthopaedic Enhanced Recovery Programme for Elective Hip and Knee Arthroplasty – Could a Regional Programme be Beneficial?

Adam Tucker[1], Darren McCusker[1], Nidhi Gupta[2], Jonathon Bunn[1], Mark Murnaghan[1]

Accepted: 6th December 2015
Provenance: Externally peer reviewed.

ABSTRACT

Introduction Arthroplasty is commonplace in orthopaedic practice, and post operative pain has been shown to substantially hinder recovery and discharge from hospital.

Objectives The current study assessed a multidisciplinary, multimodal Orthopaedic ERP in terms of its effect on patient perceived post operative pain in hip and knee arthroplasty. Secondary outcome was in the form of a cost analysis.

Methods A prospective study was performed on consecutive arthroplasty patients across a 6 week period in a district orthopaedic unit. A multidisciplinary approach to devising an ERP was undertaken between anaesthetists, surgeons and physiotherapists. Domains included optimising pre-operative nutrition, anaesthetic pre-meds, standardised anaesthetic technique, standardised intra-operative technique and use of locally infiltrated anaesthetic (LIA), as well as a post operative pain regimen. The multidisciplinary team (MDT) involved physiotherapy for the patient on day 0. Demographic data, day 1 and day 2 post operative subjective pain scores using an analogue scale were recorded. Data was collated and analysed using appropriate statistical methods. A p-value of <0.05 was considered significant.

Results A total of 40 patients (25 total hip replacements and 15 total knee replacements) were included. All conformed to the ERP. Reductions in patient reported pain scores were observed. Specifically, in total hip arthroplasty (THA), day 1 scores were not significantly improved (p=0.25), however day 2 scores improved significantly (p=0.02). For total knee arthroplasty (TKA), both day 1 and day 2 scores improved significantly (p=0.02 & p<0.001, respectively) Analgesic requirements were not significantly different between hip and knee replacements. Early mobilization occurred in 95% of patients. Length of stay was reduced significantly in hip (1.8 days, p=0.003) and knee (1.9 days(p<0.001) replacements following ERP. Cost analysis demonstrated a potential annual saving of approximately £200,000 for the study unit if ERP was applied to all elective hip and knee arthroplasty procedures.

Conclusions The study demonstrates that a tailored, MDT orientated ERP can be beneficial in elective hip and knee arthroplasty. Reductions in pain scores, early ambulation and facilitated early discharge are beneficial to the patient, and cost effective for the unit. The implementation across the region may result in further cost savings.

Keywords: Arthroplasty, Hip, Knee, Enhanced Recovery Protocol

INTRODUCTION

Orthopaedic arthroplasty procedures are amongst the most painful operations reported by patients, with over 40% noting moderate to severe pain in the initial 48 hour post-opeative period. [1] This can substantially hinder recovery and delay discharge from hospital, incurring potentially avoidable costs.[2] A Danish study identified multiple factors that impact upon length of stay following hip and knee arthroplasty.[3] Post-operative pain management was a key issue. The concept of enhanced recovery protocols (ERPs) have been successfully applied in general surgical practice, especially in colorectal surgery.[4] Literature regarding the use of similar protocols in orthopaedic practice have demonstrated pain reduction through the use of locally infiltrated anaesthetic (LIA) to the surgical area in hip and knee arthroplasty.[5-7] Similarly, other studies have demonstrated significant analgesic benefits and reduced length of stay following the use of LIA in hip arthroplasty. [8-10]

[1] Department of Orthopaedics, Craigavon Area Hospital, Lurgan Road, Portadown, BT63 5QQ, N Ireland [2] Department of Anaesthetics, Craigavon Area Hospital, Lurgan Road, Portadown, BT63 5QQ, N Ireland

Correspondence to Mr A Tucker

Specialist Registrar T&O, C/O Orthopaedic Ward, Craigavon Area Hospital, Lurgan Road, Portadown, BT63 5QQ. Tel 02838334444

TABLE 1 :

Aspects of the multimodal enhanced recovery programme utilized by department

Preoperative	Intraoperative	Postoperative
Carbohydrate drinks	Spinal anaesthetic	Early oral hydration
Continue regular analgesia	Capsular LIA by operating surgeon	Thromboprophylaxis
Analgesic Premed on day of surgery(paracetamol 1g/Longtec 10mg§/ Gabapentin 300mg*)	No urinary catheter	Physiotherapy on day of surgery to mobilise
Preoperative warming	Tranexamic acid 1g	Regular oral analgesia

§ Longtec dose reduced to 5mg for patients aged >75 years
*Gabapentin dose reduced to 100mg for patients aged >75 years

It is well recognized that the use of intrathecal diamorphine is associated with significant postoperative nausea and vomiting, and it is felt that the use of LIA can avoid this undesirable side affect.[11] We describe how a local perioperative enhanced recovery protocol (ERP) for total hip (THA) and total knee (TKA) arthroplasty has produced significant clinical, and cost benefits, in a DGH unit, that may be applicable to a larger regional scale.

PATIENTS AND METHODS

Hospital management and the acute pain team were able to provide data regarding the length of stay and pain scores post-operatively on day 1 and 2, prior to the introduction of ERP. The average lengths of stay for both total hip arthroplasty (THA), and total knee arthroplasty (TKA), were 6.3 and 6.1 days respectively in keeping with national length of stay.[12] Following the apparent success of ERPs across the published literature [5-10], a tailored ERP for the unit was devised using a multidisciplinary team (MDT) approach.

A prospective, consecutive cohort of patients admitted for primary elective total hip or total knee arthroplasty were recruited over a 6 week period. An established multidisciplinary perioperative ERP, detailed in Table 1, was followed for each patient. All patients received carbohydrate drinks pre-operatively in order to achieve optimal nutritional status and reduce preoperative fasting times. This included 4 Nutricia PreOp© (Nutricia, UK) drinks the night before surgery. For afternoon cases, a further 2 drinks could be taken the morning of surgery. An oral analgesic pre-med was given to all patients 2 hours prior to surgery. This consisted of 1g Paracetamol, 10mg Oxycontin M/R (Longtec®, reduced to 5mg for age>75 years of age), and either 300mg Gabapentin or 100mg if >75 years of age.

The use of urinary catheters was restricted to patients deemed by the anaesthetic team to be at risk for acute kidney injury or postoperative urinary retention.

At the time of surgery, a spinal anaesthetic (3ml 0.5% Chirocaine for THA or 2.3-2.5mls heavy Marcaine with 0.1-0.2mg morphine for TKA) was administered to patients. In the cases of failed spinal, a general anesthetic using Propofol with IV morphine was provided.

All TKA procedures were performed under the use of an electronic, calibrated lower limb tourniquet at a pressure of 300mmHg.

A dose of 1g Tranexamic acid was provided to all patients at the time of skin incision in THA, or 30 minutes before release of the tourniquet in TKA (unless contra-indicated).

Intraoperative LIA was administered by the surgical team at the time of surgery in all patients. This consisted of three 50ml boluses of 0.2% Ropivicaine. Two of these syringes had an added 0.25mls of 1:1000 adrenaline added. The third bolus consisted of Ropivicaine only.

For THA, one bolus of ropivicaine with adrenaline was administered to the hip short rotators and capsule. The second bolus of LIA was injected around the ilio-tibial band. The bolus of plain ropivicaine was administered subcutaneously at the time of skin closure.

For TKA, the adrenaline infused boluses were administered firstly to the posterior capsule after the femoral and tibial cuts were performed. The second adrenaline infused LIA was administered to the anterior capsule, collateral ligaments and quadriceps muscle anteriorly after insertion of the TKA components. Again, the ropivicaine only bolus was administered subcutaneously at the time of skin closure.

Post operatively, on days 0-2, all patients received regular paracetamol 1g IV QDS for 24 hours before reducing to oral paracetamol 1g QDS. IV Parecoxib was administered for the initial 48 hours post operatively if no contra-indications were present. In addition to this, regular Oxycontin® (Longtec) 10-15mg PO BD (5mg BD if >75 years) and Gabapentin 300mg PO BD (100mg if >75 years) was provided. Additional breakthrough analgesia in the form of Oxynorm® 5-10mg PO 2-4 hourly was provided on a PRN basis. On day 3 post operatively, patient analgesia was stepped down to Cocodamol 15/500, with two tablets administered QDS, and Oxynorm® 5-10mg PRN breakthrough analgesia available as above.

Post operative mobilisation was recorded by the physiotherapists as part of the multidisciplinary approach to the multimodal ERP. All morning cases were mobilised

early; were to at least stand on day of surgery, while all afternoon cases being mobilised on the morning of day 1 postoperatively.

Post operatively, oral fluids were provided in the recovery room to ensure early oral rehydration. Routine thromboprophylaxis was provided to all patients in accordance with NICE guidelines.

Primary aims were to study:

1. Effect of ERP on length of hospital stay
2. Post operative pain scores (recorded as none, mild, moderate, severe)

Secondary aim of the study was a cost analysis following ERP implementation to assess its financial feasibility.
Statistical analysis was performed using two way ANOVA for non parametric data, and independent samples T-testing where appropriate, using SPSS V21. A p value <0.05 was considered statistically significant.

RESULTS

A total of 40 consecutive primary arthroplasty patients were recruited to the study, 25 THA and 15 TKA surgeries. Patient demographics are demonstrated in Table 2. All patients conformed to the ERP protocol.

TABLE 2:

Patient demographics

	THR	TKR
N	25	15
Female : male	14:11	9:6
Average age in years (SD)	66 (15.9)	76 (6.1)
Age Range	30-89	62-89
ASA Grade		
1	4	2
2	13	8
3	8	4
4	0	0

Spinal anaesthetic was successfully performed in all cases except for 2 patients undergoing TKRs, who received a general anaesthetic, one due to patient preference and the other following failed spinal.

Tranexamic acid was withheld in 3 patients (7.5%), all of whom had a contraindication precluding its use.

LIA was administered in each of the cases as outlined in the method above. No adverse events as a result of the Ropivicaine with or without adrenaline was noted intraoperatively, or postoperatively.

Postoperative

Postoperative pain scores were assessed on days one and two post operatively by the pain team. Following THA, day 1 pain scores were not significantly different pre and post introduction of the ERP (p=0.25). However, day 2 scores were significantly improved (p=0.02). For TKA, both day 1 and day 2 post operative scores improved with the implementation of the ERP (p=0.02 and p<0.001 respectively). Table 3 and Figure 1 summarise the pain score data.

TABLE 3:

Patient reported pain scores on Days 1 and 2 postoperatively after THA and TKA before and after the introduction of the ERP

	Patient Reported Pain Score				
	None	Mild	Moderate	Severe	p Value
THA					
Day 1					
Pre ERP (n=21)	4	9	7	1	0.25
Post ERP (n=25)	8	10	7	0	
Day 2					
Pre ERP (n=21)	11	6	4	0	0.02
Post ERP (n=25)	19	6	0	0	
TKA					
Day 1					
Pre ERP (n=21)	1	10	6	4	0.02
Post ERP (n=15)	5	6	4	0	
Day 2					
Pre ERP (n=21)	5	5	10	1	<0.001
Post ERP (n=15)	10	5	0	0	

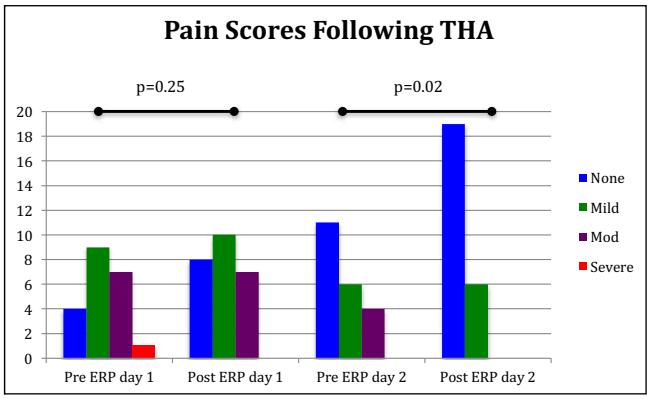
Post-operative analgesic requirements were analysed by oxycodone requirements in the forms of Oxycontin and Oxynorm. Average Oxycontin requirements for THA and TKA were not statistically significant (Oxycontin: 60.8±45.4mg Vs 58.7±23.9mg; p=0.21, Oxynorm: 48.4±55.3mg Vs 68.7±47.0mg; p=0.74 respectively).

Early mobilisation on day of surgery occurred in 100% of morning cases. None of the PM cases returned to the ward early enough to receive physiotherapy input within normal working hours. On day 1 postoperatively 38/40 (95%) of patients were mobilised (one was hypotensive and unsuitable for mobilization, one was a planned admission to ICU for 24 hours post operatively). On day 2 postoperatively, all patients had been mobilised with physiotherapy input.

Length of stay and cost analysis

Pre-ERP length of stay for THA and TKA was 6.3 and 6.1 days respectively. Our multimodal approach resulted in a statistically significant reduced length of stay following THA to 4.5 days (p=0.003) and following TKA to 4.2 days (p<0.001).

A cost analysis was undertaken looking at novel aspects of the



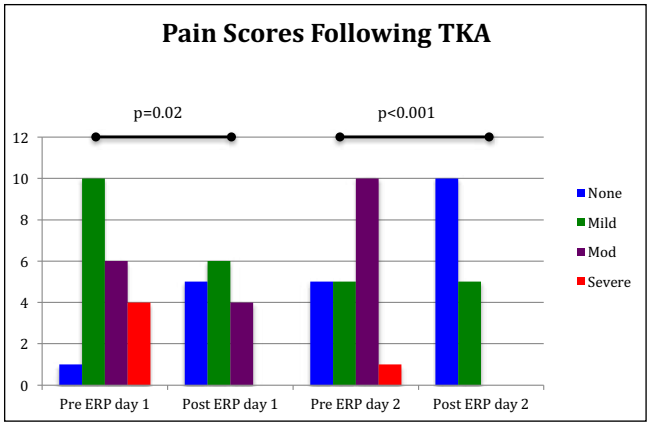


Fig 1a and b. Trends in postoperative patient reported pain scores on days 1 and 2 following TKA and THA

ERP. All other costs such as regular analgesia, cost of daily nursing etc were assumed to be part of standard care in order to specifically look at the ERP intervention. Urinary catheters were used in approximately 20% of the study population. The ERP aims to reduce unnecessary catheterization if possible, and so this figure was used for the purposes of a cost analysis. Pharmaceutical costings were obtained from the hospital pharmacy department regarding the cost per patient of LIA versus previous practice of intrathecal diamorphine. Average spend on Oxycodone per patient for THA and TKA was calculated from the study data and extrapolated. Similarly reference costs for the cost of a bed day per patient were taken from the Department of Health Reference Costs manuscript. Table 4 outlines the cost analysis calculation based on the study results for a single year based on our annual unit throughput. Overall, we calculated a potential saving of £203,524.80 per annum based on current unit throughput.

DISCUSSION

ERP's core principles are to improve patient outcomes and speed up recovery following surgery. It focuses on optimising multiple aspects of patient care, and promotes active participation from the patient in order to fast-track recovery.

ERP has successfully been utilized in colorectal surgery and has been extensively reported in the literature.[4] This has spawned interest in its possible adaptation and application for THA and TKA with a view to reducing pain, improving patient outcomes and shortening inpatient stay.[13]

Husted et al demonstrated that logistical and clinical aspects could be addressed in individual units with shorter length of stay, better patient satisfaction and thus recommended an introduction of ERPs at a national lavel.[3] A paucity of data exists for ERPs in orthopaedics as a whole, but recent studies have shown multiple benefits and a reduced mortality rate following the introduction of ERPs for lower limb arthroplasty.[14,15]

One of the key variables in lower limb arthroplasty is patient

TABLE 4:

Breakdown of costs analysis for study unit ERP. Parameters such as nursing care and regular analgesia which are considered "standard" for inpatient arthroplasty were not considered as these are necessary costs regardless of the use of ERP

	Unit price	Cases Annually	Comments	Cost Per Annum
Savings				
Catheter	£20	480	20% incidence	£1,920.00
Reduction Length of Stay	£264/Day	300 hips	mean -1.8 days	
		180 knee	mean -1.9 days	
		Total bed days	**882 bed days p/a**	£232,848.00
Costs				
LIA added cost	£61.15	480	All cases	£29,352.00
Postop analgesia				
Hip	£3.70	300		£1,110.00
Knee	£4.34	180		£781.20
			Average total p/a	£1,891.20
Overall cost analysis net saving per annum				**£203,524.80**

reported pain postoperatively, with over 40% of patients reporting moderate to severe pain in the first 48 hours.[1] Pain spikes have been reported following upper and lower limb arthroplasty, with subsequent prolongation of inpatient stay. We did not observe any spikes in pain perception in our population however.[16,17] Reduced patient reported pain and analgesia use, with subsequent improvement in patient mobilisation and reduced length of hospital stay, have been reported for patients receiving intraoperative injections of local anaesthetic as part of an ERP utilizing multimodal analgesic techniques. Whilst the exact LIA preparation varies between individual studies, it has consistently shown improvements, especially for TKA.[6,18-21]

Our study, whilst it utilizes individually tailored ERP design, has demonstrated a similar trend reported throughout the literature with regards to THA and TKA.[14-24] We have shown a significant reduction in pain scores in the immediate 48 hours after THA and TKA which is in keeping with other ERP designs.

We report significant cost savings associated with reduced length of stay by using ERP in our trust. To our knowledge, we are the only unit in the region to be utilizing an established ERP for THA and TKA. We have reported significant benefits for both patients and the unit, which are applicable on a regional scale. If ERPs were widely adopted , additional regional savings could be made.

A major limitation of our study is the relatively small sample size compared with other studies. Despite this, we have shown a significant reduction in our unit length of stay even at this small scale, as well as significant patient reported benefits through streamlining our management for primary THA and TKA using a multidisciplinary ERP. We also admit that variability in individual ERP designs limit the ability to assess where the exact benefits in terms of improved pain scores and reduced length of stay actually result from. A follow-up telephone survey may have clarified if post-operative pain management remains effective after the inpatient peri-operative stay. It is however clear that a multidisciplinary approach to an ERP does result in significant improvements in patient care, and convey significant potential annual savings for hospital trusts.

Despite the limitations, we have shown a potential saving of approximately £200,000 in a single unit utilizing our ERP methodology. In Northern Ireland in 2013, a total of 2404 primary THA and 1806 primary TKAs were performed. No other arthroplasty units currently utilise an ERP programme. Extrapolation of our figures to the 2013 data equates to a net saving of approx £1,750,000 per annum. This conveys a significant cost saving during times of financial austerity in an area of practice whose burden on NHS resources will continue to increase

CONCLUSION

Successful ERP programmes have been reported in the literature for both THA and TKA , despite variability amongst individual unit ERP designs. ERP is an effective means of reducing pain, reducing length of inpatient hospital stay and reducing costs associated with THA and TKA, as demonstrated in our study. Whilst the principles of ERP are not new, adoption in orthopaedics has been slow, but with over 160,000 THA and TKA procedures per annum in England and Wales alone[25] the application of ERPs could have huge potential savings for the NHS if adopted on a larger, regional or national scale.

REFERENCES:

1. Rawal N, Hylander J, Nydahl PA, Olofsson I, Gupta A. Surgery of postoperative analgesia following ambulatory surgery. *Acta Anaesthesiol Scand*. 1997; **41(8)**:1017-22
2. Dahl JB, Moiniche S. Relief of postoperative pain by local anesthetic infiltration: efficacy for major abdominal and orthopedic surgery *Pain*. 2009; **143(1-2)**: 7-11
3. Husted H, Hansen HC, Holm G, Bach-Dal C, Rud K, Andersen KL, *et al*. What determines length of stay after total hip and knee arthroplasty? A nationwide study in Denmark *Arch Orthop Trauma Surg*. 2010; **130(2)**:263-8
4. Lassen K, Soop M, Nygren J, Cox PB, Hendry PO. Consensus review of optimal care in colorectal surgery. Enhanced recovery after surgery. (ERAS) Group recommendation. *Arch Surg*. 2009; **144(10)**: 961-9
5. Busch C, Shore B, Bhandari R et al: Efficacy of periarticular multimodal drug injection in total knee arthroplasty. A randomized trial. *J Bone Joint Surg Am*. 2006;**88(5)**:959-63
6. Vendittoli P, Makinen P, Drolet P, Lavigne M, Fallaha M, Guestin MC, *et al*. A multimodal analgesia protocol for total knee arthroplasty. A randomized control study. *J Bone Joint Surg Am*. 2006; **88(2)**: 282-9
7. Reilly KA, Beard DJ, Barker KL, Dodd CA, Price AJ, Murray DW. Efficacy of accelerated recovery protocol for Oxford unicompartmental knee arthroplasty - a randomised controlled trial. *Knee*. 2005; **12(5)**: 351-7
8. Andersen KV, Peiffer-Jensen M, Haraldsted V, Soballe K. Reduced hospital stay and narcotic comsumption, and improved mobilization with local and intraarticular infiltration after hip arhtroplasty. A randomized clinical trial of an intraarticular technique versus epidural infusion in 80 patients Acta Orthop 2007; **78(2)**: 180-6
9. Andersen LJ, Poulsen T, Krogh B, Nielsen T. Postoperative analgesia in total hip arthroplasty. A randomized, double blinded, placebo controlled study on peroperative and postoperative ropivicaine, ketorolac and adrenaline wound infiltration. *Acta Orthop*. 2007; **78(2)**: 187-92
10. Kerr DR, Kohan L. Local infiltration analgesia: a technique for the control of postoperative pain following knee and hip surgery. *Acta Orthop*. 2008; **79(2)**: 174-83
11. Grant CR, Checketts MR. Analgesia for primary hip and knee arthroplasty: the role of regional anaesthesia. *Contin Educ Anaesth Crit Care Pain*. 2008; **8(2)**:56-61
12. Hospital Episodes Statistics. Admitted patient care, England, 2014-15. Table 6: Procedures and diagnoses. Leeds: *Health and Social Care Information* Centre [HSCIC*];* 2015. Available at http://www.hscic.gov.uk/catalogue/PUB19124/hosp-epis-stat-admi-summ-rep-2014-15-rep.pdf
13. Wainwright T, Middleton R: An orthopaedic enhanced recovery pathway. *Curr Anaesth Crit Care*. 2010; **21(3)**:114-20
14. Malviya A, Martin K, Harper I, Muller SD, Emmerson KP, Partington PF, *et al*. Enhanced recovery program for hip and knee replacement reduces death rate: A study of 4,500 consecutive primary hip and knee replacements. *Acta Orthop*. 2011;**82(5)**:577-81

15. McDonald DA, Siegmeth R, Deakin AH, Kinninmonth AW, Scott NB. An enhanced recovery programme for primary total knee arthroplasty in the United Kingdom – follow up at one year. *Knee*. 2012;**19(5)**:525-9

16. Ilfeld BM, Mariano ER, Girard PJ, Loland VJ, Meyer RS, Donoan JF, *et al*. A multicenter, randomized, triple-masked, placebo-controlled trial of the effect of ambulatory continuous femoral nerve blocks on discharge-readiness following total knee arthroplasty in patients on general orthopaedic wards. *Pain*. 2010; **150(3)**:477-84

17. Ilfeld BM, Vanderborne K, Duncan PW, Sessler DI, Enneking FK, Shuster JJ, *et al*. Ambulatory continuous interscalene nerve blocks decrease the time to discharge-readiness after total shoulder arthroplasty: a randomized, triple-masked, placebo-controlled study Anesthesiol 2006;**105(5)**: 999-1007

18. Anderson LO, Husted H, Otte KS, Kristensen BB, Kehlet H. High-volume infiltration analgesia in total knee arthroplasty: a randomized, double-blind, placebo controlled trial. *Acta Anaesthesiol Scand*. 2008;**52(10)**:1331-5

19. Bianconi M, Ferraro L, Traina GC, Zanoli G, Antonelli T, Gubert A, *et al*. Pharmacokinetics and efficacy of ropivicaine continuous wound instillation after joint replacement surgery. *Br J Anaesth*. 2003;**91(6)**:830-5

20. Essving P, Axelsson K, Kjellberg J, Wallgren D, Gupta A, Lundin A, *et al*. Reduced morphine consumption and pain intensity with local infiltration analgesia (LIA) following total knee arthroplasty. *Acta Orthop*. 2010;**81(3)**:354-60

21. Toftdahl K, Nikolajsen L, Haraldsted V, Madsen F, Tonnesen LK, Soballe K. Comparison of peri- and intra-articular analgesia with femoral nerve block after total knee arthroplasty: a randomized clinical trial. *Acta Orthop*. 2007;**78(2)**:172-9

22. Busch CA, Whitehouse MR, Shore BJ, MadDonald SJ, McCalder RW, Bourne RB. The efficacy of periarticular multimodal drug infiltration in total hip arthroplasty. *Clin Orthop Relat Res*. 2010;**468(8)**:2152-9

23. Parvataneni HK, Shah VP, Howard H, Cole N, Ranawat AS, Ranawat CS. Controlling pain after total hip and knee arthroplasty using a multimodal protocol with local periarticular injections: a prospective randomized study. *J Arthroplasty*. 2007;**22(6 Suppl 2)**:33-8

24. Lee KJ, Min BW, Bae KC, Cho Ch, Kwon DH. Efficacy of multimodal pain control protocol in the setting of total hip arthroplasty. *Clin Orthop Surg*. 2009;**1(3)**:155-60

25. National Joint Registry. Patients. Joint replacement statistics. Hemel Hempsted, UK: Healthcare Quality Improvement Partnership; 2015. Available from: http://www.njrcentre.org.uk/njrcentre/Patients/Jointreplacementstatistics/tabid/99/Default.aspx. Last accessed Feb 2016.

Ulster Med J 2016;**85(2):**92-98

Clinical Paper

An Assessment of Psychological Need in Emergency Medical Staff in the Northern Health and Social Care Trust Area

McAleese, Aisling[1] Diamond, Aisling[2] Curran, David[3]

Accepted: 20th September 2015
Provenance: externally peer-reviewed.

ABSTRACT

Setting: Psychological stress is increasingly recognised within emergency medicine, given the environmental and clinical stressors associated with the specialism. The current study assessed whether psychological distress is experienced by emergency medical staff and if so, what is the expressed need within this population?

Participants: Participants included ambulance personnel, nursing staff, doctors and ancillary support staff within two Accident and Emergency (A&E) departments and twelve ambulance bases within one Trust locality in NI (N = 107).

Primary and secondary outcome measures: The General Health Questionnaire (GHQ-12, Goldberg, 1972, 1978), Secondary Traumatic Stress Scale (STSS, Bride, 2004) and an assessment of need questionnaire were completed and explored using mixed method analysis.

Results: Results showed elevated levels of psychological distress within each profession except ambulance service clinical support officers (CSOs). Elevated levels of secondary trauma symptomatology were also found; the highest were within some nursing grades and junior doctors. Decreased enjoyment in job over time was significantly associated with higher scores. Analysis of qualitative data identified sources of stress to include low morale. A total of 65% of participants thought that work related stressors had negatively affected their mental health. Participants explored what they felt could decrease psychological distress including improved resources and psychoeducation.

Conclusion: There were elevated levels of distress and secondary traumatic stress within this population as well as an expressed level of need, on both systemic and support levels.

Keywords: Psychological need, occupational stress, secondary traumatic stress

INTRODUCTION

The psychological impact of occupational stressors has been widely acknowledged within high risk populations such as the armed forces and firefighting services. This has resulted in improved understanding and awareness of the impact on mental health and wellbeing following repeated exposure to occupational stress. [1-4] Among professions considered to be at risk, emergency medical staff are vulnerable to psychological distress given daily occupational demands. [5,6]

Research has identified high stress clinical scenarios, felt helplessness and insufficient recovery time as factors leading to stress. [7] Emergency departments have also experienced increased demand and limited resources. [8] Resource factors have been found to impact on job satisfaction, which has been inversely associated with stress, depression and anxiety. [9]

In a study of occupational stress in doctors, Burbeck discussed A&E as a specialty with unpredictable workload, limited resources, violent situations and critical decision making. [10] Limited resources correlate with aggression from patients leading to poor job satisfaction and increased stress. [11]

Through screening for psychiatric disorders, Alexander and Klien found poorer mental health in ambulance staff who had experienced a particularly distressing incident in the previous 6 months.[7] Within Northern Ireland, Rodgers found a disproportionately high incidence of mental health disorders in paramedics eligible for early retirement on medical grounds. [12]

Of significant concern is the development of subclinical PTSD, more commonly conceptualised as secondary traumatic stress. Secondary traumatic stress responses

[1] Clinical Psychology 2nd Floor Royal Belfast Hospital for Sick Children, 180 Falls Road, Belfast BT12 6BE [2]Consultant and Clinical Lead in Emergency Medicine , Emergency Department, Causeway Hospital, 4 Newbridge Road
Coleraine BT52 1HS. [3] Assistant Course Director, DClinPsych, David Keir Building, 18 – 30 Malone Road, Belfast BT9 5AG

Correspondence to: Dr Aisling McAleese

E-mail: amcaleese09@qub.ac.uk

include symptoms of PTSD along with elevated levels of anxiety, depression, significant impairment in daily functioning and poorer physical health. [5, 13] Although PTSD relates to individual, personal experience of a traumatic event, it has been established that such events can affect those who come in contact with the distressed victim. [14] In a survey of emergency medical personnel, Mishra found high levels of post-traumatic stress symptoms and in a similar study, 30% of participants reported symptoms associated with PTSD. [15] Emergency personnel have great resilience, however this may not exclusively protect against the effects of regular exposure to critical incidents and recurrent stressors. [7, 16]

Both employees and employers have a great deal to gain from detection of difficulties and early intervention. [6] Given these potential gains, we explored the level of need in Emergency Medicine in a Trust in Northern Ireland.

METHOD

Within the Trust, there were two A&E departments and 12 ambulance bases. The study was open to all ambulance personnel, A&E nurses and doctors and support staff (receptionists and porters). Ethical approval was granted from the School of Psychology Research Ethics Committee, on behalf of Queen's University Belfast.

Participants & procedure

Questionnaire packs were left within each department and completed packs returned to the researcher. There was a total sample N = 107 (*see table 1).*

TABLE 1:
Breakdown of N = 107 by profession and grade

Profession	Grade	N	%
Northern Ireland Ambulance Service (NIAS)	Paramedic	27	25.2%
	Clinical Support Officer (CSO)	4	3.7%
	Emergency Medical Technician (EMT)	4	3.7%
	Ambulance Care Assistant (ACA)	7	6.5%
	Total	42	39.3%
Emergency Medicine Nurses	Auxiliary	4	3.7%
	Nursing sister	5	4.7%
	Nurse Practitioner	1	0.9%
	Staff Nurse	21	19.6%
	Total	31	29%
Emergency Medicine Doctors	Junior grade	11	10.3%
	Middle grade	10	9.3%
	Consultant	6	5.6%
	Total	27	25.2%
Emergency Medicine Support Staff	Receptionists	4	3.7%
	Porters	3	2.8%
	Total	7	6.5%
Total Sample	107	100%	

Each questionnaire pack contained a General Health Questionnaire (GHQ), Secondary Traumatic Stress Scale (STSS) and an Assessment of Need Questionnaire.

General Health Questionnaire (GHQ-12)

The GHQ-12 is a screening tool used to measure common mental health domains. [17, 18] The potential score range is 0 – 36, with higher scores indicative of distress. The current study used mean and standard deviation score findings from Shevlin and Adamson's large NI study (N = 4,633) that administered the GHQ-12 to a non-clinical population. Clinical significance was taken as 2SDs above the mean (22.68).

Secondary Traumatic Stress Scale (STSS)

The STSS is a questionnaire designed to measure intrusion, avoidance and arousal symptoms associated with indirect exposure to traumatic events through professional contact. [19] Higher scores are indicative of greater secondary traumatic stress. Although a recently developed measurement tool, there is evidence of sound psychometric properties of the scale. [19, 20, 21]

Assessment of Need Questionnaire

This questionnaire was developed by the authors. It aimed to gather demographic information and to both quantitatively and qualitatively assess participant's experience and personal opinion of psychological need. It incorporated Likert scales to allow for comparison and open ended questions to obtain qualitative data.

Participants were asked to use a Likert scale to rate job enjoyment when they first started in emergency medicine, at the current time and also estimate future enjoyment This was used to explore if job satisfaction has an impact on psychological distress. Open ended questions asked about occupational stressors, manifestations of stress and ways to alleviate or support any difficulties.

Data analysis

Quantitative data was analysed using SPSS (version 20). As there was a small number of support staff who responded to the study (N = 7), their data was removed from statistical analysis due to low representation. Each participant obtained a total GHQ-12 score and a measure of intrusion, avoidance, arousal and a total secondary trauma score. Regression analysis was conducted to assess whether occupation was predictive of outcome. As the independent variable (profession) is categorical, dummy variables were coded.

The assessment of need questionnaire asked participants a number of yes/no questions which were analysed descriptively. New variables were coded from the data rating job satisfaction to represent changes in job enjoyment over time. Data was then compared to the standardised measures of GHQ-12 and STSS using a Kruskal-Wallis test, to explore differences in scores across levels of job enjoyment.

Table 2:

*Showing Means & Standard Deviations for scores on GHQ-12 & STSS (*No SD available for Nurse Practitioner due to low N)*

Profession	GHQ-12 (Shevlin & Adamson, 2005 mean 11.26)	STSS (Intrusion) (Bride et al., 2004 mean 8.11)	STSS (Avoidance) (Bride et al., 2004 mean 12.49)	STSS (Arousal) (Bride et al., 2004 mean 8.89)	STSS (Total) (Bride et al., 2004 mean 29.49)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Junior Dr.	16.64 (7.325)	12.45 (4.547)	17.73 (4.941)	13.18 (3.710)	43.36 (11.483)
Middle Grade Dr.	15.40 (5.060)	11.60 (4.648)	18.00 (5.831)	12.10 (3.900)	41.70 (13.309)
Consultant Dr.	13.50 (6.317)	8.83 (4.167)	14.83 (7.083)	10.00 (5.292)	33.67 (16.096)
Auxiliary	17.75 (8.302)	11.25 (4.031)	19.00 (5.831)	12.25 (4.349)	42.50 (13.916)
Clinical Sister	14.60 (3.715)	11.40 (2.608)	16.80 (2.387)	14.2 (2.950)	42.40 (6.229)
Nurse Practitioner	13.00 *	11.00 *	18.00 *	14.00 *	43.00 *
Staff Nurse	17.57 (6.882)	12.24 (3.780)	16.81 (5.724)	13.00 (4.416)	42.05 (13.313)
Paramedic	13.04 (17.547)	8.22 (3.130)	13.22 (5.618)	9.78 (4.022)	31.22 (11.927)
Clinical Support Officer (CSO)	9.75 (1.258)	9.75 (2.363)	14.00 (1.633)	9.75 (2.500)	33.50 (6.245)
Emergency Medical Technician (EMT)	14.25 (9.50)	13.00 (6.055)	18.00 (9.309)	11.50 (6.807)	42.50 (21.947)
Ambulance Care Assistant (ACA)	14.0 (3.697)	10.14 (3.185)	15.14 (4.059)	11.57 (3.645)	36.86 (10.123)
Total	14.90 (6.708)	10.60 (4.020)	15.86 (5.641)	11.63 (4.247)	38.09 (13.061)

Qualitative data obtained from the assessment of need questionnaire was analysed using thematic analysis, utilising the six phased principles as detailed by Braun and Clarke. [22]

RESULTS

General Health Questionnaire (GHQ-12)

The reliability for the scale in the current sample was high (Cronbach's alpha = .85). The mean score for GHQ-12 was 14.9 (*SD* = 6.708); the highest mean obtained by staff nurses (*M* = 17.57, *SD* = 6.822) compared to the lowest mean score which was seen within the CSOs (*M* = 9.75, *SD* = 1.258, *see table 2)*.

No group in the study obtained a clinically significant range (defined as 2 standard deviations from the NI mean) however just under a third (31%) of the total sample obtained a score one standard deviation above this norm.

Multiple regression was used to see if profession predicted distress as measured through the GHQ-12. All levels of the independent variable showed at least some relationship with the dependent variable (r = ≥ .3) and no level of profession within the study showed high bivariate correlation. The regression showed that profession explained only 10.6% of the variance (R^2 = .106, F (11, 95) = 1.029, p = .428). Staff nurses made the strongest unique contribution to explaining the dependent variable, however this was not statistically significant (□ = .328, p = .062, *see table 3)*.

Secondary Traumatic Stress Scale (STSS)

The highest mean for the intrusion sub-scale was obtained by junior doctors (*M* = 12.45, *SD* = 4.547), avoidance sub-scale was obtained by auxiliary nurses (*M* = 19.00, *SD* = 5.831), arousal sub-scale was obtained by clinical sisters (*M* = 14.2, *SD* = 2.950) and highest mean for total scale score was seen within the sample of junior doctors (*M* = 14.36, *SD* = 11.483).

Table 3:

Showing β values and levels of statistical significance for scores on GHQ-12 & STSS

Profession	**GHQ-12**	**STSS (Intrusion)**	**STSS (Avoidance)**	**STSS (Arousal)**	**STSS (Total)**
	□ (Sig)	□ (Sig)	□ (Sig)	□ (Sig)	□ (Sig)
Junior Dr.	.208 (.161)	.318 (.025)	.319 (.029)	.218 (.138)	.306 (.035)
Middle Grade Dr.	.144 (.318)	.242 (.078)	.320 (.025)	.134 (.347)	.256 (.070)
Consultant Dr.	.048 (.712)	.032 (.795)	.123 (.332)	-.008 (.951)	.060 (.632)
Auxiliary	.162 (.177)	.141 (.214)	.242 (.040)	.094 (.425)	.178 (.126)
Clinical Sister	.079 (.525)	.165 (.163)	.187 (.127)	.202 (.102)	.197 (.105)
Nurse Practitioner	.013 (.903)	.066 (.503)	.106 (.297)	.088 (.392)	.094 (.349)
Staff Nurse	.328 (.062)	.394 (.019)	.352 (.041)	.268 (.122)	.359 (.035)
Paramedic	.059 (.750)	-.077 (.968)	.106 (.559)	-.037 (.838)	.031 (.862)
Clinical Support Officer (CSO)	-.69 (.563)	.070 (.538)	.073 (.534)	-.018 (.882)	.047 (.686)
Emergency Medical Technician (EMT)	.061 (.611)	.224 (.049)	.209 (.077)	.061 (.607)	.178 (.126)
Ambulance Care Assistant (ACA)	.070 (.599)	.115 (.360)	.145 (.265)	.083 (.526)	.125 (.333)

Multiple regression was used to see if profession predicted score on the scales on secondary traumatic stress scale. Within 'intrusion', profession explained 20.2% of the variance in scores (R^2 = .202, F (11, 95) = 2.183, p = .022). Staff nurses made the strongest unique contribution, which was also statistically significant (□ = .394, p = .019). Junior doctors (□ = .318, p = .025) and EMTs (□ = .224, p = .049) also made statistically significant contribution.

Within 'avoidance', profession explained 14.6% of the variance in scores (R^2 = .146, F (11, 95) = 1.417, p = .155). Staff nurses made the strongest unique contribution, which was also statistically significant (□ = .352, p = .041). Junior doctors (□ = .319, p = .029), middle grade doctors (□ = .320, p = .025) and auxiliary nurses (□ = .242, p = .040) also made statistically significant contribution.

Within 'arousal', profession explained only 12.8% of the variance (R^2 = .128, F (11, 95) = 1.266, p = .526). Again, staff nurses made the strongest unique contribution, however this was not statistically significant (□ = .268, p = .122). Within the total STSS score, profession explained 16.2% of the variance (R^2 = .162, F (11, 95) = 1.665, p = .093). Once again, staff nurses made the strongest unique contribution, which was also statistically significant (□ = .359, p = .035). Junior doctors also made statistically significant contribution (□ = .306, p = .035).

Assessment of need questionnaire

Relationship between standardised scores and job enjoyment

Analysis found a significant impact of job enjoyment on GHQ-12 in that those who enjoyed their job when they started but do not currently, obtained higher median scores than those who showed consistency in job satisfaction ($□^2$ (7, N = 100) = 18.930, p = .008).

The same was found within STSS total and sub-scale scores, in that scores of intrusion $□^2$ (6, N = 100) = 18.855, p = .003), avoidance ($□^2$ (7, N = 100) = 25.910, p = .001), arousal $□^2$ (7, N = 100) = 24.641, p = .001) and total STSS score $□^2$ (7, N = 100) = 26.010, p = .001) showed statistically significant increases for those who enjoyed their job more compared with other groups.

No significant difference was found between scores on any scale when compared with how participants enjoy their job currently and whether they look forward to their job in the future.

Perceived impact of occupational stress on mental health

When asked about the mental health impact of occupational

stress, 69.2% stated that they thought occupational stress (either in the past or currently) has caused them psychological distress.

Thematic analysis

Q1. Briefly describe what you feel are your main sources of stress in the work place?

Among the data, stressors were identified in 7 main themes. Some professions did not identify with a theme, and some themes were unique to certain professions.

The 7 dominant themes were; patients, resources, daily & long-term job concerns, other people & services, managerial issues and morale. Within these, sub themes related to more specific stressors. Some issues, such as '*upsetting clinical issues'* were described consistently by all professions as bereavement, serious medical traumas and emergencies involving children. Some sub-themes however emerged as unique to a profession. Some doctors within the sample spoke for example of feelings of isolation;

'*... others abuse the service offered by the emergency department... the lack of social interactions with other colleagues throughout the shift makes me feel isolated'.*

Some nurses spoke of the impact of stress on morale and group dynamics:

'*Negative comments from the press has lead to low morale among my colleagues...*'

Personnel from the ambulance service spoke of training needs and communication difficulties and how this is thought to contribute to stress within the workplace:

'*Lack of training in certain areas such as communication, paediatrics and maternity... There is no feedback from management on how I performed at the scene if any query or investigation takes place'*

Table 4: *Showing dominant and sub-themes by profession from 'stressors' questions*

Q2. Do you think work related stress affects your mental health? (Yes/No) If yes, how do you think that these stressors affect you?

Through analysis, five themes emerged: low mood, anxiety/ agitation, somatic difficulties, impact on relationships and poor self-care.

Participants discussed a decrease in mood often characterised through poor motivation, lethargy and thoughts of self-harm. Participants also frequently mentioned disturbed sleep including distressing, work related dreams. Anxiety was discussed, characterised through worries and feeling frequently '*on edge'*. In relation to somatic difficulties, some participants discussed the presentation of physical pain which has presented '*without any reason other than stress*.' Many reflected on the impact of their work on relationships with several participants stating that work stress has impacted negatively on marital relationships. The main theme emerging through self-care was related to maladaptive coping behaviour such as social withdrawal and increased alcohol consumption.

Q3. Do you think there is anything that would decrease the potential for psychological distress and if so, do you think that there is anything that Psychological Therapies could provide?

Four themes emerged: resources, working conditions, training and management/support. Within themes of *working conditions* and *management and support*, the most frequently expressed thoughts related to the need for protected breaks, reassurance and affirmation. When asked about potential input from psychological therapies, one respondent stated that:

'*Staff here feel anxious and isolated, anything that can reduce that would be beneficial*'

There were three emergent themes regarding what may be needed or wanted from psychological therapies; accessibility, talking therapies and psychoeducation. Within the dominant theme of talking therapies, three sub-themes emerged: Group therapeutic sessions, direct therapeutic support and critical incident de-brief.

DISCUSSION

Psychological distress

In the current study, although no professional group obtained scores within a clinically significant range, each profession (except CSOs) scored an elevated mean. These results suggest elevated levels of distress with potential differences between emergency medical professions.

Secondary trauma experiences

The mean scores obtained for the STSS total and sub-scaled scores in the current study were higher than expected norms, suggestive of elevated levels of secondary trauma. Results found high levels of secondary trauma symptomatology across professions, with highest elevations in nursing and junior medical staff. These findings highlight the need for intervention.

Job enjoyment and psychological wellbeing

Findings show a significant correlation between job enjoyment and distress. When participants enjoy their job less than when they first started, they were more likely to have increased scores on GHQ-12 and STSS. The direction of this relationship however is unclear; do people have higher psychological distress because they do not enjoy their job as much as they used to, or do people enjoy their job less because they are experiencing higher levels of distress? As reflected by the themes generated, it is likely that this is an individual experience based on a multitude of factors such as personal resilience, morale and environment.

Exploring experience of stress and need

Themes identified by participants as their main sources of stress resembled previous studies. [6, 8, 12] Participants discussed ways in which they felt stressors affected them including low mood and anxiety. The majority of the sample engaged in regular shift work and the impact of this on physical and psychological health is well recognised. [23] With regard to the theme of self-care, many reported maladaptive patterns of coping, mirroring the findings of Roger's study. [12]

There were four areas identified as having potential for positive change. These related to improved resources, managerial changes and better working conditions. When discussing a potential role for psychological therapies, participants had varied ideas of what could be useful. The request for psychoeducation could be linked to the hypothesised high levels of resilience within the population. A dominant theme in the analysis was low morale and the need for group support and open discussion. Professional socialisation, social support and humour have been shown to enhance resilience in emergency medicine. [24]

LIMITATIONS

The directional and causal implications of the relationship between enjoyment of work and psychological distress cannot be fully explored in the current study. Also, to allow for varied analysis and exploration of the whole data set, GHQ-12 was not analysed in relation to the sub-scales contained within the measure. Although the sample was representative for each profession, more ancillary and support staff would have been beneficial.

IMPLICATIONS

A population with varying levels of psychological and systemic need has been identified within the current study. Some participants asked for an easily accessible service from psychological teams which they can use if needed

The participants in the study suggested psychoeducation as a form of support that could take on the role of normalisation for staff working within emergency settings. It could be beneficial to highlight these experiences as a group experience and as a normal reaction to an abnormal or persistent level of stress. Emotional responses such as secondary trauma are not unusual, they arise frequently among those who care for victims of trauma and as such, should be made more aware to the caring professions. [23]

CONCLUSION

Staff in emergency medicine have voiced their opinions on several issues related to their experience of occupational stressors. The elevated levels of psychological distress and secondary trauma point to the need for support on both remedial and preventative levels. The shape and structure of this support may be therapeutic, educational, communicative or consultative.

ACKNOWLEDGEMENTS

The authors would like to thank all the staff in the Northern Health and Social Care Trust for their participation. Special thanks are given to the academic and practical support offered by Psychological Therapies Services, especially from Dr Adrian Boyd, Dr Petra Corr and Dr Martin Dempster at Queens University, Belfast for statistical advice.

The authors would like to acknowledge support from Dr Orlaith Scullion in the A&E department of Antrim Area Hospital and multifaceted support and advice from Dr Daniel McAleese.

REFERENCES

1 Haslam C, Mallon K. A preliminary investigation of post-traumatic stresssymptoms among firefighters *Work and Stress*. 2003;**3:** 277-285.

2 Iversen AC, Fear NT, Ehlers A, Hacker Hughes J, Hull L, Earnshaw M, et al. Risk factors for post-traumatic stress disorder among UK Armed Forces personnel. *Psychol Med*. 2008;**38(4);**511-22.

3 Vinokur AD, Pierce PF, Lewandowski-Romps L, Hobfoll SE, Galea S, *et al*. Effects of war exposure on air force personnel's mental health, job burnout and other organizational related outcomes. *J Occup Health Psychol*. 2011**;16:** 3-17.

4 Chung YK, Park CY. The effects of injury and accidents on self-rated depression in male municipal fire-fighters. *Safe Health Work*. 2011**;2(2):**158-68.

5 Mishra S, Goebert D, Char E, Dukes P, Ahmed I. Trauma exposure and symptoms of post-traumatic stress disorder in emergency medical services personnel in Hawaii. *Emerg Med J*. 2010;**27(9):**708–11.

6 McFarlane AC, Bryant RA. Post traumatic disorder in occupational settings; anticipating and managing the risk. *Occup Med*. 2007;**57**:404–10.

7 Alexander DA, Klien S. Ambulance personnel and critical incidents; impact of accident and emergency work on mental health and emotional well-being. *Br J Psychiatry.* 2001;**178(1)**:76–81.

8 Rondeau KV, Francescutti LH. Emergency department overcrowding: the impact of resource scarcity on physician job satisfaction. *J Healthc Manag.* 2005;**50:**327-40.

9 Boudreaux E, Mandry C, Brantley PJ. Stress, job satisfaction, coping and psychological distress among emergency medical technicians. *Prehosp Disaster Med* 1997;**12(4)**;9-16.

10 Burbeck R, Coomber S, Robinson SM, Todd C. Occupational stress in consultantsin accident and emergency medicine: A national survey of levels of stress at work. *Emerg Med J.* 2002;**19(3):**234–8.

11 Gillespie M, Melby V. Burnout among nursing staff in accident and emergency and acute medicine: a comparative study. *J Clin Nurs.* 2003;**12(6)**:842–51.

12 Rodgers LM. A five year study comparing early retirements on medical grounds in ambulance personnel with those in groups of other health service staff. *Occup Med.* 1998;**48(2)**:119-32.

13 Yehunda R, McFarlane AC, Shalev AY. Predicting the development of posttraumatic stress disorder from the acute response to a traumatic event. *Biol Psychiatry*. 1998;**44(12):**1305-13.

14 Tehrani N. Managing trauma in the workplace. Oxford: Routledge Press; 2011

15 Mills LD, Mills TJ. Symptoms of post-traumatic stress disorder among emergency medicine residents. *J Emerg Med.* 2005;**28(1)**:1-4.

16 Garrosa E, Moreno-Jimenez B, Liagn Y, Gonzalez JL. The relationship between socio-economic variables, job stressors, burnout and hardy personalities in nurses; an exploratory study. *Int J Nurs Stud. 2008***;45(3)**:418–27.

17 Jackson C. The General Health Questionnaire. *Occup Med.* 2007;**57(1)**:79.

18 Shevlin M, Adamson G. Alternative factor models and factorial invariance of theGHQ-12: a large sample analysis using confirmatory factor analysis. *Psychol Assess.* 2005;**17(2)**:231-6.

19 Bride B, Robinson MM, Yegidis B, Figley CR. Development and validation of the secondary traumatic stress scale. *Res Soc Work Pract.* 2004;**14(1):**27-35.

20 Shah SA, Garland E, Katz C. Secondary traumatic stress: prevalence in humanitarian aid workers in India. *Traumatol*. 2007;**13(1):**59–70.

21 Quinal L, Harford S, Rutledge DN. Secondary traumatic stress in oncology staff. *Cancer Nurs*. 2009;**32(4)**:1-7.

22 Braun V, Clarke V. Using thematic analysis in psychology *Qual Res Psychol*. 2006**;3(2)**:77-101.

23 Sofianopoulos S, Williams B, Archer F. Paramedics and the effects of shift work on sleep: a literature review. *Emerg Med J*. 2010;**29(2):**152-55.

24 Mildenhall J. Occupational stress, paramedic informal coping strategies: a review of the literature. *J Paramedic Pract*. 2012;**4(6):**318-28.

Ulster Med J 2016;**85(2):**99-102

Clinical Paper

Patient Reported Outcomes Following Laparoscopic Surgery for Benign Upper Gastrointestinal Disease

Gary Dobson, Richard Thompson, Andrew Kennedy

Accepted: 21st October 2015.
Provenance: externally peer-reviewed

ABSTRACT

Patient reported quality of life (QOL) outcomes are important tools for measuring the success of surgical intervention. This is of particular relevance in benign disease when surgery is specifically indicated primarily to treat symptoms and improve QOL. In upper gastrointestinal disease, common conditions such as achalasia, gastro-oeosphageal reflux disease and para-oesophageal hernias can have a significant impact on patient's quality of life. The aim of this study was to compare QOL scores before and after surgery for these conditions, and to assess patient satisfaction.

Patients who underwent laparoscopic paraoesophageal hernia (POH) repair, laparoscopic cardiomyotomy or laparoscopic fundoplication over a 7 year period (2006-2013) by one surgeon were asked to assess their symptoms before and after surgery using the Gastro-oesophageal Reflux Disease-Health Related Quality-Of-Life (GORD-HRQOL) Score and The Royal Adelaide Dysphagia (RAD) Score, and to rate their satisfaction.

All procedures were carried out electively, with no 30-day mortality, and an absence of any major peri-operative morbidity.

Responses were received from 121 patients (68 female and 53 male). This comprised of 34 POH repairs, 39 cardiomyotomies and 48 fundoplications.

Median GORD scores improved significantly for all groups; POH 20.5 to 2, ($p<0.0001$), Fundoplication 24.5 to 6.5 ($p<0.0001$), and Cardiomyotomy 21 to 10 ($p=0.0008$).

Dysphagia scores improved significantly for Cardiomyotomy, 7.5 to 30 ($p<0.0001$),and POH, 25 to 40.5 ($p=0.044$), but not with Fundoplication 45 to 35.25 ($p =0.17$).

64% of patients were 'satisfied' or 'very satisfied' with their current condition. 77% were 'satisfied' or 'very satisfied' with the procedure itself.

This study has shown that there is a high rate of patient satisfaction following laparoscopic surgery for benign upper GI disease.

INTRODUCTION

Benign upper gastrointestinal (GI) diseases including achalasia, gastro-oesophageal reflux disease (GORD) and para-oesophageal hernias (POH) result in a number of overlapping symptoms that can significantly impact upon a patient's quality of life (QOL). Approximately 89% of patients with GORD complain of heartburn. Bloating, flatulence and dysphagia are also commonly reported symptoms[2]. The prevalence of GORD in Europe is amongst the highest in the world at 23.7%[3], and is known to have a significant adverse impact on QOL[4]. Achalasia has an annual incidence of 1 in 100,000 and causes symptoms of progressive dysphagia and regurgitation[5,6]. Hiatal hernias are common[7] with most being the sliding type (type 1)[8]. Para-oesophageal hernias (types 2-4) account for 5% of all hiatal hernias[7]. These may present with a variety of symptoms, including heartburn, regurgitation, dysphagia, and chest pain. They can also present acutely with gastric volvulus. All of these conditions can now be effectively managed laparoscopically[9].

Patient reported outcomes are important tools for measuring the success of surgical interventions. This is of particular relevance in benign disease when surgery is specifically indicated primarily to treat symptoms and improve QOL. There are a number of validated tools for assessing QOL in benign upper GI disease[10]. The GORD-HRQOL developed by Velanovich et al.[11] is one such tool that has been used for GORD specifically and has been validated in a number of other studies[12,10].

The dysphagia score used in this study was first devised by Dakkak et al[1] (Table 1) and has subsequently been used in a number of other studies reporting outcomes following laparoscopic fundoplication[13,14] and following laparoscopic cardiomyotomy and anterior Dor fundoplication for achalasia[6].

The aim of this study was to compare QOL scores before and after laparoscopic surgery for achalasia, GORD and POH and to determine overall patient satisfaction scores. Responses were received from 121 of 184 individual patients.

Department of Upper Gastro-Intestinal Surgery, Belfast City Hospital, Belfast Health and Social Care Trust, Belfast, United Kingdom

garydobson51@hotmail.com

Correspondence to Gary Dobson

MATERIALS AND METHODS

All patients undergoing elective laparoscopic surgery for the three conditions by a single surgeon over a seven year period from 2006-2013 were included. There were a total of 184 individual patients, incorporating 59 cardiomyotomies for achalasia, 89 fundoplications for GORD and 43 POH repairs. Of these, five patients had re-do cardiomyotomies, and two had release of fundoplication due to symptoms related to dysphagia. All the procedures were completed laparoscopically.

A review of the procedures revealed no operative or 30 day mortality. However, given the time period involved, 3 patients died of other causes.

A 7cm cardiomyotomy with an anterior Dor fundoplication was performed in all patients with achalasia. A Nissen fundoplication without division of the short gastric arteries was performed in patients with GORD. POH repair was undertaken by primary crural repair without a mesh after complete reduction of the sac. A 360° fundoplication was also undertaken in this group.

Patients were asked via postal questionnaire to grade GORD symptoms using the GORD-HRQOL score with 0 equal to no symptoms and a maximum of 50 to indicate the most symptomatic.

Dysphagia symptoms were assessed using the previously described scoring system by Dakkak et al[1], with a maximum score of 45 indicating no difficulty swallowing any of the foods included and a score of 0 indicating difficulties swallowing all of the foods in question including water. Therefore a score of 0 represents the most severely symptomatic.

Patients were also asked to rate their overall satisfaction with their current condition and with the procedure undertaken.

Of those who responded, 102 patients completed the online survey or returned the questionnaire via post. Non-responders were contacted via telephone and asked the same set of questions verbally to increase the response rate. A further 19 patients were reached this way. The individual who contacted the patients via telephone worked within the department, but had not been personally involved with any of the procedures or clinic follow-ups.

Results were analysed according to procedure and sex. The Mann-Whitney Test was used to compare median pre-operative and post-operative scores for each of the three groups which were expressed with their interquartile range (IQR).

RESULTS

121 responses (68 females and 53 males) were received. The overall response rate was 66%. The mean follow-up times for the three groups were 62.9 months for the cardiomyotomy group, 50.2 months for the fundoplication group and 32.2 months for the POH group. The range for follow-up was 4 – 84 months.

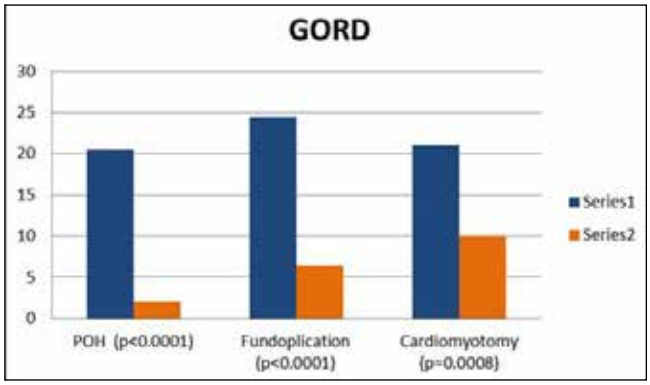


Fig 1. Incidence of GORD symptoms in pre (series 1) and post (series 2) treatment patients.

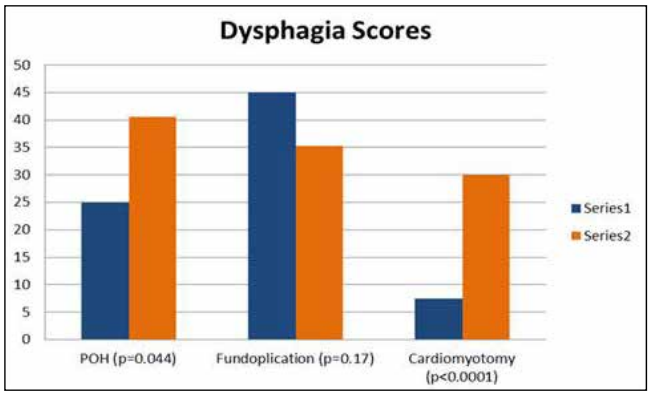


Fig 2. Dysphagia scores in pre (series 1) and post (series 2) treatment patients.

In the cardiomyotomy group there were 39 responses from a possible 58 (67%), 20 men and 19 women. This group showed a significant improvement in both symptom scores with the median pre-operative GORD-HRQOL score of 21(IQR: 8, 27) significantly improved to 10(IQR: 2, 15) following surgery (p=0.0008). RAD scores improved from 7.5(IQR: 3, 13.5) pre-operatively to 30(IQR: 20, 41) post-operatively (p<0.0001). 64% of respondents rated themselves as either "Satisfied" or "Very Satisfied" with their current condition and 90% said they were "Satisfied" or "Very Satisfied" with the surgical procedure.

In the fundoplication group there were 48 responses from a possible 84 (57%), 23 men and 25 women. This group showed an expected significant improvement in GORD symptoms with median pre-operative GORD-HRQOL score of 24.5(IQR: 18.5, 33) compared to 6.5(IQR: 2.25, 14.5) postoperatively (p<0.0001). There was also a non-significant trend towards more dysphagia symptoms following fundoplication with RAD scores falling from 45(IQR: 27.5, 45) pre-operatively to 35.25(IQR: 21.75, 45) post-operatively (p =0.17). 54% of respondents rated themselves as either "Satisfied" or "Very Satisfied" with their current condition and 63% said they were "Satisfied" or "Very Satisfied" with the surgical procedure.

In the POH group there were 34 responses from a possible 42 (81%), 10 men and 34 women. A significant improvement in GORD symptoms was also noted in this group, with median pre-operative GORD-HRQOL scores improving from 20.5(IQR: 10.25, 27.75) pre-operatively to 2(IQR: 0, 10.25) post-operatively ($p<0.0001$). Median RAD scores also improved from 25 (IQR: 8.74, 45) preoperatively to 40.5(IQR: 23.38, 45) post-operatively ($p=0.044$). 68% of respondents rated themselves as either "Satisfied" or "Very Satisfied" with their current condition and 82% said they were "Satisfied" or "Very Satisfied" with the surgical procedure.

DISCUSSION

This study using patient reported outcome measures has shown that symptoms of dysphagia and GORD can be significantly improved following laparoscopic surgery for achalasia and POH. (Figures 1&2). The fundoplication group, as expected, showed a significant improvement in GORD scores but a non-significant worsening of dysphagia scores. Satisfaction scores were also high across all the groups following surgery but lowest in the fundoplication group, possibly as a result of some patients having a degree of dysphagia. This may also help to explain why the response rate was lower in this group. However, the overall response rate in this study is in keeping with what would be expected from similar studies. It is accepted that the lower the response rate, the lower the effective sample size and the greater the risk of bias.[15]

In the achalasia group, it is clearly expected that dysphagia scores would be significantly better after surgery. It is interesting in this study that QOL in terms of GORD symptoms was also significantly better in this group. Ponce et al showed that symptoms of GORD were relatively common in patients following open cardiomyotomy for achalasia but despite this the QOL scores using the Short Form (SF)-36 were equivalent to that of the general population and satisfaction levels remained high due to the reduction in dysphagia[16]. Chan et al compared laparoscopic cardiomyotomy combined with an anterior Dor fundoplication to endoscopic balloon dilatation and showed that surgery resulted in better overall QOL scores also using the SF-36[17]. They also showed that QOL was significantly worse in patients who reported GORD symptoms postoperatively. This was more common after balloon dilatation but was not statistically significant. In our study, symptoms of GORD were relatively high preoperatively in the achalasia group; this may be due to the non-specific character of many of these symptoms. Anderson et al showed that symptoms of heartburn were relatively high both before and after surgery in patients with achalasia but that this was a poor predictor of objective GORD on pH studies[18]. Irrespective of the mechanism, it is reassuring to note that GORD related symptoms did significantly improve with surgery in our study.

The group of patients undergoing fundoplication for GORD in our study reported low dysphagia scores preoperatively. In a review incorporating open and laparoscopic studies, Wills et al reported average dysphagia rates across all the included studies with 41% of patients reporting dysphagia preoperatively. 34% still reported some dysphagia within 3 months of surgery, falling to 6% at 76 months with 4% of patients requiring further intervention for dysphagia[19]. Our low reports of dysphagia preoperatively may be due to recall bias in this retrospective study and this may explain the non-specific trend towards a worsening in of dysphagia scores in this group of patients. Patient satisfaction rates were generally lower in our study in the fundoplication group. This may be a reflection of the higher postoperative dysphagia rates as previously noted. . Kellokumpu et al reported 10-year follow-up (median 10.2 years) of outcomes after laparoscopic fundoplication. Of those who were considered cured at 10 years (72.2%), QoL scores were equal to those of the general population and overall 83% reported satisfaction with the procedure and their current condition at 10 years[20].

Para-Oesophageal Hernias may present with a variety of symptoms as noted previously. Our study revealed that symptoms of GORD and dysphagia both significantly improved in this group of patients after laparoscopic repair. Louie et al similarly revealed a sustained improvement in GERD-HRQL scores and low rates of dysphagia following laparoscopic repair at median follow up of 1.3 years. They also showed a significant improvement of QOL scores[21]. Parameswaran et al also showed a significant improvement in symptoms of abdominal pain, GORD and indigestion scores following laparoscopic repair using validated symptom specific scores[22]. They also demonstrated high rates of patient satisfaction after surgery in keeping with those reported in our study.

We conclude that our study using patient reported outcome measures has shown that laparoscopic surgery for achalasia, GORD and POH repair results in generally high rates of patient satisfaction and improvement in QOL. Patients with achalasia and para-oesophageal hernias reported significant improvement in QOL in terms of symptoms of both dysphagia and GORD.

AUTHORS DISCLOSURES

Drs. Dobson, Thompson, and Kennedy have no conflicts of interest or financial ties to disclose.

Funding details: no funding awarded

REFERENCES

1. Dakkak M, Bennett JR. A new dysphagia score with objective validation. *J Clin Gastroenterol*. 1992;**14(2)**:99- 100.
2. Irvine EJ. Quality of life assessment in gastro-oesophageal reflux disease. *Gut*. 2004; **53(Suppl 4)**:iv35-9.
3. Ronkainen J, Agréus L. Epidemiology of reflux symptoms and GORD. *Best Pract Res Clin Gastroenterol*. 2013;**27(3)**: 325-37.
4. Wiklund I. Review of the quality of life and burden of illness in gastroesophageal reflux disease. *Dig Dis*. 2004; **22(2)**:108–14.
5. Castell DO. Achalasia and diffuse esophageal spasm. *Arch Intern Med*. 1976;**136(5)**:571-9.

6. Kennedy R, Menezes C, Ahmad J, Kennedy JA. Laparoscopic cardiomyotomy for achalasia: a single unit study. *Ulster Med J*. 2010; **79(1)**:16-9.

7. Altorki NK, Yankelevitz D, Skinner DB. Massive hiatal hernias: the anatomic basis of repair. *J Thorac Cardiovasc Surg*. 1998;**115(4)**:828-35.

8. Andujar JJ, Papasavas PK, Birdas T, Robke J, Raftopoulos Y, Gagne DJ, *et al*. Laparoscopic repair of large paraesophageal hernia is associated with a low incidence of recurrence and reoperation. *Surg Endosc*. 2004; **18(3)**: 444-7.

9. Landreneau RJ, Del Pino M, Santos R. Management of paraesophageal hernias. Surg Clin North Am. 2005; **85(3)**:411-32.

10. Borgaonkar MR, Irvine EJ. Quality of life measurement in gastrointestinal and liver disorders. *Gut*. 2000; 47(3):444-54.

11. Velanovich V, Vallance SR, Gusz JR, Tapia FV, Harkabus MA. Quality of life scale for gastroesophageal reflux disease. *J Am Coll Surg*. 1996;**183(3)**:217–24.

12. Brozek JL, Guyatt GH, Heels-Ansdell D, Degl'Innocenti A, Armstrong D, Fallone CA, *et al*. Specific HRQL instruments and symptom scores were more responsive than preference-based generic instruments in patients with GERD. *J Clin Epidemiol*. 2009; **62(1)**:102-10.

13. Watson DI, Pike GK, Baigrie RJ, Matthew G, Devitt PG, Britten-Jones R, *et al*. Prospective double-blind randomized trial of laparoscopic Nissen fundoplication with division and without division of short gastric vessels. *Ann Surg*. 1997; **226(5)**:642-52.

14. Watson DI, Jamieson GG, Devitt PG, Kennedy JA, Ellis T, Ackroyd R, *et al*. A prospective randomized trial of laparoscopic Nissen fundoplication with anterior vs posterior hiatal repair. *Arch Surg*. **136(7)**:745–51.

15. Parker C, Dewey M. Assessing research outcomes by postal questionnaire with telephone follow-up. TOTAL Study Group. Trial of Occupational Therapy and Leisure. *Int J Epidemiol*. 2000; **29(6)**: 1065-9.

16. Ponce M, Ortiz V, Juan M, Garrigues V, Castellanos C, Ponce J. Gastroesophageal reflux, quality of life, and satisfaction in patients with achalasia treated with open cardiomyotomy and partial fundoplication. *Am J Surg*. 2003; **185(6)**:560-4

17. Chan SM, Chiu PW, Wu JC, Kwan SM, Kwong PY, Lam KW, et al. (2013) Laparoscopic Heller's cardiomyotomy achieved lesser recurrent dysphagia with better quality of life when compared with endoscopic balloon dilatation for treatment of achalasia. *Dis Esophagus*. 2013; **26(3)**: 231-6.

18. Anderson S, Yadegarfar G, Arastu M, Anggiansah R, Anggiansah A. The relationship between gastro-oesophageal reflux symptoms and achalasia. *Eur J Gastroenterol Hepatol*. 2006; **18(4)**:369-74.

19. Wills VL, Hunt DR. Dysphagia after antireflux surgery. *Br J Surg*. 2001; **88(4)**: 486-99.

20. Kellokumpu I, Voutilainen M, Haglund C, Färkkilä M, Roberts PJ, Kautiainen H. Quality of life following laparoscopic Nissen fundoplication: assessing short-term and long-term outcomes. *World J Gastroenterol*. 2013; **19(24)**: 3810-8.

21. Louie BE, Blitz M, Farivar AS, Orlina J, Aye RW. Repair of symptomatic giant paraesophageal hernias in elderly (>70 years) patients results in improved quality of life. J Gastrointest Surg. 2011;**15(3)**:389-96

22. Parameswaran R, Ali A, Velmurugan S, Adjepong SE, Sigurdsson A. Laparoscopic repair of large paraesophageal hiatus hernia: quality of life and durability. *Surg Endosc*. 2006; **20(8)** :1221-4.

Ulster Med J 2016;**85(2):**103-106

Medical History

James Macartney and his Successor Arthur Jacob, Pioneers in Development of Medical Education, Hospitals, Anatomy and Surgery.

Caoimhghín S Breathnach, John B Moynihan

Accepted: 6th January 2016
Provenance: internally reviewed

SUMMARY

Initially motivated by romantic disappointment, Armagh native James Macartney moved to Dublin to train as a surgeon with William Hartigan and then to London, where his subsequent posts included attachment as Surgeon to a regiment posted to Ireland in 1811 in anticipation of a French invasion. Remaining in Ireland, two years later he succeeded Hartigan as Professor of Anatomy and Chirurgery in Trinity College Dublin where he instigated a series of substantial improvements in the materials, curriculum and buildings provided for the teaching of anatomy in the medical school, often at the expense of harmony with his colleagues.

Having suffered severe ophthalmia as a child, Macartney had a personal interest in investigation of the structure and diseases of the eye. He soon founded the National Eye Infirmary and, a few years later, secured permission from the Board of Trinity College to recruit Arthur Jacob as Demonstrator in Anatomy specialising in ophthalmology.

Shortly after arriving in Dublin, Jacob was first to publish a report identifying the 'bacillary layer of the retina' which came to be named the *membrana Jacobi* and is now known as the 'layer of rods and cones'. His academic career then progressed to include appointment to the Chair of Anatomy and Physiology in, and Presidency of, his *alma mater*, the Royal College of Surgeons in Ireland. While in his clinical practice his achievements included the founding of additional dedicated ophthalmic wards in Dublin hospitals, description of rodent ulcer on the eye-lid and innovation in the treatment of cataract, he had a parallel career as co-founder and (frequently controversial) editor of, and contributor to, the weekly Dublin Medical Press, which remained in publication as the Medical Press and Circular until 1961.

JAMES MACARTNEY (1770-1843)

James Macartney (Figure 1) was born on the 8th March 1770 in Armagh to James Macartney and his wife Mary (née Maxwell) of Mullaghbrack, north of Markethill. The boy was delicate and rigidly disciplined, but did not learn to read until he was 10 years old, at which age he also enrolled in the Armagh Corps of the Irish Volunteers. In 1782 he spent a short while at the Classical Endowed School of Armagh (Figure 2), but his education was completed at home. At 18 he left to work as a clerk in his cousins' merchant business in Newry and returned in 1791, after his father's death, to take up farming with his brothers on the family's Rosebrook estate. [1-3]

Fig 1. Sketch of James Macartney MD, FRCPI, FLS, MRIA, FRS, LLD.
"Portrait of my excellent teacher and friend Dr James Macartney Professor of Anatomy and Surgery in the University of Dublin, drawn for me by my friend Dr Ross (from the life) in or about the year 1830. James Henry MD. Dalkey Lodge. Oct 1862."

Reproduced by kind permission of the Royal College of Physicians of Ireland (ref. VM/1/2/M/1).

School of Medicine and Medical Science, University College, Belfield, Dublin 4, Ireland.

caoimhghin.breathnac@ucd.ie

Correspondence to Caoimhghín S Breathnach,

Fig 2. The Classical Endowed School of Armagh as it appeared in 1819.
One of five free schools in Ulster commissioned by King Charles in 1627, it was originally at Mount Norris and moved ("founded, anew") to the City in 1635.

Disappointed in love, he resolved to take up the profession of surgery (later writing "I thought surgery would harden my heart, as it did others. In this I have been disappointed") and in March 1794 was apprenticed in Dublin to William Hartigan (c.1756-1812), an eminent surgeon who subsequently became President of the Royal College of Surgeons in Ireland. The following Christmas, Macartney returned to Armagh to renew his courtship and married his old flame, Mary Ekinhead, the following summer, resuming his studies in Dublin in October. In 1796 they moved to London and he spent three strenuous years studying at Guy's, St. Thomas' and St. Bartholomew's Hospitals, as well as the Great Windmill Street School founded in Soho by William Hunter (1718-1783). Macartney was appointed Demonstrator in Anatomy at St. Bartholomew's in 1798 and, two years later, when he qualified for membership of the Royal College of Surgeons, he was promoted to Lecturer in Comparative Anatomy and held that post for 11 years. During that period, he showed a penchant for disputes with his colleagues, perhaps emulating his father's unforgiving nature, but nevertheless was elected a Fellow of the Royal Society in March 1811. This honour was bestowed following his presentation of two communications to the Society and he later published a wide variety of papers elsewhere on anatomy, surgery, reform of the medical profession, comparative anatomy and zoology. While working at St. Bartholomew's, since 1803 he had also been attached as Surgeon to the Royal Radnor Militia, and in August 1811 he resigned his Lectureship to move with the regiment to Ireland. [1,2]

The regiment disbanded in 1812, and in December of that year, Hartigan died and his chair of Anatomy and Chirurgery in Trinity College Dublin (to which he had been elected in 1806) fell vacant. Despite discouragement from Mrs. Hartigan (who had been promised the proceeds of the public lectures if her late husband's former deputy, Dr Wilmot, had secured the professorship), Macartney resolved to apply for the post, and in May 1813 took the MD degree at the University of St. Andrews. When the Board of Trinity College met in the following month to fill the vacant chair there were five candidates. Two of them (including Dr Wilmot) each received just one vote, two none, and Macartney was duly elected when the Provost and the five other Senior Fellows voted for him. Shortly afterwards the College conferred the MD *honoris causa* on the new Professor to soothe the misgivings of the Royal College of Physicians of Ireland. It had recommended that a physician be appointed because the duties of the post included the office of Clinical Physician to Sir Patrick Dun's Hospital, giving clinical instruction to students of Medicine, a task that it believed could not properly be undertaken by someone who had only studied and practised surgery and who, in that post, could not expect the professional cooperation of physicians on the staff of the hospital. Five years later, however, Macartney overcame this objection by persuading the Royal College of Physicians of Ireland to elect him an honorary fellow, mentioning in his letter to the President that 'I might add that Dr. Harvey discovered the circulation of the blood while preparing for his lectures on surgery in the College of Physicians of London' (Figure 3). [1,4]

Figure 3. Formal portrait of James Macartney MD, FRCPI, FLS, MRIA, FRS, LLD.

Reproduced by kind permission of the Royal College of Physicians of Ireland (ref. VM/1/2/M/1).

Macartney was ambitious for the development and reputation of the school and in the year following his appointment helped to found the Medical Society of Trinity College. Anxious to afford the most complete facilities for his students, he created a museum of anatomical specimens (which was sold to the University of Cambridge after his retirement). Over the next

ten years, in the face of indifference if not antagonism from the Board, he sought increased accommodation in order to alleviate the cramped and unpleasant conditions in which anatomy was being taught. A new building for the medical school was eventually erected in 1825 on marshy ground at the far eastern end of the campus, literally reflecting the desire of the Board to keep the medical students at a distance from other students. It also arranged its separation from the rest of the University by a wall and a rarely-opened gate, so that direct access from the campus was usually blocked. It was reached instead via a stable mews from Park Street, now Lincoln Place but then the location of 'rookeries' (slums) and disreputable public houses reported by Macartney to be tempting some of his students to gambling and drunkenness. Just as unfortunately, he had been repeatedly frustrated in his attempts to supervise its design and construction, and the result was a still-inadequate, damp and badly-built school, soon requiring almost complete reconstruction. [4]

To him, and his coeval anatomists, medical studies entailed dissection by all the students, but the demand for cadavers encouraged the provision of anatomical subjects by 'resurrection men'. In earlier days Macartney himself was once 'taken prisoner' on such an expedition and was 'not liberated before morning & treated with the greatest indignity by the Cheshire Militia' employed to watch a recent grave. When popular campaigns arose in the late 1820s against such practices, he decided to campaign amongst influential members of Dublin society to encourage the bequest of bodies by example, should the law permit. Then he petitioned Parliament to pass an Act not alone to make bequest of one's body for dissection legal and obligatory for executors to fulfil, but also to repeal the law which made it a misdemeanour to buy or possess a dead body for the purpose of dissection. In 1828 he gave evidence to the parliamentary Select Committee of enquiry responsible for drafting the Anatomy Bill of 1829. That was withdrawn in the face of opposition from the Archbishop of Canterbury but later modified to be passed as the Anatomy Act of 1832, allowing bequest and also the dissection of the bodies of deceased workhouse residents unclaimed by friends. [4,5]

He was involved in repeated disagreements with some colleagues, including occasions when he sought to undertake post mortem examinations of patients who had been under the care of other physicians and also when colleagues arranged lectures to coincide with his. The latter disagreements ultimately led to his resignation of the chair 'in consequence of repeated annoyances in the past of the Board or rather the present' in 1837. But he had not been content to rely on his own teaching alone, and in 1818 the Board granted, at his request, extraordinary permission for the specialist Arthur Jacob to give extra lectures on the structure and diseases of the eye. Macartney had a direct personal interest in these subjects, having suffered severe ophthalmia, with 'barbarous' treatment, for nearly a year at the age of eight. Thus he was a sponsor, though not a mentor, of one of the most disputatious and irascible men in Irish medicine. [1-5]

ARTHUR JACOB (1790-1874)

Arthur Jacob, whose father and grandfather were surgeons, was born in 1790 at Knockfin, near Maryborough (now Port Laoise). He was indentured to his father for three years before continuing his medical training at the Royal College of Surgeons in Dublin from 1811, becoming a Member in 1814. He continued his studies in Edinburgh (where he graduated MD in 1814) and Paris. Returning to Dublin in 1819, after further studies in London, he was appointed a Demonstrator of Anatomy in Macartney's school in Trinity College, added new specimens to the anatomy museum there, and specialised in ophthalmology. The first ophthalmic hospital in Dublin, the National Eye Infirmary, had been established by Macartney in Molesworth Street in 1814, but Jacob opened his own Eye Hospital in Kildare Street. [2,4,5-7]

In 1824 Jacob resigned from Trinity College to move both his teaching and practice to the rival Park Street School of Medicine, newly-established in response to students' dissatisfaction with conditions still prevalent in the school at nearby Trinity College. Two years later he was appointed Professor of Anatomy and Physiology in the Royal College of Surgeons in Ireland, but was said to find it difficult to keep order in his classes. One anecdote recorded a class ending in chaos after Jacob offered to fight a student who had fired a pellet at his spectacles from a pea-shooter. When Macartney resigned his chair in Trinity College in 1837, Jacob was unsuccessful in his application to replace him, receiving a vote from only one member of the Board, although nevertheless elected President of the Royal College of Surgeons in Ireland in the same year. He had founded an Ophthalmic Hospital in Pitt (now Balfe) Street in 1829 and, five years later, settled in the City of Dublin Hospital in Baggot Street (of which he had been a co-founder in 1832) after the opening of a dedicated eye ward. His younger rival, Sir William Wilde, subsequently founded the competing St. Mark's Ophthalmic Hospital in Lincoln Place (beside Trinity College) in 1844. [2,4,5-7]

Jacob extended Macartney's anatomical work on the eye and in 1819 was able to publish the first account of the 'bacillary layer of the retina' which we now refer to as the 'layer of rods and cones', sensitive to light. With the eye secured under water, the posterior half of the sclerotic was removed, and the choroid coat was opened and turned down:

> *If the exposed surface be now carefully examined… instead of the blue-white reticulated surface… usually presented by the retina… a uniform villous structure, more or less tinged by the black pigment, presents itself. If… a breach is made in it,… a membrane of great delicacy may be separated and turned down in folds over the choroid coat, presenting the most beautiful specimen of a delicate tissue which the human body affords.* [8]

The light sensitivity was a later discovery, as indeed was the fine structure of the retina described by William Bowman (1816-1892) in 1849. [9]

In 1827 Jacob described 'rodent ulcer' which attacks the eyelids and the surrounding face without contaminating the neighbouring lymphatic glands [10] and, in the same year, first recommended the removal of cataract by needling to break up the lens, using an ordinary sewing needle bent at the sharp end:

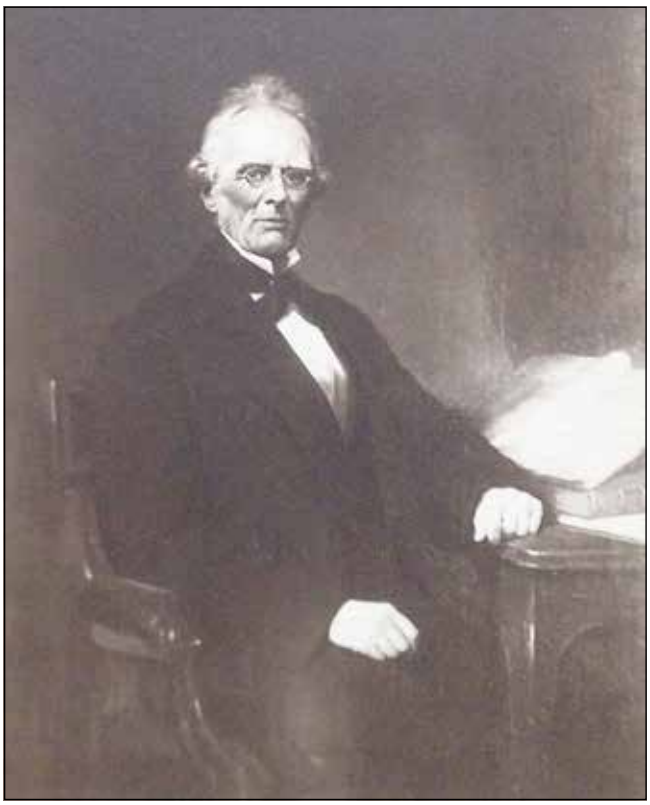


Fig 4. Portrait of Arthur Jacob, MD, FRCSI, in the year of his retirement, 1867.

Painted by Stephen Catterson Smith, PRHA, and reproduced courtesy of the Royal College of Surgeons in Ireland.

> I strike the point of the needle suddenly into the cornea, about a line [1/12 inch] from its margin, and there hold it until any struggles of the patient, which may be made, cease. There must be no hesitation… I advise the operator to pause here for a moment, holding the eye firmly and steadily on the point of his needle, and if necessary to say a word of encouragement or remonstrance to the patient. [7]
>
> Hobson's choice!

For a brief unhappy spell Jacob helped in editing the Dublin Journal of Medical & Chemical Science (founded in 1832) and later settled into editing the weekly Dublin Medical Press, which he founded with Henry Maunsell (1806-1879) in 1839 in order "to diffuse useful knowledge… to instil honourable principles, and foster kind feelings in the breast of the student" among other desirable aims. He performed his editorial duties in the realm of medical politics with provocative and combative zeal for 22 years, contributing to every issue, to be succeeded in that role for 40 more years by his fourth son, Archibald, who was also a prominent ophthalmologist in Dublin. In 1867 (Figure 4) Arthur Jacob retired from his clinical and academic appointments to live at Newbarnes (the residence of his third son, a civil engineer) in Barrow-in-Furness, where he died on 21st September 1874. [7,11]

REFERENCES

1. Kirkpatrick TP. *History of the medical teaching in Trinity College, Dublin and of the School of Physic in Ireland*. Dublin: Hanna & Neale; 1912. p. 216-223, 238, 257-264.
2. Thornton JL. A diary of James Macartney (1770-1843) with notes on his writings. *Med Hist.* 1968; **12(2)**: 164-73.
3. Fallon M, editor. *The sketches of Erinensis. Selections of Irish medical satire, 1824-1836*. London: Skilton and Shaw; 1979. p. 82-96.
4. Macalister A. *James Macartney M.D., St. Andrews and Dublin, Hon. LL.D. Cambridge, F.R.S, Professor of Anatomy and Chirurgery in the University of Dublin: a memoir*. London: Hodder & Stoughton; 1900. p. 37, 91, 129, 165, 224-229, 242, 255.
5. Coakley D. *Irish Masters of Medicine*. Dublin: Town House; 1992. p. 73-79.
6. RCSI Heritage Collection [Internet]. An eye for an eye. 2015 Apr 27 [cited 2016 Mar 18]. Dublin: Royal College of Surgeons Ireland. Available from: *http://rcsiheritage.blogspot.ie/2015_04_01_archive.html*. Last accessed March 2016.
7. Somerville-Large LB. The first Irish ocular pathologist. Arthur Jacob - (1790-1874). *Br J Ophthalmol*. 1948; **33(9)**: 601-17.
8. Jacob A. An account of a membrane in the eye, now first described. *Phil Trans R Soc Lond*. 1819; **109**: 300-7.
9. Bowman W. *Lectures on the parts concerned in the operations on the eye, and on the structure of the retina: delivered at the Royal London Ophthalmic Hospital, Moorfields, June 1847 : to which are added, a paper on the vitreous humor; and also a few cases of ophthalmic disease*. London: Longman, Brown, Green, and Longmans; 1849. p. 80.
10. Jacob A. Observations respecting an ulcer of peculiar character, which attacks the eye-lids and other parts of the face. *Dubl Hosp Rep*. 1827; **4**: 232-9.
11. Rowlette RJ. *The Medical Press and Circular 1839–1939. A hundred years in the life* of a medical journal. London: The Medical Press and Circular; 1939.

Ulster Med J 2016;**85(2):**107-112

Medical History

American Surgeons at Musgrave Park Hospital in World War II: Surgical Giants

John Hedley-Whyte, Debra R. Milamed

Accepted: 18th October 2015
Provenance: externally peer-reviewed

JOURNEY TO IRELAND

The U.S. Army 5th General Hospital[1,2] was activated on 3 January 1942 at Fort Bragg, North Carolina 3 weeks after Germany declared war on the United States. Five hundred patient beds were to be sited at "Musgrave Park in the environs of Belfast". The former boys' reformatory was occupied at that time by the 31st General Hospital of the British Army.

Fig 1. The Fifth General Hospital in Belfast, 1942[4]
First row, left to right: Saxon, Kendall, **Badger**, Keeler, **Matron Major Sinclair, Lanman** and **Zollinger.** Second Row: Strock, Emerson, Brewster, White, **Dunphy,** Pratt, Wenzel and **Quigley**. Third Row: **Simeone**, Saunders, Baldwin, Hazard, May, Smedal**,** unidentified, Cavanaugh, Freedman. Fourth Row: Hill, Burchenal, Cogdell, Dimmler, Light and Carney. Top: Tanner. **Warren.**

The 5th General Hospital embarked from New York on 19 February 1942. Seven Medical Officers, 28 Nurse Officers and 14 Enlisted Men were placed on various ships of the convoy but the remaining personnel were assigned to a single ship. This vessel, the *American Legion,* broke down in the Atlantic and subsequently returned to Halifax, Nova Scotia. The detached 7 Medical Officers (including Lt. Col. Ted Badger, to be Chief of Medicine at Musgrave Park) arrived in early March of 1942. The U.S. Nurse Officers were distributed between the 31st General and the 10th Station Hospital and the 136th Medical Regiment of the U.S. 34th Infantry Division, which had arrived in January 1942[2,3]. On 12 May 1942, the main body of the 5th General Hospital arrived at Musgrave Park. Key personnel are seen in Figure 1. Some of the U.S. personnel were stationed at Carrickfergus and commuted[2]. On May 20, I[1] attended the handover ceremony from British to US occupancy at Musgrave Park[1]. Within a fortnight, 12 wards were open and Musgrave Park was ready to care for 400 patients. By June 1942, this capacity was exceeded and Lt. Colonel Thomas Lanman became CO of an additional unit, Waringfield, a former British Emergency Medical Services (EMS) Hospital 20 miles from Musgrave Park (Table 1A). Peak patient census of 1,500 was reached that August (Table 1B).

With a hepatitis epidemic raging, U.S. Army nurses from New York's Columbia Presbyterian's 2nd General Hospital near Oxford were transferred to Musgrave Park under the supervision of Bernice Sinclair, Matron of the 5th General. These U.S. Army Nurse Officers traveled to Stranraer by train and after a rough and slow crossing landed at Larne where "almost all of the nurses were seasick"[5].

MEETING THE U.S. SURGEONS

At the welcoming party for officers of the 5th, Major, later Sir Benjamin Rycroft[6,7] introduced me to Major Robert Zollinger (Fig. 2, Fig. 3) and Captain Bert Dunphy (Fig.3). Rycroft said that he rode Sir John Milne Barbour's horses with my mother, Nancy. Zollinger said he knew that Barbour was President of the Royal Victoria Hospital. Zollinger added that he had made a living with his pony and trap delivering and selling milk for half-pennies a pint[8]. At a dinner party at our house, Major Zollinger met my pony and vowed to look after him if I had to return to England. Max, later Lord Rosenheim[7] greeted Zollinger, with whom he had become acquainted while Rosenheim was a physician at Massachusetts General Hospital, when Bert Dunphy and Robert Zollinger were surgeons at the Peter Bent Brigham, a hospital made famous by Cushing and Cutler[9,10,11,12], where Matron[2] from 1917 to 1937 was Carrie Hall (Fig. 4)[13].

1 This and subsequent first-person references refer to the first author.
2 The professional and military titles of the nurse officers mentioned in this paper reflect designations assigned at specific times and locations; these titles were often retained post-war.

David S. Sheridan Professorship in Anaesthesia and Respiratory Therapy, Harvard University, 1400 VFW Parkway, Boston, MA 02132-4927 USA

john_hedley-whyte@hms.harvard.edu

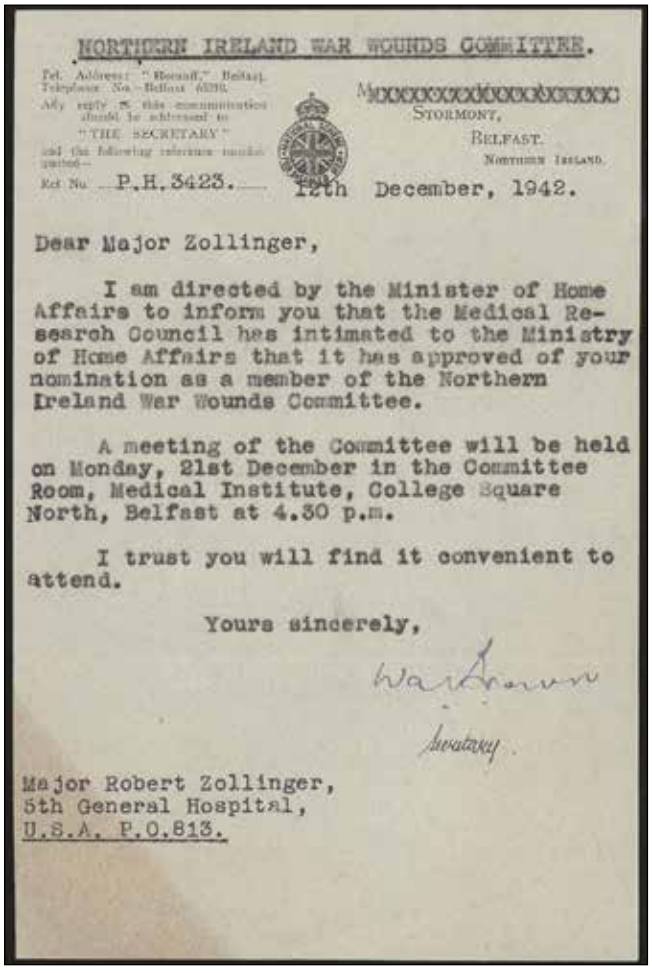
Correspondence to Prof. Hedley-Whyte

Table 1A.

United States Army Forces in Northern Ireland stations of units, United States Army Hospitals functioning in Ulster[3] in 1942

Location	County	Dates	Unit
Musgrave Park	Antrim	21 May-25 Nov 1942	5th General Hospital (V Corps)
Waringfield	Armagh	June 1942-	Detachment, 5th General Hospital
Waringfield	Armagh	1942	Detachment, 2nd General Hospital
Irvinestown	Fermanagh	19 Sep 1942-28 Dec 1943	160th Station Hospital (250- bed) (V Corps)
Ebrington Barracks (Londonderry)	Londonderry	19 May 1942-	10th Station Hospital

At the welcoming party, Benjamin Rycroft played our landlord's piano. Rycroft said he preferred George Gershwin, but would take requests. Tom Quigley asked for the "Mountains of Mourne". Tom had appeared in Repertory Theatre in Cape Cod with Jimmy Stewart and Henry Fonda[12] and said that he would sing "Mourne" solo, but we should sing the chorus. We did with feeling—casualties had been coming in from the U.S. 1st Armored Division's training "in the place where the dark Mournes sweep down to the sea"[14,15].



NORTHERN IRELAND WAR WOUNDS COMMITTEE.

Tel. Address: "Herald," Belfast.
Telephone No.—Belfast 4000.
Any reply or this communication should be addressed to "THE SECRETARY" and the following reference quoted—

Ref No. P.H.3423.

STORMONT,
BELFAST.
NORTHERN IRELAND.

12th December, 1942.

Dear Major Zollinger,

I am directed by the Minister of Home Affairs to inform you that the Medical Research Council has intimated to the Ministry of Home Affairs that it has approved of your nomination as a member of the Northern Ireland War Wounds Committee.

A meeting of the Committee will be held on Monday, 21st December in the Committee Room, Medical Institute, College Square North, Belfast at 4.30 p.m.

I trust you will find it convenient to attend.

Yours sincerely,

Secretary.

Major Robert Zollinger,
5th General Hospital,
U.S.A. P.O.813.

Fig 2. 1942 letter stating that Major Robert Zollinger had been appointed to the British Medical Research Council War Wounds Committee. Photograph courtesy of the Robert M. Zollinger MD Collection, Spec.199301. Zollinger, Medical Heritage Center, Health Sciences Library, The Ohio State University.

By 1942, John Englebert Dunphy already had an unusual career[11,12,16]. One stunt involved masquerading as Dr. Wycoff, a pompous Englishman. Dunphy read a paper entitled "The Protopathic Blood Iodides of Primiparous Women of Northern India". At the end of this speech to a serious Harvard University Dining Club, still unrecognized by the audience, the toastmaster, who was in on the secret, asked if there was any discussion. There being none, the toastmaster asked the speaker if he had seen any changes since the 1920s. 'Wycoff' then criticized the U.S. flag, medicine in the USA, and most everything to do with the audience. Only then was he recognized by a prominent member of the Harvard Faculty[16]. Not surprisingly, he failed to gain an internship there.

Fig 3. Elliott Carr Cutler and his two protégés, Majors Robert M. Zollinger and J. Englebert ("Bert") Dunphy, just outside Musgrave Park. All would receive an Honorary FRCS (Eng). Photograph courtesy of the Robert M. Zollinger MD Collection, Spec.199301. Zollinger, Medical Heritage Center, Health Sciences Library, The Ohio State University.

Professor S. Burt Wolbach gave Dunphy a Fellowship in Pathology at Harvard, and later recommended Dunphy for a delayed Surgical Internship under Robert Zollinger as Chief Resident but commented: "Needs a strong hand. Beware of his leprechaun."

Zollinger admitted that supervising Dunphy was hard work, commenting: "Greatest job leading that young man." Later, when accused by Zollinger of embroidering their stories,

TABLE 1B.

United States Army Forces in Northern Ireland stations of Units, Army Medical Units suited for Medical and Surgical Therapy[3]

Location	County	Dates	Unit
Breandrum (Enniskillen)	Fermanagh	1942	109th Medical Battalion (less two collecting companies (34th Infantry Division)
Ballymoney	Antrim	3 March-3 May 1942	53d Medical Battalion (V Corps)
Balmoral	Antrim	-27 Nov 1942	1st Section, 1st Platoon, Company A, 63rd Quartermaster Laundry Battalion
Balmoral	Antrim	8 Nov 1942-28 Feb 1943	1st Platoon, Company D, 94th Quartermaster Bakery Battalion (V Corps)
Belfast	Antrim	13 May-1 July 1942	Section, 4th Medical Supply Depot
Belfast	Antrim	1942	Company A, 63d Quartermaster Battalion (Laundry)
Brownlow House	Armagh	1 June 1942-	Headquarters, V Corps
Castlewellan	Down	May 1942	Headquarters, 1st Armored Division
Castlewellan	Down	1942	Headquarters, Combat Command B, 1st Armored Division
Castlewellan	Down	1942	Headquarters, Artillery Command, 1st Armored Division
Castlewellan	Down	1942	141st Signal Company (1st Armored Division)
Celtic Park (Enniskillen)	Fermanagh	13 Jun-14 Dec 1942	Headquarters and Headquarters Company (Less Maintenance and Service Platoons), 109th Quartermaster Battalion
Celtic Park (Enniskillen)	Fermanagh	19 Jun-14 Dec 1942	Maintenance Platoon, Headquarters Company, 109th Quartermaster Battalion
Drumdarragh House (Doagh)	Antrim	1942-9 Jan 1943	53d Medical Battalion (less Companies A and B)
Lisgoole Abbey (Enniskillen)	Fermanagh	1942	One collecting company of 109th Medical Battalion (34th Infantry Division)
Prospect House (Carrickfergus)	Antrim	1942	Companies A and B, 53d Medical Battalion
Tollymore Park (Bryansford)	Armagh	11 June -31 Oct 1942	47th Armored Medical Battalion (1st Armored Division)

Dunphy replied, "It's my leprechaun, I picked him up working for you, where 'the Mountains of Mourne sweep down to the sea'". "My foot," was Zollinger's response.

Amongst the senior nursing staff were Matron Carrie Hall (Fig. 4) and Matron Bernice Sinclair (Fig 5), a 1924 graduate of the Peter Bent Brigham Hospital School of Nursing and an instructor at her alma mater for over a decade. She served as hostess and guide to such visiting dignitaries as Clementine Churchill, Massachusetts Senator and later U.N. Ambassador Henry Cabot Lodge, Jr., and Eleanor Roosevelt[13,17]. President Clinton gave a U.S. Presidential Citation to Bernice Sinclair for her service in World War II and afterwards in her native state of New Hampshire [17].

In December 1942, 549 patients were flown or shipped to the United States and the 5th General Hospital staff were flown to Odstock near Salisbury, a new specially constructed facility. Three hundred and sixty-one remaining Musgrave Park patients were transferred to the U.S. 10th Station Hospital (Table 1A). From May 21st to Christmas 1942, the U.S. 5th General Hospital at Musgrave had cared for 7,487 patients[2].

INTO EUROPE

After D-Day a German bullet holed the crossbar of Zollinger's Normandy cot. A strong odour led to commotion and cries of 'poison gas'. The bed crossbar had shattered a bottle of Worcestershire sauce. Bert Dunphy repeatedly embroidered that happening almost to the level of a World War I gas attack.

On another occasion, just after the breakout from St. Lô, Zollinger and another colonel were riding in a jeep. It was raining hard. The canvas top was up. They were spotted and stopped by the commander of the newly deployed Third Army, General George S. Patton, Jr., himself. "Did they not know they were willfully disobeying his personal orders—all the tops down all the time, whatever the weather, for identification? This gross disobedience might lead to court-martial or friendly fire. Dunphy asked Zollie why he had not acted like Matron Helen Coghlan[18,19]. She had taken General Patton by the scruff of his neck in Sicily and thrown him out of the U.S. Army's 93rd Evacuation Hospital. Her comment at that time was "General, you go run the Army, I'll run this hospital!" and gave "pistol-packing George Patton a push out

of the front door"[20].

At the height of the Battle of the Bulge with the 5th General Hospital at Toul, orders came to prepare to retreat. Colonel Zollinger as CO was to stay alone with the patients to properly surrender and handover the patients to the enemy forces. Bert Dunphy said he looked forward to liberating "Zolly" from a German POW camp.

COLONEL SINCLAIR'S IMPORTANT ASSIGNMENT

Matron Bernice Sinclair was transferred along with the other Harvard personnel to the 5th General Hospital's new location near Salisbury, England [17,21]. In May 1944, she was appointed Chief Nurse for the United States 3rd Army, and became the only woman on General George S. Patton Jr.'s staff. Eisenhower felt that Patton needed a moderating influence [17]. From what my father later ascertained, she was recommended by Arthur, later Lord Porritt, Surgeon to Montgomery and King George VI[22,23]. She was promoted to Colonel and given her own transportation and laissez-faire pass. Her letter to the Peter Bent Brigham was contemporaneously written, but released on 9 May 1945:

Fig 4. Carrie M. Hall, Founder and Director, Peter Bent Brigham Hospital School of Nursing, 1912- 1937. Oil on canvas by Emil Pollak-Ottendorf (1864-1950), presented 1934. Dimensions 91 x 61 cm. From the collections of the Brigham and Women's Hospital, Boston, MA. Photography by Mainframe Photographics, Inc., Boston, MA.

"Gradually we worked our way through the towns that you will recall reading about, Periers, St. Lô, Avranches .... General Patton is a charming host, keenly appreciative of the work of the Army Nursing Corps… For a while my tent was pitched on the famous race track at Rennes, then I moved along through LeMans, Chartres, Orleans, visited Fontainebleau and got into Paris about two weeks after it was taken"[24]. By Christmas 1944 the 5th General Hospital had moved up to within a few miles of Patton and Sinclair, who had moved to Luxembourg to "help take care of the Bastogne break-through"[24,25].

Fig 5. Major Bernice Sinclair with General George S. Patton, Jr. (far left), preparing to present medals. Colonel Sinclair received the U.S. Legion of Merit in 1945. Photograph courtesy of the *Cocheco Times*, Weirs, New Hampshire[17].

On December 9, 1945, Colonel Sinclair was consulted about the most appropriate neurosurgeon to treat General Patton's cervical dislocation. Patton had been admitted to the 130th Station Hospital of the U.S. Seventh Army. Brigadier Cairns was forthwith flown from Oxford to Heidelberg. On December 17th zygomatic hooks were replaced with a plaster collar: the fracture-dislocation alignment was nearly perfect. On December 19th, Cairns decided it was safe to fly a conscious, spontaneously breathing Patton to the U.S. On December 20th, Patton suffered a right pulmonary embolus verified by X-ray; Patton died in his sleep on December 21, 1945[25]. I was kindly fed by the Cairns' in their Oxford home. The question of Patton came up. Professor Cairns thought he might have made it except for the pulmonary embolus.

OTHER SURGEONS AT MUSGRAVE PARK

Richard Warren (1907-1999) had an illustrious medical ancestry. Dr. Joseph Warren was the leading surgeon and physician in Boston and Major General under George Washington [26,27] . Joseph's younger brother, John, founded Harvard Medical School in 1782. Thereafter his son, John Collins Warren co-founded the Massachusetts General Hospital in 1811 [28,29,30]. His life seemed to me in 1942, and for the next half century, to be "entirely fitting for the inheritor of a family tradition, going back more than three centuries"[31].

Fiorindo A. Simeone (Fig. 1) was educated in Providence, Rhode Island, and at Brown University where his distinguished research on smooth muscle led to work with

Walter Cannon and an MD magna cum laude from Harvard Medical School in 1934. Simeone completed his surgical residency at the Massachusetts General Hospital under Professor Edward D (Pete) Churchill[9] before in 1940, being seconded to the Peter Bent Brigham. His war research with Professor Henry K. Beecher, the head of Anaesthesia at the Massachusetts General Hospital, led to classic reports from their World War II research group[32,33]. Having set up a vascular unit with Robert R. Linton at the Massachusetts General Hospital, Simeone was called to Western Reserve University in Cleveland. In 1967 he returned to Brown to become Head of Surgery. He came often to the operating rooms and offices at Harvard where he was "kind, thoughtful and compassionate"[33].

Carlyle G. Flake was a Virginian who received his M.D. from the University of Virginia in 1931. Internship and residency in surgery at Johns Hopkins followed. In 1937 Flake was called to Harvard. On January 10, 1942, he joined the 5th General Hospital as a Major and Chief of ENT. Flake was superb at retrieving extraneous objects from the lung. He commented on his extensive experience: "At least 30 a year for 30 years—bullets, safety pins, stones." Flake was discharged in November 1945 as a Colonel. He returned to the Brigham and the adjacent Children's Hospital to add his experience of draining World War II lung abscesses via the bronchi or by thoracotomy. He retired in 1971 [34,35].

The Chief Orthopaedic Surgeon at Musgrave Park was Thomas B. Quigley[2]. After college and medical school at Harvard, Quigley spent 1934 studying Pathology in New York City, from where Elliott C. Cutler appointed him Harvey Cushing Fellow at the Brigham followed by the Arthur Tracy Cabot Fellowship[12]. He was appointed an Associate at the Harvard University Athletic Department in 1945[36]. The President of Harvard University, James B. Conant, appointed Quigley Chief Surgeon to the Athletic Department in 1952.[37]

LEGACY

The Hirsch (*h*) indices of citation for the four 5th General Hospital general surgeons, Zollinger, Dunphy, Warren and Simeone, average 36, twice the de facto hurdle of 18 for a full professorship in a medical school[38,39]. Collectively this general surgical quadrumvirate wrote 30 papers that have each been cited more than 100 times. In the last five years to the present the publications of Dunphy have been cited more than 250 times and Zollinger's 200 times. Each of the 1942 Musgrave Park surgeons were transformative figures of surgery[32,40,41]. Judging by the high rate of citation of a quarter century after their deaths, their influence does not wane. Zollinger was from 1958 to 1986 Editor-in-Chief of the *American Journal of Surgery*[8]; almost contemporaneously, Warren was Editor-in-Chief of the *Archives of Surgery*[12,26].

AKNOWLEDGEMENTS

The authors thank Ms. Catherine M. Pate, M.S., Brigham and Women's Hospital Archivist at the Countway Library of Medicine, Harvard University, Ms. Ann Fladger, M.S., Librarian, Brigham and Womens' Hospital Library and Ms. Martha E. Stone, M.S., AHIP, Coordinator for Reference Services, Treadwell Library, Massachusetts General Hospital, for their expert and patient assistance with our research on the U.S. Army Nurse Officers from the Harvard-affiliated hospitals. The authors thank Mr. Rob Sargent, Librarian at the Franklin, New Hampshire Public Library, for biographical information about Col. Bernice Sinclair. The authors thank Ms. Alina J. Morris, MLIS, Hospital Archivist, Boston Children's Hospital for biographical information about Dr. Carlyle G. Flake. The authors thank Ms. Kristin Rodgers, MLIS, Curator, Health Sciences Library, Medical Heritage Center, Ohio State University, Columbus, Ohio, for assistance with material reproduced from the Robert M. Zollinger Archives.

The preparation of this manuscript and related costs were supported in full by the David S. Sheridan Professorship of Anaesthesia and Respiratory Therapy of Harvard University.

REFERENCES

1. Hedley-Whyte J. Epidemic jaundice: Harvard's 5th General Hospital at Musgrave Park in World War II. *Ulster Med J*. 2005;**74(2)**:122-5.
2. World War II U.S. Medical Research Centre. *5th General Hospital, Unit History*. Available from: http://www.med-dept.com/unit-histories/5th-general-hospital. Last accessed March 2016.
3. U.S. Army. Center for Military History. *U.S. Army in Northern Ireland, 1941-1945. Station List*. http://www.history.army.mil/reference/ireland/nistat.htm. Last accessed March 2016.
4. Bricker EM. Colonel Robert M Zollinger in World War II. *Am J Surg*. 1986; **151(6)**:659-65.
5. Tomblin BB. *G.I. Nightingales: The Army Nurse Corps in World War II*. Chapter 6.To the Rhine and Beyond, p.120-152. Lexington, KY: University Press of Kentucky; 1996. p.121.
6. Hedley-Whyte J, Milamed DR. Asbestos and shipbuilding: fatal consequences. *Ulster Med J*. 2008;**77(3)**:190-200.
7. Hedley-Whyte J, Milamed DR. Lobar pneumonia treated by Musgrave Park physicians. *Ulster Med J*. 2009;**78(2)**:119-28.
8. Van Brimmer B. Dr. Robert M. Zollinger: his legacy. *Am J Surg*. 2003;**186(3)**:217-23.
9. Hedley-Whyte J, Milamed DR. Our blood your money. *Ulster Med J*. 2013;**82(2)**:114-20.
10. Cutler EC. Fifth General Hospital (Harvard University Unit), U.S. Army. *Harv Med Alumni Bull*. 1942;**16(2)**:27-9.
11. Zollinger RM. "Bert". *Am J Surg*. 1978;**135(3)**:276-8.
12. Zollinger RM. *Elliott Carr Cutler and the cloning of surgeons*. Mount Kisco, NY: Futura Publishing Co.; 1988.
13. King M. *The Peter Bent Brigham Hospital School of Nursing: a history*, 1912-1985. Boston, MA: Brigham and Women's Hospital; 1987.
14. U.S. Army. Center for Military History. *United States Army in World War II. United States Army forces in Northern Ireland: Chronology*. Available from: http://www.history.army.mil/reference/Ireland/IRECHR.htm. Last accessed March 2016.
15. Na Hatta R. An Irish Troubadour. *Ulster Herald*. 2014 May 8; Available from: http:www.ulsterherald.com/2014/05/08/an-irish-troubadour. Last accessed March 2016.
16. Quigley TB, Crile G Jr., Hoerr SO, Harrison JH. As we remember him [Bert Dunphy]. *Am J Surg*. 1978;**135(3):**279-80.
17. Evans J. Bernice Sinclair: a New Hampshire Nurse's Odyssey. *Cocheco Times*. 2012 March 29; **21(13)**:1,24,26-28.
18. MacDonald ME. In memory of Helen "Coggie" Coghlan. *Massachusetts General Hospital Quarterly Review*, September 1990, p. 12-13.
19. Faxon NW. *The Massachusetts General Hospital, 1935-1955*. Cambridge, MA: Harvard University Press; 1959. p. 113,119, 334, 376.

20. Battit GE. The later development of the operating rooms, p129-149. In: Kitz RJ, ed. *This is no Humbug! Reminiscences of the Department of Anesthesia at the Massachusetts General Hospital*. Ashland, Ohio: Atlas books; 2003. p 137.

21. Cutler EC. Experiences of an Army doctor in the European Theater of War. *Am J Surg*. 1947;**73(6)**:637-50.

22. Hedley-Whyte J, Milamed DR. Surgical Travellers: tapestry to Bayeux. *Ulster Med J*. 2014;**83(3)**:171-7.

23. Hedley-Whyte J., Milamed DR. The Battle of the Atlantic and American preparations for World War II in Northern Ireland, 1940-1941 (before Pearl Harbor). *Ulster Med J* 2015;**84(2)**:113-6.

24. Sinclair BJ. Letter to Brigham and Women's Hospital, published in the *Alumnae Journal*. June 1945. In: King M. *The Peter Bent Brigham Hospital School of nursing: a history 1912-1985*. Boston, MA: Brigham and Women's Hospital; 1987. p. 105-14.

25. D'Este C. *Patton: A Genius for War*. Chapter 43. Patton of course: the Battle of the Bulge. Chapter 47. "A hell of a way to die." New York: Harper Collins; 1995. p. 674-702; 783-804.

26. Cary JH. *Joseph Warren: physician, politician, patriot*. Urbana, IL: University of Illinois Press; 1961.

27. Nelson JL. *With Fire and Sword: the Battle of Bunker Hill and the beginning of the American Revolution*. New York: Thomas Dunne Books, St. Martin's Press; 2011. p. 39.

28. Churchill ED. *To work in the vineyard of surgery: the reminiscences of J Collins Warren (1842-1927)*. Cambridge, MA: Harvard University Press; 1958.

29. Massachusetts Historical Society. John Collins Warren (1778-1856) Papers, 1738-1926. Ms.N-1731. Available from: http://www.masshist.org/collection-guides/viewfa0183. Last accessed March 2016.

30. Countway Library of Medicine. A family practice: the Warrens of Harvard Medical School. An online catalog of the exhibit. Available from: http://www.countway.harvard.edu/chm/rarebooks/exhibits/warrens/. Last accessed March 2016.

31. Moore FD, Barsamian EM, Couch NP, Khuri SF, Vandam LD, Wheeler HB. Memorial minute: Richard Warren, Faculty of Medicine. *Harv Gazette*. 2001 June 27. Available from: http://news.harvard.edu/gazette/2001/06.07/33-warrenminute.html. Last accessed March 2016.

32. DeBakey ME, Simeone FA. Battle injuries of the arteries in World War II – An analysis of 2,471 cases. *Ann Surg*. 1946;**123(4)**:534-79.

33. Hopkins RW. In memoriam Fiorindo A. Simeone, M.D. 1908-1990. *J Vasc Surg*. 1992;**16(5):**794-5.

34. Former Otolaryngologist-in-Chief Dies. *News in Brief*. The Children's Hospital, Boston. September 1983. p 2.

35. Carlyle Gregory Flake 1905-1983. Archival File. Library of the Childrens' Hospital of Boston, MA.

36. Warren R. In Memoriam. Thomas B. Quigley 1908-1982. *Harv Med Alumni Bull*. 1983;**57(3):**59-61.

37. Akins CM. History of the Quigley Society. Harvard Varsity Club. Available from: https://www.harvardvarsityclub.org/article.html?aid=128. Last accessed March 2016.

38. Hedley-Whyte J, Milamed DR, Hoaglin DC. Chairpersons of pathology in the United States: limited benchmarks for publications. *Am J Clin Pathol*. 2010;**134(2)**:185-92.

39. Morrison PJ. The Hirsch Index and measuring the quality of scientific papers [editorial]. *Ulster Med J*. 2008;**77(1)**:1.

40. Zollinger RM, Ellison EH. Primary peptic ulcerations of the jejunum associated with islet cell tumors of the pancreas. *Ann Surg*. 1955;**142(4)**:709-23.

41. Milamed DR, Hedley-Whyte J. Contributions of the surgical sciences to a reduction of the mortality rate in the United States for the period 1968 to 1988. *Ann Surg*. 1994;**219(1)**:94-102.

Ulster Med J 2016;**85(2):**113-117

Medical Education

The Educational Value Of Post-Take Ward Rounds For Senior Trainees

Faidon-Marios Laskaratos, David Parry, Hanan El-Mileik

Accepted: 15th February 2016
Provenance: externally peer-reviewed

ABSTRACT

Background: The educational value of post-take ward rounds (PTWRs) is an under-researched area of postgraduate medical education.

Objective: We investigated perceptions of this activity amongst higher specialty trainees.

Methods: The project was conducted in a large district general hospital in London, UK. Quantitative and qualitative data were collected to establish opinions of the PTWR amongst higher specialty trainees in medicine. Eighteen senior trainees were eligible to participate. Of these, 14 (78%) responded to our questionnaire and 4 were selected by purposive sampling to participate in semi-structured interviews.

Results: Most trainees felt that the focus of PTWRs was service provision with little time devoted to teaching (79% of respondents) and that feedback was rarely provided (71% of respondents). Trainees commented on learning opportunities available on PTWRs, as well as consultant behaviour they considered valuable. The main barriers to teaching and learning were time pressures, workload, interruptions, management (rather than patient assessment) focus, lack of follow-up of cases and feedback. The data included useful suggestions for improving the educational value of PTWRs.

Conclusions: PTWRs are currently a wasted educational opportunity. Radical change to organisation and practice will be necessary to address this. There will be resource implications.

Keywords: Ward round, post-take ward round, medical education

INTRODUCTION

The ward round (WR) has been compared with "walking a tightrope".[1] The medical teacher must balance service demands with the educational needs of learners and often has to teach multiple learners, at different stages of training, who have different learning objectives. The rotational nature of training and the shift-work pattern of learners add to the complexity of this educational activity.[2]

The PTWR is a specific type of WR, in which a consultant reviews the patients admitted to hospital as acute medical emergencies within 24 hours of admission. The patients have usually been initially assessed by a trainee who would normally present the case to the consultant during the PTWR.[3] The traditional role of the PTWR is to provide both teaching in acute medicine and a review of patients.[4]

There is limited literature available in relation to the educational value of ward rounds in general and a very small number of studies have focused specifically on the role of the PTWR. This is surprising, considering that PTWRs are a central component of registrars' training in General Internal Medicine (GIM). The present study investigated higher specialty trainees' (HST) perceptions of the educational value of PTWRs with a specific focus on the characteristics of PTWRs, the available learning opportunities and barriers to effective learning, as well as suggestions for improving the quality of teaching and learning on PTWRs.

METHODS

The setting for this study was a large district general hospital in London, UK. The participants were medical HSTs involved in GIM on-calls and PTWRs. The target population for this study included 18 medical HSTs, of whom 7 were male and 11 were female. Trainees were from the following specialties: acute medicine, cardiology, endocrinology, gastroenterology, geriatrics and respiratory medicine.

The study was divided into two phases: a questionnaire phase and an interview phase.

A previously piloted questionnaire (**Appendix 1**) was

University College London
flaskaratos@gmail.com
Correspondence to Dr Faidon Laskaratos

Table 1:

Characteristics of PTWRs

	Never	On few PTWRs	On some PTWRs	On most PTWRs	On every PTWR
I have opportunities to ask questions	2	3		7	2
The consultant makes changes in my initial differential diagnosis	2	10	1		1
The consultant makes changes in my management plan	1	8	4		1
There is some time devoted to teaching (formal or informal)	7	4	2		1
I learn something new	4	4	5		1
The consultant asks me questions	4	4	3	1	2
I receive feedback on my performance	7	3	2	1	1

distributed to all medical HSTs. The questionnaire was designed to cover a wide range of topics relating to teaching and learning on PTWRs and was divided into five parts: demographic data, characteristics of PTWRs, learning opportunities, suggestions for improvement and factors that may limit learning opportunities on PTWRs. The questionnaire design allowed the collection of both quantitative and qualitative data. The questionnaire was distributed several months after the start of the academic year and as a result trainees had been exposed to PTWRs for a sufficient period of time. The questionnaire was anonymous and participation was voluntary. Once the questionnaire collection had been completed, data were coded and interesting themes that emerged from the questionnaire data were further explored during the interview phase.

A purposively selected sample of 4 trainees was used for the interview phase. Purposive sampling allowed the selection of trainees from different specialties and different grades, thus making the sample more representative, but the risk of selection bias was also acknowledged.[5] The trainees who participated in the interviews were from different levels of training (ST3-ST6) and different specialties (gastroenterology, endocrinology, respiratory medicine. Two trainees were from gastroenterology, which was the specialty with the highest number of HST in the hospital, thus requiring a proportionately larger representation). The interviews covered four main themes: feedback, team structure, time and quality issues and suggestions for improvement **(Appendix 2)**. The interviews were audiotaped and transcribed.

Thematic analysis was used to organise qualitative data and two authors with experience in medical education research (FL, HEM) reviewed the interview transcripts and created codes and overarching themes.

The study protocol was reviewed by the University College London (UCL) Ethics Screening Service and did not require formal ethical approval by the UCL Research Ethics Committee.

RESULTS

A. Questionnaire data

Demographic data

A total of 14 out of 18 higher specialty trainees returned the questionnaire (response rate 78%). There was a balanced representation in terms of sex and speciality.

Characteristics of PTWRs

Most responders (n=11) participated in one PTWR per week on average, with a few (n=2) participating in two PTWRs per week and one on a daily basis.

Many trainees reported that they had opportunities to ask questions during the PTWR. However, many stated that consultants rarely asked them questions and often they learned nothing new after the PTWR. The majority of the responders felt that changes were rarely made in their diagnosis and management plan, that little time was devoted to teaching (either formal or informal) and that they rarely received feedback on their performance (**Table 1**).

Trainees also mentioned that the focus of the PTWR was on service provision rather than education and that there was often lack of feedback. In addition, trainees mentioned that consultants were probably interested in teaching but it was often difficult to create personal relationships with acute medical consultants. For example, one trainee wrote: *'Although it seems consultants no longer care about junior doctors (as service is now so consultant-delivered that they see junior doctors as just there to bring up the results on the computer screen and find the patient and notes) deep down I think they still feel a sense that teaching is an inherent responsibility for a senior doctor.'*

Learning opportunities

In relation to clinical skills, most responders felt that PTWRs were not very useful in conveying medical knowledge or learning history taking or physical examination. However,

they were valuable in learning how to make difficult decisions, such as those about escalation of care or resuscitation (**Table 2**).

Trainees also reported that PTWRs were usually busy and quick, which limited learning opportunities. For example, one trainee wrote: *'Post-take ward-rounds are about service provision due to the high volume of patients, not teaching'*.

In addition, they felt that PTWRs were more valuable when led by a specialty consultant rather than a general physician. Responders mentioned that PTWRs were also useful in the development of non-clinical skills, such as communication, time management and leadership skills.

Most trainees felt that valuable consultant behaviours on PTWRs included the consultant explaining his/her thought processes, giving feedback and his/her approach towards patients and staff (role modeling). Some trainees also valued other behaviours, such as the consultant's experience and ability to advise in difficult situations. They appreciated a constructive challenging approach from their consultants.

Factors that limit trainees' learning opportunities

Most trainees agreed that there were several factors limiting learning opportunities, including time pressures, large volume of patients, frequent interruptions, lack of follow-up of cases, the fact that their main duty was the organisation and management of the acute take and that they often did not have the chance to present their patients on the PTWR and receive feedback.

Suggestions for improvement

Trainees made several suggestions for improving the quality of teaching and their learning opportunities on PTWRs, which included changes in trainee (active participation, setting of learning objectives/goals, reflection on performance) and consultant behaviours (consideration of teaching role, development of a personal relationship with trainees, provision of feedback to trainees and explanation of rationale for clinical decisions), as well as structural changes (protected time for PTWRs, discussion of interesting cases at Grand Round meetings, protected time for completion of workplace-based assessments [WPBAs]).

B. Interview data

Feedback

Trainees mentioned that feedback was generally non-specific and variable depending on the type of the shift (e.g. day on-call or night shift) and the role of the trainee in the acute take.

For example, trainee 1 mentioned:

"Other than perhaps in workplace-based assessments, I would not say that you get specific feedback really. Perhaps there may be a change in the management plan and indirectly that is feedback of some sort"

Trainees also mentioned that the quality of feedback varied depending on the background of the consultant (locum vs. permanent, general physician vs. specialty consultant) and their relationship with trainees.

For instance, trainee 2 stated:

"I think the teaching is better when you have a specialty consultant, because they are more thorough…and they have more expertise. The acute physicians are very good in the general management of acutely unwell patients, but do not get into the details of the management of each patient"

II. *Team structure*

Trainees agreed that there was lack of a "firm structure" on the PTWR, as they were on-call with a different set of doctors each time and this had an impact on their learning. They felt more comfortable with permanent consultants rather than locums and with specialty consultants instead of general physicians. They reported that generally there was little interaction with consultants.

III. *Time issues, quality and value of PTWRs*

Trainees stated that teaching and learning on PTWRs was often compromised due to time pressures and that they learnt more from consultants who spent more time to review each case.

For example, trainee 1 stated:

"Some consultants are very quick and some will take a very

TABLE 2:

Learning opportunities

Clinical skills	1 (not beneficial)	2	3	4 (extremely beneficial)
Conveying medical knowledge	4	5	2	3
History taking	5	4	3	2
Physical examination	6	5	1	2
Diagnostic investigations	3	4	5	2
Patient management	3	4	3	4
Difficult decision making	3	3	3	5

long time, look at every investigation and they are probably the ones where there is more opportunity to learn"

Trainees also mentioned there was rarely change in their management, but sometimes the consultant would make a more complete and long-term plan. Trainees felt that another issue affecting the educational value of PTWRs was the fact that the PTWR was often done in the absence of the clerking doctors.

For instance, trainee 2 mentioned:

"Certainly after the night take, the consultant will come at 8am and the handover is at 8:45am, so then they post-take your patient without you having presented them; so unless you go back, you won't know what they thought and you wouldn't have got feedback"

IV. *Suggestions for improvement*

Trainees made several suggestions for improving the quality of teaching and learning on PTWRs, which were divided into 3 categories:

a. Actions that trainees should take

Trainees reported that they should become more proactive by following-up their cases, asking for feedback, participating actively and improving the efficiency of the team on the PTWR, so that consultants have more time to teach.

b. Actions that consultants should take

Trainees agreed that consultants should devote more time to teaching and feedback by discussing selected cases with trainees, organising teaching sessions and having post-round briefings with trainees.

c. Actions that institutions should take

Trainees reported that changes should be made to the on-call rota, in order to preserve a firm team structure with the same set of doctors and ideally consultants being on-call together. They also suggested that staffing levels should be improved to reduce time constraints due to the high volume of workload and allow more time for teaching. Specialty-specific teaching in organised multidisciplinary meetings, such as Grand Rounds, was also felt to be useful.

DISCUSSION

Our findings suggest that although medical registrars are exposed to a busy clinical environment with potentially many opportunities for teaching and learning, it is often difficult to make appropriate use of these experiences due to several limiting factors. Other studies have also shown that trainees considered WRs to be predominantly service orientated with little time devoted to teaching. [6,7] Chaponda et al (2009) conducted an audit to assess the educational value of PTWRs and concluded that, although National Health System (NHS) targets were met, junior doctors' education was compromised with the introduction of the European Working Time Directive (EWTD) and Modernising Medical Careers (MMC).[4] A number of factors which are undermining teaching and learning in the workplace have been identified in both this and previous studies[6-8], including time pressures, large number of patients, changes in team structure, interruptions, lack of interest from seniors and lack of organisation. Interestingly, our study also showed that lack of follow-up of cases seen on PTWRs is perceived as one of the most important factors limiting learning opportunities. Trainees tend to perform the initial assessment and management of patients, but do not usually follow-up their progress. This demonstrates that trainees need to become more active learners, take ownership of their own learning and make an effort to follow up their cases, in order to maximize learning opportunities on PTWRs.

Our study suggested that the quality of PTWR teaching and learning could be improved with changes in current practice. Active trainee participation on the rounds was highlighted as one of the key factors that could have a positive impact. This is in keeping with the findings of a previous study which showed that trainees who were uninvolved failed to benefit from many learning opportunities available on PTWRs, whereas those who were participating more actively by asking questions and presenting patients were more likely to develop their skills and attitudes.[3] Another suggestion made by HSTs in our study was that consultants should devote more time to teaching and feedback, which has also been proposed by other authors[6,7], but often there is a lack of interaction between trainees and consultants. Dewhurst (2010) mentioned that there are several explanations as to why consultants do not ask trainees questions, including not wishing to embarrass them, avoiding alarming patients by discussing other potential diagnoses, time pressures, lack of interest in teaching and trainees not being available for the entire duration of the WR.[3] Finally, changes involving the management or the hospitals have not been emphasised in the previous literature, which seems to focus more on the role of teachers and learners. Yet, it appears reasonable that improvements in the quality of teaching and learning on PTWRs would necessitate changes in the broader context in which this educational activity takes place. Trainees felt that changes in the on-call rota should be made, in order to follow a partnership system, in which the same team of doctors are on-call. This would allow more effective learning through the development of good personal relationships and team-working. In addition, improving staffing levels would allow more space and time for interaction between teachers and learners. Adequate staffing levels are not often considered in terms of their impact on education and often on-call teams operate under pressure with the minimum number of doctors needed to provide the necessary service. This in turn leads to time pressures and high volume of workload, which often has a direct negative impact on teaching and learning on PTWRs.

LIMITATIONS

This study has several limitations. Firstly, it was conducted in a single centre, which is a busy district general hospital in London. Secondly, there was no triangulation of the

findings with the consultants. It would have been interesting to identify consultant opinions regarding the educational value of PTWRs and what the issues or difficulties are from a teacher perspective. Thirdly, the primary researcher was a medical higher specialty trainee in the hospital and this could have introduced bias in the trainee responses. However, every effort was made to maintain trainee anonymity and create a confidential environment during the interview phase, in the hope that trainees would feel at ease and make unbiased comments. Finally, the interview phase included a relatively small number of participants. However, the researcher used purposive sampling, so that trainees of different levels and specialties could be included, in order to make the sample more representative.

CONCLUSION

PTWRs are currently an underused area of postgraduate medical education and many available learning opportunities are wasted. Medical teachers and learners, as well as institutions and management, should make efforts to alter current practices, in order to improve the educational value of training in acute medicine. This will result in a more highly trained and competent physician workforce.

Appendices 1 and 2 can be obtained from the corresponding author.

REFERENCES

1. Reece A, Klaber R. Maximising learning on ward rounds. *Arch Dis Child Educ Pract Ed*. 2012; **97(2)**:61-7
2. Laskaratos FM, Gkotsi D, Panteliou E, Epstein O. The educational value of ward rounds in conveying knowledge and developing trainees' clinical skills. *Br J Hosp Med (Lond)*. 2014; **75(3):** 162-5
3. Dewhurst D. Time for change: teaching and learning on busy post-take ward rounds. *Clin Med (Lond)*. 2010; **10(3):** 231-4
4. Chaponda M, Borra M, Beeching N, Almond DS, Williams PS, Hammond MA, *et al*. The value of the post-take ward round: are new working patterns compromising junior doctor education? *Clin Med (Lond)*. 2009**; 9(4):**323-6
5. Hek G, Judd M, Moule P. *Making sense of research*. London: Cassell, 1996. p.62-74
6. Claridge A. What is the educational value of ward rounds? A learner and teacher perspective. *Clin Med (Lond)*. 2011; **11(6):** 558-62
7. Laskaratos FM, Wallace D, Gkotsi D, Burns A, Epstein O, *et al*. The educational value of ward rounds for junior trainees. *Med Educ Online*. 2015; **20(Apr 21)**:27559
8. Qureshi N, Swamy NN. Postgraduate trainees' assessment of the educational value of ward rounds in obstetrics and gynaecology. *J Obstet Gynaecol*. 2008; **28(7)**: 671-5

Ulster Med J 2016;**85(2):**118-121

Desmond Whyte Memorial Lecture

Learning And Improvement In Hereditary Diseases

Altnagelvin Hospital, Londonderry, 3rd December 2015.

Patrick J Morrison

Accepted

INTRODUCTION

Thank you for inviting me to give this year's Desmond Whyte lecture and for the President's very kind introduction. It is a great honour to give this lecture, and particularly in Altnagelvin hospital where I spent many Wednesdays in outpatients seeing families with genetic disorders, and regularly availed of the excellent radiology service that Desmond had set up some years ago. The title of the lecture fits in with Dr McBride's presidential theme of 'learning and improvement' and my specialty of Medical Genetics is an excellent example of this. 50 years ago, it hardly existed and has developed from virtually nothing to become a crucial part of everyday medical care in all branches of medicine. In fact it's getting so important to have a genetic test for patient care nowadays that our test budget is usually completely spent in the first quarter of the financial year - the demand for genetic tests from so many specialties other than our own, being so great.

I want to take a few areas of genetics and show where improvements have been made in recognition, testing, management and potentially treatment of genetic diseases, some of which used to be fatal in the first twenty years of life.

1. COULD YOU TEST YOUR NEIGHBOUR'S DNA JUST OUT OF CURIOSITY?

DNA testing only became commercially available in the 1980's. Before that, identity or paternity testing in that sense, used to be tedious. Testing last century relied on fairly inaccurate indirect laboratory techniques such as blood grouping, eye or skin colour, and until the late 1980's not much had changed. The invention of the polymerase chain reaction (PCR) allowed a technique where incredibly small samples of DNA could be detected and amplified in a test tube to give sufficient yield for DNA testing (fig 1). Lengths of DNA segments similar to supermarket 'bar codes' could be run out on agarose gels using techniques including Southern blotting and more recently microsatellites and single nucleotide polymorphisms ('SNiPs'), allowing comparison of the samples from (ideally) a child, the mother and the so called 'putative father'. Matching of the samples can now fairly confidently confirm or exclude paternity (fig 2). Older techniques where mismatch of blood groups made paternity less likely, did not allow reasonable proof of paternity to be achieved. Samples using forensic techniques can now be obtained from microscopic smears of DNA from crime scenes, dental floss, beer glasses and other personal items.

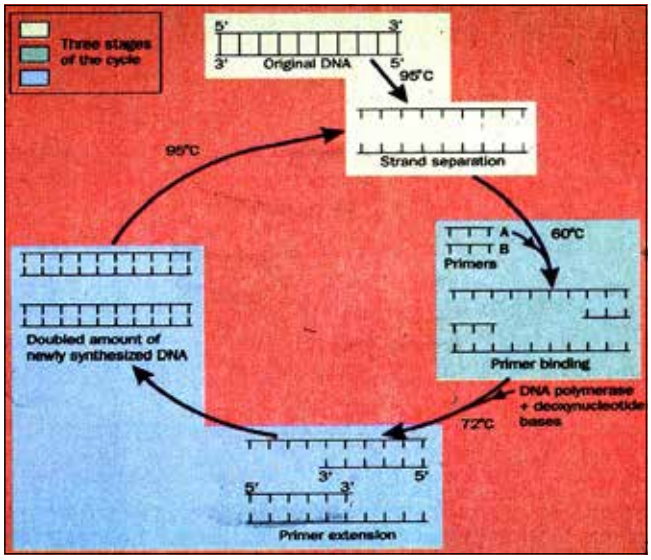


Fig 1. PCR amplification

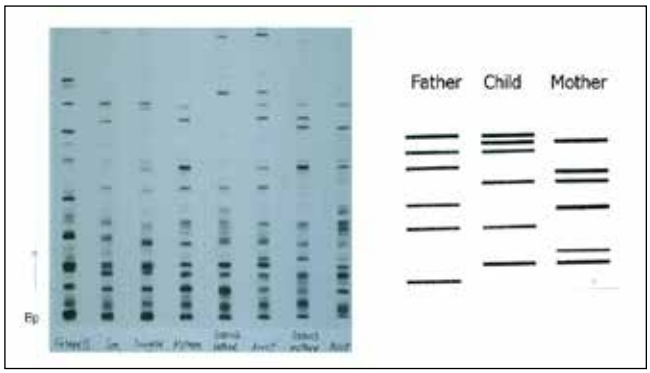


Fig 2. 'Bar code' paternity testing from the early 1990's

Consultant in Clinical Genetics

Department of Genetic medicine, Belfast HSC Trust, Lisburn Road, Belfast. BT9 7AB. UK and Centre for Cancer Research and Cell Biology, Queens University of Belfast, 97 Lisburn Road, Belfast BT9 7AE.

Correspondence to Professor Morrison.

T: +44 28 9504 8177 F: 028 9023 6911

E: patrick.morrison@belfasttrust.hscni.net

The offence of unlawful DNA theft was introduced into legislation in 2004 and the law now prevents unlawful theft of DNA through the 2005 Human Tissue Act where it is an offence to remove DNA 'without permission' so if you want to test a neighbour's dental floss retrieved from their rubbish bin (for example) to see what genetic disorders they may have, you now should obtain their permission first. Employers cannot test employees for hereditary disorders either – they have a duty to make the workplace sufficiently safe, so if an employee has a genetic tendency to asthma, their working environment should have sufficient air quality to allow them to work adequately.

2. COULD BOYS WITH DUCHENNE MUSCULAR DYSTROPHY WALK WITH TREATMENT?

When I started working in genetics in the 1980's, Duchenne muscular dystrophy – a sex-linked recessive disorder - was uniformly fatal and diagnosed fairly late at around six years of age in boys. They had rapid progression to long leg bracing and death in adolescence from respiratory failure. Identification of the dystrophin gene in 1987 was the first major advance in allowing family screening and earlier diagnosis. In cases where the mother could be confirmed as a carrier, reproductive choice became possible, and accurate carrier testing became available for other family members. Especially those who could now be defined as having a low risk, who previously could not be reassured with certainty. Testing of affected boys now results in a molecular diagnosis in most cases, allowing confirmation without muscle biopsy. Biopsy in the latter part of last century was usually open and required an anaesthetic, neither of which parents of affected boys were particularly keen on. The dystrophin gene unfortunately is one of the largest genes in the human body (fig 3) with 79 exons, so testing was tedious and time consuming. Early studies suggested that frameshift mutations caused the severe Duchenne phenotype, and in-frame deletions caused a milder Becker phenotype. We now know that there is a continuum of mild to severe phenotype rather than two distinct ends of a spectrum. Numerous mutations occur and alter the dystrophin transcript and resulting protein expression in several ways. We now know that 'leakage' occurs where some patients with large gene deletions still express low levels of high molecular weight and semi functional dystrophin. Therapy with antisense oligomer induced exon skipping in patients with leaky mutations allows an increase of the dystrophin above baseline levels and helps restore muscle function to patients with a Duchenne phenotype [1].

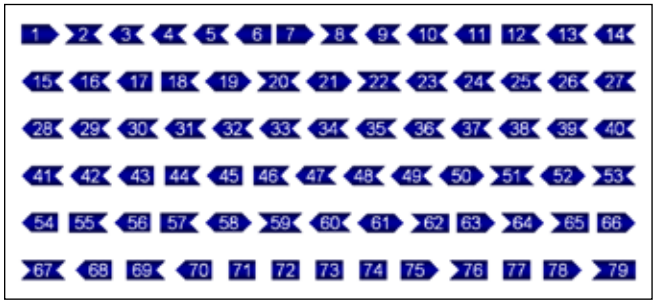


Fig 3. Dystrophin gene showing 79 exons.

Diagnosis is now possible in utero and using pre-implantation diagnosis can allow an unaffected embryo to be implanted into the mother. Cell free non-invasive DNA blood testing at around 8 weeks gestation can help a mother find out (by analysing small cell fractions of fetal material in the maternal venous circulation) if she is carrying a male or female fetus, and if female, she can relax for the rest of the pregnancy knowing she does not carry a male fetus that could be potentially affected.

3. SHOULD WE BE ABLE TO DIG UP GRAVES OR RAID MUSEUMS FOR OLD DNA SAMPLES?

Well why not if you have permission? We did just this and set the trend a couple of years ago. We had several cases of early onset pituitary disorders that Professor Brew Atkinson and his team referred in to us. We tested these for a recently described gene, AIP, that causes hereditary pituitary adenomas and found several had mutations within the gene. A mutation R304X was prevalent in several families living west of Lough Neagh. We documented the family histories and eventually found four large families with several affected generations from the Dungannon/ Magherafelt area. Some of the families mentioned that they might be related by legend, to the famous Irish giant Charles Byrne, who originated from the village of Littlebridge nearby. Byrne was 7'7" in height and left Littlebridge in 1781 for London to make his fortune. He retained an agent and was 'exhibited' for a fee sitting outside his house in a cane chair in Spring Gardens, near Trafalgar Square. Sadly, like several expatriate Northern Irishmen, he turned to drink and after his life savings of £700 were stolen, went into a despair and died. His skeleton was procured by unfair means, and exhibited by the anatomist John Hunter and is still on display in the Hunterian museum in the Royal College of Surgeons at Lincolns Inn fields at Holborn. My London colleague, Professor Marta Korbonits, was able to write and secure permission from the museum curator to extract a core of DNA from two of his teeth. Having carefully returned the teeth, sequencing of the archival DNA that we obtained, confirmed that he also carried the R304X mutation, and by careful haplotype analysis, we linked his DNA to that of the other four families confirming he was a relative. At the age of 251, this made him my oldest patient. His relatives were delighted that we were finally able to honour his memory by confirming his genetic lineage and his definitive diagnosis[2-4]. Finn McCool and other famous Irish giants lend evidence to the fact that there is a some truth behind the legends of the famous giants of Ulster. Historically evidence for hereditary giants elsewhere exists in the literature[5].

Amplification of archival DNA is now made possible by PCR of small amounts of DNA. Similar techniques have now been used to look at old unsolved criminal cases where DNA has been retained from samples and also for other historical events. Richard III's skeleton was recently exhumed and his royal lineage was famously confirmed in 2015. He was then

given a royal funeral in Leicester Cathedral[6]. My advice to those who don't want to be exhumed in the future and have their DNA chased by either a geneticist or a lawyer is to be cremated, as high temperatures in the furnace destroy DNA by denaturation if not evaporation! Budding artists should probably not try to emulate the great masters by signing their works by using their own blood as ink, for the same reasons.

4. WHY DO PATIENTS WITH DOWN SYNDROME HAVE WEAK MUSCLES?

Down syndrome was described by Dr John Langdon-Down in his article on the ethnic classification of idiots. I know some of you may still employ this classification for the grading of NHS managers. It is well recognised that patients with trisomy 21 have greater muscle fatigue than normal individuals. It has long been suspected that the extra genes on chromosome 21 interfere with regulation of muscle expression. Usually babies with trisomy 21 are tested at birth, not to confirm the diagnosis as it is usually fairly obvious clinically, but to check if they are the 95% of Down syndrome babies born due to non-dysjunction (which is more common with increased maternal age), the 2% that are mosaic with abnormal cell division occurring post-zygotically (a small proportion of certain cells may be Down syndrome and these children are typically very mild with few features), or most importantly, the 3% that are translocation Down syndrome where a balanced rearrangement of a parental chromosome may recombine to cause a familial type of Down syndrome with a risk of recurrence[7,8]. The parents of translocation Down syndrome have a high risk of recurrence – often around 10%, whereas mosaic cases usually have a negligible risk as they occur as a post-zygotic event. In all but the mosaic cases, muscle fatigue is well documented. Recent physiological studies confirm that there is a 40-70% decrement in knee extensor strength, typically giving a 20 year old with Down syndrome the equivalent muscle strength of a 70 year old[9]. Transgenic mice models have often given clues as to whether genes are downregulated or upregulated in certain genetic disorders and the Ts65Dn mouse has shown that of the 159 genes equivalent to the human, on chromosome 21, 106 are downregulated and 53 are upregulated[10]. When genes with known function regulating muscle physiology are looked at – several genes with a role in neuromuscular transmission are down regulated as are genes in skeletal muscle structure and function. Experimental muscle physiologists have concluded that overall in Down syndrome, there is normal muscle in the non-fatigued state, but abnormal post- exercise fatigue occurs and this is mediated by clear mitochondrial limitation. Evidence shows that exercise training including circuit training helps improve the recovery phase and reduces inflammatory cytokine activity so children with Down syndrome should be encouraged to lead as active a life as possible. In years gone by, often such children were put in an institution and suffered early death and intellectual deficiency as would we all if we were forbidden to exercise and given no formal education. The inference from mouse model studies suggests that if children with Down syndrome have good levels of fitness and are educated in the best schooling possible, then their educational attainment and life expectancy will considerably improve. We now find that lifespan has increased sufficiently that adult rheumatology clinics are utilised by 80% of adults with Down syndrome due to progressive arthritis and some often have earlier onset of dementia because of abnormal regulation of an extra amyloid beta precursor protein gene on chromosome 21.

THE FUTURE

We have seen great advances in genetic testing from early karyotyping to the latest DNA technology. Whole genome screening is already possible and the technology available and the costs to utilise it are improving in a similar way to the speed of computer chips over the last decade. Several famous individuals have had their genome analysed including Black Sabbath singer John Michael 'Ozzy' Osbourne whose ADH4 gene allows him to metabolise alcohol very speedily and combined with his CLTCL1 gene giving him the propensity for addictive behaviour, and his increased proportion of Neanderthal DNA, means he can still sing and provide entertainment for the public for many more years to come. He presumably also has a gene for musicality and this may someday be identified on a further analysis of his DNA.

Commercial companies such as 23andMe can provide over the counter or web based mouth swab tests for all sorts of curious genes including telling you if your lower or upper back is hairy or not, and if your ear wax is wet (European ancestry) or dry (South East Asian ancestry). You may not necessarily impress your friends with such test reports on yourself as they may say you could have saved your money by either looking at the reflection of your back in the mirror or sticking a finger in your ear. Whole genome technology does open the exciting prospect of having your personal genome checked on an admission to hospital, if not at birth, and the attending clinician can then check your predisposition to genetic diseases, microbiological and pharmaceutical sensitivities and responses, and personally tailor your treatment with what we now call 'precision medicine'.

Whether being told what genetic predispositions you might die of, will adjust individual behaviour any more than the advice we give today, I think is still unlikely. In twenty years' time we will be much better at the diagnosis and treatment of patients admitted to this hospital, but prevention may still remain very much an individual choice as it is today.

ACKNOWLEDGEMENTS

This is a condensed version of the lecture. The author has no conflict of interest to declare.

REFERENCES

1. Fletcher S, Adkin CF, Meloni P, Wong B, Muntoni F, Kole R, *et al*. Targeted exon skipping to address "leaky" mutations in the dystrophin gene. *Mol Ther Nucleic Acids*. 2012;**1:**e48.
2. Chahal HS, Stals K, Unterlander M, Balding DJ, Thomas MG, Kumar AV, *et al*. AIP mutation in pituitary adenomas in the 18th century and today. *N Engl J Med*. 2011;**364(1)**:43-50.

3. Bradley L, Morrison PJ**.** Giants of the British Isles. *Ulster Med J*. 2011;**80(1):**31-2.

4. Williams F, Hunter S, Bradley L, Chahal HS, Storr HL, Akker SA, *et al*. Clinical experience in the screening and management of a large kindred with familial isolated pituitary adenoma due to an aryl hydrocarbon receptor interacting protein (AIP) mutation. *J Clin Endocrinol Metab*. 2014;**99(4):**1122-31.

5. Donnelly DE, Morrison PJ. Hereditary Gigantism – the biblical giant Goliath and his brothers. *Ulster Med J*. 2014;**83(2):**86-8.

6. King TE, Fortes GG, Balaresque P, Thomas MG, Balding D, Maisano Delser P, *et al*. Identification of the remains of King Richard III. *Nat Commun*. 2014;**5:**5631.

7. Devlin L, Morrison PJ. Accuracy of the clinical diagnosis of Down syndrome. *Ulster Med J*. 2004;**73(1)**: 4-12.

8. Devlin L, Morrison PJ. Mosaic Down's syndrome prevalence in a complete population study. *Arch Dis Child*. 2004;**89(12)**:1177-8.

9. Mendonca GV, Pereira FD, Fernhall B. Reduced exercise capacity in persons with Down syndrome: cause, effect, and management. *Ther Clin Risk Manag*. 2010;**6:**601-10.

10. Cowley PM, Keslacy S, Middleton FA, DeRuisseau LR, Fernhall B, Kanaley JA, *et al*. Functional and biochemical characterization of soleus muscle in Down syndrome mice: insight into the muscle dysfunction seen in the human condition. *Am J Physiol Regul Integr Comp Physiol*. 2012;**303(12):**R1251-60.

Letters

REVIEW OF FACULTY OF MEDICAL LEADERSHIP AND MANAGEMENT (FMLM) NI CONFERENCE, "LEARNING TO IMPROVE".

Editor,

The Northern Ireland FMLM Conference held on the 12th November 2015 was a huge success, attracting the largest number of delegates nationally. With the city providing a picturesque backdrop, the conference at Belfast Castle enabled past, present and future leaders to celebrate success, discuss the challenges of our evolving health and social care system, and promote clinical leadership at all levels.

The theme of the conference, paralleling that of the 2015/16 UMS programme, - "Learning to Improve", was firmly embedded throughout the day; maintaining a strong focus on patient safety and quality improvement. Dr Cathy Jack, Regional Quality Improvement Lead for FMLM, welcomed Professor Sir Liam Donaldson, Chair of Health Policy at Imperial College, London and Chancellor of Newcastle University, to address delegates with a talk entitled "Quality and Safety in a Modern Healthcare System". Sir Liam outlined some of the challenges faced by leaders throughout the UK, describing variations in standards and coordination of care. He encouraged delegates to share outcomes and become "early adopters" of evidence, aiming for a truly patient-centred system which values quality and safety.

Coinciding with World Quality Day, Mr Simon Hamilton MLA, Health Minister for Northern Ireland, outlined his vision for ensuring the quality of health and social care services throughout the region. He acknowledged the "strong will and ambition amongst organisations and individuals to deliver on quality and to improve the experience of service users", and announced plans to implement a regional Improvement Institute. This Institute will enable a cohesive and collaborative approach to developing innovation, improvements and the sharing of best practice within Northern Ireland.

Vijaya Nath, Director of Leadership Development at the King's Fund, explored Medical Engagement, Collective Leadership and Quality Improvement, describing how to create a culture that delivers sustained high quality, safe and efficient care. She encouraged delegates to challenge culture until "the behaviour is so internalised that doctors are motivated to improve the quality of patient care - when no one is watching".

We were delighted to see such a wealth of local expertise complement the keynote speakers, with two excellent sessions comprising of five parallel workshops on quality improvement, innovation and leadership, professionalism, human factors, evidence based medicine and big data. Delegates had the opportunity to share their improvement experiences, with over forty high quality oral presentations, aligned to the strategic goals of Quality 2020.

Two panel sessions involving patient representative and clinical leaders, evoked much discussion on the theme of "Learning to Improve". Dr Michael McBride, Chief Medical Officer, UMS President and Regional Lead for FMLM, interviewed the eight Clinical Leadership Fellows in the inaugural year of ADEPT - Achieve Develop Explore Programme for Trainees. This was an exciting opportunity to explore the views of some of our clinical leaders of the future, reflecting the commitment among doctors in training to develop leadership skills.

As trainees, we were inspired by the passion and commitment of all present, and look forward to continuing to work collectively to achieve the aim that Quality 2020 set out – "to be recognised internationally, but especially by the people of Northern Ireland, as a leader for excellence in health and social care."

Grainne Donaghy[1] Rachael Hutton[1] Keith Gardiner[2]

Dr Grainne Donaghy & Dr Rachael Hutton, Regional Trainee Representatives FMLM NI

Professor Keith Gardiner, Postgraduate Dean, FMLM-NI QI Steering Group

Correspondence to: Dr Rachael Hutton

E-mail: rachael.hutton@hscni.net

WHAT'S ALL THIS ABOUT FRACKING?

Editor,

Hydraulic fracturing (Fracking) is currently attracting regular media attention because of its major geopolitical, economic, environmental and health implications. Fracking means the recovery by drilling of Shale Gas (a form of Natural Gas) by the use of water, sand and chemicals injected into Shale rock under high pressure. Shale is a highly compacted sedimentary rock requiring the Fracking technique to release Gas (or oil) in commercial quantities. The technique has been used in multiple areas (or Shale Basins) of the United States. Several areas in the island of Ireland have been identified as holding large reserves of Shale Gas, most notably the North West Carboniferous Basin covering parts of counties Leitrim, Fermanagh, Tyrone, Donegal, Cavan, Monaghan, Sligo, Mayo and Roscommon. License to frack (as distinct from conventional drilling) in Ireland and Northern Ireland has been withheld pending Government reports.

So what are the concerns about this technique? Many local communities worry about despoliation of the landscape by heavy truck traffic, drilling sites, waste water ponds, chemical contamination of water tables, air pollution and noise pollution [1].

Emissions from the fracking process contain chemicals that may have an association with birth outcomes (congenital heart and neurological defects) according to a recent report from the

Colorado School of Public Health[2]. This conclusion has been strongly challenged[3].

Fracking has been implicated in small earthquakes in Ohio (Richter Scale 2.7 to 4) and Lancashire.

The tourism industry has major misgivings about Fracking, and when one travels the quiet Border roads of west Fermanagh and north Leitrim the anti-Fracking placards protruding from the hedgerows are a reminder of continuing community concerns.

Health questions about Fracking lie frequently in the respiratory field. Use of sand in Fracking leads to exposure to crystalline Silica. In the USA exposure of fracking workers at 11 sites in 5 states exceeded occupational health criteria[4] but there have not been any reports of lung Silicosis: the mixture of sand with water may make the sand less respirable than in traditional mining workplaces. Exacerbations of Asthma and Chronic Obstructive Pulmonary Disease (COPD) due to Fracking are also considerations. There are some epidemiological reports implicating the process as a cause of Cancer[5] but so far evidence is rather thin. Fracking appears more suitable for large sparsely populated territories, rather than small scale areas with their delicately balanced ecosystems and historic sites, such as exist along the Erne and the Shannon rivers. From the health point of view it is also difficult to see how Governments can proceed to license Fracking at this time in the absence of adequate scientific information. If in due course, the Governments of Ireland and Northern Ireland grant full licenses for Shale gas drilling, it is likely to occur in the North –West Basin which straddles the Border. If so the establishment of a joint North-South Authority along the lines of the Loughs Agency may be the best way to proceed including from the environmental and health points of view.

The author has no conflict of interest.

Charles P Bredin

Department of Medicine,University College,Cork,Ireland.

Correspondence to: Dr CP Bredin, Suite 24,Cork Clinic, Western Road, Cork T12AOPX

Email: cathalbredin@gmail.com

REFERENCES:

1. Adgate JL, Goldstein , McKenzie LM. Potential public health hazards ,exposure and health effects from unconventional natural gas development. *Environ Sci Technol*. 2014; **48(15)**:8307-20
2. McKenzie LM, Guo R, WitterRZ, Savitz DA, Newman LS, Adgate JL. Birth outcomes and maternal proximity to natural gas developments in rural Colorado. *Environ Health Perspect*. 2014;**122(4)**:412-7.
3. Fedak K, Gross S, Jacoben M, Tvermoes B. Birth outcomes and natural gas development: methodological limitations. *Environ Health Perspect*. 2014;**122(9)**:A 232.
4. Esswein EJ ,Britenstein M, Snawder J, Kiefer M, Sieber WK. Occupational exposure to respirable crystalline silica during hydraulic fracturing. *J Occup Environ Hyg*. 2013;**10(7)**:347-56
5. McKenzie LM, Witter RZ, Newman LS, Adgate JL. human health risk assesment of air emissions from development of unconventional natural gas resources. *Sci Total Environ*. 2012;**424**:79-87

GROUP A STREPTOCOCCAL PRIMARY PERITONITIS

Editor,

A 74 year old female presented to ED with acute abdominal pain on a background of vomiting and diarrhoea. Examination of her abdomen revealed generalised peritonism. She remained oliguric and hypotensive despite IV fluid resuscitation. CRP (324mg/L) and WCC (25 x10^6/L) were elevated with an associated acute kidney injury (eGFR 9ml/min). Other than a prolonged prothrombin time of 16.9s, her remaining bloods were within normal limits.

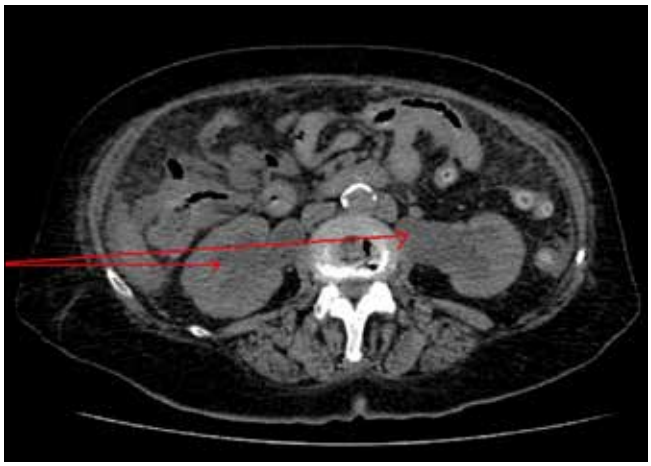


Fig 1. Image of CT AP showing bilateral hydronephrosis

An urgent CT abdomen and pelvis was performed, without contrast, which showed bilateral hydronephrosis without a clear cause and free fluid throughout the abdomen (figure 1). No pneumoperitoneum was detected.

She was transferred to a tertiary unit with specialist urology services for ongoing investigation and management. Of note, further examination demonstrated a significant procidentia and a gynaecology consultation was sought. It was postulated that this pathology could have contributed to the hydronephrosis. A vaginal pessary was inserted to reverse the prolapse.

Her abdomen remained peritonitic and she had an emergency laparotomy on the basis of clinical examination and imaging findings. Other than a bulky uterus and right ovary there was no intra-abdominal organ pathology identified. Approximately two litres of purulent fluid was drained from the peritoneal cavity and sent to microbiology for culture. A thorough diagnostic laparotomy was completed and no gastrointestinal perforation was identified.

Post-operatively she was managed in the intensive care unit, requiring multi organ support. Ultrasound imaging of her renal tracts was carried out on her first post-operative day which showed that the hydronephrosis had significantly resolved. It is likely that this was indeed secondary to the procidentia and was corrected with the insertion of the pessary. The intra-abdominal fluid had cultured Group A Streptococcus and was successfully treated with intravenous pipericillin-tazobactam. After three days she was successfully weaned from the

ventilator, her inotropic requirement ceased and her kidney function recovered to allow CRRT to be stopped. It was felt that her AKI had been multifactorial, displaying effects of pre-renal (sepsis, dehydration and hypotension) and post-renal (ureteric obstruction secondary to procidentia) insults.

Discussion:

GAS primary peritonitis is rare, but has been reported in a limited number of case reports and series[1]. It most commonly manifests in otherwise healthy females, but the entry site of the pathogen is often unclear[3,4]. Ascending urogenital tract infections, such as in this case are most common[2,3]. Spread from the bowel and from the respiratory tract has also been reported[1,3].

Many of the documented cases presented with peritonitis following a diarrhoeal illness[2]. Laparotomy, as in this case, generally shows purulent fluid within the abdominal cavity with no other organ pathology identified[2]. The mainstay of treatment is prompt resuscitation, goal-orientated organ support and intravenous antibiotics[2,3,4].

Our case highlights one possible explanation for a seemingly negative laparotomy, and the importance of sampling peritoneal fluid at the time of operation. It also illustrates how an organism which can be part of normal flora can cause a potentially life threatening infection[5].

McIlroy A, Isaac A, McIlmunn C, Kennedy R

Department of Surgery, Belfast City Hospital

Corresponding author: Ashley McIlroy

E-mail: amcilroy07@qub.ac.uk

REFERENCES:

1. Patel RV, Kumar H, More B, Rajimwale A. Primary group A streptococcal toxic shock syndrome simulating perforated appendicitis in a previously healthy girl. *BMJ Case Rep*. 2013: May 4. doi:10.1136/bcr-2013-009502
2. Tilanus AM, de Geus HR, Rijnders BJ, Dwarkasing RS, van der Hoven B, Bakker J. Severe group A Streptococcal toxic shock syndrome presenting as primary peritonitis: a case report and brief review of the literature. *Int J Infect Dis*. 2010 **14S** 208-212
3. Haap M, Haas CS, Teichmann R, Horger M, Raible A Lamprecht G, *et al*. Mystery or misery? Primary group A Streptococcal peritonitis in women: case report. *Am J Crit Care*. 2010: **19(5)**; 454-8.
4. Moskovitz M, Ehrenberg E, Greico R, Chamovitz B, Burke M, Synder D, *et al*. Primary peritonitis due to group A streptococcus. *J Clin Gastroenterol*. 2000:**30(3)**;332-5
5. CDC. Centers for Disease Control and Prevention. [Internet]. Group A stretoccocal (GAS) disease for clinicians. Atlanta, GA: Centers for Disease Control and Prevention. Available from: http://www.cdc.gov/groupastrep/clinicians.html. Last accessed January 2016.

FINDING BRUGADA SYNDROME IN A YOUNG, ACUTE SURGICAL PATIENT.

Editor,

A 21year old male presented with a 24hour history of right iliac fossa pain and vomiting. He was afebrile, tachycardic and had raised inflammatory markers. He was otherwise fit and healthy. He was seen by surgeons and booked for emergency laparoscopic appendicectomy. He was graded ASA 1E on pre-operative assessment. NICE guidelines recommend that a patient of this age and ASA grade does not require any investigations prior to this surgery[1]. In this case, a routine admission ECG was done and showed ST elevation in V2 and V3, with T wave inversion and an RSR1 pattern in III. He reported no cardiac symptoms or background. A repeat ECG an hour later was unchanged. On further discussion, his mother reported he had two cousins who suffered cardiac arrests as teenagers and subsequently had ICDs implanted. Both cousins were diagnosed with Brugada syndrome.

Following discussions with cardiology, it was decided to treat as presumed Brugada Syndrome. Surgery was not delayed due to the risk of clinical deterioration leading to pyrexia and therefore increased risk of arrhythmia. The planned procedure was changed to open as pneumoperitoneum may cause a vagal response, precipitating an arrhythmia. Anaesthetic management was planned using www.brugadadrugs.org which has a list of safe drugs for use in Brugada patients[2]. The aim for safe anaesthesia was to avoid episodes or tachy-/bradycardia and to have external defibrillation pads attached throughout.

On arrival in theatre, he was pyrexic at 37.7C, heart rate 90bpm and blood pressure 160/85. He was pre-oxygenated and a modified rapid sequence induction using thiopentone, suxamethonium and fentanyl was performed. Induction was in theatre rather than the anaesthetic room to minimise interruption in cardiac monitoring. Sevoflurane was used for maintenance of anaesthesia and vecuronium for paralysis. Isoprenaline, the antiarrhythmic of choice in Brugada syndrome, was kept in the anaesthetic room. Intravenous co-amoxiclav was given at induction and an oropharyngeal temperature probe sited. Active management of temperature was commenced with infusion of 2litres cold plasmalyte, cold forced air blanket and diclofenac. Paracetamol had been given 2hours previously. Temperature reduced to 37.3C. Dexamethasone and ondansetron were used for antiemesis and 10mg morphine given for analgesia. During surgery multiple ectopic beats were noted and recorded on a rhythm strip. One run of approximately 5 ectopic beats was noted. At this time the patient's temperature had risen to 37.8C, coinciding with dissection of the appendix. Surgery was otherwise uneventful. At completion of the procedure, 10ml 1% lidocaine with adrenaline(1/100,000) was infiltrated locally into the wound. Bupivacaine could not be used due to its pro-arrhythmic nature as a long-acting sodium channel blocker.

Post-operatively, the patient remained on cardiac monitoring for 24hours. Recovery was incident free and he was discharged the following day, with planned cardiology follow up.

This case highlights the importance of awareness of Brugada syndrome as an anaesthetist. The pharmacological and

autonomic changes during general anaesthesia can have serious implications for a patient with Brugada syndrome, and an appreciation of how these patients are managed in the peri-operative setting is essential.

Michaela Donaghy, Anna Barrow, Anupa Soni, Rosie Jones

Royal Berkshire Hospital, Reading.

Correspondence to Dr Michaela Donaghy.

E-mail: mdonaghy24@qub.ac.uk

REFERENCES

1. NICE National Instituite of Clinical Excellence. *Preoperative tests for elective surgery*. NICE clinical guideline 3: [Internet]. London: National Institute of Clinical Excellence; 2003. [updated 2013 Apr;]. Available from: http://www.nice.org.uk/guidance/cg3. Last accessed January 2016.

2. Postema PG, Wolpert C, Probst V, Borggrefe M, Roden DM, Priori SG, *et al*. Drugs and Brugada syndrome patients: review of the literature, recommendations, and an up-to-date website (www.brugadadrugs.org). *Heart Rhythm*. 2009; **6(9)**:1335-41.

SUBARACHNOID HAEMORRHAGE AND TROPONINITIS: A CASE IN POINT.

Editor,

Defining myocardial infarction increasingly relies upon the detection of cardiac biomarkers alongside clinical evidence for myocardial ischemia. Modern assays are sensitive for detection of small amounts of myocardial necrosis, with the limit of detection of a highly sensitive troponin (HsTnT assay) being as low as 0.005 ng/mL.[1] We report a case of a patient treated for myocardial infarction on the basis of an elevated troponin which was later found to be elevated secondary to a spontaneous rupture of a cerebral aneurysm.

A 66 year old female presented to the emergency department following a witnessed transient loss of consciousness, lasting for approximately ten minutes. A collateral history from her sister revealed an altered breathing pattern with no seizure activity during the collapse. At presentation, Glasgow Coma Scale (GCS) was 13/15 (E2 V5M6) with no localizing neurological signs or meningism.

On admission HsTnT was elevated at 914 ng/mL. Electrocardiograph (ECG) was normal. She was given 300mg of oral Aspirin for possible myocardial infarction. In view of her GCS, she proceeded to a computed tomography (CT) scan of the brain which showed dilatation of the lateral ventricles with high density material in both lateral ventricles, posterior to the left anterior clinoid and left Sylvian fissure (figure 1). CT angiogram showed an aneurysm arising from the supraclinoid portion of the left internal carotid, close to the origin of the posterior communicating artery.

She proceeded to urgent neurosurgical intervention with multiple coils placed within the aneurysm. She made a full recovery with no long term neurological sequel.

Discussion

HsTnT is increasingly recognised for its importance in helping diagnose myocardial infarction, however, it must be remembered, whilst sensitive for myocardial injury it is not specific. There are numerous non-cardiac causes for a troponin rise including renal insufficiency, burns and sepsis/ critical illness.

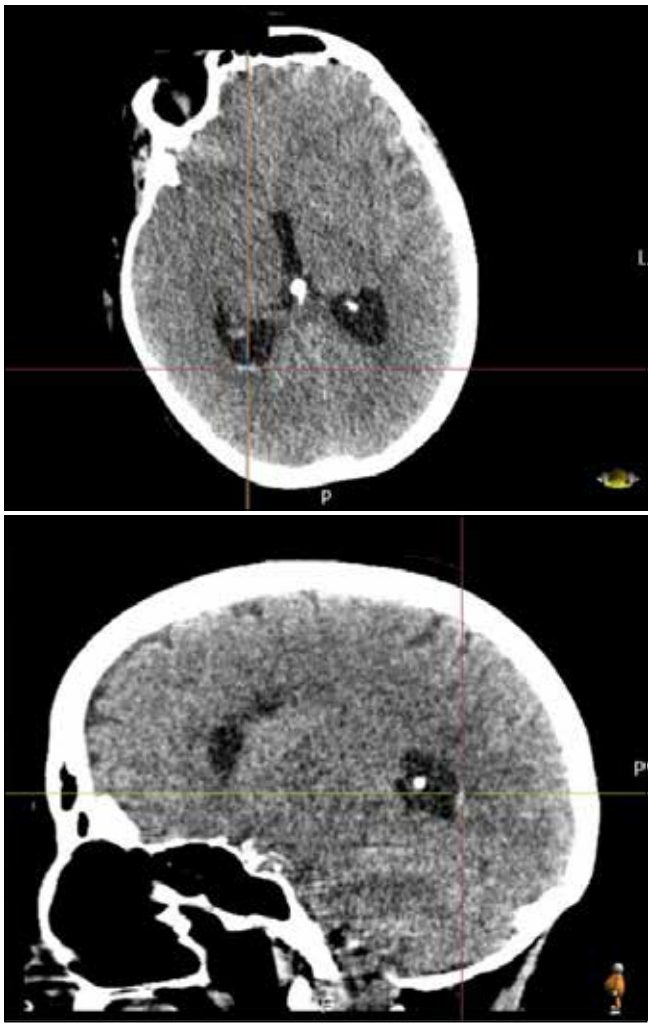


Fig 1. CT brain cross sectional images showing, high density material in the dependent part of right lateral ventricle (at centre of crosshairs).

Subarachnoid haemorrhage (SAH) accounts for 10% of all haemorrhagic strokes, with elevation in troponin being a recognised complication and associated with increased risk of cardiopulmonary and cerebrovascular complications.[2] A case series involving 149 patients with either acute ischaemic or haemorrhagic stroke, found 27% of patients to have an elevated troponin level.[3] In another case series of 223 patients with acute SAH, 20 % of patients had an elevation in troponin which appeared to be a predictor of poorer outcomes.[4]

ECGs performed in SAH patients can also show a range of abnormalities such as ST segment elevation, T-wave inversion, atrial and ventricular arrhythmias. ECGs changes in SAH have a reported prevalence ranging between 27% to 100%.[5]

The mechanism for elevation in troponin in this setting is uncertain, but is thought to be related to excessive sympathetic activity and increased catecholamine release resulting in increased stress/demand on myocardial cells.

In summary, elevated HsTnT is not specific for myocardial infarction and raised HsTNT and ECG changes are not uncommon in SAH. Interpreting HsTNT and ECGs out of clinical context may lead to diagnostic problems.

D Keenan, Specialist trainee in Nephrology and Y. Kuan, Consultant Nephrologist

Nephrology Unit, Altnagelvin Area Hospital, Belfast BT47 6SB

E-mail: dkeenan08@qub.ac.uk

REFERENCE

1. Saenger AK, Beyrau R, Braun S, Cooray R, Dolci A, Freidank H, Glannitsis E, *et al*. Multicenter analytical evaluation of a high-sensitivity troponin T assay. *Clin Chim Acta*. 2011;**412(9-10)**:748–54.
2. van der Bilt IA, Hasan D, Vandertop WP, Wilde AA, Algra A, Visser FC, *et al*. Impact of cardiac complications on outcome after aneurismal subarachnoid haemorrhage: a meta-analysis *Neurology*. 2009:**72(7)**:635-42.
3. Trooyen M, Indredavik B, Rossvoll O, Slordahl SA. [Myocardial injury in acute stoke assessed by troponin I. *Tidsskr Nor Laegeforen*. 2001:**121(4)**:421-5. Norwegian
4. Tung P, Kopelnik A, Banki N, Ong K, Ko N, Lawton MT, *et al*. Predictors of neurocardiogenic injury after subarachnoid hemorrhage. *Stroke*. 2004; **35(2)**:548-51.
5. S.Chatterjee. ECG changes in subarachnoid haemorrhage: A synopsis. *Neth Heart J*. 2011: **19(1)**;31-34

THE GYNAECOLOGICAL APPROACH TO DISTAL BICEPS TENDON REPAIR:

A PREVIOUSLY UNREPORTED SURGICAL ADJUNCT /TECHNIQUE

Editor,

Distal Biceps tendon ruptures account for 3% of all tendon ruptures, with an overall incidence of 1.2 per 100,000 per year.[1] The two-incision approach to surgical repair, described by Boyd and Anderson is the preferred method in our unit.[2] However, this may be complicated by heterotopic ossification (HO) leading to the formation of a radioulnar synostosis.[3] This is attributed to soft tissue trauma, aggressive elevation of anconeus off the proximal ulna and injury to the proximal interosseous membrane.[3]

We describe a previously unreported technique, using gynaecological cervical dilators to gradually reopen and develop the distal biceps tendon tract resulting in less soft tissue trauma than conventional means.

TECHNIQUE

First, a proximal 3cm transverse incision is made in the antecubital fossa over the distal biceps tendon sheath. The distal biceps tendon is identified and whip sutures applied (Figure 1).

Fig 1. Whip sutures

The tunnel through which the tendon traverses is identified. The narrowest diameter cervical dilator is then inserted into the tunnel and empty tendon sheath (Figure 2). It is directed towards and then past the radial tuberosity between the radius and the ulna. Rotation of the forearm confirms proper placement of the dilator on the ulnar side of the radius. With the forearm in full pronation, the dilator is advanced until it is palpable within the subcutaneous tissue of the forearm. The distal incision is then made over the site of prominence, splitting the common extensor and supinator muscles to identify the end of the dilator (Figure 3).

Fig2.

Fig3.

The diameter of the tunnel is then gradually increased in size by sequentially passing dilators of increasing diameter, until a tract is created that will easily allow passage of the often bulbous tendon (Figure 4). The tendon is then shuttled through the dilated tract and reattached to the exposed radial tuberosity (Figure 5).

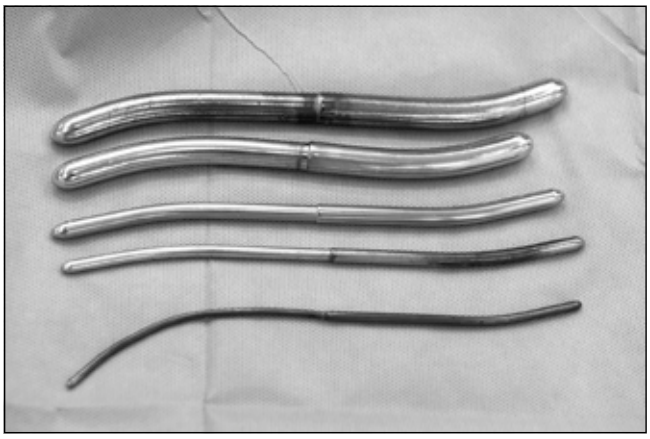


Fig4.

Fig5.

DISCUSSION

Surgical repair is the treatment of choice for distal biceps tendon ruptures. Overall patients return to pre-injury activities and regain upper extremity motion and function, with only small measurable differences in power and fatigability from pre-injury state.[4]

The two-incision technique reduces the risk of neurological injury that was observed with the Dobbie one-incision approach.[3] However, HO and radioulnar synostosis formation is estimated at 7%.[3] This is a debilitating complication when surgery, performed to restore elbow flexion and forearm supination strength, results in a complete loss of forearm rotation.[3]

In patients presenting late (after three weeks from injury) the tendon tract has often contracted at the time of surgery. Recreating a tract often results in significant injury to the surrounding soft tissues. This is in agreement with Kelly *et al* who concluded that morbidity from distal biceps tendon repairs may be attributed primarily to a delay in the timing of the repair.[5]

The use of cervical dilators allows a gradual increase in size when developing the original tendon tract. The curved shape and blunt tip are features that allow for a minimally traumatic recreation of the distal biceps tendon tunnel.

Sloan S, Murphy LE, McDonald K, Thompson NW, Charlwood AP.

Department of Trauma and Orthopaedics, Altnagelvin Area Hospital, Northern Ireland.

Corresponding Author: Lynn Murphy

E-mail: l.murphy27@hotmail.com

REFERENCES

1. Safran MR, Graham SM. Distal biceps tendon ruptures: incidence, demographics, and the effect of smoking. *Clin Orthop Relat Res*. 2002;(**404**):275-83.
2. Boyd HB, Anderson LD. A method for reinsertion of the distal biceps brachii tendon. *J Bone Joint Surg Am*. 1961;**43(7)**:1041-3.
3. Watson JN, Moretti, VM, Schwindel L, Hutchinson MR. Repair techniques for acute distal biceps tendon ruptures: a systematic review. *J Bone Joint Surg Am*. 2014;**96(24)**:2086-90.
4. Nesterenko S, Domire ZJ, Morrey BF, Sanchez-Sotelo J. Elbow strength and endurance in patients with a ruptured distal biceps tendon. *J Shoulder Elbow Surg*. 2010;**19(2)**:184-9.
5. Kelly EW, Morrey BF, O'Driscoll SW. Complications of repair of the distal biceps tendon with the modified two-incision technique. *J Bone Joint Surg Am*. 2000**;82-A(11):**1575-81.

PAEDIATRIC MENTORSHIP PROGRAMME IN NORTHERN IRELAND –A 'HANDS OFF' APPROACH

Editor

A mentor is defined as someone who helps another person through an important transition[1]. Peer mentoring occurs between individuals of equal status allowing shared insights, guidance, problem solving and support [2,3]. A recent paper by Eisen et al. supported the use of peer mentoring in paediatrics[4].

With the potential advantages of mentorship in mind, the School of Paediatrics and Child Health in Northern Ireland implemented and evaluated a peer mentorship programme.

Each ST1 was automatically enrolled to participate in the mentorship programme and was paired with a senior trainee (ST4 and above). The programme ran from August 2014 to July 2015

This was a matched process with each mentor submitting a report, which included career goals and hobbies. The mentees shortlisted three candidates. Where possible the pairing would not work in the same hospital, aiming to prevent the overlapping of the mentor role with the role of a supervising senior trainee.

All participants were emailed a mentorship guide. This

detailed the mentorship process with explanation of roles and responsibilities, taking the place of more formal education.

A questionnaire was emailed at the end of the project via survey-monkey. The questionnaire was designed by the authors and predominantly based on 5-point Likert scale with space for comments. A reminder email was sent 2 weeks after the first.

The 17 mentees were successfully paired with one of their three selected mentors. 10 (59%) mentors and 9 (53%) mentees completed the end of programme survey.

All mentors would get involved in a mentorship programme again noting an improvement in coaching/mentoring skills (60%), leadership skills (20%), networking skills (20%) and improved knowledge of the issues faced by junior colleagues (60%). 80% of mentors felt their mentee failed to engage with the programme. All mentors agreed that an introductory evening would be beneficial and 90% agreed that there should be some form of mandatory training for this programme.

63% of mentees agreed that they found the programme valuable and 88% would recommend it to a colleague. 67% of mentees felt that their mentor had engaged well with the programme with 90% reporting a face-to-face meeting. The mentees felt this programme improved their networking skills (50%), leadership skills (33%), communication skills (18%), and understanding of issues faced by senior colleagues (50%). 76% agreed that an introductory evening would be beneficial. 33% commented that the pairing would benefit if the participants worked in the same hospital.

The topics discussed in the mentor pairing included career development (50%), work-life balance (50%), postgraduate exams (50%), clinical skills (50%), relationship with colleagues (17%), ill health (17%) and personal issues (17%). (chart 1)

There were some limitations to this project. The questionnaire used was not validated and the response rate may imply the results obtained are not representative of the population.

The results of this programme would suggest that there is a desire for mentorship from both the junior and senior trainees but that there may be difficulty in establishing the relationship without support. Based on the results, there are plans for an introductory evening with formal education for those who are acting as mentors. The junior trainees will have a formal induction into the programme. Pairings will also be permitted to occur in the same hospital.

Mullen S, Richardson J, Craig S.

Royal Belfast Hospital for Sick Children.

Correspondence to: Dr Stephen Mullen

E-mail:smullen001@googlemail.com

REFERENCES

1. McKimm, J. Jollie C, Hatter M. *et al*. *Mentoring: theory and practice*. In: NHS. Multiprofessional Faculty Development. Understanding learning and teaching. Iimperial College London; 2007. Available from: http://www.faculty.londondeanery.ac.uk/e-learning/feedback/files/Mentoring_Theory_and_Practice.pdf. Last accessed January 2016.
2. Bussey-Jones J, Bernstein L, Higgins S, Malebranche D, Parajape A, Geao I, *et al*. Repaving the road to academic success: the IMeRGE approach to peer mentoring. *Acad Med*. 2006;**81(7)**:674–9.
3. Ramani S, Gruppen L, Kachur EK. Twelve tips for developing effective mentors. *Med Teach*. 2006: 28(5); 404–8
4. Eisen S, Sijhani S, Brightwell A, Stoneham S, Long A. Peer mentoring: evaluation of a novel programme in paediatrics. *Arch Dis Child*. 2013: 23 Oct; doi:10.1136/archdischild-2013-304277

Ulster Med J 2016;**85(2):**129-135

Abstracts

Ulster Medical Society Junior Members Forum Thursday 12th December 2013

Whitla Medical Building, Queen's University Belfast.

ASPIRIN THERAPY IS ASSOCIATED WITH REDUCED MORTALITY IN PATIENTS WITH ACUTE LUNG INJURY

Boyle AJ, Digangi A, Mottram LJ, Hamid U, McNamee L, White G, Cross LJM, McNamee J, O'Kane C, McAuley DM.

Introduction: Platelet activation has a role in the pathogenesis of acute lung injury (ALI). Observational data suggests aspirin treatment may prevent the development of ALI in critically ill patients. However, it is unknown if aspirin usage alters outcomes in patients with established ALI.

Methods: All patients with ALI were identified prospectively in a single large regional medical and surgical Intensive Care Unit (ICU) between December 2010 and July 2012. Demographic, clinical, and laboratory variables were recorded. Aspirin usage, both pre-hospital and during Intensive Care Unit (ICU) stay, was included. The primary outcome was ICU mortality. We used univariate and multivariate analyses to assess the impact of these variables on ICU mortality.

Results: Two hundred and two patients with ALI were included. 56 (28%) of these received aspirin either pre-hospital, in ICU, or both. Using multivariate logistic regression analysis, aspirin was found to be protective for ICU mortality.

Conclusion: Aspirin usage is associated with reduced mortality in patients with ALI. Whilst trials are ongoing to assess if aspirin can prevent ALI, these new data support the need for a clinical trial to investigate if aspirin improves outcomes in patients with established ALI.

MALFORMATION RISKS OF ANTIEPILEPTIC DRUG MONOTHERAPIES IN PREGNANCY: AN UPDATE FROM THE UK AND IRELAND EPILEPSY AND PREGNANCY REGISTERS

Campbell E, Kennedy F, Russell A, Smithson WH, Parsons L, Robertson I, Irwin B, Liggan B, Delanty N, Morrison PJ, Hunt SJ, Craig J, Morrow J.

Aim: To assess risk of major congenital malformations (MCMs) from exposure to anti-epileptic drugs (AEDs) during pregnancy.

Methods: Fifteen-year prospective observational study from 1996 until 2012. Outcomes are reported for valproate, carbamazepine, lamotrigine and levetiracetam monotherapy exposures. Main outcome measure is the MCM rate.

Results: Informative outcomes were available for 5510 cases. 1290 women were exposed to valproate monotherapy, 1718 to carbamazepine monotherapy, 2198 to lamotrigine monotherapy and 304 to levetiracetam monotherapy. The MCM risk with valproate monotherapy exposure in-utero is 6.7% (95% CI 5.5%-8.3%), compared to 2.6% with carbamazepine (95% CI 1.9%-3.5%), 2.3% with lamotrigine (95% CI 1.8%-3.1%) and 0.70% (95% CI 0.2%-2.5%) with levetiracetam. A significant dose effect is seen with valproate (p= 0.0006) and carbamazepine (p=0.03) exposed pregnancies, but not with exposure to lamotrigine (p=0.26) or levetiracetam (p=0.09). MCM rate for even the highest doses of lamotrigine (>400mg daily) were lower than the MCM rate observed in pregnancies exposed to less than 600mg daily of valproate (3.4% compared to 5.0%, p=0.35).

Conclusions: AED exposure during pregnancy increases the risk of MCM in the infants of women with epilepsy. In utero exposure to valproate carries a significantly higher MCM risk than lamotrigine (p=0.0001), levetiracetam (p=0.0001) or carbamazepine (p=0.0001) monotherapy. Our results are in contrast to previous suggestions that the MCM risk with exposure to low doses of valproate is preferable to that seen with exposure to high doses of lamotrigine. Together with recently published neurodevelopmental data, this data suggests that either lamotrigine or levetiracetam should be used as drugs of choice over valproate, even at low dose, in women of childbearing age with epilepsy.

THE USE OF HIGHLY CONCENTRATED HYPERTONIC SALINE IN THE TREATMENT OF TRAUMATIC BRAIN INJURY RELATED REFRACTORY INTRACRANIAL HYPERTENSION.

Major EH, O'Connor P, Mullan B.

Background: In recent years hypertonic saline has attracted increasing interest in the treatment of traumatic intracranial hypertension, and has a number of documented and theoretical advantages over other hyperosmolar agents. To date, no consensus has been achieved on the safest and most effective HTS concentration for administration.

Aims: The purpose of this paper was to evaluate the efficacy of intravenous bolus administration of highly concentrated

(30%) hypertonic saline (HTS) in the treatment of refractory intracranial hypertension secondary to traumatic brain injury.

Methods: Patients were treated with an intravenous bolus of 10mls of 30% hypertonic saline. Multiple physiological parameters were measured throughout, including intracranial pressure, mean arterial pressure, cerebral perfusion pressure, pulse and inotrope/pressor requirements. Laboratory investigation pre and post HTS administration included: arterial pH, pCO2, HCO3, base excess; serum biochemistry measurements of sodium, potassium, chloride, urea and creatinine; and coagulation studies.

Results: TBI patients saw a rapid and significant reduction in ICP from a baseline value of 28 ± 5.31 mmHg to 18.44 ± 6.17 mmHg at 1-hour post HTS, a statistically significant reduction that was maintained for up to 7 hours. This response was maintained even with repeated HTS administration, which was also associated with an augmented cerebral perfusion pressure from a baseline of 58.0 ± 6.48 mmHg to 76.33 mmHg within 1 hour of HTS administration.

Conclusions: No associated harmful biochemical or haematological abnormalities were noted. In conclusion, highly concentrated 30% HTS appears to be both effective and safe in the management of refractory intracranial hypertension.

DOES RHEUMATOID ARTHRITIS DISEASE ACTIVITY CORRELATE WITH WEATHER CONDITIONS?

Savage EM, McCormick D, McDonald S, Moore O, Stevenson M, Cairns AP.

Background: Patients with rheumatoid Arthritis (RA) often report increasing joint pain and stiffness with colder, wet weather. Previous studies examining weather impact on pain severity have yielded contradictory results1-2. The relationship between disease activity in RA patients and weather variance has not been formally examined.

Methods: Patients attending Musgrave Park Hospital, Belfast; with a diagnosis of RA on anti-TNF were invited to participate. A longitudinal analysis of 133 patients was performed. Data collected at 5 time points included TJC, SJC, visual analogue score, ESR, CRP, and DAS-28. This was correlated with maximum/minimum temperature, hours of sunshine, rainfall, relative humidity, pressure and wind-speed from a local weather station on day of attendance. A linear regression analysis was used to determine relationship between weather components, disease activity and pain.

Results: The weather-based components were extracted after a global factor analysis using data from all time-points revealed three components from the seven quantitative variables. Three components indicated by the factor analysis were as follows: temperature component, sunny/dry component, wet /windy component. All components were calculated from z-scores. A significant correlation was noted between low DAS-28 scores and sunny, dry conditions (p=0.001). Sunny and dry conditions ((hours of sunshine – relative humidity)/2) were associated with a DAS-28 reduction of 0.143 (95% CIs -0.230, -0.057) p=0.001. Higher temperatures (max temperature + min temperature/2) were associated with a DAS-28 reduction of 0.048 (95% CIs -0.129, 0.032), p=0.23. Wet and windy conditions (rainfall + wind-speed – pressure)/3 were associated with a higher DAS-28 (95% CIs -0.098, 0.123) p=0.82.

Conclusions: This study highlights statistically significant lower DAS-28 scores in sunny and dry conditions.

A COMPARISON OF CARDIAC COMPUTERIZED TOMOGRAPHY AND EXERCISE STRESS ELECTROCARDIOGRAM TEST FOR INVESTIGATION OF STABLE CHEST PAIN: THE CLINICAL RESULTS OF THE CAPP RANDOMIZED PROSPECTIVE TRIAL

McKavanagh P, Lusk L, Ball PA, Trinick TR, Duly E, Verghis RM, Agus AM, Walls GW, McCusker S, Stevenson M, James B, Orr C, Hamilton A, Smyth A, Harbinson MT, Donnelly PM.

Aim: The Cardiac Computerised Tomography (CT) for the Assessment of Pain and Plaque (CAPP) study compared the economic and clinical outcomes of using cardiac CT compared to Exercise Stress Test (EST) in the patients with suspected stable chest pain. Method: CAPP randomised 500 patients without known coronary artery disease to either EST or cardiac CT. All patients were followed up for clinical outcomes and for angina symptoms with the Seattle Angina Questionnaires (SAQ). Results: Of the 500 patients 12 withdrew over the year, with 245 in the EST arm and 243 in CT arm receiving follow up. In the CT arm there were less chest pain Emergency Department attendances and unplanned admissions. Patients in the CT arm also had less secondary investigations and less time to diagnosis. The EST arm had 7 patients who underwent Coronary Artery Bypass Grafting (CABG) and 12 who had Percutaneous Coronary Intervention (PCI), compared to 8 CABG and 29 PCI in the CT arm. There was a significant improvement in domains of the SAQ scores at 1 year in the CT arm compared to EST (p =<0.05). Conclusions: Cardiac CT as an index investigation for stable chest pain improved symptoms and clinical outcomes.

SERVICE REVIEW OF THE JOINT EPILEPSY AND LEARNING DISABILITY CLINIC IN THE SOUTH EASTERN HEALTH AND SOCIAL CARE TRUST

Ling P, MacPherson J, Craig J.

Background: There is currently a joint epilepsy and learning disability clinic for the South Eastern Health and Social Care Trust that began in October 2006. The clinic is for patients who would otherwise have to attend separate epilepsy and learning disability appointments.

Aims: Service evaluation and provide information for future comparison with similar services.

Method: There were forty-eight patients who attended the joint clinic during the period of October 2006, when the clinic first began and December 2011. Chart reviews for these patients were completed to evaluate the number of appointments attended and missed, reasons for referral, outcome from attendance at the clinic such as changes in seizure frequency and duration.

Results: The majority of patients attended one appointment (52 %) and missed no appointments (90%). The most common reason for referral was due to increase in seizure frequency (32%) and the most common intervention was change in medications (61%). The majority showed improvement in seizure frequency (68%) with a significant number having improvement in seizure duration (33%).

Conclusion: There was sixty-eight per cent that showed an improvement in seizure frequency. Thirty-three per cent showed an improvement in seizure duration while fourteen per cent had no further seizures. This would suggest that the clinic provides a useful tool to ensure good quality care to those people with learning disabilities and epilepsy.

COAGULATION SCREENING: CHANGE IN PRACTICE AFTER COMPLETED AUDIT CYCLE

McCrossan L.

Random coagulation screening is a poor predictor of perioperative bleeding and has a poor yield in detecting haemostatic abnormalities. Current guidelines advocate *selecting* patients requiring coagulation screens using a structured bleeding history. Using a completed audit cycle as the vehicle for implementing change, ensuring guideline adherence, random 'routine' use of the £6.50 coagulation screen has decreased; avoiding patient anxiety, theatre delays, increased pressure on labs and a high cost to an already stretched NHS budget. One hundred surgical inpatients in the UHD were identified, and notes were reviewed to determine reasons for testing which were audited against current guidelines (NICE, GAIN-NI and BCSH) Initial audit found inappropriate testing was widespread; only 23% of samples were guideline adherent. Staff education sessions and poster distribution detailing the uses/limitations of coagulation screening, importance of bleeding history and current guidelines preceded the re-audit and closure of the loop which showed significant improvement; 61% of samples were now appropriate , a 265% increase in guideline compliance. It is clear that this completed audit-cycle has successfully implemented significant change in practice; improved cost efficiency, decreased theater delays, patient anxiety and unnecessary venepuncture; ultimately improving patient care.

IMPACT OF COMORBID ALCOHOL-USE DISORDERS ON CLINICAL OUTCOME AND SUICIDALITY IN BIPOLAR I DISORDER: DATA FROM THE BIPOLAR DISORDER RESEARCH NETWORK (BDRN).

Wethers G, O'Neill FA, Forty L, Di Florio A, Gordon-Smith K, Fraser C, Jones L, Jones I, Craddock N, Smith DJ.

Objectives: Bipolar I disorder (BPI) is known to have high rates of comorbid alcohol-use disorders (AUD) but the impact of this comorbidity on long-term outcomes such as episode recurrence and suicidal behaviour is unclear.

Methods: We compared lifetime demographic and clinical characteristics of illness for individuals with BPI and comorbid AUD (n= 436) to those with BPI without AUD (n=1020) using data from the Bipolar Disorder Research Network (BDRN). A logistic regression approach was used to test for associations.

Results: Comorbid BPI and AUD patients had a worse course of illness with significantly more suicidal ideation and a greater number of depressive and manic episodes compared to patients with BPI alone. Being male, unemployed, a current smoker, current cannabis use and the presence of rapid cycling were also significantly associated with comorbid BPI+AUD. Despite this, our data suggest that those with comorbid BPI+AUD were admitted less frequently to hospital than those with BPI alone.

Conclusions: Clinical services need to provide an integrated treatment approach for AUD which is comorbid with BPI. Stigma, interventional nihilism or self-medication may explain why patients with BPI+AUD appear to have been admitted less often to hospital. Early intervention and suicide prevention initiatives should be targeted at young men with BPI plus comorbid AUD.

THE BEST PRACTICE TARIFF AND HIP FRACTURES: HOW CAN NORTHERN IRELAND KEEP UP?

Murphy L, McKenna S, Shirley D.

Current hip fractures guidelines recommend surgery within 36 hours of admission. The 2011 National Hip Fracture Database (NHFD) report shows our institute has the fewest patients meeting this target (9%). Northern Irelands' exclusion from the "Best Practice Tariff" means no incentive-led treatment or prioritisation of hip fracture patients. We performed a systematic review of post-operative results to highlight deficiencies in delivery of patient care. We reviewed 702 patients admitted between September 2009 and April 2012. Patients were prospectively identified and added to our fracture outcome and research database (FORD). Results were compared to national average values from the NHFD. 16.7% of patients met the 36-hour target to theatre compared to the UK average of 66%. 81.7% underwent a pre-operative orthogeriatric review. The main reasons for surgical delay were inadequate theatre space (58%) and medically unfit patients (29%). After exclusion of medically unfit patients, medically fit patients were divided into delayed surgery and not delayed categories. Medically fit patients who had delayed surgery had inferior outcomes- longer hospital stay and higher mortality as an inpatient and at 30 days. Without a change in funding, Northern Ireland will struggle to compete with the UK mainland and decrease mortality in this patient group.

IS THE PROFILE OF NECROTISING FASCITIS CHANGING IN NORTHERN IRELAND? A SINGLE CENTRE 6-YEAR EXPERIENCE, RESULTS AND ANALYSIS

Hodgins N, Damkat-Thomas L, Shamsian N, Yew P, Lewis H, Khan K.

Necrotising Fasciitis is a destructive infection of the skin and soft tissues, associated with significant mortality and morbidity. Survival from the condition necessitates patient referral to plastic surgery units for reconstructive procedures. We selected all cases referred to the regional plastic surgery service in Belfast over the last 6 years. We identified 46 referred patients (25 male: 21 female) and performed a retrospective case note review. The mean patient age was 59.4 years. Risk factors identified were diabetes, smoking, obesity, and immunocompromise. The most frequently affected anatomical site was the lower limb in 16 cases (35%). Infections contributed to 1555 hospital bed days with a median hospital stay per patient of 33.8 days. Necrotising fasciitis cases in Northern Ireland have been steadily increasing over the last 6 years reaching a peak in 2012. The majority are type 1 polymicrobial cases (50%). However, we observed a significant increase in type 2 Group A streptococcal infections over the timescale studied. The overall mortality rate was 28%. This is the first study from Northern Ireland, and one of the largest from the UK in the last 10 years, investigating the epidemiological features of necrotising fasciitis. It has identified a causative microbiology pool, along with changing bacterial trends that validate our current antibiotic policy. Mortality rates are consistent with those published from the rest of the UK.

THE OUTCOME OF PRECONCEPTUAL COUNSELLING IN WOMEN WITH EPILEPSY

Campbell E, Irwin B, Cooke I, Hunt S, Craig J, Cooke I, Morrow J.

Background: Preconceptual counselling (PC) to optimise seizure control and antiepileptic drug (AED) regimen is recommended as routine practice for women with epilepsy who are considering pregnancy. PC often takes place during routine outpatient clinic appointments, and previous studies have shown that information given in this context is often not retained.

Methods: Retrospective study of the outcome of PC in women attending our PC clinic over a ten-year period from 2003 to 2013. Comparison made to a cohort of pregnant women with epilepsy attending our Joint Epilepsy Obstetric Clinic from 2011-2012.

Results: A total of 122 women attended for preconceptual counselling. Overall, 74% of women attending for PC decided to continue to pregnancy without any change to their previous AED regimen. More women taking valproate, either in monotherapy or as part of a polytherapy regimen, made changes to their AED regimen following counselling than those on other drugs (42.8% compared to 4.9% for monotherapy exposures, p=0.0001 and 70% compared to 28.6% for polytherapy, p=0.03). Of those attempting to change from valproate regimens, women taking valproate as part of a polytherapy regimen were more likely achieve a sustained change than those on valproate monotherapy (85.7% compared to 50% on monotherapy). Pregnancy was subsequently recorded in 84 women. Rates of preconceptual folic acid consumption varied between the groups who had attended PC clinic and those who had not. More pregnant women who had attended PC clinic took high dose folic acid preconceptually (82.1%) compared to those attending neurology clinics (38.7%, p<0.0001) or attending a non-neurologist (35.3%, p=0.0003) and fewer abruptly withdrew AED treatment in the first trimester (1.2%) compared to those attending neurology clinics (7.5%, p=0.07) or attending a non-neurologist (11.8%, p=0.07).

Conclusion: In women attending for preconceptual counselling taking valproate, only 23.8% of those on valproate monotherapy and 60% of those of valproate polytherapy successfully changed to another AED prior to attempting to conceive. The higher rate of preconceptual folic acid intake and lower rate of abrupt AED withdrawal in pregnant women who attended dedicated preconceptual counselling clinic suggest that optimal planning of pregnancy and time dedicated to preconceptual counselling may increase the amount of information that is retained by women and improve pregnancy outcomes.

MATERNAL MORTALITY IN A RURAL HOSPITAL IN ETHIOPIA

McCauley M.

Aim: To assess the incidence and to circumstances associated with maternal mortality.

Method: Labour ward registration book was used to obtained details of patients who had died over the past 20 months. Medical records were then reviewed retrospectively.

Results: A total 48 patients were identified. Mean age was 25, and mean parity P1. 36% of patients self referred, 25% were referred from a health centre and 25% were referred from another hospital. Only 10% received antenatal care. The causes of death were severe eclampsia 32%; uterine rupture 28%; haemorrhage 24%; sepsis 10% and anaesthetic complications 6%. 75% of neonates were stillborn. 21% were comatose on arrival to hospital and died shortly afterwards. 11% died post operatively after surgery for ruptured uterus. On review only 14% of deaths may have been preventable with better inpatient management. Only 32% of patients had a discharge or death summary documented.

Discussion: The incidence of maternal mortality in Yirgalem was 1 in 67. This small study demonstrates that mothers in Ethiopia are still dying needlessly. There is an ongoing urgent effort required to reduce this unacceptably high incidence.

MOBILE PHONES IN CLINICAL PRACTICE: REDUCING THE RISK OF BACTERIAL

CONTAMINATION

Mark D, Leonard C, Breen H, Graydon R, O'Gorman C, Kirk S.

Mobile phones have become increasingly integrated into the practice of doctors and allied medical professions.. Recent studies suggest they represent reservoirs for pathogens with potential to cause nosocomial infections. We aimed to investigate the level of contamination on phones used on surgical wards and identify strategies for their safe use. The phones of 50 members of the surgical multidisciplinary team were swabbed using a standardized technique by two trained investigators. The samples streaked out using an automated specimen inoculator onto two types of culture media (Columbia blood agar and MacConkey agar). Colonies were identified and counted by a single trained investigator in a blinded fashion. Simultaneously a questionnaire investigating usage levels of phones was given to 150 healthcare workers. 60% of individuals sampled had some form of contaminant isolated from their phone. 31 (62%) of phones had only 3 colonies or less isolated on medium. No nosocomial bacterial contamination or drug resistant isolates were identified. Touch screen smart phones may be used safely in a clinical environment in the setting of effective adherence to hand hygiene policies.

'VULVAL ITCH' – ARE WE ONLY SCRATCHING THE SURFACE?

Blayney GV, Hardy CL.

Background: Lichen sclerosus (LS) is an autoimmune, inflammatory dermatosis with incidence quoted as 1:300-1:1000 and carrying a 2-4% lifetime risk of developing invasive vulval cancer. Appropriate management may reduce this risk. We audited the management of patients with biopsy-confirmed LS, against RCOG Green Top Guideline No 58.

Methods: A list of patients with biopsy-confirmed LS during 2012 was obtained from our Trust histopathology database. A proforma was devised and case notes reviewed.

Results: 23 dermatological and gynaecological patients were identified. In 3 cases, the notes were unobtainable. All were post-menopausal and aged 53-84 years. In over 60% of cases, there was no attempt to explore a wider relevant history including enquiry into incontinence or personal or family history of autoimmune or atopic conditions. Examination appeared limited and was poorly documented with only dermatologists achieving best practice through considering systemic examination. The decision to biopsy was usually taken at presentation (55%), the main indication being uncertain diagnosis (60%). Whilst recognised as safe and appropriate, only 35% had an outpatient biopsy. Following diagnosis, 10% were investigated for other autoimmune disorders and 25% were advised regarding general vulval skin care. Only 45% were prescribed ultra-potent steroids, 44% of whom were treated with the recommended regimen and appropriately instructed regarding use. In 25%, there was no communication of diagnosis, appropriate treatment or review to the patient or GP. Only 25% of patients were given an information leaflet and 20%, specifically informed regarding the risk of malignancy and the importance of self-surveillance.

Conclusion: This audit highlights that the management of LS, a pre-malignant condition, is consistently falling below recommended practice. Continued education and the use of a proforma to guide management may significantly improve practice and potentially minimise disease progression.

TRANSARTERIAL CHEMOEMBOLISATION FOR THE TREATMENT OF HEPATOCELLULAR CANCER IN NORTHERN IRELAND: OUTCOMES FROM A REGIONAL REFERRAL CENTRE

Stratton S, Bhat S, Cash J, Cadden I, Kennedy P, Ellis P, Collins A, Dargin A, McDougall N.

Background: Transarterial chemoembolisation (TACE) is used to palliate patients with inoperable hepatocellular cancer (HCC) and as a holding procedure prior to transplantation. All TACE therapy in Northern Ireland is delivered by a single centre.

Aims: To determine outcomes for patients treated with TACE for HCC since 2006.

Methods: Patients with HCC diagnosed between 1 Jan 2006 and 31 Dec 2011 who underwent TACE therapy were identified. Relevant premorbid clinical information (UKELD, MELD, Childs-Pugh (CP) stage) was calculated. NI cancer registry database was used for mortality data.

Results: 75 patients (83% male, mean age 67yrs) with HCC had their first TACE during study period, rising from 5 in 2006 to 18 in 2011.

Confirmed causes of cirrhosis included alcoholic liver disease, hepatitis B and C, haemochromatosis, primary biliary cirrhosis, and NASH. 49 patients were CP stage A, 24 were CP B and 1 CP C. Mean MELD score was 9.5 (range 6-20) and UKELD 48.5 (range 42-55).

Mortality was 4% at 30 days, 39% at 1yr and 68.5% at 2yrs. Nine patients had TACE as a holding measure pre-transplantation. Survival was influenced by age and gender.

Conclusions: The number of new patients receiving TACE for HCC in NI is rising. One year survival rate is 61%.

SPONTANEOUS HYPOGLYCAEMIA IN A NON-DIABETIC PATIENT WITH INSULIN ANTIBODIES

McQuillan LM, Graham UM, Lindsay JR.

A 58 year old non-diabetic caucasian man was admitted with a capillary glucose of 1.9mmol/l following an episode of confusion and disorientation. During his admission he had frequent episodes of nocturnal and early morning hypoglycaemia with capillary glucose <3.0mmol/l. After 21 hours of supervised fasting he was symptomatic with

plasma glucose 2.3mmol/l, insulin >1000mU/l and C-peptide 19.6ug/l. Sulphonylurea screen was negative. Given the magnitude of serum insulin, insulin antibodies were measured and were positive. Serum insulin was corrected for the presence of antibodies using PEG precipitation yet remained elevated. CT imaging of pancreas was normal. Endoscopic ultrasound demonstrated a hyper-echoic abnormality in the tail of the pancreas measuring 13x11mm. He subsequently attended for calcium stimulated venous sampling which demonstrated high insulin production throughout the gland with no localisation. The patient started carbohydrate supplementation and 5mg daily prednisolone with resolution of hypoglycaemia over 8 weeks. Insulin autoimmune hypoglycaemia is a rare condition characterised by extremely high levels of insulin in the presence of anti-insulin antibodies. It is the third leading cause of hypoglycemia in Japan, but has rarely been described in the non-Asian population. Making the correct diagnosis is important to avoid an unnecessary pancreatic surgical procedure on a hypoglycemic patient.

CASTLEMAN DISEASE

Warnock M, Campbell B, Macauley G, Hegarty S.

A previously well 27-year-old female presented with three-month history of fatigue and weight loss. She did not report any other symptoms and there was no significant recent travel history. Clinically, there were no objective signs and basic investigations revealed a microcytic anaemia with raised inflammatory markers. HIV, hepatitis virology and liver specific antibodies were all negative. An OGD plus biopsies were normal. A CT abdomen revealed a 5cm soft tissue mass in the left side of the abdomen, separate from the pancreas and adjacent to the left kidney. At this point differential diagnoses included gastrointestinal stromal tumour, lymphoma, desmoid tumour and schwannoma. She proceeded to a laparotomy were a smooth walled lesion was resected from the proximal small bowel mesentery. Her postoperative recovery was unremarkable. The histology was returned as fitting a diagnosis of Castleman disease (CD). CD is a rare non-clonal lymphoproliferative disorder of unknown aetiology. There have been less than 2000 cases reported in the literature. Mesenteric CD is very rare event with only 43 cases reported in the English literature. Awareness of CD is important because the disease is potentially life threatening, is exceptionally rare and is incompletely understood.

COST IMPLICATIONS OF UNNECESSARY COAGULATIONS SCREEN IN SURGICAL PATIENTS

Spence RAJ, Gordon E, McCrossan L, Boyd K, Weir CD.

Aim: Coagulation screens in surgical patients are routinely requested, often inappropriately. A coagulation screen costs £4.81, and often does not alter management. We performed four prospective audits (with audit cycle closed twice) of surgical inpatients in a district general hospital, comparing to Trust and NICE guidelines, to establish if coagulation screen requests were appropriate and identify cost implications.

Methods: All coagulation screen requests in surgical inpatients over two to five week periods were analysed and compared to Trust and NICE Guidelines. Medical notes and laboratory results were reviewed. This was repeated four times over a 3-year period (14 weeks in total).

Results: 313 coagulation screen requests were made over the four audit periods. Only 38% (119/313) requests were indicated as per guidelines. Inappropriate screens were typically requested for no apparent reason (29%), or unnecessary pre-operative, pre-procedure requests (28%), of the total 194 inappropriate requests. Only 3 unexpected coagulopathies were found. Over the four audit periods, total cost of inappropriate screens was £933.14

Conclusions: Despite guidelines, there were a large number of unnecessary coagulation screens performed. Extrapolating our data over the 3-year period, £10,405.20 is spent on inappropriate screens.

DOSE-RESPONSE EFFECT OF FRUIT AND VEGETABLES ON INSULIN RESISTANCE IN OVERWEIGHT HEALTHY PEOPLE AT HIGH RISK OF CARDIOVASCULAR DISEASE: A RANDOMISED CONTROLLED TRIAL

Wallace IR, McEvoy CT, Hunter SJ, Hamill LL, Ennis CN, Woodside JV, Bell PM, Young IS, McKinley MC.

Whole diet observational studies suggest a beneficial effect on insulin resistance of diets rich in fruit and vegetables (FV). We examined the dose-response effect of FV consumption on insulin resistance in 105 overweight, non-diabetic individuals with no history of cardiovascular disease. After a 4 week wash-out diet of 1-2 portions FV per day, subjects were randomised to consume 1-2, 4 or 7 or more portions FV daily for 12 weeks. Insulin resistance was assessed pre and post intervention using a 2 step hyperinsulinemic euglycemic clamp. Between group comparisons of change were made with one-way ANOVA. Eighty-nine subjects completed the protocol; 28 (1-2FV), 29 (4FV) and 32 (7FV) attained a self-reported intake of 1.8, 3.8 and 7.0 portions per day ($p<0.001$) per group. Weight was maintained ($p=0.77$). Mean change in glucose infusion rate was 3.17, -2.14 and 5.40 μmol/kg/min ($p=0.215$). No significant difference was found between groups in measures of whole-body, peripheral or hepatic insulin resistance. Increasing consumption of FV has no effect on insulin resistance in overweight individuals at high risk of cardiovascular disease in the absence of weight loss. However increasing FV intake as part of a calorie restricted diet may have beneficial effects.

NO ASSOCIATION BETWEEN VITAMIN D AND INSULIN RESISTANCE IN OVERWEIGHT HEALTHY PEOPLE AT HIGH RISK OF CARDIOVASCULAR DISEASE

Wallace IR, McEvoy CT, Hamill LL, Ennis CN, Bell PM, Hunter SJ, Woodside JV, Young IS, McKinley MC.

Observational studies suggest reduced vitamin D levels

are associated with an increased incidence of type 2 diabetes mellitus (DM). We examined the relationship with insulin resistance (assessed using a two-step euglycaemic hyperinsulinaemic clamp) in 92 overweight, non-diabetic individuals with no history of cardiovascular disease - mean age 56 years (range 40 -77 years), 64% males, 36% females, body mass index 30.9 kg/m^2 (range 26.4 – 36.9 kg/m^2), fasting plasma glucose 5.8 mmol/L (range 4.9 – 7.0 mmol/L). Vitamin D was measured using an ultra performance liquid chromatography technique (UPLC) with tandem mass spectrometry. Statistical analysis was performed using Pearson's correlation coefficients and partial correlation. Mean total vitamin D concentration was 32.2 nmol/L. Pearson's correlation coefficients for vitamin D and GIR step 1 were -0.003 (p=0.98), GIR step 2 -0.036 (p=0.73) and HOMA-IR -0.163 (p=0.13). Partial correlation analysis did not elicit any significant correlations after correction for potential anthropometric, seasonal or gender confounders. We demonstrate no association between vitamin D and measures of insulin resistance in healthy overweight individuals at high risk of cardiovascular disease. We suggest that if vitamin D is associated with a reduced risk of DM, this may be due to effects on the beta-cell rather than on insulin resistance.

OUTCOMES OF 216 TRAUMATIC BRAIN INJURY (TBI) PATIENTS REQUIRING ADMISSION IN A DISTRICT GENERAL HOSPITAL (DGH)

Spence A, Finnegan S, Flannery T, Harty J.

Introduction: Management of TBI in the DGH is based on national guidelines. There is little in the literature on the outcome of such patients.

Methods: Case notes, imaging and follow-up of 216 TBI patients admitted during one year were reviewed.

Results: The majority of patients admitted (median age: 50 years) were male (81%) and were assessed by trainee physicians; with 79% admitted between 5pm and 9am. 86 patients (41%) had evidence of alcohol consumption, 60 (29%) had decreased consciousness, 15 had dangerous mechanism of injury. 33 patients (22%) demonstrated an abnormality on initial CT brain including cerebral contusions (n=21), skull fractures (n=20), subdural (n=15), intraparenchymal (n=13), subarachnoid (n=6) and extradural haemorrhages (n=3). Four patients died shortly after initial presentation to the DGH due to a non-survivable TBI. Neurosurgical advice was sought on 19 patients - 13 were transferred of whom six required surgery; three eventually died. Glasgow Outcome Score (GOS) of the majority of available cases at last review was 5; a small number requiring minimal assistance (GOS=4, n=3); two patients had permanent disability (GOS=3, n=2).

Conclusions: Head injuries are common in a DGH and, while poor outcomes are rare, adherence to guidelines is essential to ensure optimal patient management.

LOWERING BLOOD TRANSFUSION IN CARDIAC SURGERY – RAP IS CHEAP AND EFFECTIVE

Haughey N, Booth K, Jeganathan R.

Introduction: Locally, Cardiac Surgery consumes 2000 units of blood each year.[1] Using Intraoperative cardiopulmonary bypass results in haemodilution and relative anaemia. Blood transfusion rate for the most commonly performed procedure, CABG is 59%. Resternotomy for bleeding occurs at a rate of 4.9% so we can assume that transfusion is occurring outside of post-operative blood loss. Red cell transfusion has adverse post-operative outcomes with a doubling of 5 year mortality (16% vs 7%).[2] We established national trends in blood conservation and reviewed Retrograde Autologous Prime (RAP) of the bypass circuit as a method of blood conservation.

Methodology: An online survey was carried out across all UK and Ireland units. This was correlated with a local audit of patients receiving RAP versus no RAP. Forty-six patients undergoing cardiac surgery were prospectively studied.

Results: A response rate was seen of 88.6% to the questionnaire. The most common rate of blood transfusion reported was 25-50% with RAP used as a blood conservation method. In our cohort, the addition of RAP led to a 50% reduction in the blood transfusion rate (60.9% to 30.4%).

Conclusions: The method of RAP effectively reduces blood transfusion in this small study and we suggest it as part of patient blood management.

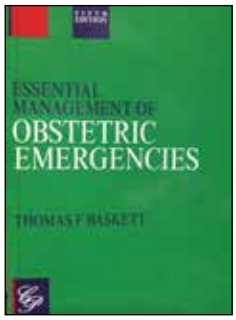
DEFINING THE ROLE OF HER1 IN INVASION AND METASTASIS USING A THREE DIMENSIONAL MODEL OF BREAST CANCER

Leeper AD, Dixon JM, Harrison D.

Breast cancer is the most common cancer in the UK. Associated mortality is almost exclusively as a result of its ability to metastasise to and disrupt distant viscera. In order to improve survival rates in breast cancer, a better understanding of the mechanisms by which cancer disseminates is required. Here we describe a 3D assay which supports proliferation and invasion of primary breast cancer biopsies. Using real time video microscopy and histopathological techniques we identify a role for HER1 in the transformation of ER+ cancer cells into an ER- phenotype. Furthermore, activation of the HER1 receptor may result in epithelial cells developing mesenchymal characteristics along with increasingly invasive behaviour. Correlation with resected breast cancer specimens identified higher levels of HER1 expression alongside a reduction in ER expression over time in patients with recurrent breast cancer. Whilst further investigation is required in both the laboratory and clinical setting, these experiments indicate there may be a role for HER1 antagonists in the setting of ER+ breast cancer to reduce the rate of conversion to a more invasive basal phenotype and systemic dissemination.

Book Reviews

ESSENTIAL MANAGEMENT OF OBSTETRIC EMERGENCIES (5TH EDITION)



Thomas F Baskett, Publisher Clinical Press Ltd 2015. ISBN-13: 978-1854570642. RRP: £22.50

Tom Basket is a "Son of Ulster" who left these shores for Canada as a trainee back in the 70s, but our loss has been their gain. He has become an internationally renowned Obstetrician & Gynaecologist and author, and has yet again put his name to this pocket sized handbook, fifth edition, of Essential Management of Obstetric Emergencies. It was first written by Tom some thirty years ago, has now been upgraded again, is simply a must for all trainees, practising Obstetricians and midwives, and indeed is especially suitable for those who think it would be surplus to their requirements.

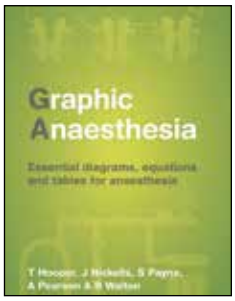
There's nothing as normal as normal pregnancy, and nothing as abnormal as abnormal pregnancy, and nothing can go so quickly from one to the other. Those golden minutes that exist during this window must be maximised, and this book gives all the best, contemporary, common-sensical, well researched and evidence based advice on how to minimise the effects of nature at her worst.

This concise, practical, beautifully written handbook addresses all the common, and many of the rarer complications which we can encounter and is clearly presented for immediate use, but also appropriately referenced for those with the time, inclination and need for in depth analysis.

Apps are part of the future no doubt, but the written word is still king, and in the emergency scenario is likely to remain as such. I truly recommend this HANDbook for everyone who could find themselves as the healthcare provider at the bedside of a mother in need anywhere in the resourced or under resourced world.

Prof Jim Dornan, Chair Health & Life Sciences UU, Chair Fetal Medicine QUB (retd.)

GRAPHIC ANAESTHESIA. ESSENTIAL DIAGRAMS, EQUATIONS AND TABLES FOR ANAESTHESIA. T HOOPER, J NICKELLS, S PAYNE, A PEARSON, B WALTON.



Scion Publishing Limited 2015. 262 pages. ISBN-13: 978-1907904332. RRP £35.00

Graphic Anaesthesia is a well-written, easy-to-read book, ideal for trainees studying for primary FRCA examinations. The chapters are divided into physiology, pharmacology, physics, equipment and clinical measurement, which are closely related to the FRCA syllabus.

Within each of the chapters, topics are limited to one page, which provides a succinct overview of each individual item. The clear standardised format of each chapter makes the information easy to read. It is well presented with words and pictorial/graphical presentation for better understanding of each heading. The reliance on a visual format makes it easier to understand each topic and then recall it later. The "infographic" nature of the information also facilitates quick revision before examinations.

By itself, this book would not suffice for the in depth knowledge needed for understanding the principles of physiology, pharmacology and physics for anaesthesia but the short concise explanations (with colourful diagrams) make it an ideal revision tool for primary FRCA OSCE/VIVA examinations.

It will also be helpful for consultants and trainees preparing practice OSCE/viva in the department. It will be an ideal companion for preparing for exams.

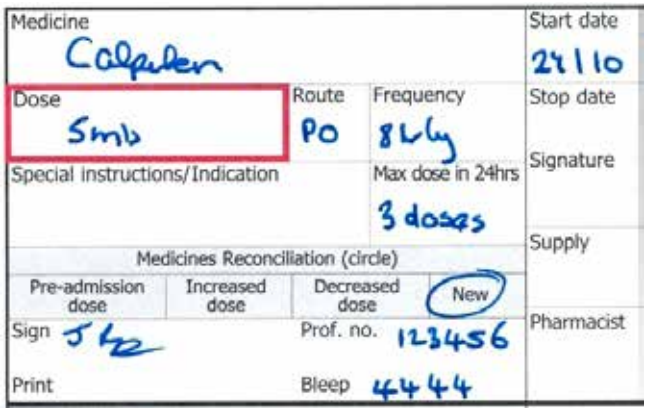
Dr Manav Bhavsar, Consultant Anaesthetist. Dr Aislinn Scullion, Core Trainee 2 in Anaesthetics

Curiositas (paediatric)

In this edition of the Ulster Medical Journal, Curiositas takes a paediatric perspective on a range of interesting clinical scenarios.

PATIENT SAFETY

Can you identify five errors in this paediatric prescription?



Dr Eamonn Sweeney (Paediatrics ST2), Mr Joe McCann (Paediatric Pharmacist) and Dr Thomas Bourke (Consultant Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland.

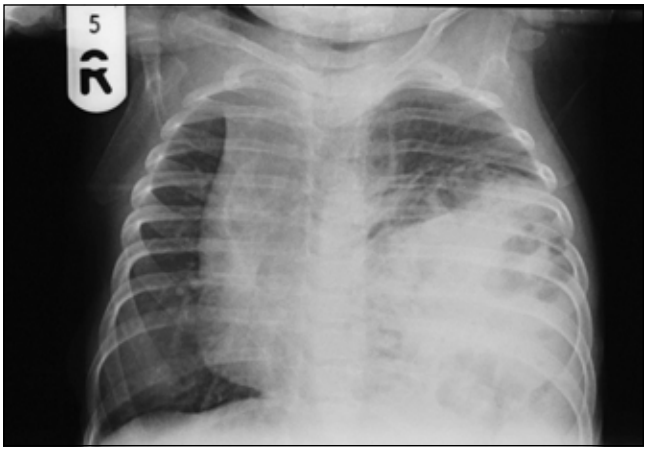
HISTORICAL QUIZ

What is the title of this sculpture and where is it located?

Dr Andrew Thompson (Consultant Paediatrician) and Dr Thomas Bourke (Consultant Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland.

POSTGRADUATE QUIZ

This nine month old presented with respiratory distress. A chest x-ray was performed.



1. What is the diagnosis?
2. How could you confirm the diagnosis and what would your management be?

Dr Caroline Hart (Paediatric ST6), Dr Roisin Bainbridge (Paediatric ST1) and Dr Andrew Thompson (Consultant Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland.

MEDICAL STUDENT QUIZ

1. What is the likely diagnosis?
2. What are the key clinical features to elicit in a patient presenting with this condition?
3. What is the imaging modality of choice?

Jennifer Thompson (4th Year Medical Student, Queen's University Belfast), Dr Julie-Ann Maney (Consultant Emergency Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland.

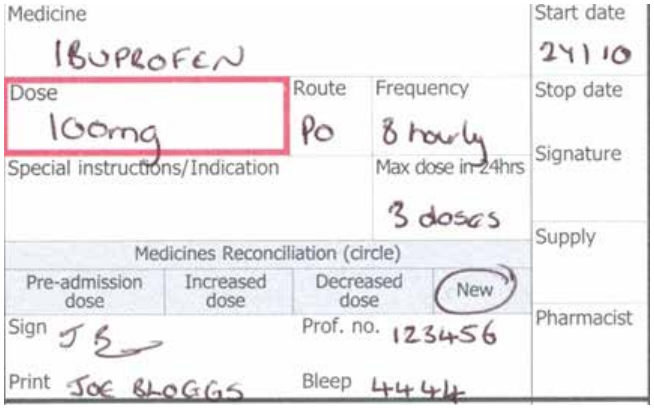
ANSWERS See overleaf

CONSIDER CONTRIBUTING TO CURIOSITAS?
Please refer to '*Curiositas: Guidelines for contributors*' http://www.ums.ac.uk/curiositas.html and email *umj@qub.ac.uk* with your ideas and submissions.

CURIOSITAS: ANSWERS

PATIENT SAFETY

1. All drugs must be prescribed generically.
2. Drug names must be written in capitals.
3. Prescriptions should be completed in black ink.
4. Acceptable abbreviations are 'g' for grams or 'mg' for milligrams. Micrograms, nanograms and units must not be abbreviated. Do not prescribe suspensions by volume (with the exception of combination preparations). If prescribing by volume always specify the concentration required E.g. CO-AMOXICLAV 5 mLs of 125/31 suspension.
5. Signatures must be accompanied by name in print.



Drug prescription and administration errors are the commonest error in medical practice, and are more common in paediatrics. Strict adherence to local prescribing policies, taking great care when making calculations, and double checking are the corner stones of safe prescribing.

Dr Eamonn Sweeney (Paediatrics ST2), Mr Joe McCann Paediatric (Pharmacist) and Dr Thomas Bourke (Consultant Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland.

HISTORICAL QUIZ

This is The Little Philosopher by Rosamund Praeger. A Praeger bronze replica sculpture was commissioned by the Royal Belfast Hospital for Sick Children Medical Staff from the Ulster Museum in October 1972 as part of the Hospital's centenary celebrations the following year. It currently resides in the small atrium at the original entrance to the Children's Hospital. The daughter of a Dutch emigrant who worked in the Belfast Linen Trade, Rosamund Praeger was a local sculptor born in 1867 in Holywood, County Down. The original Philosopher was exhibited at the Royal Academy in 1913, but now resides in the Colorado Springs Museum after it was purchased by an American Collector. Rosamund Praegar died in 1954 and permission was sought and granted from the late artists Estate to use the sculpture as a motif for the hospital by the Hospitals Centenary Committee in 1973.

Dr Andrew Thompson (Consultant Paediatrician) and Dr Thomas Bourke (Consultant Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland.

POSTGRADUATE QUIZ

1. The diagnosis is a late presentation of a congenital diaphragmatic hernia (CDH). CDH occurs in around 1 in 3000 live births[1]. The majority of cases are diagnosed antenatally by ultrasound, or present shortly after birth with severe respiratory distress. Fewer than 3% of cases present outside the neonatal period with a milder variant as in this case[2].These children may be completely asymptomatic or display non-specific respiratory or gastrointestinal symptoms. In general, right sided hernias cause respiratory difficulties predominantly, while left sided defects cause a mixture of gastrointestinal and respiratory symptoms[2].

2. Diagnosis of late presenting CDH is difficult. Many are incorrectly labelled as pneumonia, pneumothoraces or congenital lung cysts[3] resulting in morbidity through incorrect management[2]. There is no definitive diagnostic test. In this case, an upper GI contrast study confirms herniation of loops of small bowel into the left hemithorax with no mediastinal shift. In some cases, MR or CT imaging is useful to delineate the anatomy[3,4]. Initial management requires insertion of a nasogastric tube to relieve obstruction. Definitive management involves surgical correction of the defect[2].

Dr Caroline Hart (Paediatric ST6), Dr Roisin Bainbridge (Paediatric ST1) and Dr Andrew Thompson (Consultant Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland.

1. *Sridhar AV, Nichani S. Late presenting congenital diaphragmatic hernia. Emerg Med J 2004; 21: 261-2.*
2. *Congenital Diaphragmatic Hernia Study Group. Late-presenting congenital diaphragmatic hernia. J Pediatr Surg 2005; 40: 1839-43.*
3. *Hamid R, Baba AA, Shera AH, Wani SA, Altaf T, Kant MH. Late-presenting congenital diaphragmatic hernia. Afr J Paediatr Surg 2014; 11: 119-23.*
4. *Kesieme EB, Kesieme CN. Congenital Diaphragmatic Hernia: Review of Current Concept in Surgical Management. ISRN Surg 2011; 2011: 974041 doi: 10.542/2011/947041.*

MEDICAL STUDENT QUIZ

1. The likely diagnosis is periorbital cellulitis, an infection of the eyelid and periorbital soft tissues, commonly caused by Staphylococcus aureus, Staphylococcus epidermidis or Streptococcus species.
2. Careful ocular assessment is essential to elicit signs of orbital cellulitis which can be a sight threatening emergency. Worrying features include proptsis, loss of vision, pain on eye movement or an afferent pupillary defect (suggesting compression of the optic nerve)

3. CT is the imaging modality of choice. Investigations should also include culture of conjunctival discharge and blood culture. Prompt treatment with intravenous antibiotics is indicated.

Jennifer Thompson (4th Year Medical Student, Queen's University Belfast), Dr Julie-Ann Maney (Consultant Emergency Paediatrician), Royal Belfast Hospital for Sick Children, Belfast, Northern Ireland. The authors would like to thank the patient (and their parent) who gave consent for this image to be published.

Book Case

Mr Barry Clements, 6 favourites from my bookcase.

THE GREATEST GAME EVER PLAYED: VARDON, OUIMET AND THE BIRTH OF MODERN GOLF

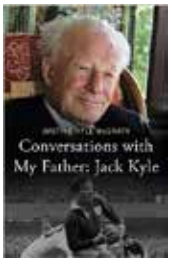
Mark Frost, (Sphere, 2003)

'There are many things in life that will catch your eye, but only a few will catch your heart - pursue these' Mark Nolan.

These are 'passions' I guess and we are blessed with hosts of quotes from Mandela to Einstein which motivate us to lead more fulfilling lives - Just google them! One of my lifelong passions is golf and throughout my life it has always been there like a old friend whose stories never lose their mirth or warmth. It is both consistent and reliable in bonding lifelong friendships and providing much joy.

This book by Mark Frost tells the story of the conception of the modern game of golf and in particular sowed the seed of the transatlantic rivalry that germinated with this story and has flourished into the spectacle that descends upon us every other Autumn in the form of the Ryder Cup. In this book Mark Frost relates the romantic 'David and Goliath' tale of how Francis Quimet, an obscure amateur golfer and local boy defeated the illustrious Englishman Harry Varden in the 1913 US open at the 'Country Club' Brookline. I've had the honour of gracing the hallowed turf in Brookline when I represented the Irish Universities versus US Colleges in 1982 and gave my opponent a proverbial 'Dog Licence' 7&6 making 2 at three of the four par three's - A cherished indelible memory!

CONVERSATIONS WITH MY FATHER: JACK KYLE



Justine Kyle McGrath, (Hachett Books, 2014)

What can I say - If we ever cared to dream and aspire to all that we ever wished for - Jack Kyle would be a reasonable role model! This book makes my list as it ticks all the boxes for me as a surgeon, sportsman and son.

The term legend is over used today but Jack was the archetypal 'Legend' in all senses of the word. He captained Ireland to their fabled Grand Slam victory in 1948 and was given official recognition by the IRFU in 2002 as their 'greatest ever player'.

I was recommended this book by a surgical colleague, Brian Rees who himself was a Welsh International hooker and its easy to see how this book was his 'cup of tea'. I'm not sure what it is about Surgeons and Rugby - should it be hollering for all ones worth at the Kingspan on a Friday night to the legendary status of Surgical Internationals such as Irwin Snr, Wilson and Kyle. We love it - it brings out the gladiator in us in one form or another.

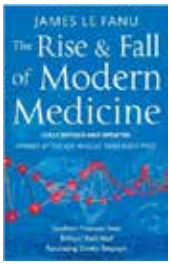
Jack's daughter Justine Kyle McGrath makes no secret of the fact that she grew up blissfully unaware that her dad was anything but a family - and a medical - man - How humbling is that! This is a searingly honest and intimate book that celebrates Jack's double life as a sporting legend and pioneering surgeon. It was Jack's brush with death that provoked the proximity between Justine and her Father which eventually convinced this reluctant hero to allow this publication. It's this element of the book that I find most salutatory and I am encouraged to spend more time with my Father and cherish that bond - while I still can.

CLINICAL ANATOMY 13TH EDITION

Harold Ellis and Vishy Mahadevan (Wiley-Blackwell, 2013)

This book was first published in 1960 - before I was born! Harold qualified in 1948 - a great year in medicine and rugby - The NHS was born and Jackie Kyle was winning a Grand Slam - Harold Ellis is one of the greatest Anatomy teachers alive, 90 this year, and believe it or not he's still as active and entertaining as ever - He is truly a great raconteur and teacher. I've used this book on many occasions from undergraduate days through my Anatomy Demonstratorship and many more times as practising Surgeon and teacher. Where this book is better than all the rest is that it gives the subject of anatomy perspective and relevance! Professor Ellis makes anatomy interesting. I have been fortunate enough to meet him in person when attending a lecture back in the 80's in the Samuel Irwin Lecture theatre, where, as a guest of Mr Odling-Smee, he lectured on Modern Management of Breast Cancer. He told stories in series for about an hour and captivated his audience throughout. The greatest thing I take from this book relates to the author. It reflects his energy, clarity and the art of teaching well - something I can only aspire to.

THE RISE AND FALL OF MODERN MEDICINE [REVISED EDITION]

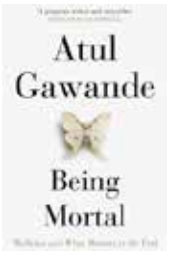


James Le Fanu (Abacus, 2011)

This book should be on the reading list for every prospective Medical Student during the 'purgatory' that exists between Upper sixth and University. To the best of my knowledge, it's on the reading list for prospective Oxbridge Medical Freshmen. The medical achievements of the post-war years rank as one of the supreme epochs of human endeavour. Advances in surgical technique, new ideas about the nature of disease and huge innovations in drug manufacture vanquished most common causes of early death, but, since the mid-1970s the rate of development has slowed, and the future of medicine is uncertain. How has this happened? James Le Fanu's hugely acclaimed survey of the 'twelve definitive moments' of modern medicine and the intellectual vacuum which followed them has been fully revised and updated for this edition. The Rise and Fall of Modern Medicine is both riveting drama and a clarion call for change. There are those that would challenge the 'Fall' element of le Fanu's

claims and the revised edition doesn't really achieve the desired effect when compared with the original publication in 2002. Nonetheless this publication is inspirational and provides perspective to anyone starting out on their medical career. It throws down the gauntlet on many fronts challenging the eager young mind to the possibilities and opportunities that a career in Medicine affords. After all - things are only impossible in one's mind!

BEING MORTAL: MEDICINE AND WHAT MATTERS IN THE END



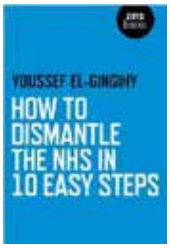
Atul Gawande (Profile Books, 2015)

I imagine no-one will be surprised to find that this book made the cut. Atul Gawande is rapidly becoming the 'Medical Philosopher of our time' . What's more, he's a Surgeon so we are kindred spirits. On the back of 'Complications' 2002, 'Better' 2007 and 'The Checklist Manifesto' 2009, in *Being Mortal*, Atul Gawande tackles the hardest challenge of our profession: Dealing with Death at a time when we are consumed with preserving life to the 'bitter end'.

We are confronted with new language such as 'Wilful neglect' and 'Avoidable harm', terms which ring loudly in our ears as we try to do what's best for our patients. As doctors we are privileged yet vulnerable as we exercise life and death decisions from day to day. Medicine is not an exact science. None the less, we must never be thwarted from the responsibility to practice what we have learned through experience. We can prepare well. Gawande eloquently deals with this thorny subject and provides a blueprint for our profession.

Paul Coehlo, the novelist captures my sentiment perfectly. ' ***When you find your path, you must not be afraid. You need to have sufficient courage to make mistakes. Disappointment, defeat and despair are the tools God uses to show us the way***'

HOW TO DISMANTLE THE NHS IN 10 EASY STEPS



Youssef El-Gingihy (Zero Books, 2015)

I am no heretic, but please indulge me for this last of my six choices. I would recommend this little book to you if you feel that your coffee time chat has become dull. The book is thought provoking for those of us who feel the pressure and constraints imposed by the current NHS and I would guess that's all of us. Surveying the canvas of the past 30 years since qualification there have been significant changes - many that have slipped under the radar - perhaps we were working too hard to notice them! Although we are aware of pastoral responsibilities to our Junior peers, perhaps the 'all out strike actions' of recent times would suggest we are failing. With surgery waiting lists growing out of control and waiting list initiatives accepted as the norm, we bear no shame. People live longer but attend the Doctor more regularly. A&E attendances continue to climb annually and we resign ourselves to looking after 'unscheduled care' and 'cancer' - but still failing to make those targets. We nibble at the other elements, namely elective surgery with out-patient times and surgical procedures firmly 'on ice'. Are we in free fall? What's the future of the NHS? El-Gingihy provides a provocative, controversial explanation of why the NHS has slipped into disrepair in the past 25 years. If you want to understand the real story behind the headlines and find out how you can preserve the NHS for the future then this book is essential reading.

Gamechangers

INCORPORATING CARDIAC CT INTO CHEST PAIN PATHWAYS

Dr R Musy, Dr D McCall

Department of Cardiology, Belfast City Hospital, Belfast Health and Social Care Trust,Lisburn Rd, Belfast BT9 7AD

Chest pain is a common presenting symptom. Identifying patients with underlying coronary artery disease (CAD) is challenging[1].

Across Northern Ireland, Exercise Stress Testing (EST) is the commonest first line investigation at chest pain clinics. EST has a 45-50% sensitivity for predicting CAD.[1] One third of patients diagnosed with non-cardiac chest pain develop ACS or die from IHD within 5 years.[1]

NICE guidelines support Cardiac CT in assessing low-intermediate risk patients. The two key components are CT coronary angiography (CTCA) and Calcium Scoring.

CTCA has a high negative predictive value for excluding CAD making it a potential 'gatekeeper' to invasive angiography. It is proposed as the best non-invasive investigation in the assessment of angina given its high sensitivity (89%) and specificity (96%).[1] Calcium scoring acts as a surrogate marker for atherosclerotic disease and functions as a risk stratification tool. The presence of any detectable calcium on CT is associated with a fourfold increase in coronary events over 3 years.[2]

An emerging use of cardiac CT is incorporating functional assessment of CAD by fractional flow reserve (FFR) to help diagnose ischaemia. CTFFR can provide high diagnostic accuracy for the diagnosis of haemodynamically significant CAD with invasive FFR as the reference standard.[3]

Improved technology has helped reduce some concerns with implementing Cardiac CT. Multi-slice scanners can reduce the imaging field and have less heart rate dependency, helping reduce radiation dose. This also enables imaging of patients previously too challenging e.g. atrial fibrillation.

Compelling evidence exists for incorporating cardiac CT into chest pain pathways. It can help reduce diagnostic uncertainty and guide the use of invasive angiography, improving outcomes for patients.

REFERENCES:

1. Moss AJ, Newby DE. CT coronary angiographic evaluation of suspected anginal chest pain. *Heart* 2016 **102**: 263-268.
2. Kantor B. Coronary Computed Tomography and Magnetic Resonance Imaging. *Curr Probl Cardiol*. 2009; **34(4)**: 145–217.
3. Nørgaard BL et al. Diagnostic performance of noninvasive fractional flow reserve derived from coronary computed tomography angiography in suspected coronary artery disease: the NXT trial (Analysis of Coronary Blood Flow Using CT Angiography: Next Steps). *J Am Coll Cardiol* 2014; 1;**63(12)**:1145-55.

THE UNTOUCHED HEART – SUBCUTANEOUS ICDS

Dr Rebecca Noad, Dr Eng Wooi Chew

Department of Cardiology, Belfast City Hospital, Belfast Health and Social Care Trust, Lisburn Rd, Belfast BT9 7AD

Since 1980 transvenous implantable cardioverter defibrillators (TV-ICDs) have been the cornerstone of sudden cardiac death prevention. They are, however, associated with venous stenosis, thrombosis, endocarditis and lead failure rates of up to 20% at 10 years. Extraction of infected or failed TV-ICD leads is highly challenging[1].

A significant proportion of these complications could be avoided with use of a new subcutaneous-ICD (S-ICD), which comprises a lead tunneled in the subcutaneous tissue along the left sternal edge and to the left anterior axillary line, where a generator is positioned. However, compared with TV-ICDs, there is no provision for long-term bradycardia or anti-tachycardiac pacing (ATP) therapies and the generator is twice as large to accommodate the need for higher energy shocks (80J vs 35J)[2].

The largest, long-term study of S-ICDs to date reported equivalent complication and arrhythmia detection rates compared with TV-ICDs[2], and an inappropriate shock rate of 11%. Recent ESC guidelines recommend that S-ICD be considered in those patients with venous access issues, previous device infections or young patients who meet S-ICD vector screening criteria when bradycardia pacing, ATP or cardiac resynchronization is not required.

In conclusion, subcutaneous ICDs have a role in prevention of sudden cardiac death with appropriate patient selection.

REFERENCES:

1. The Task Force for the Management of Patients with Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death. 2015 *ESC guidelines* for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death.
2. Burke, MC, Gold, MR, Knight BP et al. Safety and efficacy of the Totally Subcutaneous Implantable Defibrillator: 2-year results from a pooled analysis of the IDE Study and EFFORTLESS Registry. *JACC* 2015; **65(16)**: 1605-15.

RHEUMATOID HANDS IN THE BIOLOGIC ERA

Dr Claire Masih, Dr Claire Riddell

Dept of Rheumatology, Musgrave Park Hospital, Stockman's Way, Belfast BT9 7JB

The biologic era has brought exciting opportunities in rheumatology. From cautious beginnings with infliximab we now have five anti-TNF drugs: anti-IL 6, IL1, IL12/23, B and T cell blockers in our armoury. With JAK kinases as emerging oral drugs needles might not remain a necessary inconvenience.[1] The generic biosimilars may achieve similar results at reduced cost, although the degree to which they are equivalent is debated.

Rheumatologists and patients have gained confidence with biologic drugs. Initial fears of cancer, MS and TB are largely unfounded with successful treatment of patients into their eighties. With suitable patient selection side effect rates are not far off placebo in clinical trials.[2]

With such powerful treatments on offer are the textbook cases of rheumatoid deformities a thing of the past? Sadly not all patients respond and some have initially positive responses only to suffer a frustrating failure of their biologic drug a year or so down the line. There are patients who have been through all biologic treatments and wait for the next new molecule, hoping that this one may work for them.

What can we do in these circumstances? We have to rely on joint injections, corticosteroids, physical therapy, and a strong therapeutic relationship with our patients, continuing to care when we cannot cure. The biological era has brought remission to many patients and there are hopeful new drugs in the pipeline but cases of "rheumatoid hands" are not going to disappear just yet.

REFERENCES:

1. Selective JAK inhibitors in development for rheumatoid arthritis. Norman P. *Expert Opin Investig Drugs* 2014: **23(8)**: 1067-77

2. Biologics for Rheumatoid Arthritis: an overview of Cochrane reviews. Singh JA et al *In Cochrane Database of systemic reviews* 2009: **4** CD007848

Ulster Med J 2016;**85(2):**143-144

So you want to be an **ADEPT Fellow?**

Grainne Donaghy[1] Rachael Hutton[1] Keith Gardiner[2]

[1]Dr Grainne Donaghy, ADEPT Clinical Leadership Fellow, BHSCT, ST4 General Adult Psychiatry [2]Dr Rachael Hutton, ADEPT Clinical Leadership Fellow, HSCB, ST5 Urology
[3]Professor Keith Gardiner, Postgraduate Dean

Correspondence to: Dr Rachael Hutton
E-mail: rachael.hutton@hscni.net

Accepted: 24th December 2015
Provenance: invited article

Do you see yourself as a current or future Clinical Leader? Would you relish the opportunity to take a year out of programme to focus on learning, developing new skills and reflecting on your leadership experiences so far?

INTRODUCTION

There is increasing emphasis on engaging clinical staff in leadership and developing leadership and quality improvement (QI) skills for all doctors. Research demonstrates the link between engaging clinical staff to develop leadership capability and better outcomes and care for patients. Leadership is 'the art of motivating a group of people to achieve a common goal'.[1] Northern Ireland Medical and Dental Training Agency (NIMDTA) has launched, in partnership with other Health and Social Care bodies, a novel scheme for trainees: the ADEPT (Achieve, Develop, Explore Programme for Trainees) scheme.

ADEPT

The ADEPT scheme enables senior trainees in Northern Ireland to develop the organisational and leadership skills necessary to undertake future roles as clinical leaders. Trainees work on projects in an apprenticeship model with senior leaders in DHSSPS and HSC for one year.[2]

The aim of ADEPT is to give trainees a better understanding of how the health and social care system in Northern Ireland works. By working with leaders and managers to understand their strategic visions of health and social care in the region, and the factors that influence this strategy, they can identify, develop and explore the effective leadership and management styles that achieve results.

ADEPT also enables trainees to appreciate first-hand the relationship between clinical practice and service management. By thinking differently using reflective practice, gaining practical leadership and management experience, and leading on a number of QI projects, Fellows have the opportunity to work with senior colleagues facing similar challenges. This creates rich learning opportunities in which influencing and negotiating skills in a multi-professional environment can be sharpened.

LEADERSHIP DEVELOPMENT PROGRAMME

Alongside their supervised role in host organisations, the Fellows participate in a Leadership Development Programme through the HSC Leadership Centre. Coaching and mentoring sessions, host organisation insight visits, and completion and presentation of a QI project complement the attainment of a Level 7 Certificate from the Institute of Leadership and Management. ADEPT is unique in this regard, as other leadership programmes for trainees across the UK do not currently offer the opportunity to complete a formal qualification as part of their programme.

ADEPT 2015/6

There are currently eight specialist trainees in this first year of ADEPT. Each Clinical Leadership Fellow is attached to one or, in some cases, two host organisations. For 2015/6 this included three of the Health and Social Care Trusts (Belfast, Southern and South Eastern), NIMDTA, The Board Liaison Group/eHealth and Care Team, GMC/RQIA, HSC Leadership Centre/ HSC Safety Forum and The Department of Health Social Services and Public Safety**.** Each Fellow has at least one project they are leading on, as well as contributing to a number of other ongoing developments.

BENEFITS

Fellows have been able to develop both their personal and professional skills during project work, and have gained a much deeper understanding of the health and social care system as a whole. We have been encouraged and enabled to build professional networks to draw on the skills and expertise of others. Host organisations have maintained an open door policy, enabling insights into the complexities that senior clinical leaders face on a daily basis. We have had numerous educational opportunities, with access to visiting health and social care leaders from across the United Kingdom with tailored seminars from the General Medical Council (GMC), Faculty of Medical Leadership and Management (FMLM) and Government Leads.

CONCLUSION

Trainees on the front line are well placed to display leadership by identifying problems and implementing solutions[3]. The Keogh Review[4] states that doctors in postgraduate training 'must not just be seen as the clinical leaders of tomorrow, but clinical leaders of today'. Clinicians are 'potentially our most powerful agents for change.'[4]

ADEPT affords a fantastic opportunity for trainees to take a year out of programme to grow skills that will remain with them throughout the rest of their training and beyond. Any trainee that is interested should give it a go – what have you got to lose?

If you would like further information from current ADEPT Fellows, please contact rachael.hutton@hscni.net (ADEPT

Fellow, Board Liaison Group and eHealth and Care Team) or drgdonaghy@hotmail.com (ADEPT Fellow, Belfast Health and Social Care Trust). For details on how to apply please see the NIMDTA website (http://www.nimdta.gov.uk/adept/).

REFERENCES

1. The King's Fund. *The future of leadership and management in the NHS: no more heroes. Report from the King's Fund Commission on Leadership and Management in the NHS*. London: The King's Fund. Available at: http://www.kingsfund.org.uk/sites/files/kf/future-of-leadership-and-management-nhs-may-2011-kings-fund.pdf. Last accessed February 2016.
2. NIMDTA. ADEPT – (Achieve Develop Explore Programme for Trainees) 2016/2017 ADEPT recruitment. Available at: http://www.nimdta.gov.uk/adept/ Last accessed February 2016.
3. Lemer CM. Patient safety and junior doctors: are we missing the obvious? *BMJ Qual Saf*. 2013;**22(1)**:8-10.
4. Keogh B. *Review into the quality of care and treatment provided by 14 hospital trusts in Engald: overview report*. London: NHS England; 2013. Available at: http://www.nhs.uk/nhsengland/bruce-keogh-review/documents/outcomes/keogh-review-final-report.pdf. Last accessed February 2016.
5. The King's Fund. *Leadership and engagement for improvement in the NHS: together we can. Report from The King's Fund Leadership Review*. London: The King's Fund; 2012. Available at: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/leadership-for-engagement-improvement-nhs-final-review2012.pdf. Last accessed February 2016.

THE ULSTER MEDICAL JOURNAL

Whitla Medical Building, 97 Lisburn Road, Belfast BT9 7BL. United Kingdom.
Contact details: T/ F: (+44) 028 9097 5780 E: umj@qub.ac.uk W: www.ums.ac.uk

NOTICE TO CONTRIBUTORS

The Ulster Medical Journal is an international general medical journal with contributions from all areas of medical and surgical specialties relevant to a general medical readership. It retains a prime focus on material relevant to the health of the Northern Ireland population. The Journal is indexed on *PubMed Central* and *Index Medicus*.

The Journal's links with the Ulster Medical Society and Queens University Belfast are reflected in regular publication of Medical History and Medical Education articles. **The front cover** of the journal usually includes an image related to an article within, but the editor is keen to consider publishing images that reflect "**Ulster medical life**" in a broader context. Please contact the editor for further details.

Papers, case reports and letters should be sent to the Editor by e-mail at editor@ums.ac.uk. The preferred format is **Microsoft Word**.

Manuscripts should be accompanied by a covering letter **signed** by all the authors agreeing to publication and stating that the work has not been published elsewhere; and stating that they have been actively involved in the preparation of the paper and outlining their contribution to the paper. Any conflict of interest should be declared.

A **PDF** copy of the printed and signed covering letter is ideal for electronic submission.

A Consultant or GP Principal (or equivalent) is required to act as guarantor of the manuscript (usually as a co-author) in case of any issues that may arise after publication.

If e-mail submission is not possible, A CD or memory stick containing the manuscript, tables, images and covering letter can be sent to the Editor at: Dr John Purvis, Consultant Cardiologist, Cardiac Unit, Altnagelvin Hospital, Londonderry, BT47 6SB, Northern Ireland.

Articles submitted for consideration should be typewritten in single spacing, with wide margins, preferably in Times (New) Roman 12pt font. They should be fully corrected and alterations in proof may be disallowed or charged to the authors.

Colour images and tables are encouraged and there is currently no charge for colour reproduction.

Images and tables should be included as separate high resolution .jpg or .tif files and NOT embedded in the Word manuscript file. Images should be appropriately annotated and labelled.

Dr Purvis will be pleased to advise on the preparation of manuscripts on request.

After editorial checks, all manuscripts are independently refereed. The editor may request revision to a manuscript before it goes to the referee, e.g., embedded images, annotation of unlabelled images or poor quality of English.

After peer review by the referee, a manuscript may either be accepted for publication, accepted with minor or major revisions requested within a deadline or rejected. The Referee's and Editor's decisions are final and not open to negotiation. A manuscript may not be re-submitted after rejection.

1. For full or short papers, the text should indicate the purpose of the paper, and should include an introduction, sections on materials and methods, results, and a discussion relevant to the findings. A brief factual summary/abstract should be provided at the beginning of the paper along with up to six key words. For case reports, these should be **novel** or particularly important cases and *not just good teaching points*, with a maximum of 10 references and appropriate patient consent for publication of photographs.
2. Letters to the editor should be less than 500 words with up to 5 references and 1 table and/or figure.
3. Audits are eligible for publication as letters to the editor but will not be considered as original papers.
4. Scientific measurements should be in SI units (DN Baron. *Units, Symbols and Abbreviations. A Guide for Medical and Scientific Authors.* 5th ed. London: Royal Society of Medicine, 1994). Blood pressure may be expressed in mmHg and haemoglobin concentration as g/dl.
5. References should be restricted to those really necessary and useful. This journal uses the "Vancouver" style. See Uniform Requirements for Manuscripts Submitted to Biomedical Journals (www.icmje.org/recommendations/) for full details and advice. Text references are numerical and each article reference should include:
    1. a list of all authors when six or less (when seven or more only the first six should be listed followed by *et al*).
    2. the title of the article.
    3. the title of the journal *in italics* (abbreviated to the form published by the National Library of Medicine, www.ncbi.nlm.nih.gov/nlmcatalog/journals).
    4. the year.
    5. volume number and issue number (in brackets) **in bold**.
    6. first and last pages.

- *Example:* Devlin LA, Price JH, Morrison PJ. Hereditary non-polyposis colon cancer. *Ulster Med J* 2005;**74(1)**: 14-21.
- Book references should give the author, title, edition, town of publication, name of publisher, year of publication, and, where appropriate, volume and page numbers.

6. Ten offprints of each article will be forwarded free of charge to the corresponding author. Further reprints can be obtained from the printers, Messrs Dorman & Sons Ltd, Unit 2, 2A Apollo Road, Boucher Road, Belfast BT12 6HP - telephone (+44) 028 9066 6700, email info@dormans-print.co.uk - who should be approached directly. For reprint information in the United States contact: International Reprint Corporation (IRC), 287 East H Street, Benecia, California, 94590 USA. Telephone (707) 746-8740, fax (707) 746-1643.
7. Fellows and Members of the Ulster Medical Society receive the journal free. Individuals may subscribe directly. Institutional subscriptions are for a calender year. The journal has three issues per year and is published in January, May and September with a circulation of 1,000 hard copies. The journal contents are covered by *Current Contents/Clinical Practice, Index Medicus, Excerpta Medica, PubMed, PubMed Central*, and *Index Copernicus*. The journal is available in 16mm and 35mm microfilm and 105mm microfiche from UMI, 300 North Zeeb Road, PO Box 1346, Ann Arbor, MI 48106-1346, USA.

The journal attempts to conform to the International Committee of Medical Journal Editors (ICMJE) and authors should consult the ICMJE website for details of policies not specifically outlined below and particularly for research on animals and other ethical considerations. In addition, the journal is a member of the Committee On Publication Ethics (COPE).

Volume 85 No. 2 **May 2016**
ISSN 0041-6193

Front cover: A World War I advanced dressing post some distance back from the front line. Image credit: The Somme Association.