The Advanced Nurse Practitioner

ACAP
Acute Care
Advanced Practitioners

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The journal for members of ACAP

Produced in association with
Skills4Nurses

Scotland Leading the way for Acute Care Practitioners

ACAP Scotland is a new and exciting network that will enable all acute care practitioners to register as members allowing provision for bi annual forum events. These events will host guest speakers, work shops, master classes and the opportunity for discussion on topical subjects. Most importantly the forum will facilitate educational and professional development.

Members will also be entitled to quarterly newsletters and unlimited ACAP web site access

Acute care practitioners in Scotland have never had until now:

- The privilege of having an arena to showcase areas of good practice,
- The opportunity to bench mark other practices throughout Scotland,
- A national opportunity for education
- And most importantly have their voice heard.

Now with the onset of ACAP forum Scotland all this will be possible.

Mission Statement

The purpose of the forum is to promote and develop the professional role of the acute care advanced nurse practitioner in partnership with stakeholders, in order to advance the quality of care delivered to patients and clients.

ACAP Scotland Leading the way

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To receive a copy of future ACAP publications please email elaine.headley@gmail.com or jsmith53@nhs.net

Welcome

ACAP would like to welcome Caroline Nicholson and Jill Mundy, from Lothian, to the committee as non executive members. Their recommendation comes from Janet Corcoran, who resigned her post in April.

Murrayfield Event

It has now been 4 months since our Murrayfield conference which was an extremely well received event. The videos of the day are now available to peruse or download from the ACAP website. These can be found under the new tab 'master-class'

The ACAP committee have analysed the feedback you gave us from the Murrayfield event and will endeavour to meet the suggestions you have recommended. The feedback and suggestions can be found on the ACAP website.

ACAP 3rd Forum Event

The team have been planning conference number 3 since April. We can announce that this will be held in The Lighthouse building in Mitchell lane, Glasgow. Date will be 2nd November 2012. Once again ACAP has managed to keep the cost at £30.

Confirmed speakers include:

- **Dennis Purcell**, expert & author on minor injuries.
- **Dr. Pete Thompson.** Renal consultant Glasgow Western Infirmary, also fellow with SPSP. Pete will speak about fluids & electrolytes
- **Mr David Watson.** Practitioner NHSL, who is currently studying for his Doctrine in nursing. David will present his thesis proposal.
- **Ms. Laura Harvey.** Laura is a senior charge nurse in Ayrshire & Arran and will present on HEWS to HDU.
- **Ms. Karen Kindness.** Karen is from Aberdeen and will present her role as an ANP in cardiothoracic—an evolving role
- **Mr. Irwin Turbitt.** key note speaker at this year's NHS Scotland conference, will talk on leaders & leadership, plus hold interactive workshops.
- **Professor Kevin Rooney**. Kevin will talk on the work that is underway on Sepsis 6 & VTE's
- **Mr. Pat Whelan.** Pat will take us all on the journey he and his sister experienced from a recent stay in hospital. Food for thought for us all!

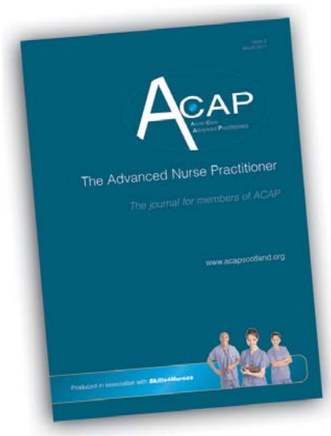
AHP's are continuing to show interest in ACAP. The SAS will be promoting the organisation through their intranet services. David Fitzpatrick, clinical research paramedic, will have a poster display at the next forum event; on advancements and research being undertaken within the service.

Future Developments

Work is underway to provide ACAP members and web users with OSCE sheets for physical assessment. This is being lead by Mhairi Sheron from Grampian. When they are completed these sheets will be available to download from the ACAP website. They will follow a traffic light theme, which will allow evidence of progression for the practitioner.

Pennie Taylor, freelance journalist & broadcaster, will be interviewing Elaine Headley, to promote ACAP, its origins and its progress. This will help raise the ACAP profile

The succession planning questionnaire findings have given ACAP some good data and have identified real gaps in the development of advanced practice. ACAP intends to pursue this with the best interests of the ACAP members, to make provision for succession planning and other areas of development.

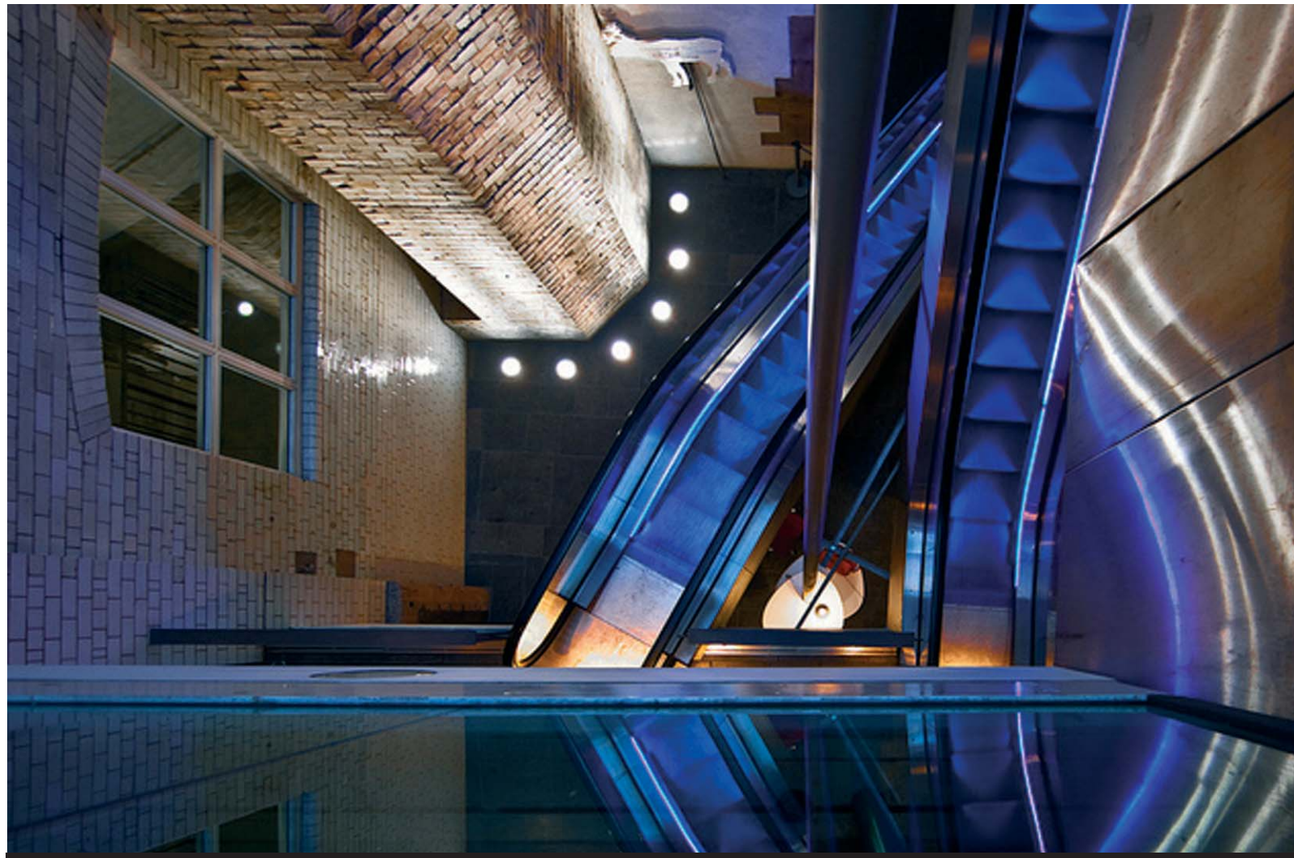


Twitter

ACAP now has more than 100 followers on Twitter—you can find out more from @acapscotland

Skills4Nurses

Nursing & Midwifery Recruitment Event
3rd October 2012 : Skills 4 Nurses
Grand Central Station Hotel, Glasgow. Recruitment exhibition. Free entry for all healthcare professional. Your chance to meet future employers face to face from UK & overseas. For further information call 01292 525970 or log onto: www.skills4nurses.com



The Lighthouse
Scotland's Centre for Design and Architecture

The Lighthouse in Glasgow, is Scotland's Centre for Design and Architecture. It was opened as part of Glasgow's status as UK City of Architecture and Design in 1999.

The Lighthouse is the renamed conversion of the former offices of the Glasgow Herald newspaper. Completed in 1895, it was designed by the architect John Keppie, of whom Charles Rennie Mackintosh was an apprentice. It is often mistakenly attributed to Mackintosh.[1] The centre's vision is to develop the links between design, architecture, and the creative industries, seeing these as interconnected social, educational, economic and cultural issues of concern to everyone.

ACAP Scotland has reserved the Conference suite and Gallery 5 for your next event.

IMPROVEMENT METHODOLOGY – ONLY PART OF THE STORY

Eileen M Moir: Designs and Dialogue for Improvement: July 2012

Introduction

Having been preoccupied for most of my health service career with improving quality, the growing focus on improvement science had left me questioning the extent to which I had actually achieved anything given the lack of quantitative evidence to demonstrate improvement. The NHS improvement movement has gathered pace in recent years influenced by The Health Foundation and global leaders such as the Institute of Healthcare Improvement. The Scottish Patient Safety Programme is an exemplar in this respect.

There has been a corresponding increase in learning and development programmes aimed at building skill in improvement science. Many of these focused on single branded methodologies such as Lean and the Model for Improvement. Wheatley (2009) is critical of over-engineered approaches and speaks about when simple processes become techniques they only grow more complex and difficult, never simpler. They become the specialised knowledge of a few experts, and everyone else becomes dependent on them. We forget what we bring to the party and act like 'meek students of difficult methods'.

There will always be a need for a small number of people trained to expert level in any discipline but I was previously struck by the number of colleagues who undertook intensives in improvement methods only to feel isolated on return to their substantive post because they were unable, for a variety of reasons, to apply their knowledge in mainstream situations (MacGregor and Moir 2011).

In my former role as Nurse Director with NHS Quality Improvement Scotland (now Healthcare Improvement Scotland), work and study with the Institute of Healthcare Improvement introduced the potential of a more systematic approach. However, on its own improvement methodology felt as if it was only part of the story and I noticed that the 'certainty' with which some improvement experts saw things could jar with those who took more of an inquiring view of the world.

GenerationQ – Getting to the Heart of the Matter

GenerationQ, the Health Foundation's most recent Quality Improvement Leadership Programme, tackles this tension head-on. The programme runs for between 18 months to 2 years with exit awards at Post Graduate Certificate, Diploma and Masters level in Quality Improvement Leadership. Ashridge Business School and Unipart Expert Practices have blended their philosophies, methods and expertise to deliver the programme in partnership. Ashridge specialises in the dynamics of organisational change and relational leadership and Unipart bring expertise in improvement science (The Health Foundation 2012).

Ashridge and Unipart have created a truly unique developmental experience which turns on its head all that we thought we knew about how to lead improvement and manage transitions. Eighteen participants were drawn from all healthcare sectors across the UK, including the third sector. It was a diverse group of senior clinical leaders, general managers and quality improvement leads. The GenerationQ approach involves deep inquiry into organisational context, culture and relational leadership and the diversity within the group made the learning experience all the more profound. A range of improvement methodologies were examined in depth, including how to select the most appropriate approach for each context, but it was the sense of balance and roundedness that drew me to apply for the Fellowship.

Having immersed myself in the cycles of inquiry, experimentation and reflection over the two years of the programme, I recognise that improvement facilitated purely as an emergent property, nurtured from the ground-up can potentially meander without the focus and creative tension generated by goals and measures. Whilst there will always be a place for highly directive approaches, as in emergency situations, improvement solely as a directed process can be constraining. Both can cause anxiety and create barriers when overused and in isolation to each other.

Goals and measures help to set the parameters within the system and focus the change effort. Without the 'how much by when' answer, the quest for improvement can become aimless with the potential loss of stakeholder commitment along the way in the vagueness of it all. For example, if you have to reduce your expenditure the first question will always be 'by how much' and the second will be 'by when'. The task is almost impossible without this clarity. It is similar when leading service improvement - if you don't know the parameters then it's difficult to know what needs to be done, what had been achieved and indeed what difference it made anyway.

Equally we know that too much tension in the system, as a result of overly rigid targets, can squeeze out the innovation needed to generate improvement. If we accept that improvement is largely a self-organising, emergent property, the outcome of which can't really be predicted, then this would go some way in reducing the stress that so many health service leaders feel when change programmes appear to falter. We are almost certain to feel frustrated if our expectations are too fixed on a single route to success. If instead, we are able to be more flexible and go with the opportunities that present themselves (like catching the waves) then there is potential for something really innovative to happen. Stacey (2010) coins a great phrase in this respect - 'unknowable but recognizable futures'. Admittedly this flies in the face of the goal orientated approach of improvement science, but it is the working with both that enables change to happen.

Kahane (2011) uses the analogy of 'Power and Love' and elegantly captures the dance between these two opposing drives. He defines power (top-down approaches) as 'the drive of everything living to realise itself, with increasing intensity and extensity' and love (ground-up dialogue) as 'the drive towards the unity of the separated - to make whole that which has become or appears fragmented'. He believes that to create something new and lasting, especially when major culture shifts are required, we have to work with both these drives and act with connection.

A Different Way of Seeing

Improving care for older people in Scotland's acute hospitals is one such example where a major cultural shift is required and was the focus of my Masters submission for GenerationQ. The Cabinet Secretary laid down the challenge in June 2011 by launching a programme of inspections but enabling improvement will take more than adapting a few policies, practices and supporting staff to be more compassionate. We need a fundamental re-think of how we care for older people in our society, not just in our acute hospitals. This is a highly complex problem with its roots going back to the social inclusion policies at the end of last century. We have also seen shorter lengths of acute hospital stay, to increase throughput and reduce waiting times, resulting in compressed and sometimes fraught clinical encounters.

Looking at this problem through a whole systems lens, it is easier to identify the unintended consequences of previous priorities and policies. We didn't know at the time about the likely rise in dementia rates when we closed the geriatric assessment wards but even so, these policies would have been right for the time. Similarly, shorter hospital stays reduce the potential for harm, but can have a negative impact on person centredness. This is what Homer-Dixon (2008) calls a 'slow-creep problem' where we don't see the changes then all of a sudden there is a non-linear shift and we find ourselves in crisis.

Rather than jumping too quickly to quick fix solutions a first step might be to stand back and look for the self-reinforcing aspects of the system that brought us to this point and begin addressing them systematically. It requires some clear sighted leadership, an orchestra of contributions and opening up to the reality that we have a tough problem but that it is no one group's fault.

Having recently entered the world of consultancy in Designs and Dialogue for Improvement, I intend to make simplicity my goal. When deconstructed, none of the concepts of improvement science are new or difficult. It is the honouring of both drives that requires the greatest time and effort and can only be enacted by the people leading service improvement on the ground. Combining improvement skills with the transformational power of appreciative inquiry and really listening and understanding one another through dialogue and building on the rich insights that emerge, is what creates the conditions for lasting change.

If I am to be an expert in anything, it has to be in the art of connecting with people, facilitating new ways of seeing and helping to make sense of these for the local context. Success for me will come from working in an equal partnership with stakeholders such as Advanced Nurse Practitioners to combine our pre-existing knowledge and skills in pursuit of service improvement. This way we learn together, improve services and contribute to the growing body of knowledge of what works and why within the Scottish context.

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Using nanoscale CT in the development of new classes of antibiotic

Dr. Gerry McDermott

Gerry is a Biophysicist in the School of Medicine, University of California San Francisco. He is also a Senior Scientist in the National Center for X-ray Tomography, and a Senior Scientist Affiliate in Lawrence Berkeley National Laboratory. Prior to taking up these positions he was Head of the Berkeley Center for Structural Biology, and worked closely with pharmaceutical companies, such as Pfizer, Roche, Amgen, Tularik and Vertex.

Developing new drugs is a notoriously expensive, high-risk enterprise. Forbes recently estimated that bringing a new drug to market cost between $4 and $11 Billion in R&D1. In recent years, companies have reported a steady increase their R&D budgets. Unfortunately, this increase hasn't lead to an upsurge in new drugs becoming available. On the contrary, there has been a steady decline in the number of new drugs against new targets[1]. This is a major concern in the pharmaceutical industry. Many commentators are now predicting the lack of new drugs in the pipeline, coupled with expiring patents on the biggest sellers, will lead to a 'death spiral'. For example, in 2010 there were only 21 new molecular entities released onto the global market, the fewest this decade. More importantly, in the same year, the number of drugs entering Phase III trials had dropped to 55% of the level in 2007[2]. As a result of this crisis, a number of therapeutic areas are now very poorly served in terms of drug options. A case in point is antimicrobials, where – despite the impetus to develop new drugs that circumvent microbial resistance - only one antibiotic belonging to a new class, daptomycin has made it into clinics in the past 50 years[3]. As a result of working for decades with little success, many pharmaceutical companies are now either abandoning the search for new antimicrobials, or dramatically reducing their R&D budgets in this area[3]. This is a troubling situation, particularly since outbreaks of infections by multidrug-resistant bacteria are becoming evermore common. In Europe there were 400,000 infections by multidrug-resistant bacteria in 2007. These resulted in 25,000 deaths and 2.5 million extra days needed in hospital. The cost of the latter alone was estimated at 1.5 Billion Euros. In the United States the situation appears even more dire, with antibiotic resistant infections currently being responsible for 8 million extra days in hospital, at a cost of approximately $20 Billion a year[2].

The question obviously becomes 'if our current model for drug discovery isn't working, what can we change'? Lets first consider how most drugs have been developed. Typically, this process has relied on designing or discovering a molecule that perturbs the function of a single gene, protein or molecular event [4], and then optimizing its efficacy. In concept, this is a logical approach. However, taking such a highly targeted approach – which is based on the assumption that disruption of a single gene or molecular mechanism is a key event in a disease ontogeny - is now thought to be one of the main failings of this model. Simply put, living systems are far too complicated to be described is such a naïve way. As a result, there is now a significant move towards testing and visualizing drug candidates directly in the complexity of a fully functional living system, such as cells, and doing this as early as possible in the drug development process.

For the past few years we have been working towards this goal by developing high-resolution nanoscale CT (Computed Tomography) [5]. This technique allows the structural differences between normal and diseased cells to be visualized, and the consequences of exposing either to candidate drug molecules quantified. Our nanoscale CT instrument is similar in concept to a clinical CT, but differs in a number of areas. Obviously, rather than looking at a torso or head, this new instrument only images individual cells, or small pieces of tissue (up to 15 microns thick). However, these small specimens are imaged at very high spatial resolution (50 nm or better). By using 'soft x-rays' - rather than the 'hard' x-rays used in clinical CT - the cells or tissues specimens can be imaged without the need to use contrast-enhancing agents. Biological molecules absorb 'soft x-rays' strongly compared to water. Consequently, sub-cellular features can easily be distinguished, and quantified based on differences in molecular composition. For example, cellular structures such as lipid bodies appear very dense (like bones in a clinical CT), whereas structures like mitochondria or lysosomes much less so. As with clinical CT, data from the nanoscale version allows a 3D reconstruction of the specimen to be calculated, and viewed as a series of slices, or sections. We have also developed an accompanying light-microscopy based technique that allows us to carry out hybrid imaging (in effect, this combination is analogous to clinical CT-PET scans in terms of information content and utility, but carried out on cells rather than patients) [6]. As with CT-PET we can image abnormalities inside a cell, and correlate this with the location of specifically labeled molecules. In clinical PET this would be an indicator of metabolic turnover, in the nano version this can be practically any molecule in the cell.

In our first demonstration of the technique we imaged the sub-cellular consequences of treating the opportunistic pathogen Candida albicans with candidate drug molecules[7]. In this trial we used molecules, called peptoids, which mimic naturally occurring antimicrobial peptides (AMPs). AMPs are ubiquitous in Nature, and act as our first line of defense against microbial infection. To date, microbes have not been able to build resistance mechanisms against AMPs, despite AMPs being present in the environment for millenia. In principle, this characteristic makes AMPS an ideal candidate for development as antimicrobial drugs. However, AMPs have one major failing as drug candidates, they easily succumb to degradation in the bloodstream. AMP mimetics, such as peptoids, function with equal antimicrobial efficacy, but being synthetic in origin are less prone to proteolysis in the body.

We began by performing nanoscale CT scans on benign Candida albicans cells, to get a baseline understanding of the sub-cellular organization. Like Dr. Jekyll and Mr. Hyde Candida cells undergo a significant morphological transition prior to becoming pathogenic. Most strikingly, they grow long hyphal protrusions that can penetrate host cells. The transition from benign to pathogenic – which is easily carried out in the lab by simply altering the pH and growth temperature - is illustrated in the tomographic reconstructions below.

[1] http://www.forbes.com/sites/matthewherper/2012/02/10/the-truly-staggering-cost-of-inventing-new-drugs/

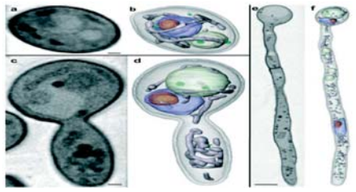

Figure 1. The three morphological forms of Candida albicans visualized in 3D by nanoscale CT. a,c and e are sections through the reconstructed tomograms. b, d and f are the same cells after the principle organelles have been segmented (Color code: nucleus in blue; nucleolus, orange; mitochondria, grey; vacuoles, white; lipid drops, green). The cell depicted in a/b is the benign form of Candida. c/d is a cell in transition to the pathogenic form. e/f is the fully pathogenic hyphal form. Scale bars: a,b,c, and f= 500nm; e and f = 2 microns.

To function as an effective antimicrobial against Candida the drug doesn't necessarily need to kill the cells, just prevent the transition from the benign to pathogenic forms – in other words, stop Jekyll from drinking his potion. Most of us live blissfully unaware that we have the benign form of Candida on our skin, and present as a component of our intestinal microbiome. After treating pathogenic Candida cells with peptoids – at a concentration known to stop growth, but not kill the cells - we imaged cells using nanoscale CT (shown below). It was immediately obvious that the peptoid molecules had prevented Candida cells from growing long hypha, and remained non-pathogenic. On closer inspection it was clear that the peptoids had caused significant structural changes inside the cells. In particular they caused changes in the nucleoli and induced the inclusion of large lipidic bodies into the nucleus.

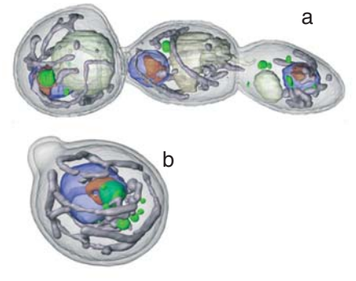

Figure 2. Candida albicans cells treated after treatment with two different peptiods. a, treatment with peptoid 1 resulted in cells that couldn't complete the transition into the pathogenic form (e/f in Fig. 1). b, treatment with a different class of peptiod retained the cells in the benign form, and caused structural changes inside the cell, such as a large lipid body (green) being incorporated into the nucleus and an alteration in the shape of the nucleolus (orange) compared to untreated cells

So how does this type of information help with the development of new antibiotics? In the first instance, we now have the means to quantify the effect of peptides and peptide-like molecules in the control of Candida morphology, and therefore, pathogenicity. In future work, we can alter the molecular composition and configuration of the peptoid molecule and quickly determine if the changes are more or less perturbing on the cellular structure of Candida. This type of quantitative feedback is invaluable in optimizing a drug in terms of efficacy and efficiency of delivery. But, more importantly, we know have very strong visual representation of the changes that take place inside pathogen cells treaded with peptoids. We can now image a range of human cells using nanoscale CT to determine if peptoids induce similar perturbations in these cells. If so, then this particular class of peptoids can be eliminated from consideration, without having to wait until negative results are obtained from expensive animal, or even human trials. Moreover, potentially malevolent changes can now be identified in cellulo. These changes may have devastating consequences over the long-term, but present no symptoms in the short. Imaging the effect of candidate antimicrobials on healthy human cells should help identify drug-induced changes long before they become an issue in a living body.

Summary

Using nanoscale CT is a promising new approach to drug discovery. Use of this technology could reduce the time, cost and risk involved in this process by identifying the cellular level consequence of exposure to candidate drug molecules. The information gained from nanoscale CT can be used to eliminate unsuitable molecules early in the process, and promote candidates that are both effective and non-damaging to human cellular structure and organization. In addition, being able to visualize the consequences of drug treatment will help guide the development of new classes of drug, particularly antibiotics that can overcome multi-drug resistance. Currently, this work is still at relatively early stages of development, and realistically won't have an immediate impact on clinical medicine and the availability of new antibiotics. Preventing the spread of multidrug resistance is – and possibly will always be – achieved most effectively by public education and the proper use of existing antibiotics.

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Using the Model for Improvement to develop a new escalation warning system for HDU – "HEWS"

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INTRODUCTION

The Scottish Patient Safety Programme (SPSP) was introduced by the Cabinet Secretary in early 2008 with clear aims to improve the safety of patients in our hospitals. Based on the work of the Institute of Healthcare Improvement (IHI 2008), the programme advocated quality improvement science as a reliable and effective means of introducing and sustaining effective change at local levels. Despite some scepticism from some, primarily medical quarters, the application of the "Model for Improvement" has become widespread within our healthcare settings, and more and more staff are becoming skilled in its application in pushing the safety agenda to the heart of every healthcare organisation.

The author of this piece of work was challenged to provide the evidence that her patient group were receiving timeous, safe and patient centred care within an open medical high dependency unit, and that they had early access to level 3 care when indicated.

Using the Model for Improvement, an escalation warning system was devised and small tests of change – PDSA cycles - were implemented to test and adapt the tool. Following a successful pilot period, the tool – "HEWS" is now fully embedded in daily practice and results demonstrate an increase in early referral to Level 3 care, improved medical management and increased staff satisfaction. This article describes the improvement journey as undertaken by a novice in improvement science.

BACKGROUND

As far back as 1998, in what would prove to be a seminal piece of work, McQuillan et al published results of a prospective confidential enquiry that identified widespread sub optimal care in patients prior to intensive care admission. Subsequently, the use of track and trigger scores, particularly Early Warning Scores (EWS) became widespread, as organisations responded to evidence of sub optimal care in their acutely ill patients (Subbe et al, 2001). Since then, the Early Warning Score has been changed, adapted and tweaked to such an extent that their validity is difficult to guarantee (Subbe, 2010). In response, the Royal College of Physician (London) has recently published a report that recommends the establishment of National Early Warning Score (NEWS) in the UK (Acute Medical Task Force,2007).

So, together with severity scoring in the intensive care environment and a national, validated early warning score for use in general ward areas, it would appear we have the identification and care of acutely ill patients all sewn up?

What neither tool has addressed however, is the increase in High Dependency Care provision, and in particular, the number of medical and surgical HDUs with no anaesthetic input – or "open" HDU as it is often referred to. These units are instrumental in reducing the need for ITU or Level 3 care, yet they are poorly addressed in the literature. Only recently in fact, has the Scottish Patient Safety Programme realised that their "critical care" workstream does not address the needs of the HDU community and are working on developing a new HDU workstream (SPSP, 2010).

Based on the literature available, the author set out to develop a score that would meet the needs of HDU patients, and assist in identifying when current management needed to be escalated – particularly in facilitating earlier anaesthetic involvement to help reduce the incidence of the patient requiring ITU care.

METHODS

Introducing the Model for Improvement

The publication of the Quality Strategy in 2010 (Scottish Government, 2010) made quality improvement a key focus for leaders in healthcare and the Scottish Patient Safety Programme offered a means in which to learn about improvement science that is designed to deliver quick and substantial results.

Though relatively new to healthcare, improvement science has been around for many years. In particular, Joseph Juran and William Deming have been instrumental in documenting this approach since the 1950s (Langley et al, 2009).

Most commonly used in healthcare is The Model for Improvement (Figure 1)

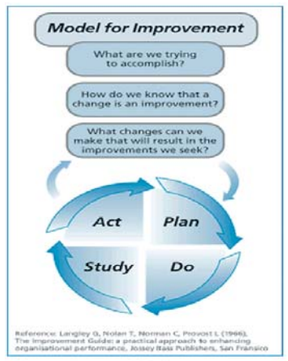

Figure 1 – Model for Improvement

As illustrated, the Model for Improvement consists of 5 principles;

1. Knowing why you need to improve
2. Feedback mechanism to know if improvement is happening
3. Developing an effective change
4. Testing the change
5. Knowing how and when to make the change permanent

Unlike traditional change management, the model used here encourages quick, effective change. It makes us answer fundamental questions throughout the process that helps ensure any changes made are an improvement (Langley et al, 2009).

Knowing why you want to improve would appear an obvious starting point but this simple question is often missed in research and healthcare is littered with unused evidence and research findings – preoperative fasting anyone?

The model used here ensures that we start with our end point in mind – asking the questions our work needs to answer before introducing the methodology required to test our change. Often referred to as "Deming Wheel", the PDSA cycle is a fast and effective means of testing small cycles of change, making any improvement easier and more user friendly (Deming, 1994). Nursing in particular is littered with abandoned research or developments, often made unachievable due to the long and protracted course that needs to be taken before any findings could be implemented.

The model for improvement makes real change and improvement a tangible and realistic achievement and its use is now beginning to be embraced by healthcare, though more cautiously by medical professionals, whose heavy reliance on quantitative research may take some time to infiltrate.

DEVELOPING HEWS – HDU ESCALATION WARNING SYSTEM

Our improvement journey began by answering the question;

"What are we trying to accomplish?"- First we had to ascertain that there was a real need for improvement. We did that by using the Global Trigger Tool (IHI, 2002) to carry out a case note review of 20 consecutive deaths in Medical HDU, and like McQuillan et al's work in 1994, our findings shared a common theme – Late referrals to Level 3 care, poor medical response out of hours and poor management escalation. Based on our findings, we were able to develop our aim;

"All patients in Medical HDU will have earlier medical intervention when their condition deteriorates and will have earlier access to anaesthetic support and ICU when necessary – ideally within 2 hours of deterioration"

As you can see, this aim clearly identifies a specific aim that is time and population specific and has measurable outcomes (Deming, 1994). Next, we asked, "How will we know if any change is an improvement?" – again we needed to define measures of both outcome and process. To identify outcome measures, we looked at HDU mortality and as a process measure; we looked at our original aim and decided to collate information on ICU referrals and admissions. Finally, to ensure we achieved balance, we developed a staff questionnaire to ensure our improvement did not have a negative effect on any other aspects of patient care. Before we could implement and test our improvement, we had to identify what change was required to meet our identified aims and, from the information we obtained during the case note reviews, we developed the first version of our escalation score – HEWS (Figure 2)

HEWS

SCORE	0	1	2	3
Airway	**Secure**	**Protected**		**Threatened**
Breathing	Spo2>90% on Low flow O2 / ABGs normal Stable on Hiflow/Vapotherm, NIV (CPAP or BiPAP) ABGs improving	Spo2 <94% on Hiflow/Vapotherm Remains hypoxic Rising respiratory rate Evidence of increased work of breathing Becoming acidotic, Co2 rising	NIV – ABGs not improving despite increasing IPAP ABGs remain acidotic with low P02 and high PC02	ABGs worsening on maximum respiratory support available in HDU
Circulation	Haemo-Dynamically Stable	New arrhythmia or sinus tachycardia >120 with no compromise to BP BP 80-100 systolic, responding to fluids/drug therapy CVP 0-10mmHg	Arrhythmia or sinus tachy >120 with BP compromise BP labile, not being maintained (despite fluid resuscitation) CVP >10mmHg but BP not maintained	Arrhythmia continues despite drug therapy BP <80mmHg despite fluid resusc Inotrope infusion in progress to maintain BP
Disability	GCS 15	GCS 10-14 with known cause	GCS 10-14 with unknown cause	GCS< 9 or sudden drop in GCS of 2 or more points
Urine Output	> 30ml/hr	< 30ml/hr with hypotension and/or ARF/CKD	<30ml/hr with good BP and no renal problems	Anuric

HEWS Action Codes and Medical Responses

Score	Response
1-3	▪ Immediate HDU nurse assessment – consider increasing respiratory support ▪ SHO Review within 1 hour (if required) ▪ Patient requires review of management plan or escalation of current management
3-6 or single score of 3 in any category	▪ Immediate SHO review ▪ Escalation of current management ▪ Inform Consultant if no improvement following 30mins of increased management
>6	▪ Immediate SHO review ▪ Consultant review should be sought ▪ ITU referral

Important points to consider

- Is escalation of therapy indicated – if YES, do not delay if contacting SHO
- Is patient receiving Ceiling Therapy and for no further escalation – If yes, DISCONTINUE HEWS SCORING
- Would patient be a candidate for ITU? Do not delay referral
- Is patient a candidate for IPPV? Use of NIV should not delay ITU referral if patient a potential candidate for invasive ventilation
- If medical staff fail to respond appropriately to a HEWS call, an HEWS Review Sheet must be completed by the nurse and forwarded to Sister for review
- DNAR status does NOT affect HEWS response if active management still being provided.

Now all we needed to do was to run small tests of change using the PDSA cycle. We began by trying out our score on one patient on one shift. When this was successful, we spread to two patients and then we tried on all HDU patients in one shift. As described by Walley and Growland (2004), the plan-do-study-act cycle forces measurement to take place, and encourages experimentation of alternative solutions, without seeing the need for change during the improvement as a failure. It also supports rapid change, which overcomes one of the biggest barriers to change.

Figure 3 below outlines our PDSA cycle;

Following the tests, we had a working system and progressed to a pilot period to embed our new system and further test the paperwork chosen. We ensured our improvement would be maintained by developing a monthly audit tool (that still incorporated the PDSA cycle) to look at compliance, along side a monthly case note review of all ICU referred patients.

Figure 3 below outlines our PDSA cycle;

PLAN	Change or Test	Devise paperwork and set time to test
DO	Carry out the plan	Spread from 1 to all HDU patients
STUDY	Summarise what was learned Describe measured results – how do they compare to predictions?	HEWS parameters appropriate for patient group with a couple of minor changes
ACT	Determine what changes have to be made	Heart rate and rhythm parameter needs changed Urinary output not sensitive enough

Fig 3

DISCUSSION

Our experience of using the model for improvement to develop HEWS has been an overall positive experience. Like all change, resistance is likely to be encountered from some quarters and our experience certainly supports this, with most opposition coming from, somewhat unsurprisingly, our senior medical colleagues. However, by engaging our own "champions" to push our improvement, we managed to ensure that what little resistance was evident did not impact negatively on our work.

HEWS is now embedded in our everyday practice and results to date remain favourable, and we have attracted the attention of other "open" HDUs who currently encounter the same problems we ourselves identified as being the drive for improvement.

The Scottish Intensive Care Society and Audit Group (SICSAG) awarded our work the 2011 Quality Improvement Prize and we are sharing our work with the HDU community.

We recommend that nursing as a discipline should embrace improvement science as a means of affecting real change and improvement that gets right to the heart of "doing the right thing" and encourages nurses to get involved in the change process.

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ASTHMA DEATHS- RISKS AND RESPONSES

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Introduction

Asthma is one of the most common conditions that practitioners will encounter in both primary and secondary care settings affecting all age groups. Although deaths are declining, the current information provided by the charity Asthma UK is a reminder of the significant disease morbidity and mortality asthma causes.

- 1,131 deaths occurred in 2009 due to asthma
- On average one person every 8 hours dies from asthma
- Currently 5.4 million people in the United Kingdom (UK) are receiving treatment for asthma equating to 1.1 million children (1 in 11) and 4.3 million adults (1 in 12).
- An estimated 75 % of hospital admissions for asthma are avoidable
- As many as 90% of deaths from asthma are preventable (Asthma UK 2012).

The majority of patients with asthma will have their routine care managed in the primary care setting, with only more complex and severe cases requiring secondary care input. Any patient is potentially at risk of a life threatening attack regardless of the severity of their asthma and clinicians need to be alert to the factors which increase this risk and what can be done in practical terms to lower it.

The British Guideline on the Management of Asthma (SIGN/BTS 2008) states that most attacks of asthma severe enough to require hospital admission develop relatively slowly over a period of six hours or more, and in one study (SIGN/BTS 2009) over 80% developed over more than 48 hours. This would indicate that in the majority of cases there is a critical time window for effective action to be taken by both the patient and clinician in order to reduce the risk of an attack requiring hospitalisation.

Confidential Enquiries into Asthma Deaths

Although currently in the UK there is not a fatal asthma register, in 2012 the National Review of Asthma Deaths (NRAD) was launched, led by the Royal College of Physicians. The NRAD will build on previous confidential enquiries into asthma deaths to provide a robust body of evidence on which to build our understanding of how life-threatening situations arise and how they can be avoided in future (Royal College of Physicians 2012).

For a 12 month period from the 1st February 2012, every death from asthma in the UK will be reviewed systematically and will be subject to an in-depth multidisciplinary confidential enquiry. By engaging with health professionals and family members the project will explore the individual circumstances surrounding the death including the medical care received during the fatal attack and also the year before death, the environmental conditions, and the involvement of workplace and school.

In a previous study (Gaga M et al 2005) revealed trends in patient characteristics which can indicate they are at a higher risk of an asthma attack. The most recent of which is an observational case series study into paediatric asthma deaths using data from the UK Eastern Region Confidential Enquiry 2001-2006 (Anagnostou et al 2012). The study findings include:

- Twenty deaths occurred including nine children who had mild to moderate asthma severity (BTS/ SIGN criteria 2008)
- The child age range was 8-17 years with the median being 11.5 years.
- 10/20 had severe asthma and one child was not known to have asthma.
- 13/20 were atopic
- 10/20 died between June and August,
- 12/20 had adverse psychosocial and behavioural factors such as family discordance, denial, neglect
- 7/20 children were on non combination long acting B2 agonist treatment without inhaled corticosteroids.
- In total only 6/20 of the children had a record of a written asthma management plan

The study by Anagnostou et al (2012) also reported four out of the 20 children died en route to the hospital in the parent's car and in 2 cases an ambulance was refused by the parents who chose to use their own transport. This acts as a cautionary reminder that outcomes may be improved by ambulance transportation, paramedic monitoring and treatment including delivery of emergency high flow oxygen and nebulised drugs en route to hospital. In addition failure of carers, patients and clinicians to recognise the severity of an asthma exacerbation may result in inappropriate transportation and subsequent delay in lifesaving treatment and supportive therapies.

Discussion

Seasonal factors appear to play a significant role in this study and reflect SIGN/BTS (2008) statements that in the UK there is a peak of asthma deaths in people aged up to 44 years in July and August. Atopic individuals appear to be at a greater risk and the recognition of allergic disorders in addition to asthma must be a priority when patients are being reviewed. The increasing presentation of 'thunderstorm' asthma as reviewed by Nasser & Pulimood (2009), suggest that part of this trend is due to a sudden, large allergen exposure caused by the specific atmospheric and environmental features of the storm on a sensitized, atopic, asthmatic individual particularly if they are outside. Nasser & Pulimood (2009), implicate the sudden release of large amounts of respirable allergenic fragments, particularly fungal spores such as Alternaria by way of an explanation . The practical relevance of this would be the recommendation that clinicians be alert to significant thunder-storm activity and the potential for this to precipitate asthma attacks, particularly in summer months.

Anagnostou et al (2012) comment that their results were similar to those in the Victoria study, where Robertson et al (1992) observed that 'mild' asthmatics still had a significant risk and the preventable factors included inadequate assessment or therapy of prior asthma (68%), poor compliance with therapy (53%), and delay in seeking help (47%). It was commented that the majority of subjects in this survey could not be classified as "high risk." Subsequently Robertson et al (1992) recommended that clinicians should ensure that all young patients with asthma are aware of optimal maintenance management; can recognize deteriorating asthma, and follow a clear individualized crisis plan.

These recommendations reflect the standards that are outlined in current asthma guidelines today and can be applied to all age groups of asthma sufferers. In addition clinicians must be vigilant in recognising asthma patients who are on long-acting beta2-agonists (LABA) which are not in combination with inhaled steroids. This can lead to non compliance with the inhaled steroid, subsequently airway inflammation is not treated and significantly recent studies have raised concerns that such patients are at a higher risk of severe/ life threatening asthma (Walters et al 2007).

The use of personalised, negotiated asthma action plans which include self management advice and education has been shown to improve health outcomes for people with asthma. Remarkably Anagnostou et al (2012) found only 30% of the child deaths they studied had evidence of such a plan. Current asthma guidelines recommend that patients should be offered a written plan that is individualised to a patient's needs. Additionally this plan should be reviewed at routine asthma checks with the patient, and where appropriate carers. The plan should include between two and three action points which advise the patient on how to recognise deteriorating asthma, what medication and action to take and how and when to seek emergency help.

SIGN/BTS (2008) comment that previous confidential enquires into over 200 asthma deaths in the UK conclude there are several factors associated with the disease, the medical management and the patients behaviour or psychosocial status which contribute to death. Many of the deaths occurred in patients who had received inadequate treatment with inhaled steroid or steroid tablets and/or inadequate objective monitoring of their asthma. There are clear treatment algorithms for clinicians to follow for both routine and acute asthma management which give specific guidance on both the assessment criteria and treatment of increasing levels of symptoms. Heavy or increasing use of B2 agonist therapy is also associated with asthma death, which indicates the importance of having systems in place for patients requesting frequent inhalers to be flagged up and reviewed. Deaths continue to be reported following inappropriate prescriptions of B-blockers and non steroidal anti-inflammatory (NSAID's) and behavioural and adverse psychosocial factors are recorded in the majority of asthma deaths.

Identifying High Risk Asthma

The BTS/SIGN (2008) guidelines include the following reference tables for clinicians to identify patients who are High Risk Asthma.

A COMBINATION OF SEVERE ASTHMA recognised by one or more of:

- previous near-fatal asthma, e.g. previous ventilation or respiratory acidosis
- previous admission for asthma especially if in the last year requiring three or more classes of asthma medication
- heavy use of **B2 agonist**
- repeated attendances at ED for asthma care especially if in the last year
- **"brittle" asthma.**

Table 1

AND ADVERSE BEHAVIOURAL OR PSYCHOSOCIAL FEATURES recognised by one or more of:

- non-compliance with treatment or monitoring
- failure to attend appointments
- fewer GP contacts
- frequent home visits
- self discharge from hospital
- psychosis, depression, other psychiatric illness or deliberate self harm
- current or recent major tranquilliser use
- denial
- alcohol or drug abuse
- obesity
- learning difficulties
- employment problems
- income problems
- social isolation
- childhood abuse
- severe domestic, marital or legal stress (BTS / SIGN 2008).

Table 2

Conclusion

The management of the condition has improved with the delivery of evidence based treatments and national clinical guidelines, however patients continue to be at risk of dying from asthma and it is imperative that clinicians continue to be vigilant in recognising the features of higher risk asthmatics; endeavour to equip the patient with the skills to self manage their asthma effectively and ensure their own clinical practice consistently reflects current recommendations. By working with patients we can influence change and therefore strive to reduce asthma death risk. Ultimately this may mean the difference for a patient between living with asthma or dying from asthma.

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