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**Address:** IMJ Editorial Office
IMO House, 10 Fitzwilliam Place, Dublin 2
**Tel:** (01) 676 7273. **Fax:** (01) 661 2758
**E-mail:** lduffy@imj.ie **Web:** www.imj.ie

# In this Month's IMJ

**Victimisation and psychosexual difficulties associated with sexual orientation concerns: A school-based study of adolescents:** Cotter et al report on a study of the sexuality and personal difficulties conducted among secondary school pupils 13-16 years across 17 schools in Cork and Kerry. Among 1112 adolescents, 58 (5%) students had either lesbian, gay or bisexual (LGB) orientation. The LGB group had higher rates of psychological difficulties, substance abuse, sexual activity and were more likely to be subjected to assault.

**Table 1 Victimisation, physical assault and sexual assault**

| | Total % (n) | Sexual orientation concerns % (n) | No sexual orientation concerns % (n) | $X^2$ | df | p | Phi |
|---|---|---|---|---|---|---|---|
| Physical Assault | 10% (111) | 40% (23) | 8% (85) | 56.3 | 1 | <.001 | .24 |
| Physical Fight | 29% (306) | 73% (40) | 26% (257) | 55.1 | 1 | <.001 | .23 |
| Sexual Assault | 2% (20) | 16% (9) | 1% (11) | 66.8 | 2 | <.001 | .25 |
| Pushed, hit or kicked you | 19% (196) | 40% (22) | 17% (170) | 16.1 | 1 | <.001 | .13 |
| Spread rumours about you | 18% (192) | 45% (25) | 17% (165) | 26.3 | 1 | <.001 | .16 |
| Teased you | 15% (159) | 18% (10) | 15% (149) | .2 | 1 | .694 | .02 |
| Deliberately left out of activities | 5% (49) | 7% (4) | 5% (45) | .3 | 1 | .562 | .03 |
| Taken money, property or food from you | 4% (42) | 14% (8) | 3% (33) | 14.2 | 1 | <.001 | .13 |
| Called you names | 17% (178) | 30% (17) | 16% (160) | 6.7 | 1 | .009 | .09 |
| Made fun of how you look or talk | 15% (163) | 20% (11) | 15% (150) | .5 | 1 | .464 | .03 |
| Made you work for other pupils or people | .8% (9) | 5% (3) | 1% (6) | 9.1 | 1 | .003 | .12 |
| Disrespected you | 12% (125) | 36% (20) | 11% (104) | 30.1 | 1 | <.001 | .18 |
| Roughed you up | 4% (44) | 11% (6) | 4% (37) | 5.0 | 1 | .026 | .08 |
| Taken advantage of you | 8% (84) | 25% (14) | 7% (70) | 20.9 | 1 | <.001 | .15 |
| Controlled you | 3% (28) | 9% (5) | 2% (22) | 7.1 | 1 | .008 | .10 |
| Hurt you | 10% (103) | 34% (19) | 8% (82) | 37.4 | 1 | <.001 | .20 |
| Trouble with bullies | 5% (48) | 14% (7) | 5% (41) | 6.8 | 1 | .009 | .10 |

**The use of digital media by women using the maternity services in a developed country:** O'Higgins et al found that among 522 expectant mothers, 95% used the Internet for pregnancy information. 76% had a smart phone, and 59% had a smart app. The content consisted of discussion forums, social network, video media, e books, blogs, and podcasts. The authors recommend that all maternity hospitals should have a media strategy.

**Table 3 Types of websites used by women for pregnancy information (% of cohort)**

| | |
|---|---|
| Discussion forums | 70% |
| Social Networks | 67% |
| Video media | 48% |
| Ebooks | 15% |
| Blogs | 13% |
| Microblogs | 9% |
| Podcasts | 4% |

**A pilot cross-sectional study of patients presenting with cellulitis to emergency departments:** Quirke et al found that in a month's study across 2 ED departments there were 59 patients with cellulitis, rate 12 per 1000 attendances. In terms of management, 54.2% received IV antibiotics and 45.8% of patients were administered oral antibiotics. Factors that determined oral treatment were CREST 1 category, self-referral, and symptom duration greater than 48 hours.

**Table 1 CREST classification for the management of cellulitis in adults[5]**

| Class I | Class II | Class III | Class IV |
|---|---|---|---|
| Patients have no signs of systemic toxicity, have no uncontrolled co-morbidities and can usually be managed with oral antimicrobials on an outpatient basis | Patients are either systemically ill or systemically well but with a co-morbidity such as peripheral vascular disease, chronic venous insufficiency, or morbid obesity which may complicate or delay resolution of their infection | Patients may have a significant systemic upset such as acute confusion, tachycardia, tachypnoea, hypotension, or may have unstable co-morbidities that may interfere with a response to therapy or have a limb threatening infection due to vascular compromise | Patients have sepsis syndrome or severe life-threatening infections such as necrotizing fasciitis |

**The feasibility of audiologists removing earwax:** Browne and Fourie state that cerumen management (earwax removal) is not currently performed by audiologists. The need to refer patients to ENT for the procedure leads to delays in audiology assessment. In a survey of 20 ENT consultants and 51 audiologists, the group agreed that the treatment could be performed by audiologists. It is proposed that a training programme should be introduced.

**Table 1: Summary of responses to questionnaire items**

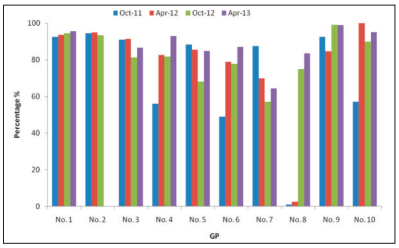
| | ENT N=20 (29%) | | Audiologist N=51 (64%); Community: N=30 (59%); Hospital: N=21 (41%) | | | |
|---|---|---|---|---|---|---|
| 1. (Biographical Information) | Strongly Agreeor or Agree | | No Opinion | | Strongly Disagree or Disagree | |
| | ENT | AUD | ENT | AUD | ENT | AUD |
| 2. Cerumen management should be within the scope of practice of audiologists, if proper training and practical experience has been completed | 95% | 73% | 0% | 6% | 5% | 21% |
| 3. Medically trained personnel are more qualified to perform cerumen management than Audiologists | 50% | 48% | 15% | 11% | 35% | 41% |
| 4. Cerumen management procedures involve a degree of risk to the patient. | 90% | 95% | 10% | 0% | 0% | 5% |
| 5. There is a greater risk to the patient if an audiologist, as opposed to an otolaryngologist, performs cerumen management. | 75% | 27% | 5% | 23% | 20% | 50% |
| 6. An audiologist's patient would be served more efficiently in the Community Audiology Service if cerumen management procedures could be performed at the audiologist's clinic. | 90% | 80% | 10% | 7% | 0% | 13% |
| 7. Given the choice, patients would prefer to have cerumen removed by the audiologist at their initial appointment than have to go to an otolaryngologist for removal, and later return to the audiologist for assessment. | 100% | 72% | 0% | 14% | 0% | 14% |
| 8. If a University-run CPD course to train audiologists in cerumen management were set-up in Ireland I would be in favour of it. | YES | | ENT 100% | | AUD 82% | |
| | NO | | 0% | | 18% | |

**A quantitative analysis of diabetic retinopathy screening in a regional treatment centre:** James et al have reviewed diabetic retinopathy screening. Among 97 diabetic patients, 64.9% were attending a retinopathy screening clinic and 35.1% were referred from GPs. Almost 90% were getting their annual review. The main deficit is that only 11% patients were getting systematic photographic screening. The wider introduction of this technology would facilitate greater community rather than hospital screening.

**Table 2 Summary of retinopathy grades***

| | Patients with type I diabetes (n =22) | Patients with type II diabetes (n = 75) | All patients (type I and II) (n = 97) |
|---|---|---|---|
| Retinopathy grade, n (%) | | | |
| R0 M0 | 11 (50%) | 39 (52%) | 50 (51.5%) |
| R1 M0 | 5 (22.7%) | 25 (33.3%) | 30 (30.9%) |
| R2 M0 | 0 (0%) | 0 (0%) | 0 (0%) |
| R3 M0 | 1 (4.5%) | 1 (1.3%) | 2 (2.1%) |
| R1 M1 | 2 (9.1%) | 4 (5.3%) | 6 (6.2%) |
| R2 M1 | 0 (0%) | 1 (1.3%) | 1 (1%) |
| R3 M1 | 3 (13.6%) | 4 (5.3%) | 7 (72%) |
| Ungradable | 0 (0%) | 1 (1.3%) | 1 (1%) |

**Implementation and evaluation of a clinic data management programme in a primary care centre:** Sweeney et al describes the feasibility of data management in general practice using the international classification of primary care, ICPC-2. The appointment of a data clinical manager led to a significant improvement. Prior to implementation there was a 69% coding rate, and after implementation the rate increased to 98%.

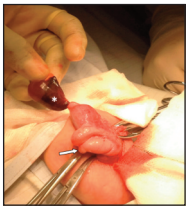



**The appropriateness of a proton pump inhibitor prescription:** Moran et al state that PPIs account for 8% of drug expenditure. Side-effects include respiratory tract infection, clostridium difficile infection, and increased bone loss. The authors found that 35.4% of patients were on PPIs at the time of admission but only 8.3% had a clear indication. The authors recommend that PPI prescriptions and the indication be reviewed at the time of discharge.

**Table 1 NICE Guidelines CG 17: Dyspepsia: Management of dyspepsia in adults in primary care 2004**

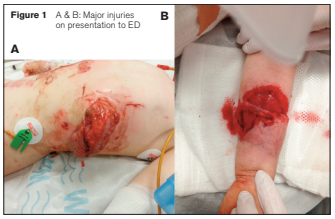
| Disease | Treatment | Long-term acid suppression | Follow Up | Endoscopy |
|---|---|---|---|---|
| Peptic ulcer disease (PUD) | Treat H.pylori if positive | | | |
| 2 month PPI if negative | Not recommended | Gastric ulcers require repeat endoscopy 6-8 weeks after commencing therapy | Refer for OGD if over 55 years of age or alarm symptoms | |
| NSAID-induced ulcer | Healing dose PPI | Not recommended | Reduce to maintenance dose. Stop NSAID where possible | Refer for OGD if over 55 years of age or continuing need for NSAID |
| Severe GORD | Healing dose PPI 1-2 months | Lowest dose that maintains symptom control | If requires oesophageal dilatation should continue long term full dose PPI treatment | Routine surveillance if Barrett's Oesophagus |
| Non-ulcer dyspepsia (NUD) | Low dose PPI for 1 month/alternate acid suppression | Lowest dose that maintains symptom control | Consider 'on-demand' basis treatment | |
| Mild symptoms of dyspepsia | Lifestyle advice. Treat on 'step-up' or 'step-down' basis | Not recommended | 1 month empirical PPI therapy if symptoms persist. H.pylori 'test and treat' | |

**An unusual cause of acute scrotum in a child:** Aworanti and Awadalla report the case of a 9 year old with a torted embryonic remnant arising from the distal spermatic cord.



**Animal attack: an unusual case of multiple trauma in childhood:** O'Grady et al report the case of a 2 year old child who was badly injured by a tapir at the zoo. The tapir, who was the size of a large pig, caused forearm lacerations and multiple perforating bites to the abdomen. She required extensive surgery including bowel resection. Fortunately she made a good recovery.

**Figure 1** A & B: Major injuries on presentation to ED



# How Well Do Performance Indicators Perform?

The evolution of quality improvement has been driven by the need to reduce errors and raise the standard of medical care. The publication of 2 reports by the Institute of Medicine (IOM) in 1999 and 2001 was the catalyst for change. The findings of both studies reported that there were preventable deaths in US hospitals and that the health system was failing to provide consistent high-quality care for all patients. The additional important step made by the IOM was the appreciation that errors were due to systems failure rather than individual mistakes. It tried to move away from blaming individual health care workers. This approach encouraged a more open, honest approach by hospitals when confronted with a medical mishap. It was appreciated that discussion and medical practice modification were the best way to prevent an error being repeated. In relation to clinical care, the principle of doing the right thing, at the right time, and in the right way was proposed. On foot of these deliberations the Joint Commission in the US in 2002 directed all accredited hospitals to collect performance data for patients with myocardial infarction, heart failure, pneumonia and pregnancy. This has now been further extended.

One of the mechanisms is to encourage hospital management to ask whether their hospital is doing a good job. In order to answer this question reliable tools are needed. The best tool is a performance indicator. The measures are mostly based on information from the patient's records or an operational process that is converted into a rate or a percentage. A good performance indicator, measure or metric should have 4 characteristics. It should be clinically important, be based on strong science, and have both usability and feasibility. Validity is the degree to which a measure documents what it is supposed to measure. It should be sufficiently robust to distinguish between good care and suboptimal care. The measure should also be reliable with low levels of inter observer variability when used by a wide range of individuals. The measure must have a goal. At the outset one must know whether you already have the data or whether you will have to set up a system to get it. It is a relatively new exercise and usually requires the institution to invest both time and resources. The investment is worthwhile because you can't improve what you don't measure.

The concept of performance measurement, which came from industry and business, has now been introduced into medical practice. Hospital managers have readily embraced it. It is pointed that it makes it possible to document the quality of care, to make comparisons between hospitals and between hospital departments. The process can also support accountability, regulation and accreditation.

On the other hand, physicians have been more questioning about the reliability of some performance indicators. This is understandable. Front-line doctors are primarily concerned with the patient's outcome rather than surrogate markers of outcome. Also doctors are frequently the subject of the quality measure. While some markers clearly have demonstrated benefit in terms of outcome, others have not been useful. High hand-washing rates are a good indication of hygiene and are associated with lower numbers of hospital-acquired infections. On the other hand, target arrival-discharge ED times have been met with criticism. There is little gain for a patient if he is seen and dealt with quickly but without a proper examination and correct treatment plan. The Mid-Staffordshire Inquiry found that in order to meet the '4 hour NHS target' there were instances in which patients were being assessed by receptionists and unsupervised junior hospital doctors. On the other hand, the assessment of ED performance in relation to factors that affect the patient's immediate health for example time to treatment in acute asthma or time to first dose of antibiotics in suspected sepsis can be very helpful.[1]

McGlynn and Adams[2] writing in JAMA have explored the relation between quality measures and clinical outcomes. They stress the need for continued, sustained efforts to produce metrics that reflect the operation and implementation of current healthcare. The comments are predicated by 2 recent papers that showed a lack of association between a performance indicator and patient outcome. The message is an important one. It is futile to continually promote and advocate for a performance indicator if it has little or no benefit to the patient. Howell et al[3] had studied elective, non-medically delivery at 37-39 weeks gestation and caesarean section in low risk women. The authors found that there was no correlation between these factors and maternal or neonatal morbidity. While this may seem surprising to many, it is pointed out that measuring quality of care in obstetrics is complex because it involves 2 individuals, the mother and the infant.

In the second paper Neuman et al[4] evaluated the measure of discharging acute hospital patients to a skilled nursing facility (SNF). The outcome variable examined was readmission to an acute care hospital or death within 30 days of the index hospital discharge. The authors found that the measure of admitting patients to an SNF after acute hospital discharge did not reduce readmission to acute hospital care or mortality rates. These recent papers point out that even when a performance seems plausible at face value and it reaches its target, it may not have any significant benefit for the patient.

The measurement of clinical and operational performance will continue to develop, expand and become more sophisticated. It will inform on how best to care for patients. Choosing measures that ultimately benefit the patient will remain a big challenge. The only way of ensuring that the correct choice has been made is to determine whether the acquisition of the performance indicator target has led to a better patient outcome.

JFA Murphy
Editor

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# The Irish Maternity Early Warning System (IMEWS)

In the acute hospital setting, the use of early warning scores (EWS) to monitor vital signs (including heart rate, respiratory rate [RR], blood pressure and temperature) has been shown to be beneficial in the early diagnosis and prompt initiation of treatment in adults with a critical illness[1]. This led to the development of the National Early Warning Score (NEWS) in Ireland by the Health Services Executive's (HSE) Acute Medicine Clinical Care Programme. The NEWS was the first guideline endorsed by the National Clinical Effectiveness Committee (NCEC) and was launched by the Minister of Health Dr James Reilly in 2013. The implementation of NEWS is now mandatory in all acute hospitals. However, NEWS is not suitable for use in pregnancy because a woman's vital signs change physiologically from early in pregnancy. National reports in Ireland and the United Kingdom (UK) on maternal mortality have led to recommendations that a modified obstetric EWS be introduced[2,3]. In Ireland, these recommendations have been further supported by separate investigations in 2008 and 2013 on two maternal deaths from sepsis[4,5].

In April 2012, the HSE Clinical Care Programmes in Anaesthesia, Critical Care, and Obstetrics and Gynaecology commenced work on critical care pathways for the obstetric patient. As part of the task, it was decided to develop a standardised modified EWS for the Irish maternity services in collaboration with the HSE Directorate of Nursing and Midwifery. An audit found that a modified EWS was in use in half of the 20 maternity units in the country. The charts used were diverse in design, the clinical circumstances for usage varied and there was no standardisation in triggering a clinical response when vital signs abnormalities were detected. While well-intended, these EWS often lacked multidisciplinary support and systematic training. Obstetric or midwifery staff who moved hospital would have to familiarise themselves with different charts and different clinical escalation policies.

A multidisciplinary design team led by Ms Ina Crowley set about developing a national Irish Maternity Early Warning System (IMEWS)[6]. Drafts were distributed nationally and feedback was obtained from the different disciplines and the different maternity units. A national training programme and an associated clinical guideline were developed to assist implementation[6]. The IMEWS was introduced nationally by the HSE in April 2013. From the outset, it was decided to call it a 'system' and not a 'score' and to emphasise that the IMEWS is there to assist clinical judgement and not replace it. The focus is on the early identification of the woman with a critical illness and not on the treatment of a score in isolation. The implementation of the IMEWS has consolidated the recording of the woman's vital signs on a dedicated chart in the obstetric records where omissions are more obvious, and trends showing clinical deterioration can be identified sooner rather than later. The measurements should be recorded contemporaneously and the recordings of the vital signs, particularly the RR, have improved[7]. There is now a national standard not only for measurement and recording of vital signs, but also for the clinical escalation in response to predefined triggers.

While EWSs have been recommended nationally and internationally, they have not yet been clinically validated in a maternity setting or for different critical illnesses[1-3]. The use of an obstetric EWS may, for example, have limitations in cases of suspected chorioamnionitis[8]. The IMEWS, however, is only part of the jigsaw that is clinical evaluation in obstetrics. For instance, the vital signs of the fetus may be just as informative to clinicians as those of the woman if fetal tachycardia is detected in cases of suspected intrauterine infection. Further work is also required to determine whether the triggers for escalation are appropriately sensitive and/or specific for the wide variety of medical conditions which can lead to clinical deterioration in the pregnant or postnatal woman. The monitoring of a woman in the labour ward has always been a priority in high-resource settings. The vital signs are recorded frequently, there is usually one-to-one midwifery care, medical rounds are frequent and there is a high degree of vigilance for the possibility of acute clinical deterioration. The IMEWS may be beneficial in the general maternity ward setting, particularly postnatally, where observations are less frequent, midwifery staffing levels may be low, medical rounds may be infrequent and clinical vigilance may be relaxed, particularly if the woman has had no obstetric complications and is considered low-risk.

Two recent audits in the UK found that there was still no national standardisation of obstetric EWS or the escalation responses[9,10]. Staff training and support for obstetric EWS were inadequate and there was a lack of clinical audit and validation. The implementation of the IMEWS over a short time frame means that the Irish health services are now more advanced than other countries in the surveillance of the pregnant woman using EWS for evidence of clinical deterioration. There is, however, no room for complacency and work is ongoing to audit compliance with the IMEWS, to undertake clinical validation, to ascertain the role of laboratory investigation, and to develop staff training. A lot has been done, but there is more to do.

PJ Maguire, A O'Higgins, K Power, MJ Turner
UCD Centre for Human Reproduction, Coombe Women and Infants University Hospital, Cork St, Dublin 8

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# Victimisation and Psychosocial Difficulties Associated with Sexual Orientation Concerns: A School-Based Study of Adolescents

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

P Cotter[1], P Corcoran[1], J McCarthy[1], F O'Suilleabháin[2], V Carli[3], C Hoven[4], C Wasserman[4], M Sarchiapone[5], D Wasserman[3], H Keeley[6]
[1]National Suicide Research Foundation, Western Gateway Building, University College Cork, Cork
[2]Family Centre, Tuslá Child and Family Services, St Finbarr's Hospital, Cork
[3]National Centre for Suicide Research and Prevention, Karolinska Institute, Stockholm, Sweden
[4]Department of Child and Adolescent Psychiatry, New York State Psychiatric Institute, New York, USA
[5]Department of Health Sciences, University of Molise, Campobasso, Italy
[6]Health Service Executive South, Cork

**Abstract**
This study examined victimisation, substance misuse, relationships, sexual activity, mental health difficulties and suicidal behaviour among adolescents with sexual orientation concerns in comparison to those without such concerns. 1112 Irish students (mean age 14yrs) in 17 mixed-gender secondary schools completed a self-report questionnaire with standardised scales and measures of psychosocial difficulties. 58 students (5%) reported having concerns regarding their sexual orientation. Compared with their peers, they had higher levels of mental health difficulties and a markedly-increased prevalence of attempted suicide (29% vs. 2%), physical assault (40% vs. 8%), sexual assault (16% vs. 1%) and substance misuse. Almost all those (90%) with sexual orientation concerns reported having had sex compared to just 4% of their peers. These results highlight the significant difficulties associated with sexual orientation concerns in adolescents in Ireland. Early and targeted interventions are essential to address their needs.

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## Introduction

Identity issues are common in adolescence, including confusion over sexual orientation and sexuality [1,2]. Increased rates of psychosocial difficulties, such as depression, anxiety and substance misuse have been reported amongst lesbian, gay or bisexual (LGB) young people,[3-6] who more commonly report a history of having experienced child sexual abuse[7]. Given that each of these factors are recognised risk factors for suicidal behaviour, it is not surprising that young people in a sexual minority group have been shown to be at higher risk of suicidal ideation and attempted suicide[8,9]. Much of the research has been conducted in North America, with limited research in Europe[10]. A recent Irish study of 1,110 Lesbian, Gay, Bisexual or Transgender (LGBT) participants aged 14-73 years, found that, on average, they realised they were LGBT at 14 years of age but did not come out to others until age 21[11]. The years of concealed sexual orientation or gender identity coincided with particular mental health vulnerability and psychological distress[11]. This paper reports the findings of a cross-sectional school-based study of Irish adolescents. It aimed to examine the association between sexual orientation concerns, mental health difficulties and suicidal and risky behaviours.

## Methods

Saving and Empowering Young Lives in Europe (SEYLE) is a school-based health promotion and suicide prevention programme. It was implemented in 11 European countries and funded by the EU 7TH Framework Programme[12]. In Ireland, 17 randomly-selected, main-stream, mixed-gender secondary schools in Cork and Kerry participated. The parent(s)/guardian(s) of 1722 adolescents mostly in second year were asked to consent to their child participating in the project. A total of 1112 adolescents participated, representing a response rate of 65%. Students were aged 13-16 years and most were 14 years of age.

Participants completed a self-report questionnaire in the classroom setting. It included a range of internationally recognised scales: the Beck Depression Inventory; the Zung Self-Rated Anxiety Scale; the Paykel Suicide Scale; the Deliberate Self-Harm Inventory; the WHO Well-being Scale and the Strengths and Difficulties Questionnaire (emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, pro-social behaviour). Students were also asked about victimisation, sexual assault, physical assault, alcohol, drugs and tobacco use, relationships and sexual activity. In Ireland, the students were also asked "have you had worries about your sexual orientation i.e. that you might be lesbian, gay or bisexual?" Those who answered positively to this question were compared with those who answered negatively in relation to a range of factors using Chi-square tests for categorical factors and one-way analysis of variance for continuous factors. The strength of the associations investigated by the Chi-square tests was assessed by the Phi statistic or Cramer's V. In line with previous recommendations, associations were considered very weak if Phi or V $< 0.10$, weak if $< 0.30$, moderate if $< 0.50$ and strong if 0.50+. One-way analysis of variance was used rather than t-tests in order to directly measure effect size using partial Eta2 and, following established guidelines, the effect size was considered very small if partial Eta2 $< 0.01$, small if $< 0.06$, medium if $< 0.14$ and large if 0.14+.

## Results

More than half of the 1112 students were male (600 (55.7%) male; 496 (45.3%) female), the vast majority were either 13 or 14 years of age (409 (37.5%) 13 years; 598 (54.8%) 14 years; 55 (5.0%) 15 years; 29 (2.7%) 16 years; Mean = 13.7 years) and over 80% lived with their mother and father (914; 83.4%). Of the 1079 who answered the question, 58 (5.4%, 95% confidence interval = 4.1-6.9%) indicated that they had concerns regarding their sexual orientation. This group consisted of 35 (60.3%) boys and 23 (39.7%) girls with a mean age of 14.1 years.

The young people who reported having concerns regarding their sexual orientation reported significantly increased levels of victimisation, especially regarding physical and sexual assault (Table 1). They were five times more likely to have been physically assaulted (40% vs. 8%) and one in six of them (16%) had been sexually assaulted compared with 1% of the adolescents with no sexual orientation concerns. Stronger associations were found regarding substance misuse (Table 2). One fifth of the adolescents with sexual orientation concerns drank alcohol frequently compared to 1% of the other young people. Only 36% had never been drunk compared with 91% of their peers. Three quarters of this group indicated that they were smokers compared with less than one fifth of their classmates. They were also much more likely to have used hash or marijuana (41% vs 2%).

The students with sexual orientation concerns did not differ significantly from their classmates in terms of getting along with people their own age or feeling that they are liked and wanted in

**CPD available online at www.imj.ie and questions on page 335.**

**Table 1 Victimisation, physical assault and sexual assault**

| | Total % (n) | Sexual orientation concerns % (n) | No sexual orientation concerns % (n) | $\chi^2$ | df | p | Phi |
|---|---|---|---|---|---|---|---|
| Physical Assault | 10% (111) | 40% (23) | 8% (85) | 56.3 | 1 | <.001 | .24 |
| Physical Fight | 29% (306) | 73% (40) | 26% (257) | 55.1 | 1 | <.001 | .23 |
| Sexual Assault | 2% (20) | 16% (9) | 1% (11) | 66.8 | 2 | <.001 | .25 |
| Pushed, hit or kicked you | 19% (196) | 40% (22) | 17% (170) | 16.1 | 1 | <.001 | .13 |
| Spread rumours about you | 18% (192) | 45% (25) | 17% (165) | 26.3 | 1 | <.001 | .16 |
| Teased you | 15% (159) | 18% (10) | 15% (149) | .2 | 1 | .694 | .02 |
| Deliberately left out of activities | 5% (49) | 7% (4) | 5% (45) | .3 | 1 | .562 | .03 |
| Taken money, property or food from you | 4% (42) | 14% (8) | 3% (33) | 14.2 | 1 | <.001 | .13 |
| Called you names | 17% (178) | 30% (17) | 16% (160) | 6.7 | 1 | .009 | .09 |
| Made fun of how you look or talk | 15% (163) | 20% (11) | 15% (150) | .5 | 1 | .464 | .03 |
| Made you work for other pupils or people | .8% (9) | 5% (3) | 1% (6) | 9.1 | 1 | .003 | .12 |
| Disrespected you | 12% (125) | 36% (20) | 11% (104) | 30.1 | 1 | <.001 | .18 |
| Roughed you up | 4% (44) | 11% (6) | 4% (37) | 5.0 | 1 | .026 | .08 |
| Taken advantage of you | 8% (84) | 25% (14) | 7% (70) | 20.9 | 1 | <.001 | .15 |
| Controlled you | 3% (28) | 9% (5) | 2% (22) | 7.1 | 1 | .008 | .10 |
| Hurt you | 10% (103) | 34% (19) | 8% (82) | 37.4 | 1 | <.001 | .20 |
| Trouble with bullies | 5% (48) | 14% (7) | 5% (41) | 6.8 | 1 | .009 | .10 |

Note: Associations are considered very weak if Phi < 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+.

**Table 2 Alcohol, drugs and tobacco use**

| | Total % (n) | Sexual orientation concerns % (n) | No sexual orientation concerns % (n) | $\chi^2$ | df | p | Phi or V |
|---|---|---|---|---|---|---|---|
| Never drinks alcohol | 74% (803) | 25% (14) | 77% (775) | 175.9 | 2 | <.001 | .41 |
| Rarely drinks alcohol | 25% (271) | 54% (31) | 23% (231) | | | | |
| Frequently drinks alcohol | 1.6% (18) | 21% (12) | 0.6% (6) | | | | |
| Never drunk | 86% (961) | 36% (21) | 91% (924) | 272.4 | 4 | <.001 | .50 |
| Drunk 1 or 2 times | 8% (90) | 17% (10) | 7% (73) | | | | |
| Drunk 3 to 9 times | 2.5% (28) | 22% (13) | 1.4% (14) | | | | |
| Drunk 10 or more times | 1.5% (17) | 21% (12) | 0.5% (5) | | | | |
| Never used drugs | 96% (1053) | 60% (35) | 98% (996) | 187.6 | 3 | <.001 | .42 |
| Used drugs 1 or 2 times | 3% (35) | 26% (15) | 2% (18) | | | | |
| Used drugs 3 to 9 times | .5% (6) | 7% (4) | 0.2% (2) | | | | |
| Used drugs 10 or more times | .7% (8) | 7% (4) | 0.4% (4) | | | | |
| Used hash or marijuana | 4% (46) | 41% (22) | 2% (22) | 180.3 | 1 | <.001 | .43 |
| Smoke cigarettes | 21% (224) | 75% (43) | 17% (174) | 110.5 | 1 | <.001 | .33 |
| Recently quit smoking | 73% (154) | 67% (29) | 74% (119) | .5 | 1 | .475 | .06 |

Note: Associations are considered very weak if Phi or V < 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+.

a group (Table 3). They were more likely to have had a steady romantic relationship (43% vs 11%) and to have experienced a break-up (72% vs 30%). The most marked difference related to sexual intercourse. Ninety percent of those with sexual orientation concerns reported having had sex compared to just 4% of their peers, they did not specify whether this was with same or opposite gender partners. In addition, the small number of young people who reported never or rarely using a condom when having sex were all among those with concerns about their sexual orientation. For each of seven measures, the young people with concerns about their sexual orientation more often reported a lack of parental attention, involvement and supervision (Table 3). Most (57%) of the group reported that their parents rarely or never know what they are doing with their spare time compared with 15% of their peers. The group with sexuality concerns had higher levels of depressive symptoms, anxiety symptoms, emotional and behavioural problems, suicidal behaviour and lower levels of well-being (Table 4). The association was most evident with attempted suicide - 29% of these students having tried to take their own life compared to just 2% of the students without sexual orientation concerns.

## Discussion

This is the first Irish school-based study to show that adolescents with concerns regarding their sexual orientation experience significantly higher levels of victimisation and psychosocial difficulties. A major indicator of the level of their difficulties was the high prevalence of attempted suicide. Their high levels of emotional and behavioural difficulties as well as depressive symptoms, anxiety symptoms and suicidal behaviour and low levels of wellbeing are consistent with other studies[3,4,8,9,13]. The cross-sectional nature of the data means that causation cannot be inferred. Therefore, the findings could be interpreted as suggesting that students with high levels of victimisation and psychosocial difficulties are more likely to have concerns about their sexuality. These difficulties may induce uncertainty regarding sexual identity. For instance, abuse and dysfunctional backgrounds are known to adversely affect identity formation, of which sexual identity is one facet[1-3]. Alternatively, it is possible that these difficulties arise as a result of being a young person with concerns regarding sexual orientation. This may be particularly true in Ireland, given its strong identification with Catholicism, which views homosexual acts as sinful[14]. Moreover, male homosexuality was only decriminalised in Ireland in 1993.

**Table 3 Relationships and sexual activity**

| | Total % (n) | Sexual orientation concerns % (n) | No sexual orientation concerns % (n) | $\chi^2$ | df | p | Phi or V |
|---|---|---|---|---|---|---|---|
| You rarely or never get along well with people your own age | 1.2% (12) | 1.9% (1) | 1% (10) | .0 | 1 | 1.000 | .02 |
| You rarely or never feel you belong to a group | 5.6% (57) | 7% (4) | 6% (52) | .1 | 1 | .768 | .02 |
| People your own age rarely or never like having you in the group | 2.3% (23) | 0% (0) | 2% (22) | .4 | 1 | .512 | .04 |
| People like you less than they like others | 50% (553) | 55% (32) | 51% (512) | .3 | 1 | .592 | .02 |
| Steady boyfriend or girlfriend | 13% (143) | 43% (25) | 11% (113) | 46.9 | 1 | <.001 | .22 |
| Broken up with steady boyfriend/girlfriend | 33% (342) | 72% (41) | 30% (289) | 40.6 | 1 | <.001 | .21 |
| Break-up was mostly bad for you | 32% (109) | 48% (19) | 30% (85) | 4.3 | 1 | .039 | .12 |
| Sexual intercourse | 8% (90) | 90% (52) | 4% (38) | 516.9 | 1 | <.001 | .70 |
| Rarely or never used a condom | 0.6% (7) | 14% (7) | 0% (0) | - | - | - | - |
| Parents rarely or never check your homework | 41% (441) | 64% (36) | 39% (400) | 12.6 | 1 | <001 | .11 |
| Parents rarely or never understand your problems | 23% (240) | 39% (22) | 22% (214) | 8.0 | 1 | .005 | .09 |
| Parents rarely or never know what you were doing with free time | 17% (184) | 57% (33) | 15% (147) | 67.4 | 1 | <.001 | .26 |
| Parents rarely or never help you make important decisions | 7% (71) | 16% (9) | 6% (61) | 6.7 | 1 | .009 | .09 |
| Parents rarely or never take time to talk to you | 17% (178) | 35% (19) | 16% (156) | 12.7 | 1 | <.001 | .12 |
| Parents rarely or never come to see you doing some special activity | 12% (133) | 26% (15) | 11% (114) | 10.0 | 1 | .002 | .10 |
| Parents rarely or never pay attention to your opinion | 7% (79) | 20% (11) | 7% (67) | 11.7 | 1 | .001 | .11 |

Note: Associations are considered very weak if Phi or V < 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+.

**Table 4 Psychological Characteristics and Suicidal Behaviour**

| | Total M (SD) | Sexual orientation concerns M (95%-CI) | No sexual orientation concerns M (95%-CI) | F | df | p | Partial Eta$^2$ |
|---|---|---|---|---|---|---|---|
| Depressive Symptoms | 6.8 (7.3) | 12.7(9.5 - 15.8) | 6.5 (6.0-6.9) | 38.9 | 1, 1057 | <.001 | .04 |
| Anxiety Symptoms | 31.7 (7.5) | 37.7 (34.4 – 41.0) | 31.3 (30.8 – 31.8) | 34.8 | 1, 921 | <.001 | .04 |
| Well-being | 17.8 (4.6) | 14.4 (12.8 – 15.9) | 17.9 (17.7 – 18.3) | 32.8 | 1, 999 | <.001 | .03 |
| Emotional Symptoms | 2.3 (2.2) | 3.0 (2.3 – 3.7) | 2.3 (2.1 – 2.4) | 5.4 | 1, 1076 | .021 | .01 |
| Conduct Problems | 2.2 (1.7) | 3.9 (3.3 – 4.5) | 2.0 (1.9 – 2.1) | 67.4 | 1, 1076 | <.001 | .06 |
| Hyperactivity | 3.6 (2.3) | 5.1 (4.4 – 5.7) | 3.6 (3.4 – 3.7) | 22.9 | 1, 1076 | <.001 | .02 |
| Peer Relationship Problems | 1.1 (1.5) | 1.6 (1.1 – 2.1) | 1.1 (1.0 – 1.2) | 7.5 | 1, 1076 | .006 | .01 |
| Prosocial Behaviour | 7.4 (1.8) | 6.7 (6.1 – 7.3) | 7.5 (7.4 – 7.6) | 9.2 | 1, 1077 | .002 | .01 |
| Emotional and Behavioural Problems (SDQ Total) | 9.3 (5.5) | 13.6 (11.8 – 15.3) | 9.0 (8.7 – 9.3) | 38.5 | 1, 1076 | <.001 | .04 |
| | % (n) | % (n) | % (n) | 2 | df | p | Phi or V |
| Life not worth living* | 19.2% (207) | 50.9% (29) | 17.1% (171) | 40.1 | 1 | <.001 | .20 |
| Wished you were dead* | 11.9% (128) | 41.1% (23) | 10.1% (101) | 48.9 | 1 | <.001 | .22 |
| Thought of taking own life* | 12.7% (137) | 35.1% (20) | 11.2% (112) | 28.0 | 1 | <.001 | .16 |
| Seriously considered taking own life* | 7.0% (75) | 25.5% (14) | 5.9% (59) | 30.8 | 1 | <.001 | .17 |
| Ever tried to take own life | 3.6% (39) | 29.1% (16) | 2.0% (20) | 117.9 | 1 | <.001 | .33 |

Note: The effect size is very small if partial Eta2 < 0.01, small if < 0.06, medium if < 0.14 and large if 0.14+. Associations are considered very weak if Phi or V < 0.10, weak if < 0.30, moderate if < 0.50 and strong if 0.50+.
* relates to the past two weeks

The degree to which LGBT people have been alienated in all aspects of Irish life and culture has been well-documented[11]. Stigmatisation and internalised homophobia have been identified as other factors contributing to negative health outcomes amongst lesbian and gay adolescents[15,16]. Therefore, it is likely that some of the adverse experiences identified in this study are associated with being an LGB youth in Ireland. These include the high levels of victimisation, sexual and physical assault, substance abuse and risky sexual behaviour found in the current sample, all of which corroborate previous findings from other countries[5-7,17,18]. This may be compounded by the low levels of parental attention reported by this group. Positive parental attention is associated with better psychological well-being and reduced substance abuse amongst adolescents[19,20]. Despite the high levels of victimisation and bullying reported by this group, they did not differ from their classmates in terms of getting along well with others, feeling like they belonged to a group and the extent to which others liked having them in the group. This suggests that the high levels of peer relationship problems reported by these young people are due to interactions with peers outside their circle of friends.

This study supports the view that some young people become concerned about their sexual orientation at a young age. Previous research has indicated that most sexual-minority young people disclose their sexual identity towards the end of their secondary school years[21]. This happens even later among Irish LGBT people[11]. These years of concealed sexual orientation or gender identity coincided with psychological vulnerability and distress. Therefore, the current findings support the need for an environment that facilitates adolescents' free expression of their sexual orientation concerns. In light of these findings, it is important to mention this study's limitations. Although, participants were randomly selected without reference to sexual orientation, which is a strength of the study, the group with sexual orientation concerns was small. This precluded the use of more complex statistics to explore heterogeneity in the sample. This study collected self-report data, in a classroom setting. Therefore, as previously shown[22], reporting may have been inaccurate for some sensitive questions. The phrasing of the key question (have you had worries about your sexual orientation i.e. that you might be lesbian, gay or bisexual?), could be seen as problematic. This could be viewed as self-exploration rather than a measure of sexual identity. LGB young people who were not worried about their sexual orientation may not have answered this question positively. Future studies should include multiple dimensions of sexual orientation[23] in single as well as mixed gender schools, across different time periods, with a focus on protective factors[24]. Future studies could also examine whether the identified sexual experiences occur with same or opposite gender partners and also look at rates of attendance at mental health services e.g. Child and Adolescent Mental Health Services, as an indication of the severity of the identified difficulties.

Reach Out, the Irish National Strategy for Action on Suicide Prevention[25] identifies LGBT people as a marginalised group and, as such, highlights the need to develop specific supports for them. At a preventative level, school and community-based health awareness programmes should include topics on sexuality and sexual orientation. The aim should be to inform young people with worries about these issues and reduce the level of stigmatisation and victimisation. These interventions should also be sensitive to the cultural contexts of LGBT young people. Key elements that should be addressed include the development of healthy sexual identities and helping young people to disclose their sexual identity to peers and adults. It is possible that adolescents with sexual orientation concerns are in need of alternative means of interacting with the health services and different treatment methods.[9] Awareness of the mental health issues of these young people should become a standard part of training for professionals working in these areas.

Correspondence: H Keeley
Child and Adolescent Mental Health Services, HSE South, 31/32 Fair St, Mallow, Co Cork
Email: helen.keeley1@hse.ie

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# The Use of Digital Media by Women Using the Maternity Services in a Developed Country

A O'Higgins, OC Murphy, A Egan, L Mullaney, S Sheehan, MJ Turner
Department of Obstetrics and Gynaecology, UCD Centre for Human Reproduction, Coombe Women and Infants University Hospital, Cork St, Dublin 8

**Abstract**
The provision of high quality healthcare information about pregnancy is important to women and to healthcare professionals and it is driven, in part, by a desire to improve clinical outcomes. The objective of this study was to examine the use of digital media by women to access pregnancy information. A questionnaire was distributed to women attending a large maternity hospital. Of the 522 respondents, the mean age was 31.8 years, 45% (235/522) were nulliparous, 62% (324/522) lived in the capital city and 29% (150/522) attended the hospital as private patients. Overall 95% (498/522) used the internet for pregnancy information, 76% (399/522) had a smartphone and 59% (235/399) of smartphone owners had used a pregnancy smartapp. The nature of internet usage for pregnancy information included discussion forums (70%), social networks (67%), video media (48%), e-books (15%), blogs (13%), microblogs (9%) and podcasts (4%). Even women who were socially disadvantaged reported high levels of digital media usage. In contemporary maternity care women use digital media extensively for pregnancy information. All maternity services should have a digital media strategy.

## Introduction

Effective communication is a key element of high quality maternity care. In addressing clinical issues this usually occurs in a one-to-one consultation between the woman and her healthcare professional. However, such consultations are limited by time particularly in a busy clinical setting, they usually focus on immediate concerns and they are dependent on the communication abilities of both parties. Before, during and after pregnancy, women are keen to receive information that will promote not only their own well-being but also that of their baby[1]. Healthcare professionals in turn recognise the importance of providing such information, particularly lifestyle advice and information about the maternity services. Women attending for antenatal care are often given large amounts of written advice at their first hospital visit. Much healthcare information continues to be provided at an individual or population level using traditional communication channels such as leaflets, magazines, television and radio.

Traditional communication channels, however, are limited. They are expensive to develop and disseminate. Written information requires the woman be able to read and to have adequate health literacy to interpret the information meaningfully. Poor health literacy is closely linked to socioeconomic disadvantage and socially disadvantaged women are at increased risk of an adverse clinical outcome[2]. Therefore, it is often the women who are most in need of information who are least able to access or interpret it. It is challenging to measure by whom traditional communications messages are accessed and what their impact is on health

outcomes. Finally, traditional communications are not designed to facilitate ongoing interactions between the woman and her healthcare providers or other women in the community. Communications in the modern world have been revolutionised by the invention of digital media. The development of social network platforms such as Facebook and Twitter has driven interactive, participative and expansive digitally-facilitated communications. By 2011, an estimated 136 million websites were disseminating pregnancy information[3]. The objective of this prospective study was to examine the use of digital media by women in Ireland in 2012-2013 to access pregnancy information.

## Methods

A paper-based anonymous survey was distributed to patients attending a large Dublin maternity hospital from November 2012 to January 2013. The Hospital is a tertiary university maternity hospital delivering over 8,500 babies per annum. It accepts women from all socioeconomic groups across the urban-rural divide and about one in eight of the country's deliveries occur in the Hospital. Antenatal patients were surveyed while attending the ultrasound department and postnatal patients were surveyed on the postnatal ward. The survey was explained by the researcher and verbal consent for participation was obtained prior to the survey being given out. The survey was then collected in person by the same researcher. Women were asked dichotomous questions about use of a state medical card, smartphone ownership, use of pregnancy Apps, internet use for pregnancy information and the regular purchase of newspapers. Ordinal questions were asked regarding parity, age, age at completion of full-time education, frequency of internet use at home and at work, preferred sources for current affairs information and sources of support and of advice following delivery. Nominal questions were asked about residence, occupation, partner's occupation, website use in general, the sources used for pregnancy information, both digital and non-digital, the types of digital media that would be useful, for both pregnancy information and for post-natal support. Unstructured questions were asked exploring the nature of pregnancy Apps and pregnancy websites used and of the perceived difficulties accessing pregnancy information. The results were analysed using Microsoft Excel (Version 14.0, Microsoft Corp., Redmond, Washington. 2010).

Women were considered socially disadvantaged is both they and their partner were unemployed, if they had left full-time education before 16 years of age or if they used a state medical card. Population characteristics for the general hospital population were obtained from the Hospital's Annual Clinical Report[4]. Differences between groups were tested using X2 analysis and a p value of ≤ 0.05 was considered statistically significant.

**Table 1: Characteristics of the study population (n=522)**

| | |
|---|---|
| Mean age | 31.8 years |
| Mean parity | 1.2 |
| Nulliparous | 45% |
| Dublin residents | 62% |
| Private patients | 29% |
| Smartphone ownership | 76% |
| Digital media use for pregnancy information | 95% |

## Results

Of the 550 surveys distributed, 542 were collected giving a response rate of 98.5%. A further 20 surveys were excluded from the final analysis as they were incomplete, leaving 522 (94.9%) for the final analysis. Of the 522 respondents, 42% (218/522) completed the survey antenatally and 58% (304/522) postnatally. The characteristics of the study population are shown in Table 1. There were no statistically significant differences for age, parity or Dublin residency between our cohort and the general hospital population. Overall regular internet use occurred more frequently at home than at work. Of the cohort, 69% (360/522) accessed the internet daily at home compared to 44% (229/522) at work ($p<0.01$). Only 7% (39/552) used the internet less than once a week at home compared to 49% (256/522) at work ($p<0.01$). Overall, 95% (498/522) reported that they had used the internet to get information related to their pregnancy or the care of their baby, 76% (399/522) had a smartphone and 59% (235/399) of smartphones owner had used a pregnancy App. Table 2 shows the sources of information women find useful for pregnancy information. Table 3 shows the type of websites women currently use for pregnancy information. Table 4 shows that the type of digital media services women want for pregnancy itself and in caring for their baby.

**Table 2 Sources of information cited as useful for pregnancy information (% of cohort)**

| | |
|---|---|
| Family | 43% |
| Friends | 41% |
| Internet sites | 36% |
| Healthcare professionals | 34% |
| Books | 29% |
| Internet discussion forums | 25% |
| Magazines | 7% |
| TV | 6% |
| Radio | 1% |

**Table 3 Types of websites used by women for pregnancy information (% of cohort)**

| | |
|---|---|
| Discussion forums | 70% |
| Social Networks | 67% |
| Video media | 48% |
| Ebooks | 15% |
| Blogs | 13% |
| Microblogs | 9% |
| Podcasts | 4% |

**Table 4 Types of digital services wanted by women for pregnancy information (% of cohort)**

| | |
|---|---|
| Text message reminders of appointments | 65% |
| General pregnancy app | 48% |
| Weekly texts about gestation specific/age specific issues until baby 1 year of age | 47% |
| Discussion forum | 41% |
| Nutrition app | 40% |
| Online videos with advice (eg physiotherapy etc.) | 39% |
| Website for feedback and suggestions on hospital services | 37% |
| Weight management app | 34% |
| Exercise app | 33% |
| Coombe website with stories from patients | 32% |
| Website with recipes and dietary advice | 32% |
| Hospital Facebook page | 31% |
| Website with access to ultrasound images | 30% |
| Website for fathers | 27% |
| Pregnancy blog | 13% |
| Podcasts | 13% |
| Smoking cessation app | 10% |
| Hospital Twitter page | 10% |

We found that neither maternal age nor parity influenced the use of digital media for pregnancy information. Of the cohort, 93% (76/82) of women aged less than 30 years and 95% (99/104) of women aged 35 years or more used the internet for pregnancy information ($p=0.47$). Of the nulliparous women 97% (229/235) used the internet for pregnancy information compared to 94% (270/287) of multiparous women ($p=0.06$). Even amongst women who were socially disadvantaged, we found high general internet usage (97%, 101/104), high smartphone ownership (61%, 63/104) and widespread usage of pregnancy smartapps among smartphone owners (48%, 30/63).

## Discussion

Our study found that women using the maternity services in Ireland in 2012-2013 reported high usage of digital media to obtain pregnancy information, with 95% using the internet to get information about their pregnancy. Almost three quarters of women owned a smartphone and we found high usage of smartapps and social media platforms. Of particular importance, we found that women used digital media more than traditional media sources and that the use of digital media was also widespread amongst socially disadvantaged women. A strength of our study is that it is a large representative sample of the communications behaviour in contemporary maternity services in a developed country. A potential weakness of the study is that it was limited to women with adequate literacy skills to complete a paper-based questionnaire and by the time it is published in the print media the findings may be out of date. The provision of any health information using traditional communication channels can be expensive to produce and to disseminate. There may be time lags between emerging best practice information and dissemination as well as geographical and language limitations[5]. In contrast, digital media can be developed at a lower cost often leveraging on high quality existing content that has already been developed, for example, for the print media. Content for digital

communications can be made available over a long time, globally as well as locally, and in different languages.

It is long established that adverse obstetric and neonatal outcomes are increased in women who are socially disadvantaged[6,7]. However, the most vulnerable women in our society have least access to or the lowest usage of traditional public health information. Our findings that digital media are extensively used by women who are disadvantaged are encouraging. They mean that digital media have the potential to be harnessed beneficially as part of a high quality maternity service and may also have a role in research intervention studies[8,9]. The use of short message service (SMS) by mobile phone is currently being used successfully in the provision of antenatal care and postnatal care for both mothers and their babies in underdeveloped countries[10]. One of the problems with traditional public health communications is that we often do not know who receives the information and whether they respond positively or not. The use of digital media, however, can be easily measured with standard software both in terms of what content is accessed and for how long[11]. It is also possible to study how individuals navigate around a particular website. Thus, we can assess if modifying the communication tool can improve usage. We can also collect information on what socioeconomic or demographic groups use digital platforms, and customise the information for different women.

One of the major social changes in high resource countries with increasing mobilisation of people is the loss of proximity to the extended family. This can leave women feeling isolated during and after childbirth because they may not have strong family support nearby. We found that the most frequently cited websites used by women for pregnancy information were discussion forums and social media platforms. These sites appear to be a useful source of support and give women the opportunity to create a sense of community with other women with similar life experiences. Market research has shown that women turn to digital sources for information and support during pregnancy more than at any other time. A survey asking women which life events prompted them to seek out information from or share opinions with others online found that pregnancy initiated online interaction in 94% of 664 respondents, compared to online interaction in 21% when looking for employment and in 37% when moving home[12]. This readiness for online engagement in pregnancy means that digital delivery of health promoting information has the potential to be effective. Moderation of such platforms by a healthcare professional also opens up new opportunities for cost effective interventions, for example, lactation counsellors supporting breastfeeding mothers. Conversely, failure of healthcare professionals to provide digital access to high quality information leaves women vulnerable to receiving erroneous or misleading information through unregulated websites and commercial pregnancy Apps.

Our findings are consistent with previous reports[8]. The gap across social gradients in mobile phone ownership is negligible, as is the use of social networking sites. The expansion of wireless internet and the development of handheld computers such as smartphones and tablets now means that accessing digital media is feasible even while breastfeeding. Based, on our study, we recommend that all maternity services should develop a digital media strategy. Given the pace of change, any strategy will have to be a rolling one capable of embracing innovation quickly. We also recommend that all healthcare professionals in maternity services modernise their communications capabilities on an ongoing basis so that the decisions they and their patients make are well informed[3]. Finally, we recommend that the effectiveness of all digital communications be measured at regular intervals. Pregnancy is a time in a woman's life when her health and the health of her family are prioritised[1]. Digital media communications in pregnancy provide a unique opportunity for healthcare professionals to enhance life-long health and well-being.

Correspondence: A O'Higgins
Department of Obstetrics and Gynaecology, UCD Centre for Human Reproduction, Coombe Women and Infants University Hospital, Cork St, Dublin 8

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# A Pilot Cross-Sectional Study of Patients Presenting with Cellulitis to Emergency Departments

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M Quirke[1], J Saunders[2], R O'Sullivan[3], H Milenkovski[3], A Wakai[1,4]
[1]Emergency Care Research Unit, Division of Population Health Sciences, RCSI, 123 St Stephens Green, Dublin 2
[2]CSTAR @ UL/Statistical Consulting Unit, Department of Mathematics & Statistics, University of Limerick, Limerick
[3]Paediatric Emergency Research Unit, National Children's Research Centre, Dublin 12
[4]Department of Emergency Medicine, Beaumont Hospital, Dublin 9

**Abstract**
To characterise the Emergency Department (ED) prevalence of cellulitis, factors predicting oral antibiotic therapy and the utility of the Clinical Resource Efficiency Support Team (CREST) guideline in predicting patient management in the ED setting, a prospective, cross-sectional study of consecutive adult patients presenting to 3 Irish EDs was performed. The overall prevalence of cellulitis was 12 per 1,000 ED visits. Of 59 patients enrolled, 45.8% were discharged. Predictors of treatment with oral antibiotics were: CREST Class 1 allocation (odds ratio (OR) 6.81, 95% CI =1.5-30.1, p=0.012), patient self-referral (OR= 6.2, 95% CI 1.9 – 20.0, p=0.03) and symptom duration longer than 48 hours (OR 1.2, 95% CI = 1.0-1.5,p=0.049). In conflict with guideline recommendation, 43% of patients in CREST Class 1 received IV therapy. Treatment with oral antibiotics was predicted by CREST Class 1 allocation, self-referral, symptom duration of more than 48 hours and absence of pre-ED antibiotic therapy.



## Introduction

Cellulitis is associated with substantial patient morbidity and accounts for a large percentage of infections requiring hospitalisation.[1,2] In Ireland in 2009, 10,465 patients were admitted to hospital with cellulitis for a median of 4 days, of which 9,716 (92.8%) were admitted through the Emergency Department (ED).[3] Furthermore, in a point prevalence survey of 20 European hospitals, skin and joint infections were second only to pneumonia as the most common indication for inpatient antibiotic treatment.[4] Despite this, cellulitis is an understudied condition. Not only is its prevalence in Irish EDs unknown, there is a lack of research-based data to guide evidence-based patient treatment, particularly in the ED setting. What treatment guidelines do exist are derived from expert consensus studies.[5-8] The Clinical Resource Efficiency Support Group (CREST) guideline (see Table 1) is commonly used in the National Health Service (NHS) to guide the treatment of cellulitis.[8] This guideline stratifies patients according to co-morbidities and signs of infection, and recommends antibiotic treatment ranging from oral therapy in CREST Class 1 to intravenous (IV) therapy in CREST Classes 2-4. To the best of our knowledge, the clinical utility of this algorithm has not been prospectively assessed in the ED setting. The primary aim of this study was to measure the prevalence of cellulitis presenting daily to EDs in Ireland. The secondary aims were to determine: (1) the clinical utility of the CREST guideline in predicting the ED disposition of patients presenting with cellulitis; (2) preliminary clinical and epidemiological factors which may predict route of antibiotic therapy; and (3) prescribing practices for the ED treatment of cellulitis.

## Methods

This prospective, cross-sectional study was performed in the EDs of the Midland Regional Hospital Tullamore (MRHT), Midland Regional Hospital Mullingar (MRHM) and Midland Regional Hospital Portlaoise (MRHP)). The combined annual census of the three participating EDs is approximately 87,000. The Health Service Executive (HSE) Midlands Area Research and Ethics Committee approved the study. Consecutive adult patients aged > 18 years presenting with cellulitis over a one-month period (September 2011) were invited to participate and written consent taken. Cellulitis was diagnosed when any 2 of the following signs were present in anybody part: erythema, warmth, tenderness, swelling and regional lymphadenopathy. The treating ED doctor prospectively completed a study data collection form during clinical assessment. Demographic and epidemiological data on patient age, gender, patient referral source, previous episodes of cellulitis, pre-ED antibiotic treatment, and discharge or admission antibiotic treatment were taken. Assessment for local risk factors included examination for tinea pedis or evidence of interdigital maceration of the feet (athlete's foot), lymphoedema (defined as a chronic swelling of the leg with premorbid pitting oedema), and venous disease (manifesting as venous ulcers, venous eczema and/or varicose veins). The presence or absence of general risk factors for cellulitis (BMI > 30kg/m$^2$, diabetes mellitus, previously diagnosed peripheral vascular disease, chronic renal and liver disease, chronic steroid use and asplenia) was recorded. This clinical data was retrieved from the patient referral documentation (for example, General Practitioner [GP] ED referral letter), the patient history or any existing hospital chart at the time of patient recruitment to participate in the study. Information on location, size and duration of symptoms was also collected. Each patient was allocated to a disease severity class based on the CREST guidelines[8] by the treating doctor.

Descriptive statistics, odds ratios and classification and regression tree (CART) analysis were calculated. Logistic regression was used to model outcomes and find predictors for each of the outcome variables. Descriptive statistics and odds ratios were produced using SPSS statistical software (Version 20.0).

## Results

*Prevalence of cellulitis*

Over the one-month study period there were 59 patients enrolled in total, 39 from MRHT, 18 from MRHT and 2 from MRHP. After excluding MRHP from the analysis due to poor patient recruitment at that study site, the prevalence of cellulitis attending the 2 remaining EDs was 12 cases per 1,000 ED visits (95% CI, 9-15 per 1,000 ED visits).

*Patient Characteristics*

Forty patients were male (67.8%) and the mean age (which was normally distributed) was 50.9 years. Female patients were significantly older than males (mean = 60.9 versus 46.2 yrs; p = 0.019). The majority of cases affected the lower limb (n=39, 71.3%). Overall, 27 (45.8%) patients were discharged on oral antibiotic treatment and 32 (54.2%) received IV antibiotic treatment. The majority were in CREST Class 1 (n=39;66.1%); the remainder were in CREST Class 2 (n=20, 33.9%). There were no CREST Class 3 or 4 patients enrolled.

*Predictors of ED discharge (see Table 1)*

In the multivariable logistic regression model, the following were predictive of oral antibiotic treatment: self-referral (OR = 6.2, 95% CI 1.9 – 20.0, p=0.03), CREST Class 1 allocation (OR 6.81, 95% CI = 1.5-30.1, p=0.012) and duration of symptoms over 48 hours (OR 1.2, 95% CI = 1.0-1.5, p=0.049). Patients who had already received antibiotics prior to ED attendance ("Pre-ED therapy" group) were more likely to receive IV treatment (OR 0.22, 95% CI 0.06-0.8, p=0.04). Seventeen patients (43%) in CREST Class 1 received IV antibiotics despite the guideline recommending oral antibiotic treatment. We attempted to produce a CART tree but this was not possible with the available set of predictors.

**CPD available online at www.imj.ie and questions on page 335.**

**Table 1 CREST classification for the management of cellulitis in adults[8]**

| Class I | Class II | Class III | Class IV |
|---|---|---|---|
| Patients have no signs of systemic toxicity, have no uncontrolled co-morbidities and can usually be managed with oral antimicrobials on an outpatient basis | Patients are either systemically ill or systemically well but with a co-morbidity such as peripheral vascular disease, chronic venous insufficiency, or morbid obesity which may complicate or delay resolution of their infection | Patients may have a significant systemic upset such as acute confusion, tachycardia, tachypnoea, hypotension, or may have unstable co-morbidities that may interfere with a response to therapy or have a limb threatening infection due to vascular compromise | Patients have sepsis syndrome or severe life-threatening infections such as necrotizing fasciitis |

**Table 2 Predicators of ED discharge with oral antibiotic therapy**

| Variable | Odds Ratio | 95% CI | P-value |
|---|---|---|---|
| ED self-referral | 6.2 | 1.9-20.0 | 0.030 |
| CREST class 1 | 6.81 | 1.52-30.58 | 0.012 |
| Duration of infection >48 hrs. | 1.22 | 1.0-1.49 | 0.049 |
| Pre-ED antibiotic therapy | 0.22 | 0.06-0.8 | 0.040 |

*Prescribing practices*

Of the 27 patients discharged on oral antibiotics, 63% (17/27) received flucloxacillin combined with penicillin V, and 26% received flucoxacillin alone, with the remainder receiving clindamycin (n=1) or co-amoxiclav (n=2). There were 3 different prescribed doses of flucloxacillin and 4 different doses of penicillin V. Thirty-two patients received IV antibiotics: 27 received combined flucloxacillin and benzylpenicillin of 3 different doses, 3 received flucloxacillin and co -amoxiclav, 1 received co-amoxiclav alone and 1 received erythromycin alone.

## Discussion

This is the first study to measure the prevalence of cellulitis among patients in the ED setting in Ireland. The ED prevalence of cellulitis in this study was found to be approximately 12 per 1,000 ED attendances. This is also the first study to investigate the clinical utility of the CREST guideline in the ED setting. Patients who self-referred to the ED, who had not received antibiotic treatment in the community, who had a duration of symptoms exceeding 48 hours and who were in CREST Class 1, were more likely to be discharged from the ED on empiric oral antibiotic treatment. The majority of discharged patients (63%) were prescribed a combination of oral flucloxacillin and penicillin-V, while the majority of patients admitted to hospital (84%) received combined IV flucloxacillin and benzylpenicillin treatment.

It is recognised that there is a lack of research describing the epidemiology of cellulitis.[9] The existing published literature is limited by heterogeneity in terms of disease classification and description.[10] For example, prior to 2010 the term skin and soft tissue infection (SSTI) described a wide range of "uncomplicated" (cellulitis, impetigo, erysipelas, furuncle, simple abscess) and "complicated" (infected burn, deep tissue infection, major abscess, infected ulcer, perirectal abscess) infections.[11] In the United States, the Food and Drug Administration (FDA) Center for Drug Evaluation and Research recently recommended grouping erysipelas, cellulitis, major abscess and wound infection together as "acute bacterial skin and skin structure infections" (ABSSSI) for the purposes of clinical trials.[12] Therefore, studies describing the prevalence of ABSSI may differ fundamentally from studies describing cellulitis or erysipelas alone. Furthermore, since the International Classification of Diseases (ICD) coding does not distinguish between abscess and cellulitis, the true ED prevalence of cellulitis without abscess ("non-purulent cellulitis") is difficult to estimate.[13] Bearing this in mind, prevalence data has shown that SSTIs account for between 1.5 to 3% of ED visits in the USA and Canada[14,15], and up to 3% of ED visits in the UK.[16] Given the recent epidemic of Community-Acquired Methicillin Resistant *Staphylococcus aureus* (CA-MRSA) infection in the USA[17], the incidence of healthcare visits for SSTI has increased by 88% between 1997 and 2005.[18] Our data did not take account of the community-based treatment of cellulitis by GPs which has been shown to be up to 10 times higher than the recorded incidence in hospitalised patients in the Netherlands (12.1 per 100,000).[19]

Although ED doctors completed a separate CREST score for each patient, adherence to the guideline was poor with 17 patients (43%) in CREST Class 1 admitted to hospital for IV antibiotics, despite the guideline recommending oral treatment for this patient subset. Marwick et al[20] also showed that 47% of admitted in-patients with cellulitis were in CREST Class 1, similarly indicating over-treatment of milder infections. There are many different contributory factors which influence the clinical decision to discharge or admit a patient presenting with cellulitis in the ED setting, including individual economic and social circumstances[5] as well as clinical impression (clinical gestalt) of infection severity. It is possible that many of these patients would have been suitable for either oral antibiotic treatment, a period of treatment in an ED clinical decision unit (CDU) or for outpatient antibiotic therapy (OPAT). It is therefore intuitively logical that a clinical prediction rule (CPR) derived and validated in the ED setting may be useful for the evidence-based ED management of cellulitis. In particular, an examination of characteristics predicting more than 24 hours of IV treatment would be helpful to differentiate patients requiring CDU or OPAT care from those requiring prolonged courses of inpatient IV antibiotic treatment.[21]

Other factors require further examination in a larger study. That patients describing over 48 hours of symptoms on ED arrival were more likely to be discharged may indicate a subgroup of indolent infection suitable for oral treatment. It is intuitive that patients who did not attend their GP prior to ED attendance were more likely to be discharged from the ED on oral antibiotics. Oral flucloxacillin and penicillin V were the most commonly prescribed antibiotics, with 63% of discharged patients receiving both. However, there is no randomised clinical trial (RCT) evidence to either refute or support this practice.[22] One small RCT showed no additional benefit when IV benzylpenicillin was added to IV flucloxacillin for the treatment of lower limb cellulitis.[23] This pilot study has some limitations. Firstly, the sample size is relatively small and the results may be imprecise. Secondly, we did not follow patients up beyond their ED admission and since we are unaware of any adverse events, we cannot comment on the validity of the CRESTguideline in the ED setting. Thirdly, the generalisability of the findings may be limited by geographical factors; since both participating EDs serve mixed urban/rural populations and the findings may not be valid in urban (city centre) EDs.

The prevalence of cellulitis is approximately 12 per 1,000 ED attendances in Ireland. Predictors of treatment with oral antibiotics in ED patients with cellulitis include CREST Class 1, self-referral, duration of symptoms over 48 hours and the absence of pre-ED oral antibiotic therapy. Current prescribing practices for the treatment of acute cellulitis are disparate and not evidence-based. A CPR derivation study, performed and validated in the ED setting, may contribute to an evidence-based approach to the ED management of cellulitis.

Correspondence: A Wakai
Emergency Care Research Unit, Division of Population Health Sciences, Royal College of Surgeons in Ireland, 123 St Stephen's Green, Dublin 2
Email: awakai@rcsi.ie

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# The Feasibility of Audiologists Removing Earwax

T Browne[1], R Fourie[2]
[1]Hearing Services, HSE West, Galway
[2]Dept Speech & Hearing Sciences, Brookfield Health Sciences Complex, UCC, Cork

**Abstract**
Although cerumen management (CM) is routinely performed by audiologists in some countries, this is currently not the case in the Republic of Ireland. This study involved surveying the opinions of Audiologists and Ear Nose and Throat specialists (ENTs) in relation to audiologists conducting CM. In total, 20 ENT Consultants (29%) and 51 audiologists (64%) in the public services responded to an online survey. There was agreement that CM should be within audiologists' remit. However, with regard to risk, opinions were significantly different, with 15 ENTs (75%), compared to 14 audiologists (27%), in agreement that CM management by audiologists was more risky to patients. Nevertheless, 62 respondents (87%) supported future CM training for audiologists. The overall similarities of opinion between the two groups contrasted to previous studies that reported strong opposition from ENTs with regard to audiologists managing earwax.

## Introduction

Audiology waiting lists in community settings in Ireland are often unacceptably lengthy. One factor contributing to this is that most community audiologists do not practice in medical settings and consequently cannot make same-day referrals for cerumen management (CM) when the eardrum cannot be visualised. Numerous audiology procedures require visualisation of the eardrum to outrule conductive components and for valid and reliable electrophysiological assessments such as tympanometry, oto-acoustic emissions and pure tone audiometry. Typically, audiologists refer patients to medical settings for appropriate treatments, but this inevitably has a negative impact on efficient and cost-effective practice.[1] Therefore, there are arguments for audiologists receiving appropriate and extensive training to remove earwax on-site, in community clinics, in the first instance.

In 1991, the American Speech Language and Hearing Association (ASHA) issued a position statement that 'limited management of occluding cerumen is within the scope of practice of audiologists'.[2] Furthermore, ASHA asserted that audiologists were the one non-medical profession best qualified to manage earwax, but qualified this by limiting this to children over the age of 5.[2] Later on, in 1992, the ASHA Ad Hoc Committee on Advances in Clinical Practice published guidelines outlining the educational and clinical learning outcomes necessary for such practice.[3] Roeser and Roland[4] pointed out that extending the scope of

practice of audiologists would increase their professional liability, but that this could be ameliorated by appropriate training. Moreover, they argue that Audiologists could apply clear guidelines with regard to which patients are suitable for CM and which complex cases should be referred for medical attention. More recently the California Speech-Language-Hearing Association[5] opined that audiologists should include CM within their scope of practice and that private hearing aid dispensing audiologists had been managing their patients' earwax ethically, legally and without complications. Nevertheless, they acknowledge the dearth literature assessing possible harm resulting from audiologists' management of earwax.[5]

There are numerous reasons why audiologists do not routinely conduct CM. For example, audiologists do not routinely receive adequate training in CM, lack opportunities for supervised clinical experience, have concerns regarding professional liability, and often are not reimbursed for providing this additional service.[6] Nevertheless, those with appropriate training are more likely to conduct CM. For example, in a recent survey of United States Audiologists with clinical doctorates, 69% performed CM,[7] compared to only 29% of audiologists with lower level academic qualifications.[8] Interestingly, although only 29% of audiologists in this study performed CM, 71% approved of audiologists conducting CM, citing insufficient knowledge, lack of supervised training and concerns over potential patient injury and liability as some of their reasons for not performing CM.[8] CM by audiologists undoubtedly has its opponents. For example, Kirkwood[9] reported that the American Academy of Otolaryngology-Head & Neck Surgery (AAO-HNS) were not in favour of audiologists independently performing CM, because it is a medical procedure for which audiologists do not consistently receive training and for which there is a risk of medical complications. Later on, Rigo et al[1] expressed surprise at this position because these researchers believed that it was common practice for physicians to assign the task of CM to others within their practices. To illustrate, Sharp and colleagues determined that only 19% of physicians in the UK performed cerumen management themselves. Indeed, most physicians allocated this task to nursing staff, some of whom had not received instruction on these procedures.[10]

This literature review highlighted the need for more up-to-date research on the topic as well as an assessment of the Irish perspective. Accordingly, the primary purpose of the current study was to obtain data from both audiologists and ENTs employed in the Irish health services regarding their opinions with regard to this topic and the possibility of audiologists managing cerumen in the future. In particular, the researchers' aims were firstly, to assess if audiologists would approve of and be interested in training in cerumen management; and secondly, to assess what ENTs believe about audiologists taking on such a role in the Republic of Ireland. Accordingly, the researchers aimed to determine whether or not it would be feasible for audiologists in Ireland to remove cerumen from patients themselves, in prescribed circumstances, instead of referring them for medical management.

## Methods

The researchers devised an online survey consisting of some of the items from a previous study by Rigo and colleagues[1] and some additional questions. Specifically, there were eight statements, the first of which gathered biographical information, the next six statements providing for responses via five-point Likert-type scales in which participants could respond as follows: strongly disagree, disagree, no opinion, agree and strongly agree;[11] the final statement was a simple yes/no response on whether or not professionals would be in favour of a continuing professional development training course on cerumen management. The items in the survey can be seen in Table 1. This survey was submitted for approval to the Clinical Research Ethics Committee of the Cork Training Hospitals (CRECTHC) and received approval thereafter.

The researchers availed of an audiology mailing list for all Health Service Executive (HSE) audiologists to invite them to participate. For the ENTs, the survey was sent indirectly via the Royal College of Surgeons Institute in Dublin who verified the number of recipients on the list. Accordingly, 70 ENTs and 80 audiologists in the HSE received emailed invitations to participate. The email contained an embedded link to the anonymous online survey. The responses from participants were analysed and compared both descriptively and inferentially. For the inferential statistics, median and modal scores for statements 2-7, for both groups were calculated, prior to using the Mann-Whitney U-test,[12] a non-parametric test suitable for comparing median scores of groups of different sizes. This allowed the researchers to determine whether or not there were significant differences in opinion between the two professional groups. The level of statistical significance was set at $p < 0.05$.

**Table 1: Summary of responses to questionnaire items**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. (Biographical Information) | ENT N=20 (29%) | | | Audiologist N=51 (64%); Community: N=30 (59%); Hospital: N=21 (41%) | | |
| | Strongly Agreeor or Agree | | No Opinion | | Strongly Disagree or Disagree | |
| | ENT | AUD | ENT | AUD | ENT | AUD |
| 2. Cerumen management should be within the scope of practice of audiologists, if proper training and practical experience has been completed | 95% | 73% | 0% | 6% | 5% | 21% |
| 3. Medically trained personnel are more qualified to perform cerumen management than Audiologists | 50% | 48% | 15% | 11% | 35% | 41% |
| 4. Cerumen management procedures involve a degree of risk to the patient. | 90% | 95% | 10% | 0% | 0% | 5% |
| 5. There is a greater risk to the patient if an audiologist, as opposed to an otolaryngologist, performs cerumen management. | 75% | 27% | 5% | 23% | 20% | 50% |
| 6. An audiologist's patient would be served more efficiently in the Community Audiology Service if cerumen management procedures could be performed at the audiologist's clinic. | 90% | 80% | 10% | 7% | 0% | 13% |
| 7. Given the choice, patients would prefer to have cerumen removed by the audiologist at their initial appointment than have to go to an otolaryngologist for removal, and later return to the audiologist for assessment. | 100% | 72% | 0% | 14% | 0% | 14% |
| 8. If a University-run CPD course to train audiologists in cerumen management were set-up in Ireland I would be in favour of it. | | | YES | ENT 100% | | AUD 82% |
| | | | NO | 0% | | 18% |

## Results

There was an overall response rate of 47% with 29% (N= 20) of ENTs and 64% (N= 51) of audiologists responding. Table 1 below is a descriptive summary of responses to items on the questionnaire. Table 2 below is a summary of median responses of ENT & Audiologists to survey items 2-7. Between-group differences were only found to be significant for statement 5. No significant differences were found between the two groups for the remaining statements.

**Table 2 Median responses of ENTs & audiologists to survey statements 2-7.**

| Statement Number | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | MEDIAN RESPONSES | | | | | |
| ENT (N=20) | 4 | 3.5 | 4 | 4 | 4 | 4 |
| AUDIOLOGISTS (N=51) | 4 | 3 | 4 | 2 | 4 | 4 |
| Mann-Whitney p-value | .059 | .957 | .175 | .005 | .934 | 0.83 |

Scale for responses: 1 = Strongly disagree; 2 = Disagree; 3 = No opinion; 4 = Agree; 5 = Strongly agree.

## Discussion

Although the final response rate of 29% from ENTs was somewhat lower than the 64% response rate of the audiologists, Templeton, Deehan, Taylor, Drummond, and Strand (1997) suggest that a relatively low response rate need not affect the validity of data collected, citing a lack of time, spam filters, and a lack of interest on a topic.[7] Nevertheless lower response rates do introduce the risk of response bias and therefore results of this study need to be interpreted cautiously. Although there were differences in opinion with regard to the degree of risk involved in CM, both ENTs and Audiologists believed that patients would be served more efficiently, and that the patients themselves would prefer it, if CM occurred in the audiologist's clinic. However, they disagreed that the risk to a patient would be greater if the audiologist were to remove cerumen. These findings are of clinical importance and could pave the way for a change in audiology practice with more responsibility being afforded to audiologists regarding CM.

The majority of ENTs (95%) and audiologists (73%) in the current study agreed that CM should be within the audiologist's scope of practice. Possibly, ENTs believe that minor procedures such as CM should be handled by other, suitably qualified and experienced professionals, especially in a context of lengthy waiting lists in the public service. This positive response from ENTs in this regard is inconsistent with most previous studies. For example, Rigo et al[1] reported 75% of ENTs being against CM as part of the audiologist's remit. Similarly, Skordas and Primus[8] reported that 55% of ENTs did not approve of CM by audiologists, with a further 32% responding they were 'uncertain'. However, it is important to note that both these previous US studies included private practitioners who may have responded in this manner to protect professional interest.[8] Moreover, comparisons between US and Irish health system may not be appropriate due to the differences in cultures and goals of these two systems. Audiologist responses were similar to recent findings by Johnson et al[7] which determined that 98% of audiologists agreed that it is appropriate for them to perform CM with proper training and experience. Again, it is important to note that the Johnson study also included private practitioners and that 39% of respondents in that study charge for CM.[7] With regard to the current study, it is relevant to note that 41% of audiologists practiced in Hospital settings with easy access to ENT clinics and this may have influenced the responses of this sub-group. It is not surprising that only 5% of all respondents disagreed there was a degree of risk to the patient in relation to CM as it is an invasive procedure, with risks of complication and injury to the patient. The majority of ENTs (75%) strongly agreed that the patient is at greater risk when an audiologist performs CM as opposed to an ENT. However, there was a surprising and statistically significant difference of opinion between the two professional groups. Of interest, this was also the statement to which the highest number of audiologists (22%) gave no opinion. This may be due to the fact that Irish audiologists have no experience in performing CM procedures.

All respondents believed it would be more efficient and that it would be the patient's preference to have CM performed by the audiologist at the time of their initial appointment. Overall, it is unsurprising that all ENT respondents and 82% of Audiologists are in favour of setting up a University-run CPD course to train audiologists in cerumen management. When discussing cerumen management Roeser and Crandell[13] believed the benefits to patient care and increased professional independence far outweigh the potential risks. Furthermore, Rigo and colleagues highlighted that a better appreciation of the need for the audiologist's involvement in cerumen management and a mutual understanding of the limited conditions under which the procedure would be performed can only serve to benefit professional relations in this area of practice.[1] In terms of the aims outlined earlier, it has been shown that the majority of audiologists are interested in being trained to remove cerumen and that the majority of ENTs are in favour of audiologists taking on such a role in Ireland. It can therefore be concluded from this study that it would be feasible for audiologists in the community setting to remove cerumen, in prescribed circumstances, if proper theoretical and practical experience were completed.

Correspondence: T Browne
Hearing Services, HSE West, Galway
Email: teresa.browne@ymail.com

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# A Quantitative Analysis of Diabetic Retinopathy Screening in a Regional Treatment Centre



M James, TH Heng, D Minasyan
Department of Ophthalmology, Cork University Hospital, Wilton, Cork

**Abstract**
The aim of the study was to assess the current diabetic retinopathy screening infrastructure and implications on workload for a designated treatment centre following roll-out of a national screening programme. A combination of chart analysis and patient questionnaire was undertaken over a 4-week period in 2011 at Cork University Hospital (CUH). Data were collected on 97 patients and categorized as demographic, medical, and screening-related. The majority of patients (80; 82.5%) had either no retinopathy or background retinopathy only. One (1.0%) patient was deemed to be ungradable due to dense cataract, while 6 (6.2%) patients had non-diabetic ocular pathology requiring follow-up. Only 11% were screened through retinal photography. In all, 74 (76.3%) patients were deemed suitable for community rather than hospital screening. Digital retinal photography is an underused screening resource. Significant numbers of patients could be discharged from hospital-based to community screening to offset the increased workload expected from the national screening programme.

## Introduction

Diabetes is a group of chronic metabolic diseases, which may lead to a variety of macrovascular and microvascular complications. It is estimated that the number of adults aged 20 years and over who have diabetes in Ireland in 2007 is nearly 144,000.[1] This equates to approximately 4.5% of the adult population, and is expected to increase to 5.2% by 2015. One of the most debilitating complications of diabetes is retinopathy. The incidence of blindness in Europe due to diabetic eye disease has been reported to be between 53-64 per 100,000 people with diabetes per year.[2-4] Timely management of patients with diabetic retinopathy can significantly reduce visual impairment and its associated financial burden, and improve quality of life.[5] Expenses associated with the detection and treatment of diabetic eye disease through screening programmes are a fraction of that which may otherwise be incurred as a result of managing advanced ocular complications and blindness.[6,7] Indeed, the cost-effectiveness of such screening programmes far exceeds that of other commonly provided medical interventions.[8]

In Ireland between 1996 and 2003, there was a dramatic increase in the number of individuals registered as blind as a result of diabetic retinopathy from 147 to 323.[9] Up until recently, retinopathy screening services in Ireland have been ad hoc, with wide variation in terms of delivery, and characterized by the absence of a population-based approach, quality assurance systems, or adequate use of community resources.[10] As a structured retinopathy screening programme can result in significant reductions in blindness statistics,[11,12] the Health Service Executive (HSE) set up an expert advisory group to advise on the development of a national screening programme as a priority, the proposed framework for which was published in 2008.[10] In 2010, the National Cancer Screening Service (NCSS) assumed responsibility for the implementation of such a programme, aiming to screen the majority of diabetic patients by the end of 2014. In this paper, we report on the current state of screening for diabetic retinopathy within a tertiary referral centre, how this compares to the aforementioned published national guidelines, and the likely impact the roll-out of the programme nationally may have in terms of workload for hospitals designated as treatment centres.

## Methods

This study involved a combination of patient questionnaire and chart review of diabetic patients attending CUH. Ethical approval was obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals. All patients with diabetes mellitus who attended the CUH ophthalmology outpatient department over a 4 week period in 2011 were eligible for inclusion in the study. Patients were recruited from both general ophthalmology clinics and specialist diabetic retinopathy screening clinics, which have annual attendance figures of 14,205 and 1,566 respectively, of whom 483 were screened with fundal photography. The general clinics involved a mixture of primary screening as well as assessment of referred problem cases, predominantly with slit-lamp biomicroscopy. The numbers attending general clinics for retinopathy screening were recorded and used to estimate equivalent figures over a year-long basis using the hospital's patient management information system. The specialist retinopathy clinics provided a primary screening service through fundal photography, direct ophthalmoscopy, or slit-lamp biomicroscopy.

Data recorded for each subject were classed as demographic, general medical, and screening-related. Demographic data included age, gender, ethnicity, and education level. General medical data documented the type and duration of diabetes, relevant risk factors, HbA1c levels, as well as the patients' subjective recall of their last HbA1c results. Screening-related data included referral source, interval since last ophthalmic exam, screening method, visual acuity, and retinopathy grade as per the classification used by the national screening programme in England and Wales.[13] Sight-threatening diabetic retinopathy was defined as the presence of any of the following: pre-proliferative (R2) or proliferative retinopathy (R3), or maculopathy (M1).[13] Due to the skewed distribution of variables, median values were calculated using Stata statistical software package (Stata 8, StataCorp, College Station, TX).

## Results

Of the 97 patients who consented to partake in the study, 63 (64.9%) were attending dedicated diabetic retinopathy screening clinics, while 34(35.1%) were sourced from the general ophthalmology clinics (19.9% of all patients attending these general clinics in CUH were identified as requiring diabetic retinopathy screening). Demographic details are summarized in Table 1. The male to female ratio was1.2:1 (53 males and 44 females). There were 22 (22.7%) patients with type I diabetes and 75 (77.3%) with type II. With respect to their knowledge of HbA1c, only 49 (50.5%) patients knew what the term referred to, of whom 35 (71.4%) were able to give a subjective estimate of their last HbA1c level on the questionnaire. Seventy-six (78.4%) patients had a HbA1c result available from biochemistry within the previous 12 months, where the median (interquartile range) HbA1c was 55 (48-63.3) mmol/mol. Of these, only 36 (47.4%) had HbA1c levels within an accepted target of 7% (53 mmol/mol). Twenty-five (25.5%) subjects had HbA1c levels from both the questionnaire and biochemistry results; of these, 17 (68.0%) were accurate when providing their HbA1c levels (in percentage format) to the degree of +/- 0.5%.

Seventy-nine (81.4%) patients were reviewed within one year of their previous ocular exam. Of note, 8 (8.2%) patients denied ever having had a formal ophthalmic assessment, 3 (37.5%) of whom

**Table 1 Patient demographic and medical details**

| | Patients with type I diabetes (n =22) | Patients with type II diabetes (n = 75) | All patients (type I and II) (n = 97) |
|---|---|---|---|
| Age (years) | | | |
| Median | 34 | 64* | 59 |
| Interquartile range | 19.25-48 | 56-70.5 | 48-69 |
| Gender, n (%) | | | |
| Male | 12 (54.5%) | 41 (54.7%) | 53 (54.6%) |
| Female | 10 (45.5%) | 34 (45.3%) | 44 (45.4%) |
| Ethnicity, n (%) | | | |
| White Irish | 19 (86.4%) | 69 (92%) | 88 (90.7%) |
| White British | 2 (9.1%) | 3 (4%) | 5 (5.2%) |
| White Central European | 1 (4.5%) | 2 (2.7%) | 3 (3.1%) |
| Asian | 0 (0%) | 1 (1.3%) | 1 (1%) |
| Highest education level, n (%) | | | |
| Primary | 3 (13.6%) | 33 (44%)† | 36 (37.1%) |
| Secondary | 10 (45.5%) | 26 (34.7%) | 36 (37.1%) |
| Third level | 9 (40.9%) | 16 (21.3%) | 25 (25.8%) |
| Duration of diabetes (years) | | | |
| Median | 18.5 | 7* | 7 |
| Interquartile range | 7-21.5 | 4-12 | 4-17 |
| Drug therapy, n (%) | | | |
| Insulin | 22 (100%) | 14 (18.7%)* | 36 (37.1%) |
| Anti-hypertensive | 8 (36.4%) | 47 (62.7%)† | 55 (56.7%) |
| Anti-lipid agent | 6 (27.3%) | 42 (56%)† | 48 (49.5%) |
| HbA1c (mmol/mol) | | | |
| Median | 69 | 51* | 55 |
| Interquartile range | 62-72.5 | 48-60 | 48-63.25 |

*: p 0.001 with respect to differences between type I and type II categories.
†: $p < 0.05$ with respect to differences between type I and type II categories.

were newly diagnosed with diabetes within the previous 12 months. Chart review of original referral letters showed that 34 (35.1%) participants were referred from the endocrinology department, 22 (22.7%) were referred from GPs, 4 (4.1%) directly from opticians, and 10 (10.3%) were referred from GPs on the advice of an optician, while the original referral letter was either unavailable or unrelated to diabetic retinopathy screening in 27 (27.8%) cases. Only 11 (11.3%) patients had referral letters with a provisional retinopathy grade.

The vast majority of patients (80; 82.5%) had either no retinopathy (R0) or background retinopathy (R1) only (Table 2). Of the 9 (9.3%) patients who were noted to have proliferative retinopathy, 8 (88.9%) had previously undergone laser photocoagulation. One (1.0%) patient was deemed to be ungradable due to dense cataract, while 6 (6.2%) patients had non-diabetic ocular pathology requiring follow-up in the eye clinic. Therefore, the number of patients who would be suitable for discharge to community screening were 59 (93.7%) and 16 (47.1%) from the dedicated screening and general clinics respectively.

**Table 2 Summary of retinopathy grades***

| | Patients with type I diabetes (n =22) | Patients with type II diabetes (n = 75) | All patients (type I and II) (n = 97) |
|---|---|---|---|
| Retinopathy grade, n (%) | | | |
| R0 M0 | 11 (50%) | 39 (52%) | 50 (51.5%) |
| R1 M0 | 5 (22.7%) | 25 (33.3%) | 30 (30.9%) |
| R2 M0 | 0 (0%) | 0 (0%) | 0 (0%) |
| R3 M0 | 1 (4.5%) | 1 (1.3%) | 2 (2.1%) |
| R1 M1 | 2 (9.1%) | 4 (5.3%) | 6 (6.2%) |
| R2 M1 | 0 (0%) | 1 (1.3%) | 1 (1%) |
| R3 M1 | 3 (13.6%) | 4 (5.3%) | 7 (7.2%) |
| Ungradable | 0 (0%) | 1 (1.3%) | 1 (1%) |

R0, no retinopathy; R1, background retinopathy; R2, pre-proliferative retinopathy; R3, proliferative retinopathy; M0, no maculopathy; M1, maculopathy.
*There were no statistically significant differences between any of the retinopathy grades with respect to diabetes type.

## Discussion

Retinal photography fulfils all the criteria outlined by Wilson and Jungner to determine whether screening is worthwhile, namely having a simple, sensitive and inexpensive test which is acceptable to the patient, and for which there is cost-effective treatment for a disease with a well understood natural history and long preclinical stage.[14] In 2008, the use of digital retinal photography in the community was proposed as the screening method of choice for the detection of diabetic eye disease in a new national retinopathy screening programme in Ireland,[11] because of its effectiveness and high degree of sensitivity.[15] Not only may it be a more sensitive test than existing opportunistic practice with direct ophthalmoscopy,[16] but also the more cost-effective option.[17] In Cork, there has been no unified system as to how diabetic patients are screened and referred for treatment.[11] Referrals into the CUH originated from a variety of hospital and community-based sources, with no standardized referral protocols in place. Most patients were referred for primary screening, with only 11.3% having referral letters with a provisional retinopathy grade. Approximately 20% of all patients attending general ophthalmology clinics were diabetic patients, where assessment at the dedicated retinopathy screening clinics would have been more appropriate for the majority of cases. However, despite the cost effectiveness of diabetic screening being maximised with systematic photographic screening,[17] only a minority (11%) of patients attending CUH are screened by this method, with most being screened by an ophthalmologist using slit-lamp biomicroscopy.

The current national guidelines recommend that patients are screened annually, and almost 90% of our sample had their review appointments within this target, suggesting good follow-up within the system. Over 90% of patients attending the CUH dedicated diabetic retinopathy screening clinics had non-sight threatening eye disease and would be appropriate for retinal photography in the community instead. This is unsurprising given that this is a primary screening clinic with retinopathy rates similar to published studies on community-based retinal screening programmes.[12,18] Of diabetic patients attending the general CUH ophthalmology outpatients, almost half could be safely discharged to community screening. This smaller proportion compared to that of the dedicated screening clinics is due to the increased complexity of diabetic and other eye problems referred as would be expected in a hospital-based clinic. In the absence of a quality assured national screening programme, a pilot community retinopathy screening programme commenced in 2011 through the Diabetes in General Practice (DiGP) forum of Cork and Kerry.[18] This involved the use of digital fundal photography on over 1500 patients performed by local optometrists, following which, those found to have sight-threatening retinopathy were to be referred for specialist assessment at CUH. However, of the new referrals not already under the care of an ophthalmologist, less than 15% were seen in the CUH within the recommended guidelines.[10] This demonstrates the absence of a structured clinical care pathway to treat urgent cases, and highlights the importance of developing adequate resources within designated treatment centres. These issues will need to be addressed if quality assurance standards for the management of sight-threatening referrals are to be met.[19]

If the results of our analysis are extrapolated to the total number of diabetic patients attending CUH ophthalmic services annually, potentially over 2200 patients could be discharged safely to the NCSS programme for screening in the community. This would have obvious benefits in terms of freeing up resources for the timely management of sight-threatening cases. However the results of the study should be interpreted with care, as it was a single centre study, and may not be representative of practice throughout the HSE. Another point of interest was the lack of availability of HbA1c results and general poor understanding patients had regarding their HbA1c status. This may suggest a

further role for the NCSS in patient education as part of the screening process, in view of the associations higher HbA1c levels have in terms of retinopathy progression rates.[20] It has also been suggested that individualizing the screening process so that patients at low risk of progression have their screening interval extended beyond the recommended annual visits may be a safe way of reducing the costs of implementing a national programme.[21]

In conclusion, our study suggests that there is good follow-up of patients already within the hospital system but that digital retinal photography is an underused resource. The lack of comprehensive community screening and absence of a sufficiently funded referral system with defined care pathways compromises retinopathy screening in the area. Our findings may also have implications for the national screening programme, and suggests that re-organization of current screening practices within the hospital may allow significant numbers of patients to be discharged to community screening. This may help balance the additional resources required to manage the increased workload expected from the national programme, so that referrals with sight-threatening disease can be assessed and treated in a timely fashion as per the recommended guidelines.

Correspondence: M James
University College Cork Medical Education Unit / Department of Ophthalmology, Cork University Hospital, Wilton, Cork
Email: m.james@ucc.ie

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# Implementation and Evaluation of a Clinical Data Management Programme in a Primary Care Centre

J Sweeney[1,2], S McHugh[2], IJ Perry[2]
[1]Livinghealth Clinic Primary Care Centre, Mitchelstown, Co Cork
[2]Department of Epidemiology and Public Health, University College Cork, Cork

**Abstract**
Electronic health records (EHR) support clinical management, administration, quality assurance, research, and service planning. The aim of this study was to evaluate a clinical data management programme to improve consistency, completeness and accuracy of EHR information in a large primary care centre with 10 General Practitioners (GPs). A Clinical Data Manager was appointed to implement a Data Management Strategy which involved coding consultations using ICPC-2 coding, tailored support and ongoing individualised feedback to clinicians. Over an eighteen month period there were improvements in engagement with and level of coding. Prior to implementation (August 2011) 4 of the 10 GPs engaged in regular coding and 69% of their consultation notes were coded. After 12 months, all 10 GPs and 6 nurses were ICPC-2 coding their consultations and monthly coding levels had increased to 98%. This structured Data Management Strategy provides a feasible sustainable way to improve information management in primary care.

## Introduction

Managing clinical information effectively is an essential part of all medical care[1]. Electronic health records (EHR) support clinical management, administration, quality assurance, research, and service planning. The Health Information and Quality Authority (HIQA) have emphasised the need for correct and up-to-date data for the provision of high quality clinical and social care[2]. The development of robust clinical information systems and the increased use of EHRs has been a priority in national health policy for over a decade[3]. Several strategy documents[4-6] have highlighted the importance of developing an EHR that can be shared across health services, and the need for standardised methods for assessing data quality[7]. For many people the majority of their interactions with health services occur in general practice, therefore high quality data at general practice level are essential for establishing a comprehensive national electronic patient record[8].

The number of computerised practices and the use of EHR by Irish GPs has grown substantially over the past fifteen years[8]. Incentives to computerise practices include funding from Indicative Drug Budgeting, computerisation grants and training programmes run in conjunction with the Irish College of General Practitioners[9]. Historically, data sources in primary care in Ireland have developed in an uncoordinated way and data are often fragmented, not easily accessible, and difficult to compare across providers. The absence of basic information on the pattern, intensity and cost of activity in primary care has been recognised as a major impediment to the proposed shifting of resources from secondary to primary care[10]. The establishment of a sentinel practice network has been recommended to address this deficit of core activity data in primary care[11]. According to primary care clinicians, missing clinical information is common, multifaceted, likely to impact on time and may adversely affect patients[1]. Consequently, EHR data quality, uniformity and retrievability are key challenges in primary care. To date, Ireland has not adopted a national standard for coding primary care data and the use of coding by GPs is variable. Clinical coding is a way to record structured data which are then readily searchable by the computer system[12]. However, a number of barriers to clinical coding have been highlighted including the limitations of current coding systems and the level of specificity of codes available, the skills gap, time and attention required to record structured data in the consultation, primary care professionals' motivation, and priorities within the organisation[12].

Although there is overwhelming acceptance of the importance of coding as part of general practice data management, high quality coding of clinical data is not yet ubiquitous[13]. To address the barriers to clinical coding and data quality, a Data Management Strategy (DMS) was developed and introduced in a large primary care centre. The aim of the strategy was to facilitate the recording of information in a unified, logical and secure manner and to improve levels of coding within the centre. This would allow for more accessible high quality information in the EHR to support clinical management, administration, quality assurance, service planning and research. The objective of this study was to evaluate the implementation of the DMS among GPs and nurses with reference to uptake of coding, impact on audit and pattern of activity recorded over an eighteen month period.

## Methods

The DMS was implemented in Livinghealth Clinic as a joint collaboration between the Department of Epidemiology and Public Health University College Cork & Livinghealth Clinic (LHC). LHC is an advanced primary care centre in Mitchelstown, Co. Cork operational since November 2008 with 10 GPs, 6 nurses, a Clinical Data Manager (CDM) and a patient database of 22,000 patients. In July 2010 a Clinical Data Manager with a nursing background was appointed to oversee implementation of a DMS. This role involved providing information and training on data protection procedures, clinical disease coding and audit. The CDM monitored the coding of consultations, provided on-going support, tailored feedback to clinicians, and monthly practice management reports. A multidisciplinary coding team including GPs, nurses, the CDM and the practice manager was established. The clinical coding system ICPC-2 (International Classification of Primary Care) was adopted as the coding standard. ICPC-2 was introduced in 1987, and recognised by the World Health Organisation as a classification system for recording data in general practice in 2003[14]. It is based on the subjective, objective, assessment and plan method of recording the episode of care and consultation findings. Health care professionals were encouraged to assign an ICPC-2 code at every consultation to the symptom, diagnosis, or reason-for-encounter. This code could then be retrieved by Socrates, the practice management software, for the purpose of monthly progress reports and audit. In the absence of a specific code, standard codes were discussed at the multidisciplinary coding team meeting so that all staff were coding consistently. Recording and coding multiple problems within the consultation was also promoted (e.g. T90/T31/A50 i.e. Non-insulin diabetic, medical exam partial and prescription renewal).

The primary outcome was the proportion of GP and nurse recorded notes that were ICPC-2 coded, as an indicator of levels of consultation coding. This measure captures patient-related activity beyond face-to-face contact, for example phone calls or writing reports. Furthermore coding of multiple issues within a consultation is represented in this measure. Secondary outcomes included the number of staff engaging in regular coding and changes in levels of coded consultation notes over time. Data on coding levels were extracted through the GP software system over 18 months at four time points to monitor progress - October 2011, April 2012, October 2012 and April 2013. Descriptive analysis was carried out to examine coding levels and changes over time.

## Results

*Encourage engagement in coding & improve levels of coding in practice*

Prior to implementation (August 2011), 4 of the 10 GPs engaged in coding and on average 69% of their consultation notes were coded. Within 2 months 9 GPs were engaged in ICPC-2 coding and 71% of consultation notes were being coded. Figure 1 illustrates the variation across GPs and the improvements in coding levels over eighteen months. The extent of improvement among GPs ranged from an 8% increase in coding levels to a 98% increase.

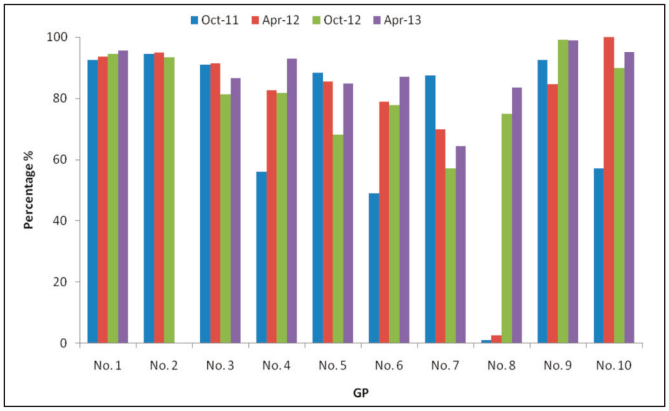


**Figure 1** Percentage of consultation notes coded by GPs over an 18 month period

As Figure 2 illustrates, nurses were coding 91% of their notes at baseline (Oct 2011) compared to GPs who were coding 71% of consultation notes. After 12 months, monthly coding levels among GPs had increased to 91.5%. Figure 2 illustrates the marked improvements within the first six months of implementation and more modest changes in the last 12 months.

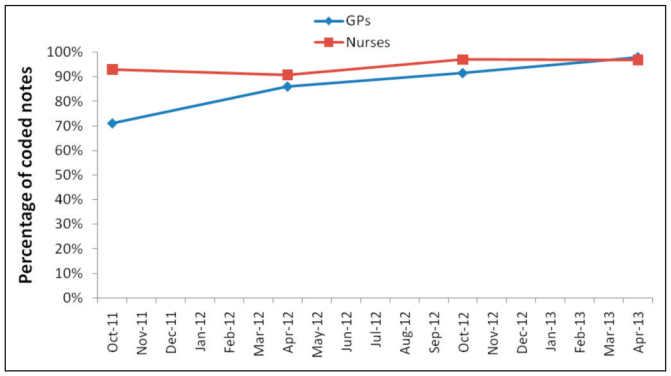


**Figure 2** Percentage of consultation notes coded by health care professional over an 18 month period

*Adoption of ICPC-2 coding as a practice standard*

Figure 3 illustrates the top ten codes used in October 2012 and April 2013. At both time points, blood tests were the most commonly applied code. There was no dramatic change in the types of activity captured as coding levels increased.

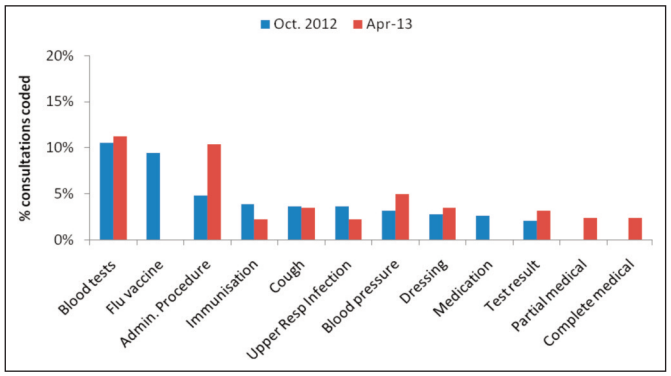


**Figure 3** Top 10 ICPC-2 codes used in October 2012 and April 2013

## Discussion

The aim of this study was to examine the impact of a Data Management Strategy on engagement in and levels of coding in the primary care setting. The DMS was envisaged as a way to improve consistency, completeness and accuracy of EHR information. Over an eighteen month period there was an increase in the number of GPs and nurses engaging in coding. Furthermore, the overall level of coding increased from 71% to 98%. The results suggest that computerisation and coding can be incorporated into the patient consultation. The DMS was developed to address some of the barriers to implementing health information systems in general practice. These include lack of time, privacy concerns, previous experience[15] and a lack of support[9]. The DMS involved the introduction of a Clinical Data Manager to provide ongoing support and training to practice staff. The availability of individual support, assessment, feedback and tailored training appears to improve engagement in clinical coding[16]. Hence, the development of Health IT infrastructure at a national level will require investment and targeted resources such as support, specific training, strong IT management and the standardisation of medical terminology[15].

The ICPC-2 coding framework was adopted in this initiative to improve the consistency of coding in the centre. This is a step forward as Ireland has not adopted a national standard for coding primary care data to date. However, there are challenges to the implementation of coding systems such as the absence of certain codes and the suitability of others. To address this shortcoming, multidisciplinary coding team meetings were held to discuss gaps in the coding system and to reach consensus on standard codes. The most commonly used consult codes were blood tests, blood pressure checks, immunisations, administration procedures and cough. The CDM provided ongoing feedback at an individual practitioner level and monitored monthly progress using customised reports. The adoption of a DMS and standard coding practice has ongoing implications for clinical practice, quality assurance, clinical governance and research. As a result of the DMS a structured audit programme is in place, and all patients taking Warfarin now have the indication for therapy ICPC-2 coded into their EHR. All medical letters received by the clinic are examined for relevant information, for example procedures and results, this is then ICPC-2 coded by the CDM into the patients EHR, expanding the information in the past history and enabling classification of the episode from reason-for-encounter to outcome[17]. Data from general practice in other countries are seen as an important and rich source of information about the health of their population, their behaviours and health service utilisation[13]. Furthermore EHR data are expected to have a central role in healthcare commissioning[7] and this programme could be seen as a way to access the untapped potential of Irish primary care data[13].

The main limitation of this study is the lack of information on quality of coding per patient visit. While the use of coded consultation notes as an outcome measure allowed us to capture activity in general practice beyond the face-to-face patient consultation the quality and depth of coding was not assessed. Additionally, un-coded EHR notes such as out-of-hours GP entries need to be identified for each GP to accurately capture their level of coding activity. This study examined levels of coding before and after the implementation of the DMS. However, our conclusions are tempered by the lack of a comparable control group. While the results are encouraging, this is only the first step in a continuous quality improvement process and more focus is needed on the quality and depth of coding. It will also be important to examine the impact of this organisational change on patient care and outcomes. A qualitative follow-up study is being planned with practice staff on the advantages and disadvantages of the initiative, as recording structured data during the consultation can be distracting and depends on the level of motivation among professionals and the priority within the organisation[12]. The learning from this initiative could be applied to other general practices to allow data to be compared between practices, which ultimately could lead to improvements in routinely collected clinical data quality[17] and support the creation of a national primary care database of international comparability[13].

In conclusion, this study found increases in engagement with and level of ICPC-2 coding following introduction of a structured supported DMS. Clinical coding at the levels achieved and sustained by GPs and nurses in this intervention is one way of successfully leveraging technology to potentially improve patient care and primary care information management. The results suggest that ongoing support, education and training, and incremental change can improve data quality. This strategy provides a feasible sustainable way to improve primary care information management in Ireland.

Correspondence: J Sweeney
Livinghealth Clinic, Mitchelstown, Co Cork
Email: janice.sweeney@ucc.ie

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# The Appropriateness of a Proton Pump Inhibitor Prescription

N Moran, E Jones, A O'Toole, F Murray
Gastroenterology Department, Beaumont Hospital, Beaumont, Dublin 9

**Abstract**
Proton pump inhibitors (PPIs) are one of the most commonly prescribed groups of drug in Ireland, at great expense to the Irish healthcare executive. This study aims to evaluate the appropriateness of PPI prescriptions on admission and discharge in a tertiary referral hospital. All non-elective admissions in the Emergency Department in one week were included in the study. 102 patients in total were included, with 36 (35.4%) treated with a PPI on admission. Of these, only 3 (8.3%) had a clear indication noted as per current NICE guidelines. 18 new in-hospital PPI prescriptions were documented. 11 (61%) of which were present on discharge prescriptions. Continuing PPI prescription on discharge into the community may be inappropriate, costly and potentially harmful. Brief interventions aimed at reducing inappropriate PPI prescriptions have been shown to be effective at reducing the cost and potential harm of unnecessary treatment.

## Introduction

Proton pump inhibitors (PPI) are the second most frequently dispensed medication in Ireland accounting for 8% of overall drug expenditure in 2011[1]. Previous reports have estimated that over 60% of all PPI prescriptions are generated from within the hospital setting[2], and multiple studies have documented widespread inappropriate use of PPIs within hospitals[3]. Furthermore, PPI therapy has been increasingly linked with adverse side effects including lower respiratory tract and clostridium difficile infections, and accelerated bone loss[4,5]. The evidence for short term prophylactic PPI use in hospital inpatient care is well recognised. However this treatment is often not subsequently reviewed, resulting in a considerable number of inappropriate PPI prescriptions persisting beyond discharge. The National Institute of Clinical Excellence (NICE), guidelines on the appropriate use of PPIs, recommends regular review of patients to assess the continuing need for PPIs and stepping down of therapy if indicated. Stopping PPI therapy can be associated with a transient rebound hyper secretion dyspepsia when a PPI is discontinued after more than 3 months therapy[6]. This gives a short window of opportunity in which to identify inappropriate PPI prescriptions. Physicians should advise patients of this temporary rebound phenomenon to prevent a perceived PPI dependence.

## Methods

We performed a brief observational study in our Emergency Department to assess practices surrounding PPI prescription in acute medical and surgical admissions. Details of all non-elective admissions by the medical and surgical teams during one week from 6th-10th February 2013 were obtained. Admission notes to document PPI prescription prior to admission were reviewed and we interviewed patients as to whether they knew the indication for their PPI treatment. We assessed in-hospital PPI prescribing and follow up, as well as discharge prescriptions.

## Results

In total, 102 patients were included in the study, 54 female (53%). The median age was 67 (range 19-88 years). 36 patients (35.4 %) were treated with a PPI on admission. The indication for PPI treatment was documented in only 3 (8.3 %) patients' notes. Following patient interviews, we were able to identify a reason for ongoing PPI use in 13 cases (35%) that were consistent with current NICE guidelines. 18 patients (17.8%) were commenced on a PPI on admission, with stress ulcer prophylaxis and dyspeptic symptoms the most common indications noted. Of the 18 new in-hospital prescriptions, 11 (61%) were present on discharge prescriptions.

**Table 1 NICE Guidelines CG 17: Dyspepsia: Management of dyspepsia in adults in primary care 2004**

| Disease | Treatment | Long-term acid suppression | Follow Up | Endoscopy |
|---|---|---|---|---|
| Peptic ulcer disease (PUD) | Treat H.pylori if positive | | | |
| 2 month PPI if negative | Not recommended | Gastric ulcers require repeat endoscopy 6-8 weeks after commencing therapy | Refer for OGD if over 55 years of age or alarm symptoms | |
| NSAID-induced ulcer | Healing dose PPI | Not recommended | Reduce to maintenance dose. Stop NSAID where possible | Refer for OGD if over 55 years of age or continuing need for NSAID |
| Severe GORD | Healing dose PPI 1-2 months | Lowest dose that maintains symptom control | If requires oesophageal dilatation should continue long term full dose PPI treatment | Routine surveillance if Barrett's Oesophagus |
| Non-ulcer dyspepsia (NUD) | Low dose PPI for 1 month/alternate acid suppression | Lowest dose that maintains symptom control | Consider 'on-demand' basis treatment | |
| Mild symptoms of dyspepsia | Lifestyle advice. Treat on 'step-up' or 'step-down' basis | Not recommended | 1 month empirical PPI therapy if symptoms persist. H.pylori 'test and treat' | |

## Discussion

A recent study of the pharmacoeconomics of PPI therapy outlined the possible savings to the healthcare system that can be achieved by brief interventions, with a reduction of 51% of inappropriate prescriptions following education and medication review[7]. Potential cost savings to the Irish healthcare system of between 24-46% per annum have been identified by initiating dose reduction and therapeutic switching or substitution when appropriate[8]. These savings could be further enhanced with the discontinuation of inappropriate PPI prescriptions on discharge from hospital. Our study confirms that a significant proportion of patients commence PPI therapy on admission or during the inpatient stay. This may be overlooked on discharge and continue into the community. Older patients in particular have been identified as 'at risk' for perpetuating inappropriate PPI prescriptions[3], with educational interventions in this group proving effective at reducing inappropriate therapy[9]. Simple, fast and effective interventions including junior physician education and systematic review of medicines commenced during inpatient stay could reduce the number of inappropriate PPI prescriptions on discharge.

As PPI use has become more widespread, and in particular with the recent advent of OTC formulations, doctors are less likely to question the original indication for patients' prescription. Patients themselves are often unaware of why they are taking these particular medications. With the mounting number of adverse side effects documented, and the increasing pressure on the healthcare budget, a brief investigation of the indication for treatment should be performed. In- hospital PPI prescriptions should be reviewed on discharge to ensure ongoing PPI treatment is appropriate.

Correspondence: F Murray
Gastroenterology Department, Beaumont Hospital, Beaumont, Dublin 9
Email: frankmurraymd@gmail.com

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# An Unusual Cause of Acute Scrotum in a Child

O Aworanti, S Awadalla
Children's University Hospital, Temple St, Dublin 1

**Abstract**

Acute non-traumatic scrotal pain in children, commonly due to a torted testicular appendage (hydatid of Morgagni) or torted epididymal appendage is well described. These vestigial embryonal duct remnants are of Müllerian and Wolffian duct origin respectively. Very rarely, the other infrequently encountered Wolffian duct remnants known as the paradidymis or organ of Giraldés and the superior and inferior aberrant ducts known as the organs of Haller can become torted. We describe the presentation, management and diagnosis of a torted embryonal remnant arising from the distal spermatic cord.

## Introduction

Acute non-traumatic scrotal pain in children is commonly due to a torted testicular or epididymal appendage, intravaginal testicular torsion and epididymoorchitis in that order of frequency[1,2]. We report an unusual torted cystic structure arising from the distal spermatic cord and presenting as acute scrotal pain.

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**Case Report**

A nine year old autistic Irish boy presented with a 36 hour history of pain followed by swelling of his left testicle. There was no preceding history of trauma and no urinary symptoms. On examination, the left hemiscrotum was mildly erythematous and the left testis was enlarged, tender, and felt soft and compressible; the lie however appeared normal. He proceeded to immediate scrotal exploration with a provisional diagnosis of a necrotic left testicle due to intravaginal torsion of the cord. At surgery, the left testicle was normal and had a normal testicular appendage on its upper pole. However, arising from the distal portion of the left spermatic cord was a necrotic cystic structure (figure 1) measuring 30mm x30mmx4mm. This cyst was twisted 360 degrees on a short stalk and it was excised at its base. The contralateral testis was not explored. The histopathology of the specimen revealed a hollow unilocular cystic structure with no solid components and devoid of epithelial lining. One side of the cyst wall was bordered by mesothelial cells focally, and within the cyst wall focally, there was a morule of epithelial cells consistent with a portion of a Müllerian duct remnant. The histopathological diagnosis of an embryonal duct remnant cyst with evidence of infarction was made. Based on its location we suggest this was a torted paradidymis, also known as organ of Giraldés.

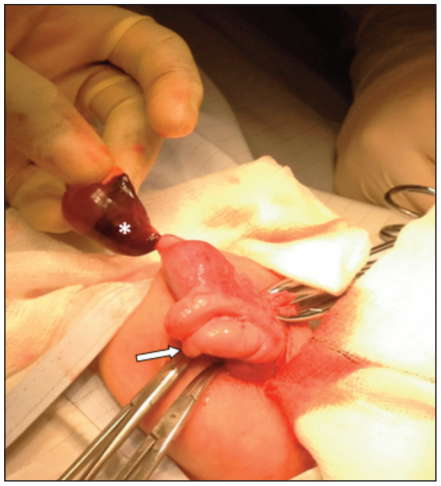

**Figure 1**

intraoperative view of left testis showing a torted necrotic cystic structure arising from the distal spermatic cord (asterisk) and a normal testicular appendage (solid arrow)

**Discussion**

Genital embryonal duct remnants in males are predominantly either the vestigial remnant of the paramesonephric (Müllerian) duct which is a testicular appendage located on the upper pole of the testes and commonly called the hydatid of Morgagni or the vestigial remnant of the mesonephric (Wolffian) duct which is located on the head of the epididymis. They are found in roughly 75% and 20% of the population respectively[3]. Furthermore, one large series reported 93.3% and 21.5% sessile testicular and epididymal appendages respectively while 6.7% and 78.5% were stalked testicular and epididymal appendages respectively[3]. When stalked, these appendages are susceptible to torsion resulting in ischaemic necrosis and manifesting clinically as acute scrotal pain. The other genital embryonal remnants very infrequently encountered are the paradidymis (organ of Giraldés) located on the distal spermatic cord and the superior and inferior aberrant ducts (organs of Haller) located near the upper and lower poles of the testes respectively[4].

They are both vestigial mesonephric duct remnants and have been reported to very rarely undergo torsion causing acute scrotal pain[2,5]. As evident in the above case, unlike intravaginal testicular torsion, torsion of the organ of Giraldés like torsion of the testicular and epididymal appendages usually has an insidious onset of symptoms[2], but unlike a torted testicular or epididymal appendage has not been reported associated with a "blue dot sign" on visual inspection of the upper scrotum[1]. Structures of Müllerian and Wolffian origin have been described to have unique histological features, however it is often impossible to distinguish between these two embryonal remnants[6,7]. Therefore, the location of these structures in relation to the testis, epididymis and cord must be specified to enable a diagnosis[6,7]. In the case we describe, based on the intraoperative finding of a necrotic structure arising from the distal end of the spermatic cord, an extremely rare torsion of the paradidymis was diagnosed.

In conclusion, apart from torsion of the testicular and epididymal appendages that surgeons are familiar with, the organs of Giraldés and Haller can very rarely undergo torsion. The treatment is simple excision and a proper description of its location will facilitate the pathologist in making a diagnosis.

Correspondence: OM Aworanti
Children's University Hospital, Temple St, Dublin 1
Email: drgbenga@hotmail.com

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# Animal Attack: An Unusual Case of Multiple Trauma in Childhood

E O'Grady, M Doyle, CWR Fitzgerald, A Mortell, D Murray
Children's University Hospital, Temple St, Dublin 1

**Abstract**

A 2½ year old girl attended our facility following attack by a tapir at a city zoo. She sustained multiple injuries including a forearm laceration and multiple perforating wounds to her abdominal wall. She had several procedures, including bowel resection, performed under the care of the General Paediatric Surgery and Plastic Surgery teams and was treated with a course of IV antibiotics. She recovered well and to date has suffered no long term adverse outcome.

## Case Report

Tapirs are herbivores about the size of a large pig, originating in South America. There have been few reported attacks. Only one of these, a fatality occurring in Brazil[1], is fully documented in the medical literature. Other attacks reported in general media include an attack in the wild and one in Oklahoma Zoo where a keeper was attacked by a female tapir who had recently calved. Our case concerns a 2½ year old girl brought in by ambulance following attack by a tapir at a city zoo. The father reported that the child was attending a behind-the-scenes tour in the animal's enclosure and was attacked by a female tapir who had recently calved. She was bitten, held to the ground and shaken. Her mother intervened and sustained bite injuries while attempting to rescue the child. No loss of consciousness was reported. Initial observations showed Glasgow Coma Score 14-15/15, heartrate 140 and blood pressure 109/54. Multiple injuries were noted including: a deep laceration of the palmar aspect of her left forearm, haematoma on her right forehead and multiple abdominal lacerations, the largest of which was at the left costal margin and had large bowel eviscerated through it.

Following stabilisation and initial imaging she was brought to theatre for a trauma laparotomy. She was found to have a total of 4 wounds on her abdomen – 2 stab/puncture wounds on the right upper abdomen and 1 stab/puncture wound on the left upper abdomen, as well as the large elliptical wound previously noted in the left upper quadrant. There was significant contamination of her wounds with plant matter and soil and extensive tangential muscle injury. All 4 wounds were found to breach the peritoneum. A transverse incision was made from left to right lower stab wounds. Inspection of viscera revealed an 11cm region of serosal injury and perforation in the jejunum approximately 65cm from the DJ flexure. No other visceral injury was found.Resection of the de-serosalised/perforated segment of jejunum followed by an end to end anastomosis was performed. The appendix was also excised prophylactically. The peritoneal cavity and muscle wall defects were washed out and wounds were closed both internally and externally with absorbable sutures.

During this anaesthetic the patient also underwent debridement and primary closure of a left forearm wound under the care of the Plastic Surgery team. Her basilic vein had been traumatically divided within sufficient length for re-anastomosis and so was tied off. Post operatively the patient was nursed in the Paediatric Intensive Care Unit with nil orally, nasogastric tube drainage, catheter output monitoring and intravenous antibiotic therapy with Piperacillin-Tazobactam, Gentamicin and Metronidazole as per the Infectious Diseases team. A peripherally inserted central catheter was inserted Day 1 post op and total parenteral nutrition was started. She did very well and was transferred to the ward Day 1 postop. She continued to improve and started oral diet Day 4 post op. Her wounds remained clean and antibiotics were stopped Day 5 post op. She was discharged home on Day 7 post op. At six-week follow up she was found to have fully recovered and both her abdominal and forearm wounds were healing well with no signs of infection.

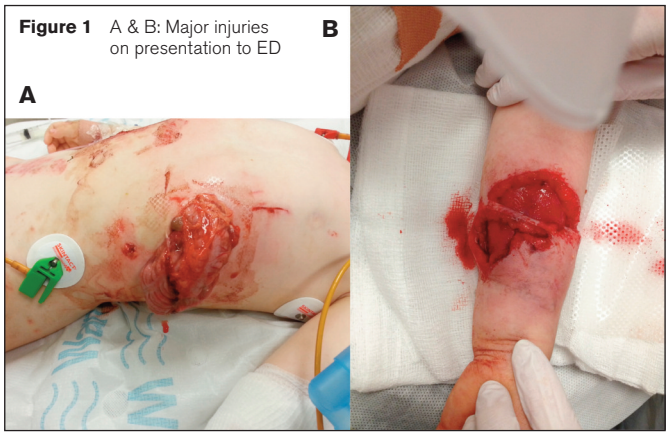


**Figure 1** A & B: Major injuries on presentation to ED

## Discussion

Animal bites (most frequently dog /cat bites) are relatively common in both children and adults, with children being particularly at risk –being both more frequently bitten and tending to sustain more severe injuries (75% of fatalities from animal bites are children).[2,3] Children are also more likely to suffer multiple injuries.[4] Infection is a frequent complication with 15-20% of bites becoming infected.[5] Our patient was fortunate in that she suffered no infectious complications despite being at high risk for infection (puncture wounds, arm wounds, full thickness wounds requiring debridement)[6] and also emerged with no long term morbidity.

Correspondence: E O'Grady
Children's University Hospital, Temple St, Dublin 1
Email: evaogrady@gmail.com

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# Left Atrial Appendage Thrombus with Resulting Stroke Post-RF Ablation for Atrial Fibrillation in a Patient on Dabigatran

R Lobo, C McCann, A Hussaini, TB Meany, TJ Kiernan
University Hospital Limerick, Dooradoyle, Co Limerick

**Abstract**

Dabigatran etexilate is licensed for use in prevention of deep venous thromboembolism and in prevention of stroke and systemic embolism in nonvalvular atrial fibrillation (AF). It has also been used in patients for other indications as a substitute for warfarin therapy because it requires no monitoring; one group being patients undergoing radiofrequency (RF) ablation for AF, although there have been no consensus guidelines with regards to dosage and timing of dose. We report the case of a patient with documentary evidence of left atrial appendage (LAA) thrombus formation and neurological sequelae post-RF ablation despite being on dabigatran. This case highlights the concern that periprocedural dabigatran may not provide adequate protection from development of LAA thrombus and that a standardised protocol will need to be developed and undergo large multicentre trials before dabigatran can be safely used for patients undergoing RF-ablation.

## Case Report

A 58 year old female with recurrent persistent symptomatic AF underwent a RF-ablation procedure. The patient had normal coronary arteries on angiography and mildly dilated left atrium on trans-thoracic echocardiography which was otherwise normal. CHADS2 score was 0, and normal renal function. The patient was on valsartan, lansoprazole, levothyroxine and sotalol, none of which had any known interactions with dabigatran. The patient was anticoagulated with dabigatran 150 mg twice daily for 6 weeks prior to the AF ablation and was omitted the day before and on the morning of the procedure (about 38 hours in total). The procedure was performed under general anaesthesia. Transesophageal echocardiogram (TEE) prior to left atrial access demonstrated no thrombus in the left atrium or the LAA (Figure 1). Heparin bolus (10,000 units) was administered before performing the trans-septal punctures. Heparin was infused via the 2 trans-septal sheaths throughout the case at a combined rate of 1000 units per hour. Additional heparin boluses were administered during the case aiming for target activated clotting time > 300 sec. The procedure involved wide area circumferential ablation and DC cardioversion to sinus rhythm. All pulmonary veins were successfully isolated. Dabigatran was restarted 3 hours after the procedure.

The patient was discharged home the next morning. 48 hours later, she presented with transient right sided hemiparesis and slurred speech. Physical examination at the time of admission revealed mild dysarthria only. Initial computed tomography (CT) scan of the brain was normal. The patient had a repeat TEE which demonstrated spontaneous echo contrast in the left atrium with thrombus present in the LAA (Figure 2). The patient was switched from dabigatran to warfarin with enoxaparin cover. A repeat CT brain performed four days later demonstrated a small acute left cerebellar infarct. The patient made a full recovery and had been well since.

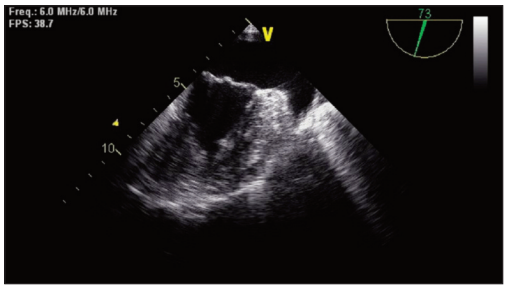


**Figure 1**

Transoesophageal echocardiogram prior to left atrial access demonstrating no thrombus in the left atrium or left atrial appendage

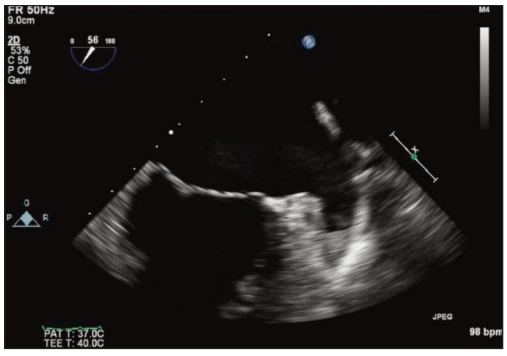


**Figure 2**

Repeat transoesophageal echocardiogram demonstrating spontaneous echo contrast in the left atrium with thrombus present in the left atrial appendage

## Discussion

LAA thrombus can potentially cause significant morbidity. It appears that despite the use of dabigatran pre-and-post procedure, the patient developed a LAA thrombus that subsequently resulted in a stroke. The normal TEE prior to ablation demonstrates that the thrombus formed post-procedure. There have been a number studies looking at the use of dabigatran in patients undergoing RF ablation for atrial fibrillation using different protocols[1-5]. The current data in the literature is conflicting with regards to the use of dabigatran in RF ablation for atrial fibrillation. Our case supports the conclusions of Lakkireddy et al[2]. Some studies with dabigatran are showing promise. Winkle et al[1] showed favourable outcomes using dabigatran post-ablation by covering patients with enoxaparin before starting dabigatran 22 hours post procedure. Bassiouny et al[4] showed favourable outcomes in patients already on dabigatran by restarting dabigatran early (as soon as the procedure ended).

However, it is currently uncertain if there are potential interactions occuring that could alter the pharmacodyamics of dabigatran in patients undergoing invasive procedures. It has been shown that following hip surgery, the absorption of dabigatran can be both delayed and reduced[5]. This could have significant clinical consequences as dabigatran's oral bioavailability is only about 6.5%. There are also questions arising if dabigatran would alter the pharmacodynamics of other anticoagulants. Bassiouny et al[4] have noted that the mean activated clotting time were significantly lower in patients who were on dabigatran, despite the use of higher doses of intra-procedural heparin while undergoing RF-ablation. Although the authors of that study suggest that the higher requirements are secondary to the rapid elimination of dabigatran[4], the exact pharmacodynamics involved is uncertain. It would appear that a definitive protocol would need to be developed and undergo large multicentre clinical trials before dabigatran can be safely used for patients undergoing RF-ablation. Detailed knowledge of the pharmacodynamics of these new agents is essential to ensure safe prescribing. Remember, primum non nocere.

Correspondence: R Lobo
University Hospital Limerick, Dooradoyle, Co Limerick
Email: DoctorRLobo@gmail.com

## Acknowledgements

Cardiac Diagnostics Department, University Hospital Limerick, Limerick; and Cardiac Diagnostics Department, Mater Private Hospital, Dublin.

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# Confronting Evidence: Individualised Care and the Case for Shared Decision-Making

P Ryan[1], D Vaughan[2]
[1]Centre for Health Policy and Management, 3-4 Foster Place, Trinity College, Dublin 2
[2]Department of Leadership and Quality Improvement, Royal College of Physicians of Ireland, Dublin 2

**Abstract**
In many clinical scenarios there exists more than one clinically appropriate intervention strategy. When these involve subjective trade-offs between potential benefits and harms, patients' preferences should inform decision-making. Shared decision-making is a collaborative process, where clinician and patient reconcile the best available evidence with respect for patients' individualized care preferences. In practice, clinicians may be poorly equipped to participate in this process. Shared decision-making is applicable to many conditions including stable coronary artery disease, end-of-life care, and numerous small decisions in chronic disease management. There is evidence of more clinically appropriate care patterns, improved patient understanding and sense of empowerment. Many trials reported a 20% reduction in major surgery in favour of conservative treatment, although demand tends to increase for some interventions. The generalizability of international evidence to Ireland is unclear. Considering the potential benefits, there is a case for implementing and evaluating shared decision-making pilot projects in Ireland.

## Introduction

The traditional hallmark of high quality clinical care was accurate medical diagnosis, and formulation and execution of a treatment plan based on that diagnosis. But the frequent ambiguity of medical evidence and the changing expectations of patients demand other attributes. For some conditions (for example, a fractured femur) there is only one accepted treatment, and patient preferences have little relevance. But for many conditions there exists more than one acceptable path, and each choice entails distinct benefits, side effects and subjective trade-offs. In these preference-sensitive contexts, which may account for a quarter of all health care spending[1], patients' preferences and values can guide the intervention strategy. Shared decision making (SDM) is a process that allows patients and providers to make health care decisions collaboratively, taking into account the best available scientific evidence, as well as patient's values and preferences. This can enhance clinical appropriateness, and improve communication, patients' knowledge, and involvement in decision-making. A study of 1,000 out-patient visits where more than 3,500 decisions were made found that fewer than 10% of decisions fulfilled minimum standards for informed decision making[2], and the importance of improved decision-making is underscored by large variation in treatment patterns within health systems, unrelated to the availability of resources[1].

## Methods

We conducted a literature search on the topic of shared decision making in the PubMed database, using the following search term: (((((“shared decision making”[Title/Abstract]) OR “informed decision making”[Title/Abstract]) OR “informed medical decision making”[Title/Abstract])) AND (((quality[Title/Abstract]) OR evidence[Title/Abstract]) OR effectiveness[Title/Abstract])). The search was restricted to papers published from 2008 to 15th December 2013. A total of 843 papers were found. We included recent systematic and non-systematic literature reviews that summarize evidence and implementation challenges relating to SDM. We identified additional papers and books by searching the bibliographies of references, and the website of the Informed Medical Decisions Foundation.

## Results

*Examples of shared decision-making*

SDM is relevant for numerous clinical conditions associated with preference-sensitive care, such as bothersome lower urinary tract symptoms in men with benign prostatic hyperplasia. If a patient judges the surgical risks of incontinence and sexual dysfunction to outweigh the potential gains, there may be no need for surgery, despite capacity for clinical benefit. In a Canadian orthopaedic study, expert physicians identified patients in potential need of joint replacement based on symptoms and radiographic findings. Only 8-15% of these patients were “definitely willing” to undergo the intervention when informed of its evidence base[3], illustrating the need to balance patients' preferences with evidence. Table 1 presents a selection of relevant clinical scenarios and associated treatment options.

**Table 1: Some applications of shared decision-making[4-6]**

| Condition | Option 1 | Option 2 |
|---|---|---|
| Benign prostatic hyperplasia | Surgery | Medication or watchful waiting |
| Early prostate cancer | Surgery | Radiation or watchful waiting |
| Herniated lumbar disk | Back surgery | Physical therapy and watchful waiting |
| Hip and knee osteoarthritis | Joint replacement | Pain medication |
| Mental health (depression) | Antidepressants | Psychotherapy |
| Carotid artery stenosis | Surgery | Aspirin |
| End of life care | Goal of prolonging life | Comfort care |
| Asthma | Decisions affecting dosage, scheduling, types of medicine | |

SDM is also applicable to many types of care not traditionally considered preference-sensitive, including end-of-life care and the array of small decisions in chronic disease management. An elderly patient with Parkinson's Disease may prioritise certain forms of functionality such as the ability to communicate with relatives over the internet, whereas a physician may define treatment success in narrow terms of biomedical metrics such as presence of tremor. Aggressively optimising particular clinical targets may compromise overall quality of life[7]. In such situations it is sensible to elicit and account for the patient's specific values and goals.

*Tools for shared decision-making*

SDM should convey up-to-date scientific evidence to patients in a comprehensible manner. One strategy is to train clinicians in communication skills and facilitation of SDM. Systematic reviews show this may improve communication, patients' understanding, and satisfaction, but there is no firm evidence of altered clinical outcomes and utilisation patterns[8]. Another approach is adoption of decision aid tools, which inform patients on the risks and benefits of diagnostic and treatment strategies. For example, the Prostate Interactive Education System presents information on prostate cancer treatment in an interactive format. Patients can access the decision aid freely online and examine texts and videos on the rationale for treatment options such as external beam radiation, robotic surgery, and watchful waiting (active surveillance)[9]. It holistically deals with family and relationship issues arising from prostate cancer. For example, a section for women offers written advice and videos of women discussing methods for dealing with a spouse's illness, medical decision-making, social interactions with family and friends, and side effects of treatment. On the topic of radical prostatectomy, there are video simulations of physician counselling for topics such as pain, relative effectiveness, and interaction with medicines.

*What does the evidence say?*
A recent Cochrane review summarises much of the evidence for decision aids addressing treatment or screening decisions. It showed improved patient-clinician communication, superior patient enthusiasm, knowledge, understanding of trade-offs, and involvement in decision-making. The effects on consultation length were inconsistent. There appeared to be no adverse effects on patient satisfaction or clinical outcomes[10]. Adoption of decision aids was associated with a 20% reduction in utilisation of major surgery in favour of conservative treatment, reduced use of PSA screening, and reduced use of post-menopausal hormones. A study found that women in the United Kingdom suffering from abnormal uterine bleeding, when informed properly of the risks and benefits chose surgery significantly less often (relative reduction of 20%). Patients with back pain and herniated disks were 30% less likely to choose surgery when fully informed[10]. Some demand may be postponed rather than obviated. The economic consequences are unclear. Reduced utilization may not translate into reduced net costs, as this is influenced by implementation costs and the sensitivity of cost structures to reduced demand. The generalizability of utilization reductions is unclear. Much evidence is from the predominantly market-oriented US system, and some comes from settings such as Canada and the United Kingdom[6,10]. The effects may vary across settings depending on baseline provision rates. The goal is to avoid both overuse and underuse rather than to uniformly temper demand. SDM tends to increase demand for some interventions such as spinal stenosis surgery

*Caveats and limitations*
Do patients truly want the added responsibility of SDM? Some patients may prefer to delegate the burden of decision-making to a clinician, and SDM may be incongruent with patients' psychosocial needs, especially in the face of far-reaching uncertainty, fear and distress. If patients (or their families) choose a treatment that culminates in poor outcomes, the ensuing guilt may amplify anguish and regret. Nonetheless evidence suggests SDM has high levels of acceptability with patients and can improve the care experience. In one provider organisation, 76% of patients over 65 years would "strongly recommend" use of a decision aid prior to deciding on a surgical procedure[11]. In a study of 20 women with suspected recurrent ovarian cancer, 95% would recommend the use of a decision aid, despite its association with high anxiety levels[12].

SDM may impose a cognitive burden unsuitable for some patients. People are prone to inconsistent and irrational decision-making, and framing the same evidence in different ways can alter perceptions of effectiveness, for example patients and physicians may perceive a "10% mortality rate" differently from a "90% survival rate"[13]. Studies suggest that physicians and patients frequently misinterpret statistical evidence[6]. Mammography screening for breast cancer has a miss rate of around 10%, and its false positive rate is only slightly lower, but in a German study 46% of women (and 42% of men) reported it as "absolutely certain". SDM must be carefully structured to overcome such misunderstanding.

## Discussion
Implementation of SDM touches on cultural issues, and it can be difficult to alter established work practices. In a Veterans Administration hospital, a decision aid for benign prostatic hyperplasia lowered the demand for surgical procedures and maintained patient satisfaction, but its use was terminated after the volume of surgeries became insufficient for urology residents to attain board certification[14]. In a study of SDM in end-of-life care, treatment intensity persistently exceeded patients' recorded preferences[15]. It is unclear if clinicians disregarded patients' preferences, or whether unmeasured changes in patients' preferences occurred as death approached. The prevailing medical culture urges clinicians to do their utmost to heal, and this may inadvertently deter tempering of treatment intensity in accordance with patient preferences. SDM may prove a key tool for Irish clinicians to reconcile evidence-based medicine with individualized care. Successful implementation could substantially influence patterns of clinical care, and this demands multi-stakeholder commitment to improvement.

Correspondence: P Ryan
Centre for Health Policy and Management, 3-4 Foster Place, Trinity College, Dublin 2.
Email: ryanp17@tcd.ie

**Acknowledgement**
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# RE: Follow-up Arrangements for Breast Cancer Patients; Is it Appropriate to Transfer Surveillance to General Practitioners?

Sir,

The literature review by Kerrigan et al confirms the alacrity and confidence that patients have in screening follow-up care provided with their General Practitioner. It confirms that results of follow up in general practice are favourable versus hospital review. The study alludes to the provision of such care in Canada and the Netherlands, albeit at an early stage of development. The provision of such care in the jurisdictions of both Canada and the Netherlands comes in the context that up to 10% of their health budget is provided to General Practice Care compared to a State spend of 2.3% in Ireland whilst the Gross Health spend in both jurisdictions as a percentage of GDP is of the order of 10.4% and 12% respectively. Ireland languishes at a below average OECD health spend of 8.5% of GDP. One has to remember that this difference is in the order of billions of euro spent on healthcare resources and systems. Both Canada and the Netherlands have spent decades investing in General Practice thus allowing innovative patient-centred cost effective transfers of care from secondary to Primary Care.

The article indicates confirmation that the proposed transfer of follow up care of Breast Cancer patients to General practice by the National Cancer Programme to be appropriate whilst signalling that "further resources may be required to aid such transfer" reflecting the "resulting additional workload". The research found that General Practitioners were equally divided regarding their support for transfer of follow up. The study is timely as it comes some 18 months after the attempted transfer of Breast Cancer patients without engagement with the IMO and without recognition of the resources required to ensure best practice transfer, possibly explaining the dichotomy of views of the study population.

The Irish Medical Organisation GP Committee welcomes and supports the planned transfer of secondary care workload to primary care with the provision of appropriate resources through discussion and agreement with the IMO as the representative body for GPs. It is only by such engagement that a structured programme with organised surveillance and equity of access that optimal care will prevail. Indeed it is only by the advocating of such an approach by General Practitioners that patients will continue to have confidence in the care that they provide.

R Walley
Vice President and Chair of GP Committee, Irish Medical Organisation

# Pseudo-Pseudogout

Sir,

Calcium pyrophosphate (CPP) arthritis was classically described in terms of "pseudo" presentations including pseudo-gout, pseudo-rheumatoid arthritis and pseudo-osteoarthritis[1,2]. We present here a case of rheumatoid arthritis (RA) presenting as apparent CPP arthritis, a case of pseudo-pseudogout.

**Case Report**

A twenty-eight year old woman presented with an eleven month history of right knee pain and swelling and a four month history of left wrist and knee pain and swelling. Right knee aspirate five months previously demonstrated CPP crystals. Her left wrist and knees were hot, tender and swollen. Routine haematology, biochemistry and urate were normal, erythrocyte sedimentation rate was 63mm/hr and C-reactive protein 46mg/L. Rheumatoid factor, anti-cyclic citrullinated peptide antibodies and metabolic screen were negative. Right knee radiograph was normal. Magnetic resonance imaging of the right knee demonstrated synovitis and diffuse cartilage loss. A diagnosis of chronic CPP crystal inflammatory arthritis was made and she was commenced on colchicine 0.5mg twice daily. On review two months later she had persistence of her previous symptoms and in addition had developed pain and swelling of the small joints of her hands and early morning stiffness of two hours. There was synovitis at the wrists, knees, ankles, metacarpophalangeal , proximal interphalangeal and metatarsophalangeal joints. Tender and swollen joint counts were 20/28. A diagnosis of seronegative RA was made. She commenced methotrexate and a prednisolone taper and has had significant symptomatic improvement.

**Discussion**

The presence of CPP crystals is commonly used to confirm the diagnosis of CPP arthritis[1]. However CPP crystals have been described as occurring in patients with rheumatoid arthritis in up to 25.8% of cases[3]. There is a strong correlation between patient age and disease duration in rheumatoid arthritis patients in whom CPP crystals are found, our case is unusual given the patient's youth and the short disease duration[4]. Our case met the European League Against Rheumatism diagnostic criteria for chronic CPP crystal inflammatory arthritis and the 2010 American College of Rheumatology/European League Against Rheumatism classification criteria for rheumatoid arthritis[1,5]. In our clinical judgement given the patient's age, lack of an identifiable metabolic precipitant or positive family history, and a typical clinical examination consistent with rheumatoid arthritis, this was the most likely unifying diagnosis. In conclusion we report here a case of rheumatoid arthritis presenting initially as apparent crystal confirmed CPP arthritis. Our case demonstrates the constant need to re-evaluate diagnoses in the light of symptom progression and through the prism of time.

C Low, R Conway, FD O'Shea
Department of Rheumatology, St. James's Hospital, James's St, Dublin 8
Email: drrichardconway@gmail.com

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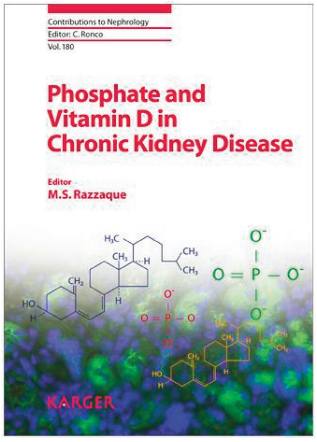
# Phosphate and Vitamin D in Chronic Kidney Disease

**Editor:** Mohammed S Razzaque

**Publisher:** Karger

Understanding phosphorus homeostasis in chronic kidney disease is essential in order to enhance patient care. Phosphorus homeostasis, until recently, was considered as secondary to changes in calcium metabolism based on interactions between the calciotophic hormones, parathyroid hormone (PTH) and activated vitamin D. The necessity to maintain ionised calcium within a tight range is ensured by an exquisitely sensitive and rapid response in PTH secretion. In states of hypocalcaemia, PTH maximises reabsorption of filtered calcium but at the same time impairs phosphate reabsorption. PTH promotes activation of vitamin D in the kidney, which in turn enhances both calcium and phosphorus absorption from the intestine that compensates in part for the renal losses. To a lesser extent, PTH activates bone remodelling with a negative remodelling balance releasing both calcium and phosphorus from the skeleton. In chronic kidney disease, phosphorus retention and declining ability to activate vitamin D both predispose to hypocalcaemia with consequent rise in PTH secretion manifesting with chronic secondary hyperparathyroidism. Medical strategies aimed at curtailing phosphorus dietary intestinal absorption with various binders coupled with administration of activated vitamin D are partly successful. But the principal concern remains regarding phosphorus toxicity manifesting with widespread vascular mineralisation as a consequence of an increased calcium-phosphorus ion product, which is associated with substantial morbidity and mortality.

The understanding of phosphorus homeostasis in general, and in chronic kidney disease in particular, has been expanded immeasurably by the discovery of fibroblast growth factor 23 (FGF23) and Klotho. Any nephrologist or endocrinologist who manages patients with disorders in phosphorus homeostasis should read this book. It is a multi-authored book with easy to read chapters and informative figures that cover the concepts related to FGF23 – its production in bone, its action in impairing renal phosphorus reabsorption by inhibiting expression of sodium-phosphorus transporters in the kidney, its inhibition of 1-hydroxylation of vitamin D, its stimulation of catabolic pathway for vitamin D, and its inhibitory effect on PTH secretion – all key components of calcium homeostasis. The reader will also learn about Klotho, which is predominantly a membrane-bound protein that acts a co-receptor for FGF23 as it binds to its receptor FGFR1. Klotho may also have a direct effect on renal phosphorus handling. Klotho expression is also important the effect of FGF23 on the parathyroid gland. In advanced secondary hyperparathyroidism when there is nodular hyperplasia Klotho expression on the parathyroid gland is diminished, suggesting that preventing secondary hyperparathyroidism is critical. The book opens up the possibility of future interventions than may ameliorate the hyperphosphatemia of chronic kidney disease and its devastating consequences.




M McKenna
Endocrinology Department, St Vincent's University Hospital, Elm Park, Dublin 4

# Continuing Professional Development

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

## Victimisation and Psychosocial Difficulties Associated with Sexual Orientation Concerns: A School-Based Study of Adolescents

P Cotter, P Corcoran, J McCarthy, F O'Suilleabháin, V Carli, C Hoven, C Wasserman, M Sarchiapone, D Wasserman, H Keeley. Ir Med J. 2014; 107: 310-3.

**Question 1**
The number of secondary schools involved in the study was

a) 11
b) 13
c) 15
d) 17
e) 19

**Question 2**
The number of adolescents studied was

a) 1112
b) 1212
c) 1312
d) 1412
e) 1512

**Question 3**
The number of students with sexual orientation concerns was

a) 56
b) 58
c) 60
d) 62
e) 64

**Question 4**
The prevalence of suicide attempts among students with sexual orientation concerns is

a) 23%
b) 25%
c) 27%
d) 29%
e) 31%

**Question 5**
The rate of physical assault on students with sexual orientation concerns was

a) 30%
b) 35%
c) 40%
d) 45%
e) 50%

## A Pilot Cross-Sectional Study of Patients Presenting with Cellulitis to Emergency Departments

M Quirke, J Saunders, R O'Sullivan, H Milenkovski, A Wakai. Ir Med J. 2014; 107: 316-8.

**Question 1**
The number of patients with cellulitis was

a) 51
b) 53
c) 55
d) 57
e) 59

**Question 2**
The rate of cellulitis was

a) 10 per 1000
b) 12 per 1000
c) 14 per 1000
d) 16 per 1000
e) 18 per 1000

**Question 3**
The number treated with IV antibiotics was

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

**Question 4**
The number treated with oral antibiotics was

a) 23
b) 25
c) 27
d) 29
e) 31

**Question 5**
The mean age of the patients with cellulitis was

a) 47.9 years
b) 48.9 years
c) 49.9 years
d) 50.9 years
e) 51.9 years

## A Quantitative Analysis of Diabetic Retinopathy Screening in a Regional Treatment Centre

M James, TH Heng, D Minasyan. Ir Med J. 2014; 107: 321-3.

**Question 1**
The proportion of the adult population with diabetes is

a) 2.5%
b) 3.5%
c) 4.5%
d) 5.5%
e) 6.5%

**Question 2**
Between 1996 and 2003 the number diabetics registered as blind increased to

a) 313
b) 323
c) 333
d) 343
e) 353

**Question 3**
The number of diabetic patients in the study was

a) 91
b) 93
c) 95
d) 97
e) 99

**Question 4**
The proportion of diabetic patients screened with retinal photography was

a) 11%
b) 13%
c) 15%
d) 17%
e) 19%

**Question 5**
The number of patients with no retinopathy or background retinopathy only was

a) 76
b) 78
c) 80
d) 82
e) 84

# It pays to protect your income

## Can you afford not to safeguard your largest financial asset and in doing so protect your lifestyle?

### What is Income Protection?

Income protection will provide you with an alternative regular income if you suffer an illness or injury that prevents you from working.

### Why should you consider this form of protection?

Since March 31st 2014 paid sick leave for public service employees including HSE employees has been reduced:

| Old arrangement: | New arrangement: |
|---|---|
| Six months full pay | Three months full pay |
| Six months half pay | Three months half pay |

### The facts

There are numerous products on the market with similar features:

- Benefit cannot exceed 75% of pre-disability income
- Benefits cease on recovery, return to work, retirement or death
- It can pay out after 8, 13, 26 or 52 weeks following illness or injury
- To protect against inflation, payments to claimants can be indexed
- Applications are subject to underwriting
- Tax relief is available on your premiums at your marginal rate of tax

**As IMO FS is not tied to a single life assurance company, we can search the market for the cheapest quotes on your behalf and advise you on the product most suitable to your specific circumstances.**

**You can also avail of a tailored income protection product offered exclusively to IMO members. It is specifically designed with the medical profession in mind and offers special features such as:**

* **Cover while abroad** *(e.g. EU countries, USA, Canada, Australia, New Zealand, South Africa, Saudi Arabia). This is of particular interest to those planning to gain work experience abroad for a period of time.*
* **Includes a percentage of overtime when calculating maximum benefit**
* **Special offers available**

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