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IMJ

Official Journal of the Irish Medical Organisation

Irish Medical Journal

MARCH 2014 Volume 107 ■ Number 3

IRISH MEDICAL ORGANISATION
Ceardchumann Dochtúirí na hÉireann

Subscriptions 2014
6 Month Subscription:
Ireland, UK, EU €125
Outside EU €200

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In this Month's IMJ

Use of lean principles to improve flow of patients with fractured neck of femur – the HOPE study: McNamara et al applied lean principles in the management of patients with a fractured neck of femur. Following process mapping a number of new measures were introduced. A number of beneficial improvements were achieved – the proportion admitted to the trauma ward within 4 hours increased from 27% to 37%, a 38 minute increase in theatre starting time, an additional 12% received surgery within 24 hours, a 1 night length of stay reduction.

Table 2 Waiting Time for Surgery

Date	Timeframe	Surgery < 24 hours	Surgery > 24 hours	Surgery <48 hours	Surgery >48 hours
Historical Data					
May 08 to Dec 08	6 months	57%	43%	66%	34%
Jan 09 to Dec 09	1 year	56%	44%	68%	32%
Jan 10 to Dec 10	1 year	58%	42%	70%	30%
Trial Period					
10th January to 6th March 2011	3 months	44%	58%	65%	35%
21st March to 15th May 2011	2 months	56%	44%	73%	27%

Comparison of co-morbidities in patients with pre-diabetes to those with diabetes mellitus type 2: Farrell and Moran found that many of the common co-morbidities in the diabetes mellitus type 2 are found with similar frequency in the pre-diabetes group. However peripheral vascular disease, eye disease and cerebrovascular disease are more common in the diabetes mellitus type 2 group. The authors conclude that the findings emphasise the early detection and management of the condition.

Table 1 Prevalence of complications in Type 2 and Pre-diabetic patient group

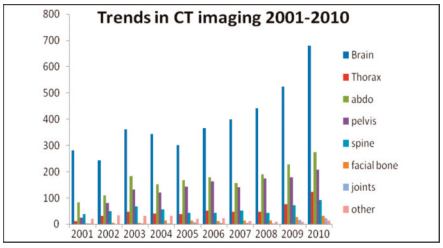
	Ischaemic Heart Disease	Chronic Kidney Disease	Cerebrovascular Disease	Peripheral Vascular Disease
Pre-DM	20.6%	3.9%	3.5%	7.7%
Type 2 DM	17.8%	5.5%	5.2%	12.9%
P-value	.369 (NS)	.337 (NS)	.321 (NS)	.034 (S)
	Eye Disease	**Peripheral Neuropathy**	**Automatic Neuropathy**	
Pre-DM	0.3%	2.6%	5.5%	
Type 2 DM	6.5%	8.7%	3.6%	
P-value	<.001(S)	.001 (S)	.249 (NS)	

Seasonal influenza vaccine uptake in HSE-funded hospitals and nursing homes during the 2011/2012 influenza season: The study examined the flu vaccine uptake among health care workers (HCWs) in acute hospitals and nursing homes. 45 hospitals and 120 nursing homes provided uptake data. The flu uptake by HCWs was only 18% in hospitals and 14% in nursing homes. The authors propose the introduction of an 'opt out' type of vaccination programme.

Table 1 Hospital influenza vaccine uptake among HSE grade category staff for all returns* in all HSE regions, 2011/2012 influenza season

		All returns	
HSE Grade Category Staff	Total No. Eligible Staff	No. Vaccinated	% Vaccinated
Management & Administration	6806	1405	20.6%
Medical & Dental	5480	1194	21.8%
Nursing†	19139	2306	12.0%
Health & Social Care Professionals	5586	1385	24.8%
Other Patient & Client Care§	2929	571	19.5%
General Support Staff¶	6326	1337	21.1%
Total*	**46287**	**8228**	**17.8%**

Analysis of the last decade of weekend out-of-hours CT imaging: how have things changed? Culleton and Torreggiani have audited the increased demand for CT imaging at weekends. Over the decade 2001-2010 CT examinations increased 210.7%. CT brain imaging accounted for 46% of the workload followed by CT thorax, pelvis and abdomen. The rise is in part explained by use of scanning in the management of strokes and pulmonary embolism. The authors point out the need for balance between clinical need and the health related risks of CT scanning.



The national incidence and outcomes of gastroschisis repairs: Barrett et al have examined the clinical patterns for gastroschisis. Seventy babies were identified giving an incidence 1.96 per 10,000 live births. Eighty two per cent were diagnosed antenatally. The caesarean section rate was 48%. The mean length of stay following surgery was 31 days.

Table 2 Entire Cohort and Primary Repair Day 1 versus No Primary Repair Day 1 Cohorts

Clinical Course Entire Cohort	Total 70 patients		
Day of repair[1]	2 (1-3)		
Length of stay in PICU[1]	7 (5-11)		
Duration of TPN[1]	20(14-30.75)		
Incidence of CCRIs	33/70 (47%)		
Number of blood transfusions[1]	1 (0-2)		
Length of Stay[1]	31 (25-57)		
Clinical Course: PR Vs NPR	**PR (n=28)**	**NPR (n=42)**	**p value**
Length of stay in PICU[1]	5 (4-7)	8 (7-12)	0.017*
Duration of TPN[1]	16 (12-22)	22 (15-38)	n/s
Incidence of CCRIs	13/28 (46%)	20/42 (47%)	n/s
Number of blood transfusions[1]	1 (0-2)	1 (0-2)	n/s
Length of Stay[1]	28 (21-43)	32 (30-60)	n/s

Unscheduled undergraduate teaching in surgery: a multi-institutional analysis: Mulholland et al surveyed undergraduate teaching in surgery. The findings indicate that a significant amount of unscheduled teaching takes place within surgical teams. NCHDs play a large role in the teaching. Small group teaching is the preferred mode by students. This valuable teaching resource should be formalised.

Table 1 Frequency of Unscheduled Teaching Sessions by Grade

	More than weekly	Weekly	Fortnightly	Monthly	Less than monthly
Intern	5	7	4	6	7
SHO	4	3	4	6	2
Registrar	2	2	2	1	1
SpR	4	2	0	2	0
Surgical Tutor	2	0	1	0	0
Consultant	3	3	1	1	2
	20	17	12	16	12

The value of health libraries and librarians to the Irish health system: Lawton reports that librarians working in the Irish health sector are under threat. Librarians are not being replaced due to the financial cutbacks. Librarians perceive that doctors and nurses are not clear on the role of librarians. It is suggested librarians should work in clinical teams and help to provide evidence based information to support patient care. It may be helpful for them to attend teaching ward rounds as well. The SHeLLI report strongly advocated the role of the librarian. 'Google can bring you back 100,000 answers, a librarian can bring you back the right one'.

Table 1 Snapshot of value of health science librarians to Irish health system

Role of librarian	Program/Beneficiary	Value
Online clinical query service Assistance with evidence compilation for clinical guidelines	National Cancer Control Programme National Clinical Effectiveness Committee	• Quality information • Saves time • Influenced decision on patient care, policy, clinical practice • Reduce risks and errors
Bibliotherapy Service	Patients	• Access to quality approved books specific to conditions e.g. bereavement
Educator	Students in all health professions	• Lifelong learning information skills • Information-seeking skills for systematic reviews and published research
Clinical librarian as part of multidisciplinary hospital and clinical teams	Clinical teams Hospital teams Patients	• Improve access for clinicians to quality information • Information at point of care

Evidence Based Medicine

The word evidence and the practice of medicine have become inextricably linked. Evidence has become central to how we manage patients in the clinical setting. It is difficult to comprehend that it is a relatively new concept. It appears to have been there for a very long time. Surprisingly it has only been with us for 22 years. Recently on the 25th Jan 2014 the BMJ and JAMA simultaneously published the same editorial 'evidence based medicine-an oral history. The article was accompanied by a video interview with the major figures in the field.

The seminal paper on evidence based medicine was published by Gordon Guyatt in JAMA in 1992. This paper introduced the concept to the wider world. Guyatt's background was at McMaster medical school where epidemiology and statistics were taught together with clinical medicine. When he arrived there in 1990 critical appraisal was being practiced. This was to be the forerunner of evidence based medicine. Guyatt urged doctors to treat patients based on the evidence about what worked best according to the evidence. He wanted a new balance to be struck between intuition and this new approach to patient care. He initially called it scientific medicine but following further deliberation the term 'evidence based medicine' was coined. Initially he thought that graduates would be able source the evidence for themselves but this did not happen. He subsequently concentrated on training them about how to seek secondary sources of evidence. He is optimistic that we know have the technology and knowledge to complete the integration of evidence based medicine into clinical practice.

The other big players at McMaster at that time were Guy Sackett and Brian Haynes. From the 1980s onwards they had been researching the area of critical appraisal. Furthermore they were seeking ways of bringing critical appraisal to the bedside. Sackett has a clear understanding of the difference between critical appraisal and evidence-based medicine. Evidence-based medicine goes beyond critical appraisal. It integrates the knowledge with the clinical skills and the patient's values. He gives the example of anticoagulation in patients with atrial fibrillation where one presents the data to the patient in a way that he can weight up the benefits of preventing a stroke against the risks of developing a bleed. Initially, there was a degree of backlash against the introduction of evidence based medicine. Some detractors stated that it was simplistic and would lead us down the path of 'cook-book medicine'. Others felt that it represented an attempt by managers to simplify medicine and bypass the consultant specialists. However the protagonists quickly won over and bypassed the detractors.

Kay Dickersin had been working in Johns Hopkins where she had become interested in the registration of perinatal trials. She was advised to visit Oxford and to collaborate with Ian Chalmers in Oxford at the National Perinatal Epidemiology Unit. In their collaborative they found that 25% of RCTs were never published. Often the researchers lost interest and moved on to other things. The results of the research simply ended up in a drawer. A lesser problem was editors of medical journals refusing to publish trials with negative results. This failure to publish such a large number of trials was a major cause of concern because the evidence was the likely to be skewed in favour of positive findings and positive results. It means that there could be evidence out there that we don't know about. Dickersin feels that there should be a greater emphasis on safety. The harms literature needs to be expanded. It is not sufficient to concentrate on the effectiveness limb of trials.

Drummond Rennie, while deputy editor NEJM got a manuscript from Tom Chalmers, Johns Hopkins in 1977. It was the first metanalysis that he had ever read and it seemed to solve a huge number of problems at the one time. It represented a new way of dealing with the medical literature. It showed how to deal with important clinical questions such as whether one should give anticoagulants to patients with a myocardial infarction. It showed that it was a good idea and proved it. Subsequently, Rennie met David Sackett who came to meet the editors of the NEJM. He proposed a series for the NEJM. When he moved to JAMA Rennie put together a series on evidence based medicine. NEJM was a bit lukewarm at the time. Its problem was that you are never comparing apples with apples when you do a metanalysis. Rennie points out that unless you are going to depend on one paper only you have to allow for some latitude.

Brian Haynes was a 2nd year medical student at Alberta. He attended a psychiatry lecture on Freud. When he asked about the evidence, he was told that there was none. Subsequently when he went to Toronto, people used to get cross when he asked what the evidence was. Later in a lecture given by Dave Sackett he learned that one could find and obtain evidence for clinical actions. Haynes went on to work with Sackett. He developed a health research unit in order to see how best the evidence could be simplified. He called this the 'knowledge translation'. He wanted to get away from the idea that you had to wait for old doctors to die off in order to bring in new concepts particularly evidence based medicine.

Paul Glasziou, an Australian had been working in the area of epidemiology and clinical trials. He met with Dave Sackett when he visited Sydney and this represented a new direction for him. He retrained as a GP so that he could determine how research could be made most useful for primary care doctors. He points out that when learning medicine, students need to be sceptical rather than being overwhelmed by authority. He thinks that we are too slow in doing systematic reviews and that they take too long. Also he thinks that we should do more non-pharmaceutical trials. Unlike some others, he feels that it possible to apply evidence to patients with co-morbidities. It is a matter of beginning with the most important condition.

Iain Chalmers and Muir Gray have been the major UK innovators of evidence based medicine. Chalmers established the Cochrane Collaborative. They both felt that the 20th century was the century of the doctor and that the 21st century is the century of the patient. Personalised medicine will become increasingly important.

All these individuals came together in the 1980s and 1990s with the single determination to make scientific research the basis of clinical practice. Over a period of 2 decades they altered the face of medicine and how we practice it.

JFA Murphy
Editor

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CT Analysis of Renal Stone Composition: A Novel and Non Invasive Method to Analyse Stones

The treatment of renal stone disease is very dependent on the composition of the stone. Uric acid stones for example have a completely differerent eitiology and treatment pathway to calcium phosphate or oxalate stones. Until now, the diagnosis of renal stone disease was mainly done through urine analysis and formal stone analysis once the stone has been removed. There is now a novel method of analysing the composition of stones by utilisation of dual energy CT, a technology that we have recently introduced to Ireland. CT not only has the ability to detect stones with a sensitivity of close to 100%, but now has the ability to actually give a breakdown of the underlying composition of the stone. Renal stone disease is estimated to have a lifetime incidence of up to 15%, thus making it a common presentation to both the primary care setting and emergency departments[1]. The classical presentation of loin to groin colicky pain with haematuria is well known. More atypical symptoms include abdominal pain, nausea, urinary frequency or difficulty voiding. The majority of renal stones are calcium oxalate stones and account for up to 75-80% of renal stones. Struvite (magnesium ammonium phosphate), calcium phosphate, uric acid, cysteine and mixed stones make up the remaining 20-25%[2].

Traditionally, plain radiographs of the abdomen aided in the diagnosis when a calcified density projected over the region of the kidneys or along the course of the envisaged ureters was seen. However, only 80% of stones are visualised and further information such as the presence of obstruction cannot be obtained. Intravenous pyelograms (IVP) have a higher sensitivity and specificity for the detection of stones and can also assess for hydronephrosis but are a costly exercise in both time and patient safety with significant radiation exposure and the necessary administration of intravenous contrast. In fact, in most departments IVPs have become obsolete. Ultrasound may be considered in the assessment of hydronephrosis however small stones are frequently missed. The imaging test of choice today is non-contrast computed tomography of the kidneys, ureters and bladder (CT KUB) which has an accuracy rate of close to 100% in the diagnosis of renal stones and is low in radiation dose thanks to new low-dose techniques[3,4].

While imaging can provide a definitive diagnosis of renal stone disease further investigations should be undertaken to determine the composition of the stone in order to initiate appropriate therapy. With approximately 50% of patients expected to present with recurrence of renal stone disease within 10 years of their initial presentation, consideration should be given to stone characterisation in order to commence appropriate preventative measures[5]. In patients with established renal stone disease and at moderate and high risks of recurrence, stone analysis is an essential part of their workup. 24-hour urine collection is a non-invasive investigation that can be used to determine the possible composition of a patient's stone. However this test can be inaccurate and is time-consuming and reliant on patient compliance[6]. Thus, stone fragment analysis is an important approach in the management of renal stone disease, but depends upon patient retrieval of passed stone or retrieval of stone during an invasive urological procedure.

Although only in its infancy, the emergence of dual energy CT as a method of renal stone analysis in vivo has the potential to make a significant impact on patient care as it not only allows non-invasive, pre-procedural stone composition analysis but can directly influence the management of these patients based on analysis findings. Dual energy CT is not a new concept and was first described in the 1970s. However, its use was not practical at that time due to timely acquisition of images, poor image quality and excessive radiation exposure[7]. A number of basic physical principles should be first explained. CT relies on the production of X-ray beams by an x-ray tube, which are then passed through the body and received by opposing detectors. As the x-rays pass through a volume of tissue they may or may not interact with that tissue and become attenuated. Some tissues are more likely to attenuate an x-ray beam at a given energy and it is known that the higher the density and the higher the atomic number of a material, the more likely attenuation will occur. For example, bone is much more likely to attenuate an x-ray beam compared to air. The composition of the imaged volume of tissue is determined by the differing attenuations of x-ray beams which are received by the detectors and then computer processed and reconstructed to produce virtual slices of that particular volume of tissue. Within each slice we can confidently distinguish between bone, air, fat, soft tissue, fluid etc.

However, tissues which are of similar density and atomic number will look identical on conventional CT, for example a calcium oxalate and a uric acid renal stone will be indistinguishable. This is where the use of dual energy CT takes a step further into the realm of tissue characterisation. With this technique two x-ray tubes of different tube kilovoltage potentials, usually 80 Kvp and 135 Kvp, image the same tissues, or in this case a renal stone. Two stones of differing atomic composition will demonstrate differences in attenuation and this can be analysed using sophisticated post-processing techniques to provide information about tissue composition beyond that obtainable with single-energy technique. Initial studies, both in vitro and in vivo, have been promising with dual energy CT correctly identifying renal calculi composition with 92-100% accuracy[8-10]. Significantly, the recent use of dual energy CT has not demonstrated an increase in radiation dose to the patient and indeed has the capability to further reduce dose is possible in certain cases[11].

Dual energy CT as a method of non-invasive renal stone characterisation is an exciting and novel development with far-reaching implications in the investigation and diagnosis of patients and subsequent management of renal stone disease while obviating the need for time-consuming or invasive procedures.

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Use of Lean Principals to Improve Flow of Patients With Fractured Neck of Femur – The HOPE Study

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Abstract
We describe the implementation of a care pathway for patients with fractured neck of femur (NOF) using Lean and Six Sigma principles. After introduction of the Lean pathway, 32 patients out a total of 86 (37%) with fractured NOF were admitted to the Trauma Ward within 4 hours of presentation to the hospital; prior to implementation this was 16 patients out of a total of 59 (27%). Post-Lean an earlier mean theatre start time of 8.40am was achieved, resulting in a 38 minute increase in daily theatre time. An additional 52 patients (12%) received surgery within 24 hours of admission, resulting in 1 night length of stay reduction. Lean methodology proved an effective method to guide change resulting in an improved journey for the patient and significant workflow gains.

Introduction

The best practice care for fractured NOF is well-defined. The British Orthopaedic Association provides an evidence-based guideline on management of hip fracture and states that patients should be admitted to an orthopaedic ward within 4 hours of presentation and undergo surgery within 48 hours, if fit. Prompt and effective multidisciplinary intervention can improve quality of care and reduce associated costs.[3] At University Hospital Limerick (UHL), we wished to ensure that these targets were met and sought a systems-approach to improving patient flow for those patients presenting to the Emergency Department (ED) with fractured neck of femur. Lean thinking as developed by the Toyota Motor Company incorporates a wide-systems approach to optimising flow of processes, eliminating waste and improving quality. To do this, care is focussed on the patient and how the 'product' can be improved to provide a more streamlined, seamless care pathway.

Lean has been used in a number of settings in emergency medicine showing significant improvement opportunities,[4] and has been adopted previously in the setting of hip fracture with improvements in mortality for those patients with fractured neck of femur.[6] Six-sigma is also a term from industry, developed by Motorola. It seeks to improve the quality of process outputs by minimising variability in production process and by eliminating causes of error. The purpose of this project was to develop and implement a process and controls using Lean and Six-sigma principles to consistently achieve admission within 4 hours and surgery within 24 hours of presentation for all uncomplicated fractured NOF patients. Patients were defined as being uncomplicated if they had an American Society of Anaesthesiology (ASA) score of 2 or less.

Methods

A multidisciplinary project team was assembled comprising representatives from emergency medicine, orthopaedic surgery and operating theatre staff, and from the University of Limerick Lean Healthcare Programme. In order to establish best practice in clinical care of fractured neck of femur, four observational studies were carried out at UHL to establish process mapping of patient management from presentation to theatre. Lean and six sigma concepts were then applied in an attempt to reduce waste and improve upon efficiency. Baseline data regarding all emergency admissions of patients with fractured NOF were collected from May 2008 until December 2010. Collection recommenced during the subsequent trial period, from February to May 2011. Waiting times in the ED and between admission and surgery were recorded.

To study the operational efficiency of the operating theatre, observational information was gathered in orthopaedic theatre by members of the HOPE team on four criteria: the time from request for the first surgical patient of the day from the ward until arrival at theatre, the time of registrar and consultant anaesthetist arrival as well as the time of first patient paint and preparation; the time taken between first patient arrival and commencement of surgery and the proportion of theatre time in which surgery was actually carried out. Data regarding when the first patient from the daily surgery listing actually arrived to theatre was collected from 10 January 2011 until 6 March 2011. Here data collection was limited to Monday through Friday, to give a study period of 40 days.

Once baseline measurements were established, team members identified the following areas for improvement and proposed solutions: 1) The introduction of a fast-track management protocol for fractured NOF to reduce ED waiting times until admission; 2) The improvement of daily theatre times by the introduction of processes to ensure a more timely arrival of first patient to theatre; and 3) Improved communication between all teams involved in patient care. Following this process, observations of

Table 1 Transfer Times in The Emergency Department

Historical Data 2008-2010							
Date	**Timeframe**	**N**	**Mean**	**Minimum**	**Maximum**	**< 4 hours in ED**	**> 8 hours in ED**
May 08 to Dec 08	6 months	181	5 hours 41 minutes	43 minutes	21 hours 24 minutes	37%	20%
Jan 09 to Dec 09	1 year	261	6 hours 37 minutes	42 minutes	21 hours 8minutes	16%	25%
Jan 10 to Dec 10	1 year	208	7 hours 7 minutes	15 minutes	23 hours 58 minutes	18%	23%
Trial Period Transfer Times in The Emergency Department 2010-2011							
Date		**N**	**Mean**	**Minimum**	**Maximum**	**< 4 hours in ED**	**> 8 hours in ED**
Oct 2010 to Jan 2011	3 months	62	7 hours 4 minutes	15 minutes	23 hours 58 minutes	22%	26%
Feb to May 2011	3 months	83	7 hours 8 minutes	15 minutes	20 hours 54 minutes	19%	38%
Transfer Times in The Emergency Department For Non- complex Fracture Neck of Femur Patient 2020-2011							
Date		**N**	**Mean**	**Minimum**	**Maximum**	**< 4 hours in ED**	**> 8 hours in ED**
Oct 2010 to Jan 2011	3 months	59	5 hours 21 minutes	15 minutes	15 hours 32 minutes	27%	14%
Feb to May 2011	3 months	86	5 hours 15 minutes	15 minutes	20 hours 53 minutes	37%	19%

CPD available online at www.imj.ie and questions on page 95.

ED waiting times, theatre start and usage times and the waiting times for surgery were repeated. Data from pre implementation measurements and post solution development were analysed and compared. All data were analysed using Statistical Package for the Social Sciences (SPSS®) software

Results

ED to Admission

Data collected from May 2008 until December 2010 was grouped and evaluated by calendar year (Table 1). Observational baseline analysis found the mean wait time for a fracture NOF patients to be 7 hours and 7 minutes. The average wait-time in the ED increased by 23% between December 2008 and December 2012. Only 27% of patients were admitted in less than 4 hours. During the trial period of February to May 2011, for all fractured NOF patients the mean wait time in A&E was 7 hours and 8 minutes. Analysis of data specifically for non-complex fractured NOF patients (ASA grade <2) revealed that during the pre-trial period the mean waiting time for admission in the ED was 5 hours 21 minutes with 27% of patients being admitted within 4 hours. During the trial period the mean waiting time for admission was 5 hours 15 minutes with 37% of patients being admitted within 4 hours (Table 1).

Table 2 Waiting Time for Surgery

Date	Timeframe	Surgery < 24 hours	Surgery > 24 hours	Surgery <48 hours	Surgery >48 hours
Historical Data					
May 08 to Dec 08	6 months	57%	43%	66%	34%
Jan 09 to Dec 09	1 year	56%	44%	68%	32%
Jan 10 to Dec 10	1 year	58%	42%	70%	30%
Trial Period					
10th January to 6th March 2011	3 months	44%	58%	65%	35%
21st March to 15th May 2011	2 months	56%	44%	73%	27%

Waiting Time until Surgery

Data collected from May 2008 until December 2010 were evaluated by calendar year. The percentage of all fractured NOF patients who received surgery within 24 hours ranged from 56% to 58% depending on calendar year (Table 2). Analysis of pre-trial data collected from January 2011 until March 2011 reveal that 44% of fractured NOF patients received surgery within 24 hours, 21% received surgery between 24 and 48 hours and 35% received surgery in over 48 hours since presentation (Table 2). Analysis of the data collected during the trial period from March 2011 until May 2011 reveal that 56% of fractured NOF patients received surgery within 24 hours and 27% received surgery in over 48 hours (Table 2).

Theatre Start time

The results of pre-study current state analysis found that between January 2011 and March 2011 the mean start time for the first surgery of the day was 9:10 am and only 3 surgeries beginning before 9:00 am. After protocol introduction, between March 2011 and May 2011 a mean theatre start time was 8:40am, representing a reduction in start time of approximately 30 minutes. During the study period was a reduction in the range of theatre start times from 3 hours and 15 minutes pre-protocol introduction to 1 hour and 20 minutes post protocol introduction.

Theatre Time Usage

Current state analysis found that during an 8 week pre trail period approximately 273 hours were available to surgery. After protocol intervention the available theatre time was found to increase over 45 hours to a total of 319 hours of time over the 8 week trial period. Following the trial to increase theatre operating capacity on 21st March 2011 the percentage of fractured NOF patients that received surgery within 24 hours was 56% with 27% of patients experiencing surgery delays of more than 48 hours. Compared to the Pre-Trial data this shows an increase of 12% of

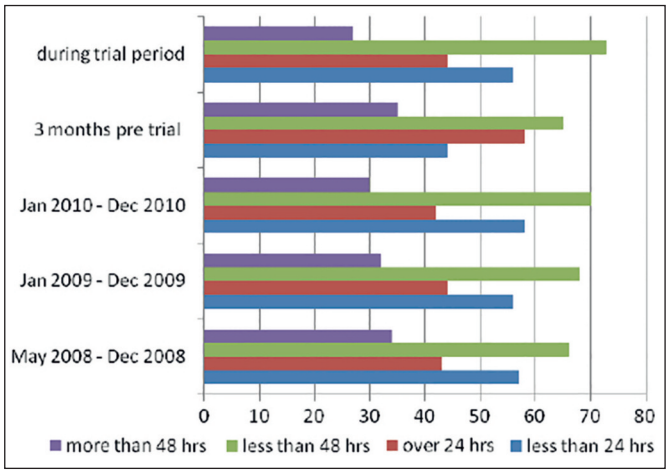

Figure 1 Waiting time for surgery, historical data and trial period

patients receiving surgery within 24 hours and a decrease of 8% of patients experiencing delays of more than 48 hours.

Discussion

Hip fractures are a major cause of morbidity and mortality in the older people.[1] This increase will represent a significant strain on the health services in terms of finances, personnel hours and resources used.[5] The benefits of proper and prompt treatment of hip fracture have been well established by the British Orthopaedic Association[4]. This project attempted to design and implement a protocol for the management of non-complex fractured NOF in the UHL to improve efficiency, reduce costs and achieve best practice in care. The most significant impact on the management of non-complex fractured NOF patients noted during this study was the improvement in theatre start time and time usage. The improvements noted in theatre time have several important implications. Firstly, these advances meant that on a consistent basis more patients will be able receive surgical intervention in a timely manner. Secondly, improved time management has implications in terms of cost reduction in healthcare delivery. Finally, these findings support the idea that Lean and Six Sigma principles are tools which can effectively improve the quality of healthcare delivery.

Reducing the amount of time patients stay in hospital has major economic implications. The cost of one night in hospital is €1,366[5] and thus increasing the number of patients who are taken to theatre within 24 hours of presentation and thus spending one day less in hospital represents considerable economic savings. During the trial period, there was a reduction of 12% in the number of patients who had to wait over 24 hours for surgery and an 8% reduction in those waiting over 48 hours. Assuming an average of 254 patients per year based on current statistics, and a nightly cost of €1,366, this would yield a projected annual cost saving of €97,149. It is important to acknowledge that there were considerable shortcomings to this project. The target of developing a protocol for non-complex fractured NOF patients to be admitted in less than 4 hours from the time of their presentation to ED was met with only limited success. Overcrowding in ED has been identified as a major contributor to delays and data for this study was gathered during a time at which the ED of UHL was facing periods of exceptionally high delays possibly due to the restructuring of local catchment areas.

In addition it is possible that there was a significant 'Hawthorn effect' from being part of the project, and that the successes seen may not be sustainable without the additional resources and emphasis on hip fracture that the project generated. These factors may affect the generalisability of our results. In conclusion this case study has shown that Lean methodology is applicable within the Irish healthcare environment. Lean proved an effective method to guide change resulting in an improved journey for the patient, significant workflow gains through placement of emphasis on

having the right patient in the right place, at the right time. Future research should focus on expanding the use of Lean and Six Sigma methodology within the Irish healthcare system with a focus on flow improvement and cost reduction.

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Acknowledgements
All staff at University Hospital Limerick who were involved in the HOPE process, and the HOPE team from the University of Limerick.

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Comparison of Comorbidities in Patients with Pre-Diabetes to Those with Diabetes Mellitus Type 2

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Abstract
A cross sectional study performed on 309 pre-diabetes and 309 type 2 diabetes patients, selected from General Practices in Cork. The prevalence of complications was calculated and the data analysed to determine is there a statistically significant difference in prevalence of complications. The prevalence of co-morbidities in the type 2 diabetic group are Ischaemic Heart Disease 55 (17.8%), Chronic Kidney Disease 17 (5.5%), cerebrovascular disease 16 (5.2%), peripheral vascular disease 40 (12.9%), eye disease 20 (6.5%), peripheral neuropathy 27 (8.7%) and autonomic neuropathy 11 (3.6%). The prevalence of co-morbidities in the pre-diabetic group are Ischaemic Heart Disease 64 (20.6%), Chronic Kidney Disease 12 (3.9%), cerebrovascular disease 11 (3.5%), PVD 24 (7.7%), eye disease 1 (0.3%), peripheral neuropathy 8 (2.6%) and autonomic neuropathy 17 (5.5%). The prevalence of many of the co-morbidities assessed is statistically the same in pre-diabetes patients with only peripheral vascular disease, eye disease and cerebrovascular disease having a statistically significant higher prevalence in type 2 diabetes.

Introduction

Pre-diabetes is defined as Impaired Glucose Tolerance (glucose values post OGTT between 7.8 to 11.0 mmol/L) and/or Impaired Fasting Glucose (fasting glucose between 6.1 to 6.9 mmol/L). There is very little research on the prevalence of diabetes related complications in pre-diabetes patients and none comparing this to that prevalence in type 2 diabetes patients in Ireland. Pre-diabetes and type 2 diabetes are extremely common and their prevalence is expected to increase rapidly as a result of an aging population (IDF data) and a continuing change in human behavior and lifestyle. Data from the adult U.S population aged ≥ 20 years in 2005 – 2006 shows that 12.9% have diabetes while 29.5% have pre-diabetes making pre-diabetes almost three times as prevalent. This data also shows that > 40% of the adult US population has some hyperglycemic condition[1]. Patients with pre-diabetes and diabetes type 2 are at an increased risk of development of cardiovascular disease. According to studies in Europe[2] and Asia[3] only a minority of individuals with ischaemic heart disease have normal glucose tolerance (NGT). In pre-diabetes patients, even without metabolic syndrome, there is an increased incidence of ischaemic heart disease[4].

Hyperglycaemia increases the prevalence of microalbuminuria. That prevalence varies for different ethnic groups. In a study carried out among >5,000 Maoria and European subjects, microalbuminuria was found in 21% of those with diabetes and 16% of those with pre-diabetes but only in 4% of normoglycemic individuals[5]. There is an association between cerebrovascular disease and hyperglycaemia. The botnia study finds a history of stroke in pre-diabetes subjects with metabolic syndrome is 3.6%. In those without the syndrome it is 0.9%[4]. Again, peripheral vascular disease is more common in patients with diabetes. In a study carried out in 2007 "Prevalence of lower extremity diseases associated with normal glucose levels, impaired fasting glucose, and diabetes among U.S adults aged 40 or older" the prevalence of peripheral vascular disease in those diagnosed with diabetes is 7.5%[6]. The prevalence of peripheral vascular disease in people with a normal glucose level is 3.9 % and those with pre-diabetes 5.4%[7]. In the Diabetes Prevention Program, diabetic retinopathy (with at least microaneurysms) occurred with a frequency of 7.9% in the Pre-diabetic group compared with 12.6% in the diabetic group. The prevalence was lower in non-diabetics[8].

A cross-sectional study using a combination of physical examination, focused history, and vibration threshold measurements found peripheral neuropathy in 26% of 279 patients with diabetes, 11.2% of 89 patients with pre-diabetes, and only 3.9% of 577 age-matched normal control subjects[9]. Nerve conduction studies can also demonstrate that neuropathy is already present in 10–18% of patients at the time of diabetes diagnosis[10]. Autonomic neuropathy is more common in patients with pre-diabetes and type 2 diabetes than those without these conditions[11]. Previous studies have demonstrated that poor glucose control is associated with increased microvascular complications, for example, retinopathy and nephropathy. In GP and hospital settings type 2 diabetic patients are likely to be screened through clinical examination and relevant investigations whereas prediabetic patients may not get the same stringent screening[12,13].

Methods

This is a cross sectional study in which the patients were selected

CPD available online at www.imj.ie and questions on page 95.

using stratified sampling (age, gender). Sample size was determined with the help of a statastician. Using the prevalence data of the comorbidities of interest in the literature for Pre-diabetic and type 2 diabetic population the minimum sample size was calculated for each individual complication to show that there is a statistically significant difference in the prevalence of that particular complication between a pre-diabetes patient and a type 2 diabetes patient. The prevalence data used is in the literature review. Patients were selected from the diabetes interest group database which is a database of all the diabetes patients in approximately 30 general practices in Cork city and county. 309 pre-diabetes patients were selected and 309 type 2 diabetes patients were selected using stratified sampling by age and gender i.e. the first pre-diabetes patient on the list was selected and then the next type 2 diabetes patient on the list of the same gender and within 5 years of age was selected.

The measurement tool used was a questionnaire which was piloted at The Fermoy Clinic. This questionnaire was completed by either myself, the doctor or the practice nurse. The questionnaire helped determine the prevalence of the following comorbidities; ischaemic heart disease, renal disease, cerebrovascular disease, peripheral vascular disease, eye disease, peripheral neuropathy, autonomic neuropathy. The parameters which determined whether a patient has each disease are as follows: Ischaemic Heart Disease: Angina, Infarct, Stent, CABG; Renal Disease: Microalbuminuria or Chronic Renal Disease; Cerebrovascular Disease: TIA or Stroke; Peripheral Vascular Disease: Pain, Ulcers, Amputation; Eye Disease: Diabetic Retinopathy; Peripheral Neuropathy: Sensory loss, neuropathic pain; Autonomic Neuropathy: Genitourinary and cardiovascular (e.g. dizziness on standing up and sexual dysfunction).

309 pre-diabetes patients and 309 type 2 diabetes patients were selected by stratified sampling. Having contacted each individual general practice and obtaining their permission to access patient information I visited the practice and completed the questionnaire or gave it to the doctor / practice nurse to be completed. The data from each questionnaire was entered into a Microsoft Excel sheet, imported into SPSS 17 and then analyzed. Using SPSS a cross sectional study was performed and the prevalence of diabetes related conditions in patients with pre-diabetes and type 2 diabetes calculated. A chi-square test was performed to determine if there is a statistically significant difference in the prevalence of these complications between pre-diabetes and type 2 diabetes patients. The questionnaire was piloted at The Fermoy Clinic by the practice nurse. Full ethical approval for this study was granted by the Clinical Research Ethics Committee of the Cork Teaching hospitals in June 2010.

Results

Summary

For ischaemic heart disease, renal disease, cerebrovascular disease and autonomic neuropathy the p-values are 0.369, 0.337, 0.321 and 0.249 respectively. These results indicate that the prevalence of ischaemic heart disease, renal disease, cerebrovascular disease and autonomic neuropathy is statistically the same in the pre-diabetic population and the type 2 diabetic population. For peripheral vascular disease and eye disease the p-value are 0.034 and < 0.001 respectively. This result indicates that there is a statistically significant difference in the prevalence of peripheral vascular disease and eye disease between pre-diabetic population and type 2 diabetic population.

Ischaemic Heart Disease prevalence

The prevalence of ischaemic heart disease is higher in pre-diabetes with a prevalence of 20.6% compared to 17.8% in type 2 diabetes with a p-value of 0.369 indicating that in this study there is not a statistically significant difference in the prevalence of ischaemic heart disease.

Chronic Renal Disease prevalence

The prevalence of renal disease is higher in type 2 diabetes with a prevalence of 5.5% compared to 3.9% in pre-diabetes with a p-value of 0.337 indicating that in this study there is not a statistically significant difference in the prevalence of chronic renal disease.

Table 1 Prevalence of complications in Type 2 and Pre-diabetic patient group

	Ischaemic Heart Disease	Chronic Kidney Disease	Cerebrovascular Disease	Peripheral Vascular Disease
Pre-DM	20.6%	3.9%	3.5%	7.7%
Type 2 DM	17.8%	5.5%	5.2%	12.9%
P-value	.369 (NS)	.337 (NS)	.321 (NS)	.034 (S)
	Eye Disease	**Peripheral Neuropathy**	**Automatic Neuropathy**	
Pre-DM	0.3%	2.6%	5.5%	
Type 2 DM	6.5%	8.7%	3.6%	
P-value	<.001(S)	.001 (S)	.249 (NS)	

Cerebrovascular Disease prevalence

The prevalence of cerebrovascular disease is higher in type 2 diabetes with a prevalence of 5.2% to 3.5% in pre-diabetes. The P-value is 0.321 indicating that in this study there is not a statistically significant difference in the prevalence of cerebrovascular disease between pre-diabetes patients and type 2 diabetes patients.

Peripheral Vascular Disease prevalence

The prevalence of peripheral vascular disease is higher in type 2 diabetes with a prevalence of 12.9% compared to 7.7% in pre-diabetes. The P-value is 0.034 indicating that in this study there is a statistically significant difference in the prevalence of peripheral vascular disease.

Eye Disease prevalence

Eye disease has been defined in this study as diabetic retinopathy. The prevalence of diabetic retinopathy is higher in type 2 diabetes with a prevalence of 6.5% compared to 0.3% (only one patient out of 310 has diagnosed diabetic retinopathy) in pre-diabetes. The P-value calculated is <.001 indicating that in this study there is a statistically significant difference in the prevalence of diabetic retinopathy between type 2 diabetes patients and pre-diabetes patients.

Peripheral Neuropathy prevalence

The prevalence of peripheral neuropathy is higher in type 2 diabetes with a prevalence of 8.7% compared to 2.6% in pre-diabetes. The P-value calculated by the Pearson chi-square test is.001 indicating that in this study there is a statistically significant difference in the prevalence of peripheral neuropathy between pre-diabetes patients and type 2 diabetes patients. As expected it can be stated that the prevalence of peripheral neuropathy is higher in type 2 diabetes than pre-diabetes.

Autonomic Neuropathy prevalence

The prevalence of autonomic neuropathy is actually higher in pre-diabetes with a prevalence of 5.5% compared to 3.6% in type 2 diabetes. The P-value is.249 indicating that in this study there is not a statistically significant difference in the prevalence of autonomic neuropathy.

Discussion

This is the first study performed in Ireland which looks at the prevalence of complications in pre-diabetes and compares this rate to that in type 2 diabetes. It highlights the fact that the prevalence of many diabetic complications is statistically the same in the pre-diabetic and type 2 diabetic population. The prevalence of ischaemic heart disease, renal disease, cerebrovascular disease and autonomic neuropathy is statistically the same in both groups and active management of these co-morbidities is required.

This study is representative of Cork city and county as the patients are selected from general practices across this region. There are no exclusion criteria and patients are selected based on which general practitioner they attend. Stratified sampling (by age, gender and demographics) is the sampling method used which reduces the effect which confounders such as age and gender may have.

As this project is a chart review it is reliant on the appropriate data entry of others notably the general practitioner. Peripheral

neuropathy in this study is much lower than that found in the literature. The lower prevalence of peripheral neuropathy in this study may be due to findings of clinical examination not being recorded at all or inadequately. Another weakness is the potential for measurement bias in the completion of the questionnaires. The sequence of events cannot be established in this study.

A future study could be performed comparing nondiabetic population with a pre-diabetes patient sample. A study on the introduction of screening for hyperglycaemia for certain high risk groups, such as age > 50 and obese individuals need to be looked at as well as research on the cost effectiveness of pharmacological management in pre-diabetes.

The fact that the prevalence of many of the complications in pre-diabetes is statistically the same as in diabetes indicates the importance of early detection and management of the condition. It is important to identify and manage each individual risk factor (smoking, hypertension and obesity). It is necessary to identify and manage each complication. Even simple lifestyle modification can help prevent the progression to type 2 diabetes and patients could revert back to normoglycaemia.

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Seasonal Influenza Vaccine Uptake in HSE-Funded Hospitals and Nursing Homes During the 2011/2012 Influenza Season

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Abstract
Annual seasonal influenza vaccine is recommended for all health care workers (HCWs) in Ireland. For the 2011/2012 influenza season, information was collected on influenza vaccination uptake among HCWs employed in Health Service Executive (HSE)-funded hospitals (primarily acute) and of nursing homes (NHs) and also among NH long-term and short-term respite care residents. Forty-five hospitals (80%) and 120 NHs (75%) provided uptake data. Nationally, influenza vaccine uptake among hospital employed HCWs was estimated to be 18% and 14% among HCWs in NHs; in NHs vaccine uptake among long-term care residents was estimated to 88%. These findings highlight the continued low uptake among HCWs of all categories and demonstrate the need for sustained measures to improve uptake rates.

Introduction

Influenza vaccination of health care workers (HCWs) is routinely recommended in all European countries as part of national strategies to prevent and control influenza in health care settings. Studies have found that health care facilities with higher uptake among patients and staff reported fewer deaths among elderly patients in particular[1,2]. However, despite a universal HCW influenza vaccination recommendation in most developed countries, few have achieved high uptake. In many countries annual influenza vaccination rates for HCWs is less than 20%, although the United Kingdom, Netherlands, United States, Canada and Switzerland have achieved uptakes in excess of 50%[3-6]. Since 2008 the National Immunisation Advisory Committee of the Royal College of Physicians in Ireland has recommended that Irish HCWs receive annual influenza vaccination[7]. Vaccine is provided free of charge by the HSE through the National Immunisation Office (NIO) to all hospitals and nursing homes (NHs) for staff and residents. Vaccine administration is organised locally, in hospitals usually by occupational health (OH) departments and in NHs by a local OH department on site or at a designated location. NH staff are usually vaccinated by a GP or medical officer. In Ireland, previous national estimates of seasonal influenza vaccine uptake among HCWs have been based on two telephone surveys. The first (2006-2007 season) reported a 20% uptake in individuals stating that they were HCWs[8]. A subsequent similar survey in 2010 (2009/2010 season) reported a 27% uptake (Health Protection Surveillance Centre (HPSC), unpublished data).

The Health Service Executive (HSE) issues guidance annually on influenza vaccination – specifying target groups (at risk individuals and health care workers) and reminding staff to avail of vaccination[9]. Information is also provided through leaflets, posters, online and an annual communications campaign. Despite this, influenza outbreaks have been identified in Irish NHs, with high attack rates among residents where vaccine uptake among residents has generally been high, but low among staff[10].

Methods

In mid-2011, a working group was convened to develop a standard methodology for collecting influenza vaccination uptake data from HSE-funded hospitals and NHs. The group included representatives from within the HSE including the NIO and the National Hospitals Office (NHO) as well as OH physicians. Survey forms for hospitals and NHs were designed in MS-Excel and aggregate data was sought on the number of all staff eligible for vaccination and vaccinated in each staff category (management and administration, medical and dental, nursing, health and social care professionals, other patient and client care, general support staff). The number of hospital staff reported vaccinated was determined by data retrieved by the OH departments. The number of NH staff reported vaccinated was determined by the person completing the form; the information source was not sought as part of the survey.

Additionally, information was sought on the number of clients resident in the NH during influenza season (including those admitted for respite care) and the number vaccinated. Information was also sought on whether the NH has a policy regarding agency staff vaccination or for patients admitted for respite care. Instructions on how to complete the forms, how to calculate the numerator (number vaccinated) and denominator (number eligible) of staff and clients, and a description of staff categories were included in protocols specifically developed for this project (HPSC, unpublished data). The hospital protocol and the survey form were distributed via the HSE Regional Directors of Operations (RDOs) offices at the end of 2011. The NH protocol and questionnaire were sent directly from HPSC to NHs using lists obtained from the HSE.

Two surveys were undertaken for each site; the first in January 2012 (mid-season), with aggregate data of vaccinations administered since between October 2011-December 2012, and the second in May 2012 at the end of the season, with aggregate vaccination data for the whole season (October 2011–April 2012). Completed questionnaires were returned via email or fax to HPSC; data was entered into a MS-Access database and analysed in MS-Excel. Reminders were sent to RDOs (for hospitals) and non-responding NHs.

Results

Final end-of-season data were used where it was provided, however, some hospitals and NHs only provided mid-season data (provisional data). For this report, these data were included in order to more accurately provide data on the majority of locations.

Hospitals

Fifty-six acute care HSE-funded hospitals were identified, including four psychiatric hospitals and two orthopaedic hospitals. A total of 45 (80%) hospitals participated; 24 (43%) provided end-of-season cumulative data and 21 (38%) provided only a mid-season return. For all combined returns (end-season and mid-season only) the overall seasonal influenza uptake rate among staff in all of the reporting hospitals was low (18%, range 0-40%). Vaccination uptake was highest among health and social care professionals (25%, range 0-100%) and lowest among nursing staff (12%, range 0-35%) (Table 1).

Nursing Homes (NHs)

From the 159 NHs identified, 120 (75%) participated in at least one of the two surveys; 45% (n=72) participated in the final end-of-season survey, 30% (n=48) participated only in the first (mid-season) survey, and 13% (n=20) of all NHs participated in both surveys. Although the original focus of the surveys was on NHs catering for elderly residents (those aged ≥65 years), at least 27 units catering for individuals living in disability residential units also submitted data. Overall, vaccination uptake by staff category for all returns was 14%, was highest among management and administrative staff professionals (16%) and lowest among medical staff (7%) (Table 2).

Table 1 Hospital influenza vaccine uptake among HSE grade category staff for all returns* in all HSE regions, 2011/2012 influenza season

HSE Grade Category Staff	All returns		
	Total No. Eligible Staff	No. Vaccinated	% Vaccinated
Management & Administration	6806	1405	20.6%
Medical & Dental	5480	1194	21.8%
Nursing†	19139	2306	12.0%
Health & Social Care Professionals‡	5586	1385	24.8%
Other Patient & Client Care§	2929	571	19.5%
General Support Staff¶	6326	1337	21.1%
Total*	**46287**	**8228**	**17.8%**

* Details of both eligible staff and vaccine uptake numbers for different staff categories were not consistently provided by all participating hospitals and consequently, totals do not equal the sum of eligible and vaccinated staff numbers for each grade category.
† e.g. Nurses, Student Nurses; ‡e.g. Physiotherapists, Dieticians, Radiographers, Social Workers;
§ e.g. Attendants/Aides, Care assistants;
¶ e.g. Maintenance, Domestic Staff, Porters, Security etc

Uptake among residents (accommodated since the beginning of the 2011-2012 influenza season) was 88% for long-stay. On average, the highest uptake at 91% was reported among residents from the larger NHs (60+ beds) compared to uptake rates of 85-86% among smaller units. Vaccine uptake among residents varied according the size of the unit from 0 to 100% (Table 3). Ninety-two NHs reported that they had respite beds, 88 (96%) of which provided information regarding vaccination policy for elective admissions to these beds. Of these, five (6%) had an elective admissions policy recommending influenza vaccination of respite residents. Only one of 78 NHs that provided information regarding pre-employment vaccination policies for agency staff had such a policy.

Table 2 NH influenza vaccine uptake among HSE grade category staff for all returns*, 2011/2012 influenza season

HSE Grade Category Staff	All returns		
	Total No. Eligible Staff	No. Vaccinated	% Vaccinated
Management & Administration	414	66	15.9%
Medical & Dental	99	7	7.1%
Nursing†	2540	294	11.6%
Health & Social Care Professionals‡	575	68	11.8%
Other Patient & Client Care§	1770	267	15.1%
General Support Staff¶	1271	159	12.5%
Total*	**6806**	**920**	**13.5%**

* Details of both eligible staff and vaccine uptake numbers for different staff categories were not consistently provided by all participating NHs and consequently totals do not equal the sum of eligible and vaccinated staff numbers for each grade category.
† e.g. Nurses, Student Nurses; ‡e.g. Physiotherapists, Dieticians, Radiographers, Social Workers;
§ e.g. Attendants/Aides, Care assistants;
¶ e.g. Maintenance, Domestic Staff, Porters, Security etc.

Discussion

There was high participation rate of the hospitals and NHs for either the mid or end-of-season data collection. The relatively low end-of-season data submission may reflect a perception among staff that the mid-season data reflected the complete data as little or no vaccine was administered after December. Of concern is the low influenza vaccine uptake among most staff employed in HSE-funded hospitals and NHs, especially among nurses as the largest professional group, with a particularly close and prolonged daily contact with patients. NH residents are particularly vulnerable to influenza and its complications as influenza vaccine effectiveness in elderly patients is less that than in younger adults. As short-term respite residents are most likely at similar risk to influenza and its complications as long-term care residents, policies should be in place to ensure that they too are vaccinated prior to admission, and failing that on admission. Estimates presented in this report should be interpreted with some caution as both numerator (number vaccinated) and denominator (number eligible for vaccination) may have been incorrectly reported. For the former, uptake may have been underestimated if HCWs were vaccinated outside the OH setting (by their GP or local pharmacy)

Table 3 Influenza vaccination uptake among long term residents in NHs (by unit size), 2011/2012 influenza season			
Unit size	**No. units by bed capacity (% total)**	**Total No. vaccinated in these units / Total No. residents in units of this size (% residents) since season start (01/Oct/2011)**	**Range uptake (% residents vaccinated in any single unit within this size category)**
No. long stay beds		**Long stay patients**	
<20	35 (30)	319/369 (86)	53%-100%
20-29	25 (21)	528/614 (86)	0%-100%
30-39	17 (14)	476/562 (85)	52%-100%
40-59	14 (12)	584/687 (85)	55%-100%
60+	27 (23)	2162/2387(91)	51%-100%
Not reported	2 (2)	0/0 (0)	N/A
Total	**120 (100)**	**4069/4619 (88)**	**0%-100%**

Note: Not all residential units provided details of vaccine uptake among their patients since season start.
N/A = not applicable

and therefore their vaccination status was not reported by OH. For the latter, some hospitals (n=12) reported whole time equivalent staff, rather than total number of eligible staff (as requested in the protocol), which may have resulted in an over-estimation of uptake. Additionally, the number may be under-estimated if staff on long-term leave were included in the overall number eligible for vaccination. Anecdotal reports indicated that some OH departments may have over-estimated uptake by including non-hospital staff in the number of hospital staff vaccinated as their information systems did not discriminate between hospital and community staff. Within the NHs, particularly for those without OH services on site, information on the method of determining vaccination status was not collected.

Other limitations include incomplete representation from all areas. One area (Limerick, Clare and Tipperary North) did not submit any hospital data. It is not always clear who completes the forms, particularly in relation to NHs, where input by local management, human resources (HR) and OH departments are required. It is also unclear how eligible and vaccinated staff figures are precisely determined. Furthermore, the survey does not capture self-reported vaccine status, information on the age profile of respite patients or their underlying medical conditions. It is clear that substantial work is needed in Ireland to identify reasons for non-vaccination and where necessary, improve access to vaccination clinics through mobile units operating on-site, in the wards for all shifts; improve knowledge and attitudes to vaccination; organise timely reminders and incentives; and assign personnel dedicated to supporting the vaccination programme. In recent years, a number of professional organisations in the United States have called for mandatory HCW vaccination to protect both HCWs and patients[11-15]. Perhaps the most important factor is corporate support and leadership, and an expectation from HSE management that their HCW staff have an important role to play in protecting their patients[16], including organising well-designed, coordinated annual vaccination programmes[17]. At a minimum, influenza vaccine coverage of HCWs should be included as a performance indicator by the HSE and the Health Information Quality Authority in both hospitals and NHs. The current lack of clarity on the issue of mandatory staff vaccination and personal autonomy could be addressed by implementing an 'opt-out' type of vaccination programme.

The ability to accurately report on staff and client uptake in all healthcare settings is key to the systematic monitoring of any vaccination programme. Vaccination uptake, particularly among respite and new entrant patients could be boosted if a standard checklist was filled out with their vaccine status identified prior to admission. Further analysis of future survey data is recommended, looking at uptake by different sectors of the health care system, for example comparing acute with non-acute hospitals, or long-stay with respite patients, or staff in direct patient contact versus non-direct patient contact. Specific studies are needed to identify factors associated with uptake in different settings e.g. organisational issues, role of vaccine administrators and monitoring staff uptake. GPs have a major role to play in boosting influenza vaccination in the community and among community-based staff. Involving local Departments of Public Health and infection control staff, both of which have particular expertise in the area of vaccination, prevention of infectious diseases and management of outbreaks, should be encouraged.

It is hoped that this data will assist managers to recognise the need to monitor uptake among HCWs in their facilities, to identify ways to improve their programme and to allay misinformation that has been found to negatively impact on vaccination. The HPSC has already commenced qualitative work (interviews and surveys) to identify barriers and facilitators to vaccination in NHs. Achieving high uptake of influenza vaccination should be a priority and a marker of quality care in Irish health care settings. Based on this study it is evident that substantially more work is needed.

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Acknowledgements
HPSC and NIO wish to sincerely thank the support of the HSE's NHO, NIO, RDOs, Assistant National Directors, the hospitals and their OH and HR units and also the NHs, who submitted data.

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Analysis of the Last Decade of Weekend Out-of-Hours CT Imaging: How Have Things Changed?

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To receive CPD credits, you must complete the questions online at www.imj.ie.

Abstract
CT has become an invaluable diagnostic tool. The clinical applications and technological capacity of CT has continued to increase. There is an increasing demand for radiology services including during weekend on-call hours. The objective of this study was to assess the trend in weekend CT imaging requests over a ten-year period form 2001-2010. Electronic data was retrieved from the hospital Radiology Inpatient System. In total 8530 CT scans were performed during weekend on-call hours. Over the decade weekend imaging grew from 466 to 1448 (210.7%) CT examinations. CT brain imaging accounted for 3944 of the total 8530(46%) and this was a 126% increase. A ten-fold, eight-fold and three-fold increase occurred in adult CT thorax, CT pelvis and CT abdominal imaging respectively. These results demonstrate rising demand on radiology services and need to plan for continued future growth. Radiology and emergency departments need to prepare and develop pathways to deal with this projected growth.

Introduction

CT is playing an increasingly prominent role in medical decision making and care[1]. In the emergency department CT is often the technique of choice for a wide range of indications because of the timely and reliable diagnostic information it provides[2]. The use of CT has grown dramatically in the last decade spurred by rapid technological advances, imaging speed and growing access to CT[2]. CT can identify patients needing urgent surgical assessment or help establish a diagnosis for many acute presentations including pulmonary emboli or renal stones. Currently almost all Irish hospitals have access to CT imaging. With many emergency departments operating twenty four hours a day and the development of acute medical assessment units the demand for CT imaging has grown rapidly. This has resulted in growing pressure on many radiology departments to increase weekend and out-of-hours CT availability. However there is little data on Irish out-of-hours CT imaging. This study specifically analysed the trends in the utilisation of CT imaging at the Adelaide Meath and National Children's Hospital Tallaght Dublin. This is a 625-bed university- affiliated tertiary care hospital. It provides both an adult and paediatric emergency department service. This study assessed CT imaging during weekend on-call hours over a ten-year period.

Methods

In this retrospective analysis the trend in diagnostic CT imaging was assessed for a ten year period from January 2001-December 2010. This included all requests for CT imaging for both adult and paediatric patients during weekend on-call hours. Electronic data was obtained from the hospital's Radiology Information System (RIS). This included the type of CT imaging performed and the referral source. Referral source was either inpatient or from the emergency department. The total number of CT scans performed during the weekend on-call hours per year for the ten- year period was calculated. CT imaging was grouped into eight categories (brain, abdomen, pelvis, spine, thorax, other, facial bones and joints). The growth and trend in each category per year over the study period was analysed.

Results

Overall a total of 8530 CT examinations were performed during weekend on-call hours from 2001-2010. The emergency department accounted for a total of 52.6% of referrals, compared to 47.4% for the inpatient group. There was a 210.7% increase in all weekend on-call CT imaging from 2001 to 2010. Weekend on-call CT imaging accounted for approximately 15% of all CT imaging however as the number of CT studies increased in all categories of conventional CT imaging this therefore represents an area of significantly increasing demand and growth. Results were subdivided by eight CT categories. CT brain imaging accounted for the largest volume of CT examinations. A total of 3944 CT brains were performed accounting for 46% of all imaging and increased by 142% over the decade. This increase in CT brain imaging is displayed graphically (Figure 1).

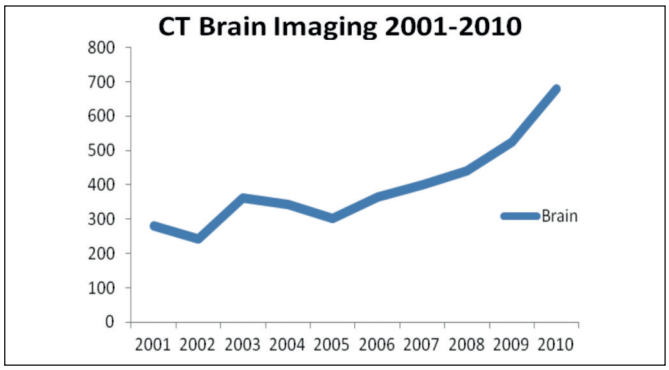

Figure 1 The rise in CT Brain imaging is displayed graphically

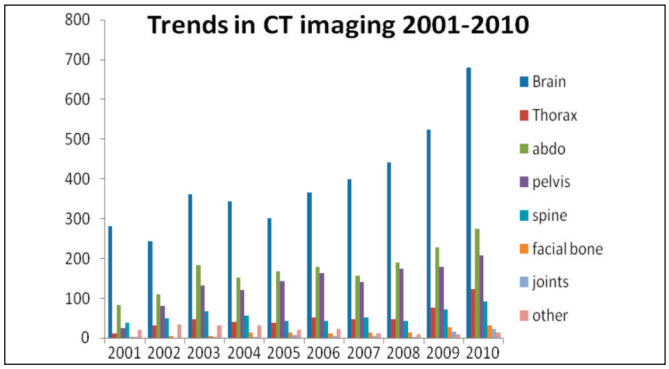

Figure 2 Displays the ten year trend in each CT modality

CPD available online at www.imj.ie and questions on page 95.

The seven remaining categories of CT imaging changed over time in keeping with this increase[3] in CT brain imaging. Thoracic CT imaging in 2001 was only 12 scans compared to 124 in 2010 this showed an overall 933.3% increase. CT abdominal imaging experienced a 231.3% increase, rising from 83 to 275. CT imaging of the pelvis showed a significant increase from an annual total of 26 to 208, a 700 % increase. CT abdominal and pelvic imaging is commonly performed together. However they were recorded separately on our RIS as they are not always imaged together for example for CT adrenals and the results were analysed separately in this study. CT of the facial bones grew by 3100% from 1 to 32. CT imaging of the spine grew from 4 scans to 23 scans, a 475% increase. The growth and in the eight categories of CT imaging is shown graphically (Figure 2). Figure 3 shows the total percentage of each modality for the decade of study.

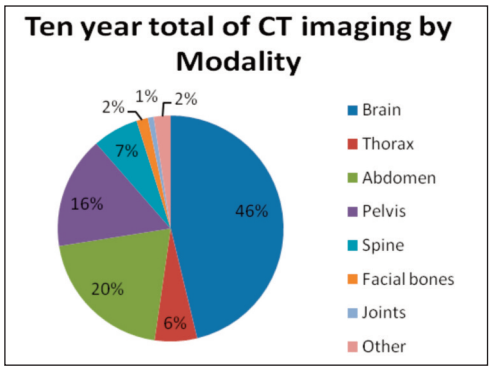

Figure 3

Displays the percentage for each modality for the decade

Discussion

CT utilisation has been growing steadily worldwide. According to the 2006 report of the United Scientific Committee on the Effects of Atomic Radiation, the average frequency of CT examinations in developed countries increased yearly from 6.1 per 1,000 population in the 1970s to 48 per 1,000 population in the period between 1991 to 1996[3,4]. Statistics from the US and UK indicate a 20-fold and 12-fold increase in CT usage over the past two decades[5]. Furthermore one US study concluded that the total radiology work load is increasing by 8% annually and while the number of radiologists in practice is estimated to have increased by only approximately 1.5% annually[6,7] leaving radiologists faced with managing a rapidly increasing work load.

Many clinical pathways advocate the use of CT imaging. CT brain imaging has transformed the management of stroke and non-contrast CT brain imaging is a critical element of stroke care pathways. This may in part, account for the demand of CT brain imaging which was observed at our institution. Furthermore headache accounts for a large number of emergency department visits[3]. CT imaging of emergency headache has become widespread leading to increased demand for brain imaging. The speed of CT imaging means that the need for sedation or anaesthesia may be avoided particularly on-call when there is reduced anaesthetic cover available particularly in the paediatric population. The utilisation of imaging is largely determined by the practices of referring clinicians[17]. Changing clinical practices may represent, in part, increased growth in CT examinations. In the UK a significant increase in CT is postulated to be in part due to the use of CT as a primary tool for pre-surgical diagnosis of acute appendicitis[5]. This may have influenced the three-fold rise at our institute in abdominal CT imaging. The ten-fold observed increase in thoracic CT may reflect changes in imaging for pulmonary embolism. One US study demonstrated increased trends in thoracic imaging over a decade with an increase in the ratio of CTs for pulmonary embolism per patient coupled with a decrease in the ratio of pulmonary angiograms and V/Q scans. It observed that CT is replacing more traditional techniques for diagnosing pulmonary embolism[8]. CT is now also widely used for guiding lung biopsy.

This study focused on weekend on-call hours requests as CT imaging preformed during this time is deemed urgent and unavoidable reflecting acute clinical emergencies such as trauma. The outcome of such CT imaging may immediately change patient management in keeping with best patient care. This is also the time when the radiology department has lowest staffing levels. Ever growing numbers of CT scans are requested during routine working hours and to facilitate this work load on many days of the week the radiology department has to extend the hours during which these scans are performed. This makes it difficult to decipher which scans were requested and performed during weekday on-call hours. Choosing the study period of weekend on-call hours avoids this, ensuring all scans are both ordered and performed during our institute's out-of-hours imaging service. This study has some limitations. Due to the restrictive criteria of weekend on-call hours, selected for reasons as discussed above we have only assessed a small proportion of out-of-hours imaging as weekdays were not assessed. Secondly the clinical indications for examinations were not available from electronic records and therefore, unavailable to this study[9]. Our data was therefore not adjusted for disease severity nor did we look at the appropriateness of CT requests. The purpose of this study was not to evaluate the appropriateness of imaging practices or to determine which factors affect utilisation of imaging studies[10]. We assessed trends only and did not analyse imaging patterns for specific clinical indications[10].

CT however is not without health- related risks. Physiological risks include contrast-induced nephropathy and potential allergic reactions including life threatening anaphylaxis. Long- term there is a risk of developing cancers. CT results in organ radiation doses that are typically 100 times larger than those from conventional radiological procedures such as x-rays[5]. Longstanding controversy exits about the level of carcinogen risk attributable to low level ionising radiation[2]. A linear dose-response relationship has been suggested between exposure to ionising radiation and the development of certain neoplasms[11-13]. For a given exposure, radiation risks are greatest in young patients because of both intrinsically greater radio sensitivity of their organs and longer life expectancy[2]. However even for high-dose radiological procedures when appropriately used the risk to the patient is small and the benefit/risk balance is generally in the patients' favour[5]. In many scenarios CT is the appropriate choice, but undoubtedly a significant proportion of scenarios where CT is not medically justifiable or where equally effective alternatives exist[5]. Studies suggest that up to one third of CT imaging may fall into this category[5,3,14]. Physicians are requesting increasing volumes of CT scans and should bear in mind the benefit-to-risk ratio balancing the highly context-dependant benefits of imaging against the patient- specific cumulative risks[18]. We need to avoid potential over utilisation of imaging where imaging is requested and performed but is unlikely to improve patient outcome or aid clinical diagnosis or management. Such use of imaging results in unnecessary and avoidable radiation exposure without any clinical benefit to the patient.

Overall, the data shows that utilisation of CT during weekend on-call hours increased three-fold over the last decade. CT brain was the most common type of CT examination. This growth can be attributed various factors such as ageing populations, advances and availability of technology and that radiology is indicated in more clinical conditions[15]. CT demand shows little sign of abating[16] as diagnostic imaging has become an integral part of clinical medicine[1]. CT is likely to continue to grow as technology progresses and other clinical applications emerge[9]. It is hoped that this study and other similar studies will promote ongoing dialogue among radiologists, emergency room staff and other physicians, and indeed the public to slow the increase in CT usage and CT doses, without compromising patient care[5].

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Staff Support for the Health Service Executive (HSE) Global Health Programme

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Abstract
The Global Health programme (GHP) within the Health Service Executive (HSE) aims to improve health in developing countries by creating partnerships between Irish and developing world healthcare institutions. To ascertain the level of interest among HSE staff for the GHP a web-based survey was conducted. 1,028 responses were received. Medical professionals, 202 (27.7%) composed the largest category of respondents. The majority, 503 (69.3%) of respondents wished to actively participate in the GHP. 237 (23.1%) staff had previous experience of working in the developing world. This survey highlighted a number of themes respondents considered important for successful partnerships including: reciprocal staff exchange, joint scientific research, the avoidance of "brain drain" and utilising the Internet to link institutions. Less than 1% (2/203) of comments expressed a negative view of the GHP.

Introduction

In 2007 the HSE carried out a survey of its staff to investigate their experience of working in the developing world. The findings confirmed that the level of experience reported by respondents was substantial. Consequently the HSE established the GHP with the aim of improving health in developing countries. The GHP is aligned with Irish Aid . In 2012 Ireland became a member of ESTHER[4], an organisation that facilitates partnerships between European and developing world healthcare institutions. Accordingly the GHP decided to carry out a new survey to provide an updated picture of the experience among HSE personnel and to offer them further information regarding the ESTHER programme. The information from this survey will facilitate institutions within Ireland forming partnerships (or strengthening already existing partnerships) with developing world institutions.

Methods

A questionnaire was developed and piloted by the survey team. An email was sent to all individuals with HSE email addresses inviting them to participate in the survey through Survey Monkey[5]. All hospitals were requested to circulate the message through their email lists. Nurses and doctors were invited to participate through messages from the Irish Nurses and Midwives Organisation and the Royal College of Physicians of Ireland. There were nine questions in the survey. Questions one, two and three focused on employee's previous developing world experience. Questions four and five investigated if healthcare organisations in Ireland provided support for developing countries. Question six asked if staff would be interested in becoming involved with the ESTHER programme and questions seven and eight requested respondents contact details and job classification. Question nine invited staff to provide comments on how they believe constructive links could be created between Irish and developing world institutions. Comments were analysed qualitatively and organised according to themes that emerged.

Results

The survey prompted 1,028 responses.

Table 1 What staff category are you?

Staff Group	Response count	Response percentage
Medical	202	27.7%
Allied health professional	188	25.8%
Nursing	171	23.5%
Management/Administration	91	12.5%
Laboratory	13	1.8%
Pharmacy	11	1.5%
Ambulance	7	1.0%
Information technology/ Trades/ Porter/ Other	46	6.2%
Total	**729**	**100%**

Profile and experience of respondents

A total of 729 respondents provided details of their staff category, Table 1. 237 (23.1%) employee's had experience of working on aid projects mostly through Non Governmental Organisations (117/34.7%), Table 2. Employee's duration of experience varied from less than 12 months (131/51.6%) to greater than 5 years (37/14.5%).

Current support provided by Irish institutions

59.3% (610) of respondents did not know if their workplace provided support to developing countries while 26.4% (271) of staff confirmed their employer grants no assistance. Only 14.3% (147) of employee's indicated their institution offers overseas support. The most common format of this support was the donation of equipment (50.8%) followed by the provision of healthcare (27.7%) and the training of staff (21.5%). The majority of staff (503/69.3%) wished to work on projects that allowed Irish healthcare institutions partner with similar organisations in the developing world.

General comments

A total of 203 staff submitted suggestions for creating and maintaining partnerships. Comments covered themes including: the formal twinning of institutions, using internet resources to strengthen partnerships, fundraising, reciprocal exchange of staff between organisations, donation of relevant equipment, joint scientific research, learning from NGOs' experience and the provision of managerial support to allow staff from Irish institutions obtain leave to work in partner institutions. Two out of the 203 (<1%) comments expressed a negative attitude towards forming partnerships through the ESTHER alliance.

Discussion

As a consequence of the methodology selected, the survey was not representative of all staff working within the health service. Unfortunately it was not possible to access the contact details of those working within general practice in Ireland. A comprehensive list of contact details for non-consultant hospital doctors (NCHD's) was not available. A large percentage of these NCHD's are non-EU nationals[6] therefore they are potentially a rich source of information for building partnerships between Irish and developing world institutions. The concept of partnership was strongly supported throughout the survey. This is reassuring as it indicates staff are aware that future progress depends on strong relationships built on mutual respect over time. The challenge facing the HSE is how to channel this staff experience into partnerships that support the provision of evidenced based healthcare to those at greatest need.

Table 2 What type of organisation did you work with?

Organisation	Response count	Response percentage
Non Governmental Organisation (NGO)	117	34.7%
Mission organisation	59	17.5%
Local healthcare institution	49	14.5%
Government agency	37	11.1%
United Nations agency	19	5.6%
Other	56	16.6%
Total	**337**	**100%**

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Acknowledgements

To all staff who gave of their time to complete the survey.

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The Ictal Bradycardia Syndrome: Persistence of Seizures Despite Cardiac Pacemaker Implantation

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Abstract

Ictal bradycardic syndrome (IBS), a rare manifestation of temporal lobe epilepsy is both difficult to diagnose and treat. Our case study of a 24 year old with persistent and unexplained syncope highlights the typical presentation, investigation and treatment of IBS.

Introduction

IBS refers to a rare condition where patients experience a slow heart rate during epileptic seizures.[1] It typically occurs with temporal lobe epilepsy.[2] The prevalence of IBS is uncertain but severe bradycardia/asystole occurs in 0.27-0.5% of seizing patients undergoing video-EEG monitoring.[3] It is likely that the incidence of IBS in refractory epilepsy is much higher and it remains an underdiagnosed condition. Ictal asystole (IA) results in atonia when asystole lasts >8 seconds. This inevitably leads to sudden collapse.[3] IBS can be confused with syncope of cardiovascular origin as the patients do not exhibit the typical features of epilepsy but it is not associated with cardiovascular risk factors or abnormal baseline ECG.

Case Report

A 24 yr old woman was referred in December 2009 with "recurrent episodes of collapse". She had 10 episodes of sudden onset syncope in previous 12 months lasting approximately 30 seconds. The patient had no pre-syncope, remained "loosely conscious" and had slight head twitching but no tongue biting,

incontinence or a post-ictal period. Other typical features of epilepsy were not apparent including myoclonic jerks, staring episodes, abnormal sensation in the stomach or unusual taste in the mouth. Assessment included cardiovascular and neurological examination, ECHO, ECG, 48 hr Holter Monitor and MRI brain – all normal. A loop recorder was inserted and identified multiple episodes of bradycardia and asystole which correlated with episodes of syncope. Levitiracitam 250 mg bd was commenced but in the subsequent 6 months, the frequency of attacks continued so the dose was increased to 750mg bd and Lacosamide (100 mg od) added.

However attacks increased in severity and frequency. Some of the attacks correlated with ECG changes and others did not. After much consideration, a DDDR pacemaker was inserted. Subsequently the syncope became less frequent (2-3 per month). In April 2012, video EEG monitoring was performed as an inpatient. An habitual attack was recorded by video, EEG and ECG. This was a complex partial seizure associated with loss of awareness, upper limb automatisms and staring. As the seizure developed, her heart rate fell from 120bpm to 60bpm. This was accompanied by an ictal rhythm in the left temporal region on scalp EEG (Figure 1). At this point her pacemaker commenced pacing her heart (Figure 2) and she did not collapse. She was relatively still for a further 7 seconds when her heart rate returned to normal, her pacemaker stopped pacing and her EEG normalized. She looked confused but then recommenced folding her socks. She had no recollection of the event. These findings suggest a seizure of temporal lobe origin resulting in ictal bradycardia and would likely have resulted in syncope if the patient had not had a pacemaker. Antieileptic drug therapy was intensified and Carbamazepine was introduced. At 6 months follow-up, the patient had been completely seizure free and could recommence her work as a chef.

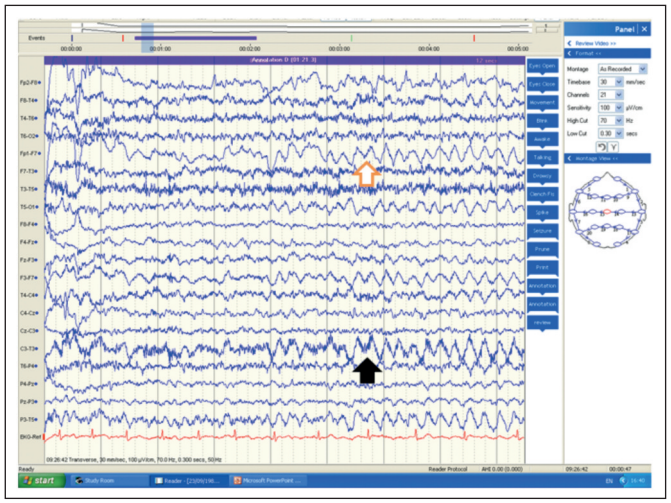

Figure 1 Progressive slowing of heart rate as seizure discharge develops in the left temporal region (arrow)

Discussion

Changes in cardiac rhythm are associated with most forms of epileptic seizures. Sinus tachycardia occurs in >90% of seizures but usually has no clinical significance.[2,4] Sinus bradycardia or asystole are rare but may be an important factor in the mechanism of sudden unexplained death in epilepsy (SUDEP).[5] Identifying patients who have syncope as a result of IBS is difficult and guidelines on how to diagnose and treat this condition are not available.[6] It is useful to obtain a baseline ECG and EEG but both of these investigations are likely to be normal. A baseline ECHO and MRI-brain are necessary to out-rule structural anomalies in the heart and lesions in the brain. A loop recorder is important in establishing if syncope is associated with cardiac rhythm changes before pacemaker insertion.[7]

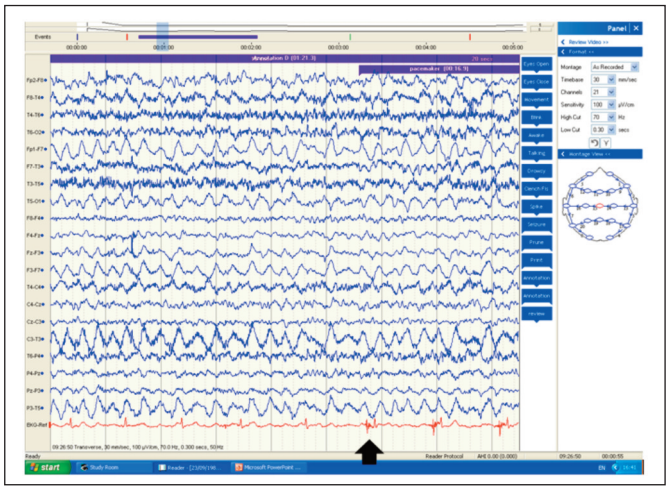

Figure 2 Triggering of pacemaker approximately 12 seconds after onset of ictal discharge on EEG (arrow)

Ultimately, video telemetry facilitates diagnosis in over 80% of tested patients[8] and is the investigation of choice despite its expense and lack of availability. Patients with refractory epilepsy require cardiovascular workup as well as neurologic work-up. Conversely, IBS should always be remembered as a differential in patients suffering from unexplained syncope, even if the patient has no other features of epilepsy. Good epileptic control is essential in treating this condition but cardiac pacemaker should be considered in patients with refractory IBS to prevent trauma associated with collapse and potentially to prevent SUDEP.[9]

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Acknowledgement

Thanks to the Neurology and Cardiology Departments in UCHG for help with this publication

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A Grossly Abnormal Trachea- Severe Tracheal Diverticulosis and Mounier-Kuhn Syndrome

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Abstract
A 53 -year-old smoker presented with a history of recurrent lower respiratory tract infections. A diagnosis of Tracheal Diverticulosis due to Tracheobronchomegaly (Mounier-Kuhn Syndrome) was made. The clinical history, diagnosis and treatment options are discussed.

Case Report

A 53-year-old female ex-smoker presented with a long-standing history of recurrent lower respiratory tract infections and chronic purulent sputum production. 6 months previously she had required hospitalisation for treatment of right middle lobe pneumonia. Subsequent follow up chest X-ray, at 2 months post discharge, showed complete resolution of the pneumonia. She had a 25 pack-year smoking history, no significant medical history and no significant occupational exposure or history of childhood chest infections or asthma. Physical examination was unremarkable.

Laboratory results including sputum culture, serum immunoglobulins, alpha-1 anti-trypsin levels and aspergillus serology were normal. There was no obvious abnormality on chest X-ray. Chest computed tomography (CT) showed an enlarged tracheal diameter with a large diverticula arising from the left postero-lateral aspect of the upper trachea (Figure 1), enlargement of right and left main bronchi and central bronchiectasis. Peripheral bronchi and lung parenchyma were normal. Endoscopic visualisation of the trachea at bronchoscopy confirmed an enlarged trachea and revealed a grossly abnormal posterior membranous wall with multiple large diverticulae, many of which had retained secretions (Figure 2). A diagnosis of severe tracheal diverticulosis due to idiopathic tracheobronchomegaly (Mounier-Kuhn Syndrome) was made.

Discussion

Mounier-Kuhn Syndrome is characterised by marked dilatation of the trachea and large bronchi[1,2]. The aetiology is unknown but a decrease in elastic tissue of the trachea has been implicated. While the vast majority of cases of Tracheobronchomegaly are sporadic it can be associated with diseases where abnormalities of elastic tissue are implicated such as Marfan's Syndrome, Ehlers-Danlos, Cutis Laxa and other connective tissue diseases[3]. Tracheomalacia and weakness of the posterior membranous wall, may lead to tracheal diverticulosis[1,3], as seen in a severe form in this case. Tracheal diverticulae are present to some extent in approximately one third of patients with Mounier-Kuhn Syndrome and most commonly originate from the right postero-lateral wall[4]. Patients may be asymptomatic or present with symptoms and signs of bronchiectasis, tracheobronchitis or recurrent lower respiratory tract infections[1,3-5]. Bronchiectasis when present is typically central with normal bronchi after the third to fourth degree branches[3].

The diagnosis of tracheobronchomegaly is based on enlarged diameter of the trachea[6]. Potentially the increased diameter may be appreciated on plain chest radiography but this was not the case here. On Chest CT a tracheal diameter of 3cm or greater, measured at the level of arch of aorta, is considered abnormal. Right and left main bronchus diameters should normally be less than 2 and 1.8 cm respectively[6]. The presence of associated diverticulae may be appreciated on Chest CT or at bronchoscopy. Tracheal diverticulae can be congenital or acquired[5,7]. Congenital tend to be single and it is believed that they represent a super-numerary branch of the trachea due to embryonic mal development resulting in a blind ending pouch. Acquired diverticulae tend to be multiple and it is postulated they are caused potentially secondary to increased airway pressure, possibly due to chronic cough, in the setting of an already weakened tracheal wall. There is no specific treatment for tracheobronchomegaly. Appropriate anti-microbial therapy should be initiated early for an acute infective exacerbation of associated bronchiectasis. Physiotherapy has an important role to play with regards airway clearance techniques. The importance of smoking cessation should obviously be stressed. There is some limited experience with the use of tracheal stenting in severe cases, but, in general, surgical intervention is inappropriate given the diffuse nature of the disease[8,9].

Our patient was treated with an empirical 7 day course of antibiotics with subsequent resolution of symptoms. She had physiotherapy input with education on airway clearance techniques. At 3 month follow up she reported significant reduction in volume of sputum and no infective exacerbation since her assessment. In this case, the onset of presentation in adulthood, the absence of childhood infections and the lack of any underlying potential cause of tracheobronchomegaly, leaves us to postulate as to the congenital or acquired nature of disease in our patient.

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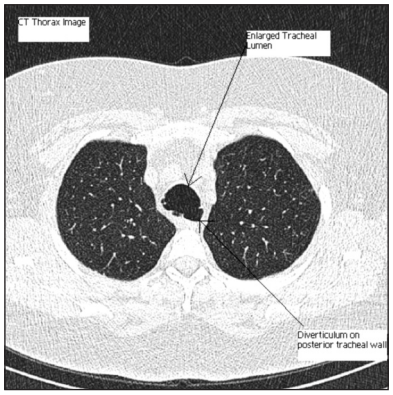

Figure 1

Section of CT Thorax showing an enlarged Trachea with a diverticulum on the left postero-lateral wall

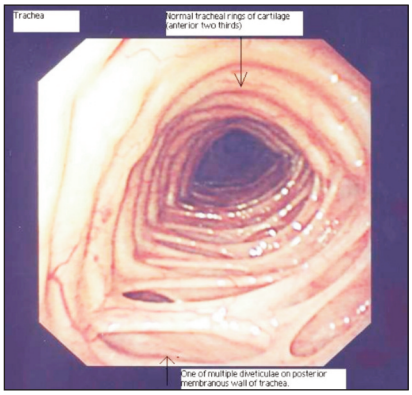

Figure 2

Bronchoscopy: Tracheomegaly with multiple diverticulae on posterior tracheal wall

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The National Incidence and Outcomes of Gastroschisis Repairs

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Abstract
The birth prevalence of gastroschisis worldwide has increased over the past decades. We aim to determine the Irish national incidence of gastroschisis repairs (NIGR) over a 5 year period (2007- 2011) and clinical outcomes by a retrospective cohort review of cases admitted to all Irish paediatric surgical units. Seventy patients were identified. The NIGR per 10,000 live births was 1.96 (SD 0.51) per year. Fifty eight (82%) were antenatally detected. Twenty eight (40%) had primary repair day 1 with the remaining repaired in a median of 3(2-5.75) days. Thirty three (47%) experienced a central catheter related infection. Duration of stay was significantly correlated with decreasing gestational age (p=0.016), decreasing birthweight (p=0.005), increasing numbers of blood transfusions (p<0.001) and co-morbidity or complication (p<0.001). This study provides individual centres with patient outcomes and national data that can be provided to parents and clinical staff regarding the clinical course of gastroschisis.

Introduction

The birth prevalence of gastroschisis worldwide has increased steadily over the past few decades, with considerable financial and resource implications for healthcare providers.[1] In 2007, an Irish study by Murphy et al reported 53 gastroschisis repairs from 1998 to 2004, which translates to an average rate of 1.3 per 10,000 live births.[2] The overall antenatal detection rate in Ireland from 1998 to 2004 for anterior abdominal wall defects is reported as 44%.[2] Antenatal screening with ultrasound has a high success rate in the detection of anterior abdominal wall defects with successful diagnosis reported in up to 86–90%.[3] Advances in neonatal intensive care and the development of parenteral nutrition have reduced infant mortality rates for gastroschisis from 60% in the 1960s to 3-10% in the mid-1990s with no clear evidence of a reduction in mortality since then.[4-7] Nationally and internationally surgical strategies for gastroschisis have evolved on limited evidence and no consensus on the optimal initial management or an effective clinical pathway.[1, 2]

Recent studies have stratified neonates with gastroschisis into simple and complex groups which reliably predicts outcome at one year.[1,5,8] Our aim was to establish the national incidence of gastroschisis repairs (NIGR) in Ireland over a 5 year period (2007- 2011). We describe maternal and infant demographics with clinical course and outcomes of gastroschisis admissions.

Methods

A dual site retrospective cohort review of neonates admitted for gastroschisis repair in the period 2007-2011 to Irish tertiary level paediatric hospitals was performed. Patients were identified using theatre records, the Hospital Inpatient Enquiry System (HIPE) and were cross-referenced with ICU datasets and patient case notes. All data collection was processed by two reviewers and transferred to an electronic database. All data queries were dealt with by consensus. All data originates from medical paper records and databases. Measurements from a Gaussian distribution were compared using means and 2-tailed Pearson's correlation upon meeting assumptions for parametric tests. Non-Gaussian distributions were compared using median (interquartile ranges), Mann Whitney test and 2-tailed Spearman's correlation. Binomials were analysed using Chi Squared test. Data was analysed using SPSS 18.1. Significance was defined as $p \leq 0.05$.

Results

In the period 2007-2011 a total of 70 infants had gastroschisis repairs. The NIGR per 10,000 live births is 1.96 (0.51) over the study period. Infants were born as late preterm infants with the median gestational age at 36(2) weeks. (Table 1) Forty one (58%) mothers were 25 years old or younger and 44 (62%) primigravid. Eleven (15%) infants born were considered small for gestational age (SGA). The antenatal detection rate for this cohort was at 83%. Seven (7/58) infants with an antenatal diagnosis were postnatal transfers to the tertiary surgical centres from outside the Dublin maternity hospitals. Four children had concurrent cardiac abnormalities (patent ductus arteriosis, atrial septal defect, mild aortic stenosis, and aortic incompetence) and none required cardiothoracic intervention during their initial admission. Three children had concurrent renal abnormalities

Table 1 Infant and Maternal Characteristics at Birth

Characteristics		Total 70 patients
Gestational Age (Weeks)[1]		36 (2)
Apgars	1 minute[1]	9 (6-9)
	5 minute[2]	9 (9-10)
Birth weight (Grams)[1]		2375 (516)
SGA		11/70 (15.7%)
Antenatal diagnosis		58/70 (82.8%)
Postnatal transfer from outside the Dublin maternity Hospitals		11/70 (15.7%)
Congenital abnormalities	Bowel atresia	7/70 (10%)
	Cardiac	4/70 (5.7%)
	Renal	3/70 (4.2%)
	Syndrome	1/70
Primigravid		44 (62.8%)
Mean Maternal Age (years)[1]		24 (5.4)
Mode of delivery	Caesarean	34/70 (48.6%)
	Vaginal	36/70 (51.4%)

1= Mean and standard deviation, 2=Median and interquartile range

(hydronephrosis, dysplasia and vesicoureteric reflux). A single child had a syndrome phenotype which has no associated genetic abnormality. No abnormal karyotypes were detected.

The caesarean section rate was at 48% (34/70). To further subdivide this figure into emergent and elective section we find that the elective rate stood at almost 13%. Caesarean section was only significantly associated with lower 1 minute (p=0.02) and 5 minute (p=0.04) apgars scores. The median duration of time for all gastroschisis repairs was 2 days. Further subdividing this group we identified 28(40%) whom had primary repair (PR) day one with the remaining patients (NPR) repaired in a median of 3(2-5.75) days. The median length of stay in the PICU was 7(5-11) days. (Table 2) A significant difference in the duration of stay in the PICU between the PR and NPR groups (p=0.017) exists.

For the entire cohort median duration of total parenteral nutrition (TPN) was 20 days with the median length of stay at 31 days from admission to the hospital. There was an observed trend of longer duration of TPN in the NPR group however this was not statistically significant. Just under half of patients (47%) experienced a central catheter related infection (CCRIs) which was equally distributed between PR and NPR groups. There was no significant difference between PR and NPR groups for number of transfusions or duration of stay. Analysis of the entire cohort reveals significant correlations between the duration of hospital stay and gestational age (Pearson's p=0.016), birth weight (Pearson's p=0.005), duration of TPN (Spearman's p<0.001), number of transfusions (Spearman's p<0.001) and co-morbidity or complication (Spearman's p<0.001). Decreasing gestational age and birth weight correlates to a longer duration of hospital admission. Increasing duration of TPN therapy, number of blood transfusions and co-morbidity or complication correlates to a longer admission. Concurrent bowel atresia was noted in 7 (10%) patients. Symptoms and findings consistent with necrotising enterocolitis (NEC) occurred in 12 (17%) patients. A single death occurred due to overwhelming septicaemia and NEC. TPN related adverse events occurred in 5 patients.

Table 2 Entire Cohort and Primary Repair Day 1 versus No Primary Repair Day 1 Cohorts

Clinical Course Entire Cohort	Total 70 patients		
Day of repair[1]	2 (1-3)		
Length of stay in PICU[1]	7 (5-11)		
Duration of TPN[1]	20(14-30.75)		
Incidence of CCRIs	33/70 (47%)		
Number of blood transfusions[1]	1 (0-2)		
Length of Stay[1]	31 (25-57)		
Clinical Course: PR Vs NPR	**PR (n=28)**	**NPR (n=42)**	**p value**
Length of stay in PICU[1]	5 (4-7)	8 (7-12)	0.017*
Duration of TPN[1]	16 (12-22)	22 (15-38)	n/s
Incidence of CCRIs	13/28 (46%)	20/42 (47%)	n/s
Number of blood transfusions[1]	1 (0-2)	1 (0-2)	n/s
Length of Stay[1]	28 (21-43)	32 (30-60)	n/s

1 = Median & interquartile range (IQR); *= significant; n/s= not significant; PR = Primary Repair Day 1; NPR = No Primary Repair Day 1.

Discussion

Gastroschisis is challenging as its causes (a complex biomedical and sociocultural set of risk factors and developmental origin) are largely speculative or unknown. From a public health perspective it appears to disproportionately target children of young mothers and it is increasing in many countries worldwide. This study reveals that the NIGR is 1.96 per 10,000 live births during the study period 2007-2011.[9] This corresponds to EUROCAT 2006-2010 registry prevalence rates for Gastroschisis of 2.23, 2.05 and 1.82 per 10,000 from Cork and Kerry, Dublin, and South East Ireland respectively.[10] The antenatal detection rate of this condition is at 83% which is significantly higher than previously reported from Ireland.[2]

This may be due to a multitude of factors including the improved local antenatal screening programs, despite the lack of a uniform national antenatal screening program. The postnatal benefits of prenatal diagnosis of gastroschisis include family awareness, adequate planning of delivery with alerted paediatric staff, optimal risk categorisation and a personalised protocol for action. The caesarean section rate is almost 49%. To further subdivide this figure into emergent and elective section we find that the elective rate stands at almost 13%. No studies have definitively shown the benefit of routine caesarean section for delivery.[11] In the entire cohort, there was a significant correlation between gestational age, birth weight, length of PICU stay, and duration of TPN, number of blood transfusions and co-morbidity or complication with the duration of hospital admission. Risk categorisation allows more informative parental counselling and planning regarding expected potential complications, mortality rate, length of hospitalisation and cost.[8] The identification of co-factors related to relevant patient outcomes, such as CCRIs, and amenable to improvement reveals future targets for improvement in patient care, outcomes and costs. [12, 13]

This national cohort compares favourably with other national cohorts.[1, 2] Unfortunately our retrospective study, being subject to the flaws of such research, did not lend itself to collection of data upon suspected risks factors (due to the absence of uniform data documentation in clinical notes) such as smoking or concomitant illicit drug usage. Therefore a multivariate analysis of risk factors was not undertaken. Early neonatal deaths (albeit rare) at sites of referral could not be included. The strength of this study is its robust data collection of a national cohort over 5 years. This nationally representative study provides a benchmark against which individual centres can compare outcomes and performance. This study provides data which can be provided to parents regarding the clinical course spectrum in relation to gastroschisis repairs. This information may help clinical staff to optimise antenatal delivery, postnatal and tertiary care plans or to define targets upon which improvement is sought. We recommend further local prospective studies with international collaborations to elucidate the risk factors, management strategies and outcomes.

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Unscheduled Undergraduate Teaching in Surgery: A Multi-Institutional Analysis

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Abstract
A significant amount of valuable undergraduate medical teaching may be informal, unscheduled and delivered by non-consultant hospital doctors (NCHDs). 800 Questionnaires were distributed to consultants, NCHDs and medical students in Irish teaching hospitals. The aim was to quantify the level of unscheduled teaching carried out in these hospitals and the manner in which it was performed. The response rate was 46% (364/800). 71% of doctors who replied are independently teaching undergraduate medical students (77/109), including 71% of interns and senior house officers (48/68). Students tend to prefer small group teaching. Fifty-six percent of students suggest they would benefit from more surgical teaching time (144/255). No interns surveyed were scheduled to teach as part of a formal curriculum. A significant amount of unscheduled teaching by interns and senior house officers takes place in Irish hospitals. It may prove beneficial to incorporate interns into scheduled surgical teaching curricula.

Introduction

Undergraduate teaching has a powerful effect on medical students, influencing not only grades[1], but also career choice[2] and enjoyment of surgical rotations[3]. It has been shown that the level of interest in surgery is declining[4] and that resident staff who are effective educators and mentors encourage students to pursue surgical careers[2]. Teaching is beneficial for house officers as it increases their own medical knowledge[5]. While carefully constructed curricula are in place, a great deal of surgical teaching is unscheduled and entirely dependent on the consultant or non-consultant hospital doctor (NCHD) involved. These encounters tend to be brief, ad hoc and unplanned[6]. This informal teaching however, has the potential to have a positive impact on medical students' experience of surgery. It has been suggested that junior hospital staff are more crucial to the undergraduate learning experience than consultants, as much of the onus of teaching medical students, particularly in the area of perioperative management falls to the NCHDs[3].

The present study attempts to quantify the amount of unscheduled teaching provided by surgical NCHDs and consultants in Irish teaching hospitals, and to establish potential for improvement. Interns are in their first year post-qualification, Senior House Officers typically two and three years post-qualification, with Registrars and Tutors typically four to six years and Specialist Registrars greater than five years post-qualification. The secondary aim was to examine the teaching medium with which surgeons and trainees feel most comfortable. The tertiary aim was to assess students' experiences with unscheduled teaching and to assess their ranking of teachers of different grades.

Methods

250 questionnaires were distributed over a three month period to NCHDs and consultants working in seven Irish University Hospitals, each a tertiary referral centre with large numbers of undergraduate students attending annually. A total of 550 surveys were distributed to medical students at the end of their training in all major third-level institutions in Ireland. Students were asked to rate which mode of teaching they found to be most useful, again using a 5-point Likert scale with 1 being the most beneficial and 5 being the least beneficial. The modes of teaching investigated were didactic tutorials, bedside tutorials, case presentations, lectures and data interpretation sessions. Following retrieval of the completed questionnaires the results were tabulated and analysed (Tables 1 and 2).

Results

Survey 1

A total of 109/250 (44%) surveys were completed by various grades of hospital doctors – interns (45), SHOs (23), Registrars (10), Specialist Registrars (13), Surgical Tutors (4) and Consultants (14).

Scheduled Teaching

64% (70/109) of responders were not scheduled to provide undergraduate teaching. No intern was scheduled to teach as part of the formal undergraduate curriculum compared to 22% (5/23) of SHOs and 83% (34/41) of registrars, tutors, specialist registrars and consultants. The most common form of scheduled teaching was bedside tutorials 42%, (22/53), followed by didactic tutorials 28% (15/53), with 17% (9/53) scheduled to deliver formal lectures, 11% (6/53) scheduled to hear case presentations and 1% (1/53) scheduled to deliver data interpretation sessions. 33% (13/39) responders were scheduled for more than one teaching session per week with 53% (21/39) scheduled for weekly sessions. The remaining 12% (5/39) had been scheduled for fortnightly or less frequent sessions.

Unscheduled Teaching

71% (77/109) respondents provided unscheduled teaching sessions, 64% of Interns (29/45), 83% of SHOs (19/23), 80% of Registrars (8/10), 69% of Specialist Registrars (9/13), 75% of Surgical Tutors (3/4) and 64% of Consultants (9/14) provided unscheduled teaching to undergraduates. The most common mode of unscheduled teaching was bedside tutorials 39%

Table 1 Frequency of Unscheduled Teaching Sessions by Grade

	More than weekly	Weekly	Fortnightly	Monthly	Less than monthly
Intern	5	7	4	6	7
SHO	4	3	4	6	2
Registrar	2	2	2	1	1
SpR	4	2	0	2	0
Surgical Tutor	2	0	1	0	0
Consultant	3	3	1	1	2
	20	17	12	16	12

(48/124), followed by didactic tutorials 25% (31/124) and case presentations 24% (30/124). Only a small minority provided unscheduled lectures or data interpretation sessions, 12% (15/124). With regards to frequency of the unscheduled sessions, 64% of responders (49/77) providing unscheduled teaching sessions did so on at least a fortnightly basis (Table 1).

Miscellaneous

33% of (36/109) responders reported adequate time to teach, 33% of interns (15/45), 17% of SHOs (4/23), 40% of registrars (4/10), 38% of Specialist Registrars (5/13) and 35% of Consultants (5/13). 87% surveyed (94/109) could provide fortnightly or more sessions with 14% (15/109) stating they could only teach monthly or less than monthly.75% (39/52) of interns and SHOs reported bedside tutorials (17/52) or didactic tutorials (23/52) as their preferred mode of teaching and 85% reported lectures and data interpretation sessions as the least preferred (44/52).

Survey 2

A total of 184 surveys were fully completed and 71 were partially completed by medical students throughout the country.56% of students felt they were not receiving enough teaching (144/255). 87% felt they would benefit from more scheduled teaching time (221/255). 67% of students (142/255) received unscheduled teaching sessions on a weekly basis and 36% received at least twice weekly sessions (91/255). Students' rating of scheduled and unscheduled teaching performed by each rank of doctor from intern to consultant is shown in Table 2. 63% of students rated bedside tutorials as the most beneficial mode of teaching (132/184).

Discussion

While the numbers of doctors (109/250) and students (255/550) who replied were less than 50% in both cases this study suggests that in Ireland, a minority of surgeons (consultants and trainees) are scheduled for formal teaching sessions as part of the undergraduate curriculum. These scheduled teaching sessions consist mainly of small group teaching, including didactic tutorials and bedside teaching. The latter was the mode of teaching most preferred by teachers and students alike, but such sessions are limited as only small numbers of students can attend. In order to provide adequate teaching to all students, more tutors are required. The final years of medical undergraduate education are characterised by various in-hospital placements with different specialist teams. This 'clinical apprenticeship' provides opportunities to practice clinical skills under the watchful eye of experienced clinicians who provide constructive feedback and gradually relax their level of intervention as the students become more proficient[7]. This clinical clerkship is the principal source of mentoring, or form of apprenticeship[8].

Table 2 Students' Rating of Scheduled vs Unscheduled Teaching by Grade

Intern – unscheduled teaching		Registrar – scheduled	
1	53	1	46
2	40	2	31
3	42	3	28
4	22	4	20
5	20	5	22
SHO – scheduled teaching		**Registrar – unscheduled**	
1	17	1	43
2	32	2	46
3	24	3	34
4	12	4	25
5	17	5	16
SHO – scheduled teaching		**SpR – scheduled**	
1	25	1	64
2	55	2	50
3	41	3	28
4	22	4	18
5	16	5	21
Tutor – scheduled		**SpR – unscheduled**	
1	82	1	43
2	42	2	37
3	21	3	20
4	33	4	21
5	16	5	23
Tutor – unscheduled		**Consultant – scheduled**	
1	40	1	82
2	35	2	36
3	18	3	17
4	11	4	12
5	21	5	25
		Consultant – unscheduled	
		1	46
		2	31
		3	21
		4	17
		5	24

However, with decreasing numbers of elective surgical admissions[9] and increasing numbers of long stay patients[10,11], the opportunities for medical students to learn has become more limited. Such long term patients are less suitable for teaching and learning the basics of history taking, physical examination, and clinical evaluation as their acute illness has resolved. Clinical skills are disappearing[12], the availability of student mentors has decreased drastically[13] and traditional bedside teaching skills have deteriorated as each generation is less exposed to them[14]. Our study suggests that a significant amount of unscheduled teaching takes place within surgical teams. The junior members of the team are contributing significantly to such teaching and this teaching is valued by the students. Despite this, students feel they are not getting enough teaching in surgery. Small group teaching is the preferred mode of teaching for students and teachers alike and the majority of teachers feel they could commit to fortnightly or greater teaching sessions for undergraduates. Junior members of the surgical team should be treated as a valuable teaching resource as they themselves have experienced final medical exams more recently than any other grade of doctor.

By incorporating interns and SHOs into formal teaching curricula the number of small group and bedside tutorials could increase. Such a policy shift would also increase the number of student mentors available which may augment the clinical skills and expand the medical knowledge of our undergraduate students. In addition, it may upskill teaching skills among future generations, as more students will have augmented exposure to traditional bedside teaching. More regular mentoring may also help to counteract the declining numbers of junior hospital doctors interested in a surgical career[15]. As interns and the vast majority of SHOs are currently not scheduled to teach, it is reasonable to assume that they could feasibly be incorporated into existing curricula in order to provide extra small group teaching for undergraduates. This should confer greater benefits for both students and teachers alike[2,5,6].

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Paediatric Diabetes: Information-Seeking Behaviours of Families

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Abstract
The Internet provides patients and their families with ready access to on-line health related information. However, this information is not always accurate, understandable or provided by health professionals or advocacy groups. One hundred children with Type 1 diabetes mellitus, or their parents, attending a paediatric diabetes clinic during September to November 2011 were invited sequentially to participate in this questionnaire-based survey of Internet use in searching for diabetes-related information. Sixty-seven (67%) returned completed anonymised questionnaires: 36/67 (53%) were categorised as socio-economic groups C1/C2. Of the 67 families who returned completed questionnaires, 64 (96%) had a home computer and 62 (93%) had home Internet access; 27 (40%) rarely, and 40 (60%) frequently, searched on-line for diabetes-related information. Key search terms were not provided by respondents. There appears to be considerable internet use in seeking health related information for children with Type 1 diabetes mellitus. Clinicians should make efforts to direct patients and their families to websites that present accurate and current information.

Introduction

As the incidence of Type 1 diabetes mellitus (T1DM) is increasing, particularly in children, the availability of therapeutic options and technological support for patients is also increasing. For example, T1DM can now be treated via continuous subcutaneous insulin infusions (CSII), augmented by continuous glucose monitoring systems (CGMS), and an increased range of insulin, insulin delivery instruments and glucose monitoring systems. Some of these options require access to a computer and the Internet for optimum use. For many children and parents, the Internet is a vast source of answers to health-related questions[1-3], but retrieving appropriate and accurate data can be difficult[1,4-6]. Examples of reasons for inaccurate data include information that is out of date, or not updated frequently. Furthermore, information may be appropriate to some but not all individuals with a particular condition. Finally, information retrieved online may be difficult for parents and families to apply without the guidance of their clinical care team. And information sourced on-line from unvalidated third parties may be difficult for the diabetes multi-disciplinary team to explain or apply.

Our paediatric T1DM clinic is located in a university-affiliated regional centre, providing care to patients from both urban and rural backgrounds and from a representative sample of socio-economic groups. Approximately 250 children and adolescents with T1DM attend this clinic. Within this context, the aims of this study were, within attendees at our paediatric clinic: i) to survey the attitudes and approaches to Internet searches for diabetes-related information(DRI) of children or parents of children with T1DM; and ii) to explore the difficulties encountered when performing these searches.

Methods

Ethical approval for this study was obtained from University Hospital Limerick Research Ethics Board. A pre-validated questionnaire was administered prospectively to study subjects by a single investigator (ES). Any child with T1DM, or their parent(s), attending the paediatric diabetes clinic at University Hospital Limerick during September to November 2011 was eligible for inclusion and invited to participate. Questionnaires were completed during clinic time. All questionnaires were anonymised. Inability to read or speak English were exclusion criteria. Where families had more than one child with T1DM, only one questionnaire was completed per family. Socio-economic demographic data were determined from the highest reported level of parental education. The results were entered anonymously into a database for further analyses. Summary statistics were applied.

Results

The one hundred families invited to participate represented approximately 40% of families attending the clinic. While no-one refused to participate, only 67 completed questionnaires were returned, from 64 families with a home computer including 62 with home internet access. The patients with T1DM had a mean age of 11.5 years (±3.6), and a mean duration of T1DM of 3.4years (±2.9). Their mean HbA1c levels were 8.9±1.4%.

Of the 62 families with home internet access, forty-eight accessed the Internet daily and nine weekly. Of the nine families who searched weekly, eight rarely searched for DRI. Of the 48 families who searched the Internet daily, 17 (35.4%) and 3 (6.2%) families rarely or never searched on-line for DRI, respectively. DRI is searched for by 27/48 families who searched the internet daily, including 3/48 (6.2%), 16/48 (33.3%) and 8/48(16.6%) who searched for DRI information daily, weekly and monthly, respectively. Of 62 families with home Internet access, 28 (45%) did not use any specific phrases or words to search DRI. Eight families (12.9%) felt that the on-line information they retrieved was not useful, and the most common reason cited was that information was related to Type 2 diabetes mellitus. Information volunteered by families included that they would value "chat rooms" for children with T1DM and that they found dietary information particularly difficult to retrieve on-line. Most families, 36/67 (53%) were from the C1/C2 socio-economic group. The remainder of families included 14/67 group D, 2/67 group A, 11/67 group E and 5/67 group B. Of the 27 families who searched the Internet at least once per month for DRI, the highest level of parental education (either parent) was third level in 14 cases, finished second level in11 cases and some second level in 3 cases.

Discussion

Since the internet was first launched, the potential health benefits to the population were recognised to be one of its great opportunities. However, access to this information is not equal to all people. Factors which might affect the quality of a website for health related information include when the site was updated, who hosts and contributes to the site, especially if there is a

professional patient advocacy group involved, and references to the evidence for information being provided. In one study, the evaluation of chronic inflammatory bowel disease related online information suggests that the quality of websites and information is very variable, but frequently poor[7,8]. It is certainly possible that T1DM related websites are similarly variable in quality, but further research is required. One option to improve the utility of internet searches for families might be for diabetes health care teams to provide lists of suggested websites, suitable for both children and for their parents.

This survey was by questionnaire, administered by a single investigator assessing the approaches adopted by children and families seeking diabetes-related information on-line. Disappointingly, despite conducting this study in our clinic waiting room, a relatively small number of children and families returned questionnaires. Nonetheless, this number comprised approximately one quarter of the paediatric diabetes patient cohort in the Mid-West region. Thus, these results are probably representative of the wider population throughout Ireland. This study has limitations. It is a relatively small study utilising a retrospective questionnaire. There are potential sources of bias in child/parental recollection and it is possible that families answered questions in a manner which they perceived to be helpful to the researcher. However, data were anonymised. Further, it was beyond the scope of this study to evaluate how parents and families decide if information retrieved is relevant to their own child.

The results of our study suggest a need for diabetes-related on-line information to be filtered for children and parents, to allow children and their parents the optimum opportunity to retrieve information which is high quality and appropriate for their child. Encouragingly, a large proportion of respondents described attempts at home to gather knowledge from the internet, indicating a willingness to learn and to supplement information directly provided by the diabetes team. Furthermore, it is encouraging that the spectrum of maximum parental education among those searching for information was wide, and included parents who had not completed second level education. Clinicians should consider providing patients and their families with a portfolio of websites which have content informed and monitored by specific professional groups. Specific to T1DM, these groups might include professional organisations or hospital networks which operate specific information sites for families, and high quality patient advocacy groups.

In conclusion, despite the high proportion of families with home Internet access, relatively few searched on-line for information on T1DM and those who did search, described frustrations with their search results. Furthermore, very little information was provided on how searches were performed. Several families used recognised websites, such as those supported by diabetes organisations. However, little is known about the quality of information on unregulated sites[1,9]. Physicians should be aware of information-seeking behaviours of families, and seek to help families retrieve accurate and relevant information[1,10,11] perhaps in the first instance, by directing families to sites operated by professional diabetes organisations. This study suggests a willingness of families to search for information, among those with internet access, but also that these families experienced difficulties retrieving information.

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Acknowledgements
The contributions of the children with type 1 diabetes mellitus and their families.

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Electronic Discharge Summaries – Are They Being Done and Do They Have the Required Information?

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Abstract
A retrospective audit was conducted to evaluate the completeness of the available electronic discharge summaries. Forty-five randomly selected patients had their respective electronic discharge summaries reviewed including criteria such as length of stay; discharge summary availability; documentation of discharge medications; medication changes; medical co-morbidities and follow-up arrangements. There were electronic discharge summaries available for thirty-six (80%) of the included patients of which; thirty-three (91.7%) had the medication list available; twenty-six (72.2%) had clear documentation of medication changes; thirty-five (97.2%) had clear documentation of the patients' co-morbidities; and thirty (83.3%) had clear follow-up plans documented. The readmission rate was found to be high when compared to published numbers with a quarter of the discharged patients being readmitted within 28 days. The recommendations resulting from this audit include the need for improved education on the requirements of the electronic discharge summary, appropriate documentation and possible implementation of out-of-hours discharge summary availability.

Introduction

Discharge summaries are a vital multi-purpose tool serving to disseminate summarised data regarding a patient's care in hospital. They are vital from a medico-legal aspect whilst having financial implications with regards to coding and hospital payment for services rendered. They contain vital administrative information as well as patient demographics including those pertaining to the admission cause, investigations, results and management outcomes which are then projected to the community health professionals. Although discharge summaries have previously been a paper-based system we are now recognising and increased utilisation of an electronic-based system. These new electronic systems are considered of higher quality than their older traditional counterparts.[1,2] The objective of this audit was to review whether the electronic discharge summaries are being completed within the current care structure and to review whether the summaries contained the required information to convey the management plan agreed upon during their admission to hospital. The readmission rate for this sample of patients was also reviewed using a 28 day window from date of discharge as the cut-off window for review.

Methods

A random sample of patients admitted through the Emergency Department to a medical ward within the hospital between the 1st of January and the 28th of February 2011 was obtained using electronic random number sampling. A review of the admission duration and presence of electronic discharge summary was conducted. The following information was extracted from electronic discharge summaries using the hospital's computerised discharge summary system; age, gender, ward of discharge, length of stay, readmission within 28 days, availability of Electronic Discharge Summary (EDS), documentation of discharge medications, documentation of medication changes, documentation of medical co-morbidities and documentation of follow-up arrangements. Statistical analysis (t-test or chi-square calculation) was conducted using SPSS v1.0.

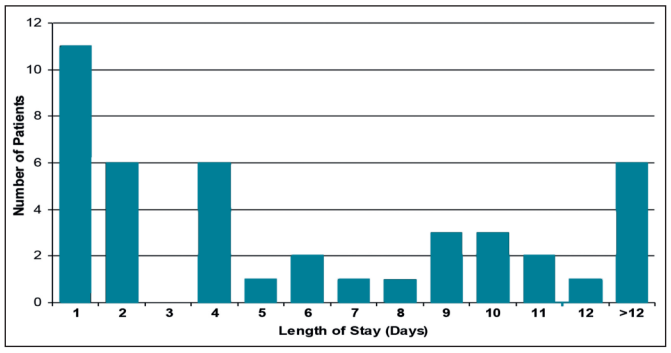

Figure 1 Length of Stay

Results

Following random sampling using an electronic sample generator; a total of 45 patients were included in the audit and the data was analysed accordingly. The ages of the patients admitted ranged from 16 to 97 years with a mean age of 65.5 years and a median of 72 years (CI: 59.6, 71.5). There were 2 male admissions and 22 female admissions (Figure 1).

Table 1 Destination of Follow-up

Follow Up Plans	Number
GP Follow-Up	12 (40.0%)
Specialist F/U	10 (33.3%)
Cardiac	8 (26.7%)
No Follow Up Plans Documented	12

The majority of patients (75.6%) were discharged from the Cardiac Wards (n=15), General Medical Wards (n=1, 28.9%) and the Acute Medical Short Stay Ward (n=6, 1.%). The remainder were either discharged from the Surgical wards as Medical Outliers (6.7%), or from the Emergency department (n=1, 2.2%). Seven patients (15.6%) were discharged from the medical department but had no documentation of the ward they were discharged from on the Electronic Discharge Summary. 80% of the included patients (n=6) had Electronic Discharge Summaries pertaining to admission episode. The remaining 20% (n=9) had no record of any Electronic discharge summary on the hospital's electronic database. From the available discharge summaries a total of 91.7% (n=) had the medication list available on the summary; 72.2% (n=26) had clear mention of any changed to the medications made during admission on the summary; 97.2% (n=5) of the summaries had clear documentation of the patients' co-morbidities on discharge; and 8% (n=0) had clear documentation of any follow-up plans on discharge.

Of the patients who were discharged the majority had follow-up plans to be done by their respective general practitioner (40%), or by specific specialist clinics (33.3%). A small group (26.7%) were referred for cardiac follow-up. A total of 12 of the discharge summaries had no note of any follow-up plans (Table 1). The length of stay of the forty-five patients ranged from 1 to a total of 31 days with a mean stay of 7 days (Figure 2). A total of 12 patients (26.7%) admitted during the study period were readmitted within 28 days of discharge. The patients readmitted were divided into two separate groups; those under the age of 75 years ("<75"); and those over and including 75 years ("75+"). The "75+" age group made of the majority of the readmissions: 17.8% (n=8) and the "<75" age group made up just 8.9% (n=4). There was a statistically greater chance of readmissions in the "75+" group than in the younger age groups ($p<0.05$). A total of two patients (4.4%) passed away during their hospital admission.

Discussion

The discharge summary forms available on the hospital's EDS system includes most of the recommended fields as recommended by the SIGN Guidance (Guideline No. 65) but there are a few missing areas such as admission mode, source, disability and mobility scoring and the date of death. Some of these are sometimes documented within the main text of the document but there is no obligatory section. It is widely understood that the information in the discharge summaries may not always be completely correct but it is currently the best available system by which information is disseminated to the primary care physicians and surgeries.[4] There is evidence, however, to suggest what the General Practitioners would appreciate in the letters sent on discharge and they are, in essence, similar to what the SIGN guidelines suggest should be in the letters. The most essential aspects which needed to be present included admission diagnosis; pertinent finding on admission; results obtained during admission; any procedures undertaken during admission; any active complications; discharge diagnosis; medications on discharge; and follow-up plans.[5]

The department scored well on the presence of documentation of discharge medications (91.7%) and documentation of co-morbidities (97.2%) but falls short in the presence of an electronic discharge summary (80%), presence of medication changes during admission (72.2%) and documentation of follow-up arrangements (8.%). There was, however, the possibility of a paper summary having been sent to the community practitioners. This form of summary would not be available online; and although this may provide the necessary information in the short term, it would not be ideal as its accessibility for future information would be limited. The readmission rate for the study group, with regards to medical admissions, was also found to be high with a rate of 26.7% within 28 days of initial discharge. There was no recent documentation which stated medical readmission rates, even though there was data available for femur fractures, stroke, hip replacement surgery and hysterectomies.[6] The data available for emergency readmissions published by Hudson B was the closest available data for comparison.[7] The readmission rates for the medical admissions in the study group were considerably higher that these numbers by around 25%. Hudson states a readmission rate of 9.1% in the "16-74 years" age group and 1.9% in the "75+ years" age group. This may be explained by the time period in which the audit was conducted; where the winter months may be

prone to the admission of sicker patients requiring more time for recuperation resulting in more admissions as well as managerial pressures to clear medical beds.

Although the forms available contain the main aspects required as recommended by the relevant guidelines there are still some improvements that need to be made. There needs to be a drive for obligatory EDSs for each and every discharge event from hospital. Improvements are required in the fields pertaining to changes in medications and in the documentation of follow-up plans in the community or within the hospital framework. There may be merit in requesting formal input from the general practitioners in the community to review what they would like to see included in the discharge summaries; and also whether they actually do receive the discharge summaries from hospital either as an electronic version, paper version or both.

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The Value of Health Libraries and Librarians to the Irish Health System

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Abstract
Librarians working in the Irish health sector are under threat. This is a relatively young profession in comparison with international counterparts, with a low staffing base even at its peak. The public sector moratorium has led to professionally qualified librarians and library assistants not being replaced right across the health system. Librarians are employed in the HSE, voluntary sector, and university sectors. The value that this profession brings to healthcare has been documented in systematic reviews and literature in other countries.[1-4] In Ireland this group is represented by the Health Science Libraries Group (HSLG), a section of the Library Association of Ireland. The HSLG commissioned research into the status of the profession as well as Irish health libraries. This resulted in the publication of the "SHeLLI Report"[5] in 2011. Results of the report are outlined here and selected examples of value of librarians to healthcare are described.

Introduction

In 2010 the HSLG formed a "Health Research Group" to investigate producing research into Irish health librarians and libraries as part of its Strategic Plan 2009-2013[6]. The Group was made up of librarians from the Health Service Executive, Royal College of Surgeons in Ireland and the Health Research Board while also representing all librarians working in the Irish health sector. A number of factors influenced the decision to conduct research. Firstly, the last time any formal research was done in this sector was in 1995, with the publication of the "MacDougall Report"[7]. This was instrumental in the creation of jobs for librarians in the then health boards and voluntary hospitals. Following this, a second edition of the *Standards for Irish health libraries* was published in 2004[8]. Standards were an important benchmark for quality improvement initiatives for all Irish health libraries. Fresh evidence was well overdue for this sector. Secondly, the economic and political environment in Ireland led to staffing cuts, library closures and redeployment of staff in the public sector. Lastly, the explosion of information or what is now called "big data", together with massive advancements in technology and the way doctors, nurses and patients access information has changed radically. This progress in information technology had a direct impact on the way librarians work and especially on physical libraries, which was something that needed evaluation in an informed way.

Methods

The HSLG Health Research Group convened in 2010. As the group is voluntary it was necessary to outsource the research. A tender was published and in 2010 the contract was awarded to the Department of Information Science at Loughborough University. The team at Loughborough adopted a mixed methods approach. Qualitative methods included a focus group and interviews with key stakeholders in the Irish health sector namely the HSE, Department of Health and Children, HIQA, INMO and users – nurses, doctors, and librarians. Quantitative methods included a survey of health library staff in Ireland. Preliminary results were shared with the wider profession at the annual conference of the Library Association of Ireland in 2011. Full results were shared with European librarians at the European Association for Health Information and Libraries Conference in 2012[9] and with US librarians at the Medical Library Association Conference in 2013.

Results

The result of the research was the publication of the "SHeLLI Report" which was officially launched by the CEO of the Royal College of Physicians in Ireland, in January 2012. The findings confirm that the profession is under threat and that a skills gap will result if the economic and political climate does not change (i.e. the moratorium). The sector is small with at least 75 library units in

existence, of which 49 deliver services from hospitals. On a positive note, there is an appreciation by stakeholders – doctors, nurses, managers – of the value of librarians to their work. The library service in the health system in Ireland was also found to be professionally run. However there is a lack of a collective body of evidence to demonstrate the value and impact of the work of librarians. Other countries have published evidence demonstrating the vital role of librarians in the delivery of clinical services[3]. A key recommendation is to build this body of evidence.

There is a perception amongst librarians that doctors, nurses and other health professionals are not clear on the value or role of librarians in healthcare. This is something that our profession must tackle. It is recommended that librarians market their expertise in EBM, information literacy, evidence to support corporate governance and specialist information services to clinicians and other health professionals. A possible future role is that of a 'clinical librarian'[10]. This involves a librarian working in clinical teams, attending clinical meetings, providing evidence based information to support patient care and in some cases, being included on ward rounds. Another role is that of "Corporate Librarian" – informing evidence based managerial decision-making and clinical governance. In summary, recommendations arose in three strategic areas: build a body of evidence, promote the value of librarians and develop staff and services.

Discussion

Since the publication of SHeLLI, the HSLG set up a SHeLLI working group made up of librarians working across the health sector. The group has reviewed and prioritised recommendations and is in the process of drawing up action plans around their implementation. The implementation process is more important now than ever particularly as the health system is haemorrhaging staff. Within the HSE alone, since 2006, over one third of library staff have been lost. Similar scaling down is happening in the academic and voluntary sectors. Doctors, nurses, health and social care professionals are all essential to an operational health system. Librarians are too. The World Health Organisation states that a well functioning health system "requires a variety of institutional mechanisms…which includes arrangements to make information accessible to all involved, including communities, civil society, health professionals and politicians".[11] Making information accessible to all is what librarians do best.

Table 1 Snapshot of value of health science librarians to Irish health system

Role of librarian	Program/Beneficiary	Value
Online clinical query service Assistance with evidence compilation for clinical guidelines	National Cancer Control Programme National Clinical Effectiveness Committee	• Quality information • Saves time • Influenced decision on patient care, policy, clinical practice • Reduce risks and errors
Bibliotherapy Service	Patients	• Access to quality approved books specific to conditions e.g. bereavement
Educator	Students in all health professions	• Lifelong learning information skills • Information-seeking skills for systematic reviews and published research
Clinical librarian as part of multidisciplinary hospital and clinical teams	Clinical teams Hospital teams Patients	• Improve access for clinicians to quality information • Information at point of care

The recent annual conference of the HSLG showcased initiatives that librarians in Ireland are spearheading (Table 1). They include the beginnings of a clinical librarian model. The HSE in various locations have developed a clinical query service. This enables any health professional working in the HSE to submit their query online and receive results of a literature search by email in return. In determining the impact of such a service, Dalton reported that responders to a survey evaluating the service in a six month period showed that 93% of staff found that information provided by the library had saved them time, and 86% claimed it had influenced their decision on patient care, clinical practice or policy. Over half of respondents indicated that risk or errors had also been reduced.[12]

The National Cancer Control Programme is supported by HSE librarians with clinical queries. Beaumont and Connolly Hospitals piloted the involvement of librarians in ward rounds, but although benefits were cited by clinicians, the practice was deemed unsustainable in the current climate. Flynn found that attitudes of doctors to the inclusion of a 'clinical informationist' on a clinical team were mainly positive including: improving clinicians' access to information, patient care, teaching and utilisation of evidence-based medicine and for continuing professional development[13]. A librarian working in the Midwifery Department at Trinity College Dublin documented the impact of information literacy courses he runs in improving the search skills of undergraduate midwifery students[14]. The librarian at the Milford Care Centre reported on the positive impact of a bibliotherapy service she set up on the ability of the bereaved to cope with their loss. These examples are a snapshot of the value librarians bring to the spectrum of the health system, from patients to students to clinical teams in hospitals. The HSLG is tasked with the compilation of this evidence of value into a digestible piece for decision makers in our health system.

We are living in the information age. Doctors and other health professionals are time poor, while the volume and depth of clinical information available is rich. The modern patient is more likely to be informed and self-sufficient than patients of a previous generation. Patients are turning to the internet for help and information but how effective are their searching skills? Clinicians have a role to play in improving the quality of information available on the internet about health; however librarians once employed, could play a role in the organisation of this information and in the education of consumers about finding, evaluating and using this information. The SHeLLI report advocates a role for librarians in the provision of quality health information to the public.

In this era of lean thinking, can we afford to have a health system diminished of its librarians? The message to doctors and health professionals is, in the words of author Neil Gaiman, "Google can bring you back 100,000 answers, a librarian can bring you back the right one."[15] With the support of health professionals, librarians could be integrated into clinical teams and become an integral part of the health system. The embedded librarian could advance evidence based practice and culture in the Irish health system of today and tomorrow.

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Acknowledgements

The LISU team at the University of Loughborough for the production of the SHeLLI report, the HSLG Research Group and the Library Association of Ireland and the HSLG SHeLLI Working Group.

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Down in the Wards: Point Prevalence of Antidepressant and Benzodiazepine Use

Sir,

The point prevalence use of Anti depressant (AD) use in Ireland in 2011 was 5.5 % and Benzodiazepine (BDZ) use was 4.1%[1]. Depression is under recognised and under treated in hospitalised patients[2] but the prevalence of AD use in acute general medical inpatients has been little studied internationally and unknown in Ireland. We report the point prevalence of AD and BZD use in a general medical hospital inpatient population.

We studied all 168 in-patients admitted to the Department of Medicine on December 13th 2011 for AD and BZD prescriptions on admission in patients over the age of 18. The protocol was approved by the HSE Mid-Western Area Research Ethics Committee. 48.2% were male and 51.8% were female. 61.4% were public and 38.6% were private insurance holders, age ranged from 18-97 with a mean age of 67.5 years [SD 18]. The prevalence of AD use was 25.9%. and BZD use was 16.3%. 11.3% of males and 39.4% of females were taking ADs ($p<0.001$). 23.5% of public patients and 29.7% of private patients were on ADs ($p=0.378$). Patients who did not take ADs were on an average of 5.5 medications [CI 4.8-6.3], and those who did take ADs were on average of 9.5 medications [CI 8.25-10.75] ($p<0.001$). 17.5% of males and 15.1% of females were taking BZDs ($p=0.678$). 15.7% of public patients and 17.2% of private patients were taking BZDs ($p=0.799$). Patients who did not take BZDs were on 5.9 medications [CI 5.2-6.6] and those that did take BZDs were on 9.9 medications [CI 8.3-11.5] ($p<0.001$). This is the first study of AD (26%) and BZD (16%) prescriptions in an acute hospital with a prevalence six times higher than the community (Irish National Drug Prevalence Study (INDPS) of 2011) The 3 fold higher prevalence of AD use in females reflects international trends[3]. The prevalence of depression is high in acute general hospitals and in patients with chronic disease[3]. Rentsch found a prevalence of 26.9% of depression in general hospitalized patients[2]. This correlates with our results of AD use.

The high prevalence are unlikely to be explained by a high background population drug use as the national study showed a lower prevalence of AD and BZD use in the Mid –West.[1]

Patients on ADs or BZDs were on nearly twice as many medications as those not on them which may indicate a higher burden of organic illness in those treated with depression. This may reflect a greater burden of chronic diseases. We were surprised that prescriptions for ADs and BZDs were similar between public and private patients. One explanation might be that chronic illness overrides the effects of social class in susceptibility to depression. This study should stimulate further research on the role of depression in hospitalised medical patients.

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Acknowledgements
A Hannigan, Consultant Biostatistician at University of Limerick for statistical support.

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Use of Lean Principals to Improve Flow of Patients with Fractured Neck of Femur – The HOPE Study

R McNamara, A Butler, C Baker, J Mullen, B Lenehan, S Grimes, H O'Donoghue, P Evans, M Liston, F Cummins, F Condon. Ir Med J. 2014; 107: 70-2.

Question 1
Following the introduction of the lean care pathway the proportion of patients admitted to the fracture ward within 4 hours of presentation was

a) 7%
b) 17%
c) 27%
d) 37%
e) 47%

Question 2
The increase in daily theatre time was

a) 32 mins
b) 34mins
c) 36mins
d) 38mins
e) 40mins

Question 3
The additional proportion of patients receiving surgery within 24 hours was

a) 10%
b) 12%
c) 14%
d) 16%
e) 18%

Question 4
Prior to the implementation of the lean programme the proportion of patients admitted to the trauma ward within 4 hours was

a) 7%
b) 17%
c) 27%
d) 37%
e) 47%

Question 5
After the introduction of the lean programme the total amount of available theatre time over the 8 weeks trial was

a) 300 hours
b) 319 hours
c) 338 hours
d) 357 hours
e) 376 hours

Comparison of Comorbidities in Patients with Pre-Diabetes to Those with Diabetes Mellitus Type 2

C Farrell, J Moran. Ir Med J. 2014; 107: 72-4.

Question 1
The number of pre-diabetes patients in the study was

a) 279
b) 289
c) 299
d) 309
e) 319

Question 2
In the type 2 diabetic group the prevalence of ischaemic heart disease was

a) 17.8%
b) 19.8%
c) 21.8%
d) 23.8%
e) 25.8%

Question 3
In the type 2 diabetic group the prevalence of peripheral vascular was

a) 9.9%
b) 12.9%
c) 15.9%
d) 18.9%
e) 21.9%

Question 4
In the type 2 diabetic group the prevalence of eye disease was

a) 3.5%
b) 4.5%
c) 5.5%
d) 6.5%
e) 7.5%

Question 5
In the pre-diabetes group the prevalence of ischaemic heart disease was

a) 18.6%
b) 19.6%
c) 20.6%
d) 21.6%
e) 22.6%

Analysis of the Last Decade of Weekend Out-of-Hours CT Imaging: How Have Things Changed?

S Culleton, W Torreggiani. Ir Med J. 2014; 107: 77-9.

Question 1
Over the decade 2001-2010 the week-end CT imaging increased by

a) 170.7%
b) 180.7%
c) 190.7%
d) 200.7%
e) 210.7%

Question 2
The increase in CT thorax scanning was

a) 7-fold
b) 8-fold
c) 9-fold
d) 10-fold
e) 11-fold

Question 3
The increase in CT abdominal imaging was

a) 2-fold
b) 3-fold
c) 4-fold
d) 5-fold
e) 6-fold

Question 4
The total number of CT scans performed during on call week-ends

a) 8510
b) 8520
c) 8530
d) 8540
e) 8550

Question 5
The proportion of referrals from the emergency department was

a) 32.6%
b) 42.6%
c) 52.6%
d) 62.6%
e) 72.6%

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