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Editorial
Dr Malcolm J Valentine, December 2013 (editor@irhc.co.uk)

The Journal of the IRHC:

‘The Journal of the Institute of Remote Health Care (IRHC) exists as a means by which information can be published and ideas exchanged among the International Remote Health Care Community. Provided as a benefit to IRHC Members, Affiliates and Corporate Members, it seeks to broaden understanding of the specialty of Remote Medicine and to promote the interests of all the practitioners and others involved in supporting remote health care provision. The Journal provides a platform for publication of material that will contribute to the quality development of remote health care. The Journal is edited in the UK – but is focussed on issues relevant to wherever there is remote health care provision – all “corners” of the globe. In time, it is hoped that the Journal will acquire its own status as a significant contributor to quality development in international remote health care. Further information on publication requirements are listed towards the end of the journal’.


As we once again celebrate the production of another edition of the journal, there are two important things to mention in this edition. Firstly, the publication months have been moved from June and December to January and July. This is to accommodate various issues regarding publication and distribution which occurs when trying to do anything in December. So this edition will be the unique 2014 edition and as such, may yet prove to be a collector’s piece! Secondly, we are all pleased to have been given an International Standard Serial Number (ISSN) which appears at the top of the front page. This means that the journal is now internationally listed and content can be quoted as such. It represents a real mark of progress for us. I hope that this will spur even more authors to come forward with articles. As I said in the last edition, I well understand the effort needed to put pen to paper and to produce something worthwhile. But it is also a good discipline to have and without the effort to disseminate information in an objective and structured way, we would not be able to share these experiences, thoughts and analyses.

In reading the journal - maybe you, reader, could consider whether there is something in your work or experience that you want to get out into a wider audience. If so, then the editor would be more than happy to engage in helping with the production of any publishable material.
The leading article by Mark Bloch was commissioned earlier in the year. I hope at some point to have an edition themed around ‘pre hospital care’ and Mark’s article sets the scene for this. Perhaps you have an interest in this area of work? If so, then please contact the editor and I would be more than happy to help in the production of something publishable.

In our original articles section, there is the third submission from Frano Mika and colleagues at Siapem regarding their Telemedicine developments. Two articles were featured in the last edition of the journal and this comprises the third article. This one reviews their work on Tele-cardiology and again illustrates the potential of what can be done now. Saipem have really exploited available technologies and the back-up clinical expertise to make use of the technologies meaningful. This paper illustrates very clear cost savings when adopting such a strategy.

The next paper is from Tom Loney and Tar-Ching Aw. I have been trying to get a review article regarding Occupational Medicine development in the Middle East for some time now and I think this paper exceeds all expectations in terms of depth, clarity and referencing. It really does help understand how things have progressed to date and the continuing efforts.

Following on is a paper that brings it all back to the physical homeland of the IRHC. Bill McKerrow writes about the development of the Scottish School for Rural Health and Wellbeing (SSRH&W) in Inverness and the potential to integrate IRHC with that. It’s an interesting paper that points a real way ahead for the IRHC and how a very high level collaboration would work.

Additional articles include a review from Prof Page and Paul Allan that highlights the succinct learning points from the Piper Alpha Disaster. This was one of the seminal pivot points in terms of training and topside support systems and will be an event that informs in perpetuity future activity around training and calibration of remote medical support.

Finally, your Editor has a short article reflecting on continuation of the IRHC and how that might look. It’s included as a topic for debate - so feedback would be welcome.

So again, there is no shortage of ongoing activity - but there will always be space for more.

Keep these articles coming folks!

Malcolm Valentine

editor@irhc.co.uk
Nelson’s Column

July 2014

After a decade of effort the IRHC has become established and generally known as an independent academic organisation devoted to the improvement of healthcare for those who live and work in remote places associated with hostile environments worldwide. Since the council usually meets in Aberdeen and in view of the background and interests of a majority of council members it has concentrated on the problems of healthcare practitioners working for the oil and gas industry and largely in the North Sea.

IRHC activities have been directed from the outset along the lines suggested by the discussions held at the first IRHC symposium. These were influenced by the results of the very full study carried out by Harry Horsley on the problems and aspirations of remote medics and reported on at that symposium.

The issues raised were professional isolation of the medic, lack of professional appreciation, absence of regulation of the profession, inconsistency of training courses from a variety of providers and lack of accredited CPD courses. These issues were addressed by discussion with higher education institutions, the establishment of a journal which encouraged discussion among remote practitioners, by the establishment of an external advisory committee, by the establishment of a web-site and by holding annual conferences on key subjects.

An accreditation system was also established so that courses from various providers could be independently evaluated and finally a voluntary register was established which it is planned could be extended to come under the acceptance of the new PSA system.

It has to be said that the response to these initiatives has been disappointing in terms of uptake, particularly in membership, course accreditation, registration and support for the external advisory committee. This may be because the council misread the wishes of the medics and the industry or it may be because each initiative has been established in a manner which does not suit the wishes of the membership. In any event it is difficult to identify the problem without feedback and all practitioners are earnestly requested to comment via the journal, the web-site or directly with council members so that the necessary changes can be made, direction changed. If the IRHC is considered to be irrelevant it will allow the very small number of active participants to scale back their efforts or direct their energies into other areas of remote healthcare.

The founders of the IRHC initially expected to provide educational courses and to provide various medical services but they did not do so in order to avoid competition with the large number of providers in existence. This has allowed the IRHC to maintain strict independence but it also deprived it of a source of income apart from membership fees and research contracts. It thus allowed standards to be set, education to be evaluated, qualifications awarded and a professional body to be established which would end professional isolation. The current thrust is directed towards establishing the educational and ethical requirements for the emergence of a competent, international, remote, healthcare practitioner. This would be a new type of practitioner who would be of equal professional status to other regulated medical practitioners as they become accepted as members of a respected professional body. The Institute has thus initiated many projects designed to fulfil the professional needs of its oil related members. Feedback is necessary to determine whether it is on the right lines.

Time will tell whether this vision is shared by the members of IRHC. Meanwhile, there is no doubt that the IRHC has now been accepted as an international brand name of some note and it seems reasonable to determine whether there are new areas which could be developed for the advantage of those who live in remote areas and which would help to develop further the concept of the competent international remote healthcare practitioner.
There is an increasing problem in providing medical cover in the remote and rural areas of Scotland and this has been recognised by Government and by the Royal colleges of Medicine and Surgery in Scotland. This is an international problem and it occurs in remote and rural areas of Norway and Canada since doctors prefer to work in cities. The same problem exists in certain parts of the Middle East, such as Oman and parts of Abu Dhabi Emirate. The problem could be solved by the emergence of remote and rural healthcare practitioners along the same lines as those of the oil and gas industry and backed in the same way as by consultants at a distance. Collaboration in development between the oil related and community related practitioners towards a common qualification could provide mutual benefits and interesting career outlets for both groups.

Another area of current medical concern in UK is that of NHS Accident and Emergency departments which are entering an unsustainable position from lack of adequate staffing and increasing numbers of patients. The IRHC conference of 2012 discussed the problem of emergency support offshore when a medic may see a cardiac arrest once every two years or so while an ambulance paramedic will probably deal with one or two a week. Discussions between the Industry and the NHS authorities could provide mutual benefit if fully trained medics could be employed in hospitals part time. This would not only be of value to a beleaguered NHS but provide medics with experience to offset skill decay and a broader based and interesting career. Once again this would require the emergence of qualifications and recognition for the new concept of the remote healthcare practitioner.

For initiatives such as these to succeed it would require a groundswell of interest from existing members and for collaborative discussions between the Government, universities and major oil companies to take place.

J Nelson Norman.
May 2014
Leading Article

A day in the life of...now and in the future

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Introduction

Pre-hospital care comes in many guises and is one of the most exciting areas of current medicine. Increased demands are being placed on the teams who provide this vital service, and its development is an important factor in delivering even better patient care.

Mark Bloch is the clinical lead for Bond Offshore Helicopters, is a Consultant Anaesthetist and Honorary Clinical Senior Lecturer at the Aberdeen Royal Infirmary, the Royal Aberdeen Children’s Hospital and the University of Aberdeen. He works with both the Bond Offshore Helicopters operated JIGSAW Search and Rescue (SAR) crews and provides voluntary operational cover for the Scottish Ambulance Service if advanced medical care is required pre-hospital and is involved with the SAS Clinical Advisory Group. He is on the board for the Faculty of Pre-hospital Care within the Royal College of Surgeons Edinburgh and the British Association of Immediate Care in Scotland. He was part of the Joint Royal College Ambulance Liaison Committee Guidelines Development Group and is an expert advisor for the College of Paramedics. He was the founding lead for ‘the expanding professional role of Paramedics’ initiative for the Department of Health with the South East Coast Ambulance Service. In particular this involved the Critical Care Paramedic program for which he was the clinical lead for the University of Hertfordshire and on the validation team for Glasgow Caledonian University. He is the governance and research lead for Outreach Medical Skills (ORMS). Dr Bloch is actively involved in both hospital and pre-hospital care in a variety of roles including the Anaesthetic pre-hospital lead for NHS Grampian. This article uses this experience to discuss the work of SAR and pre-hospital teams today and looks at what the future holds for them.

Being part of a pre-hospital team

In the clinical areas of SAR and land ambulances the response teams are doing all they can to save lives. A terrifying ordeal or horrific accident comes without warning at any time of the day or night. With lives at risk, the rescue and pre-hospital care teams need to work fast and in harmony with each other. Everyone has to be clear about their role, with multi-agency teams working seamlessly together. Each situation is unique and may present real dangers; not just for the patient but also for the medics, helicopter crew or land based pre-hospital team. Blending of services within health and social care allows for the provision of meaningful governance with timely and appropriate interventions throughout the patient pathway while remaining financially viable.

Helicopter and pre-hospital care medical teams are needed in a wide variety of challenging situations. Whether dealing with a ditched crew-change helicopter, medical evacuation, a man overboard or the evacuation of an offshore platform, the work these teams do can make the difference between life and death. Equally, land-based pre-hospital provision may be called to deal with anything from a newborn who is not breathing, to a 90 year old with cardiac problems and a complex medical history, a major incident with multiple casualties, or a serious injury following a trauma. Each situation needs to be assessed and the risks and benefits of every action carefully judged utilising both technical and non-technical skills to allow for dynamic risk assessment. On one hand, the teams need to consider the patient who may have a severe injury or life-threatening illness, and judge whether the best outcome would result from the rapid clinical intervention provided by a ‘999’ ambulance or a rotary SAR asset.
On the other, they need to assess any risk to the responders who are required to work in often hazardous environments, such as dangerously bad weather conditions and other logistic constraints. If one looks into the aetiology of medical error in most situations, one would most likely find multi-factorial causal elements. Of these, inadequate practise of non-technical skills and in particular not obtaining, maintaining and anticipating situational awareness forms a large component of this.

**The differences between land and air**

Land ambulances are becoming more and more focused on triage and treatment, and aim to provide transport only when it is really needed. This integration of health and humanity is increasing in importance. This is a significant change from the established historic role as ‘transport’ focused organizations and relies upon clinical competent decision-making. It does, however, hold out the prospect of improved patient care at a lower cost with unnecessary patient transportsations to Emergency Departments increasingly being avoided. This does however raise the question of Paramedic training where previously 90% of the training involves approximately 8% of the 999 call-outs. The nature of the work done by SAR assets is necessarily different. In remote locations such as oil rigs in the North Sea patients are almost always transported to hospital, even if their clinical condition is not as severe as initially thought when the emergency call was made. There are many examples of patients being taken to hospital who would not have been transferred to definitive care, if their injury or illness had occurred on land, but SAR assets almost always transports away from the scene. This highlights the value of patient systems which offer support methods prior to the deployment of a helicopter; with effective tele-medicine and triage working to minimise unnecessary call outs and ensure more appropriate deployment of an expensive asset in what is often a high-risk role. This may become of increasing importance with guidance suggesting that patients that may not be able to self-extricate from a helicopter should not be transported on a crew change aircraft thus increasing the requirement for non-urgent forms of medevac capability.

The nature of the SAR environment means an emphasis on transport as well as triage and treatment. Over recent years there has, however, been a marked improvement in the amount of care that can be delivered en-route, with the teams’ skills, competencies, equipment and medications now resembling those seen in Accident and Emergency Departments, or even in Intensive Care.

**What skills and operational models are needed?**

When there is a rescue situation, multidisciplinary and multi-agency elements are involved in the process. There are differences and similarities in the technical and non-technical skills required to improve patient outcome between land and helicopter operations, but lessons can be learned from both. Primary retrieval gets the patient from the place of incident to a place of safety and more definitive care. Secondary or tertiary retrieval or transfer takes patients from a place of safety to more definitive care, but may still require providing intensive care during transit to keep them stable. Can individuals attain and maintain the ideal of all of the skill sets required for primary and secondary or tertiary retrieval or transfer? This scope of practice requires all of the components in the Paramedic curriculum and soon to be competency framework as well as additional elements including navigation, communications, principles of flight and aeromedicine – including the practicalities surrounding the treatment of patients in the confined space of an airplane cabin. This multi-skill concept, along with the resources and requirements of a service and the type of Air Operator Certificate (AOC) needed, can be further explored while looking at the differences between SAR, Helicopter Emergency Medical Service (HEMS) and Medevac roles. These all provide different functions but the clinical parameters discriminating between
them are not always clear, and an individual service may regularly be asked to fulfil elements from across these differing roles.

Conceivably such a multi-skilled practitioner would need to be a consultant Anaesthetist with extensive Paediatric and Intensive Care experience, who has many years of experience in pre-hospital care and appropriate higher qualifications. Two different approaches to requirements are taken throughout the world and variants of both are found in UK practice: The first is a physician-delivered model and the other a physician-led model. Both of these camps have evolved over time with structured education, training and robust, resilient governance frameworks providing capability and capacity. Both have benefits but, inevitably, both also have drawbacks. The question we should be asking is, “Which finds the best balance and which will deliver the ‘best for most’ in the future?”

**A developing profession**

Over recent years there have been interesting developments in the training of both doctors and allied health professionals, including Paramedics:

- Through the General Medical Council, the Royal College of Surgeons of Edinburgh Faculty of Pre-hospital Care has developed the subspecialty of pre-hospital care for a doctor.

- Huge advances have been made in Paramedic education and training with a move to Higher Education Institution based diploma or degree tuition as recently described in the PEEP document.

- Opportunities for certain Allied Health Professionals also exist for further postgraduate study which allows for the development of tier levels of practice - a model which has been used in the physician context for decades and more recently within the nursing profession.

- Although the Health and Care Professions Council cannot annotate the professionals register with postgraduate qualifications, the uniformity and maintenance of standards in areas with extended roles can be helped through the utilisation of specialist (voluntary) registers. Two of these areas recognise the need to record those paramedics who are increasingly working in primary care, often called ‘Paramedic Practitioners’ and those working in critical care, ‘Critical Care Paramedics’ as mentioned earlier. These and future work streams (including one which is in the context of this article) will add a level of assurance that could be of value to both paramedics and employers with obvious benefits to the patients.

**The way forward**

Therefore the way forward will need to be the most pragmatic one trying to overcome prejudice along with personal and traditional organisational agendas and semantics. One solution may be to use operational models that provide the best teams using the best transport modality for the circumstances at hand within the right timeframes. Such models would require systems that are appropriately resourced, resilient and adaptable. At the end of the day, we should be striving for the best clinical care and quality assurance, without any significant geographical variation in the quality of level of care, using finite resources in the most cost-effective way. Appropriately trained Paramedics and medics should work within a well thought-out and structured clinical governance framework, alongside effective technology and physician-led support aimed at providing resilient and high-level guidance, decision support and triage. These fundamental issues apply to both land-based and offshore provision of care and the strategic development of this with tactical and operational delivery take up a large component of the author’s time (most on a voluntary basis).
We, along with many others, will continue to make ourselves available to respond and provide advanced medical care in the SAR, HEMS and other pre-hospital roles. Looking to the future, however, there are issues as to how we develop systems to improve these services, save more lives, value our colleagues, operate more safely and work more efficiently.

Rather than simply continuing based on current expertise available, a better way forward, might be to continue to develop the systems that support the wider body of pre-hospital practitioners and allow them to progress both their technical and non-technical skills, including dynamic decision making processes and generic human factors.

In all forms, pre-hospital care is an exciting area of medicine. Increased demands being placed on it, and forms an integral part in the development of numerous pathways and systems, including trauma and unscheduled care. Furthermore, it has a developing, ongoing evidence base which cannot always be extrapolated from in-hospital care. There have been marked developments in the systems that enable both safe and effective delivery of rescue and care, but this is still a very person-centred area of practice. Improving the care and support of the people who deliver the pre-hospital services should be a priority and will lead to even better care of the casualties, patients and staff.

“Ten good soldiers wisely led will beat a hundred without a head.”

Euripides 480 – 406 BC

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(Accepted January 2014)
Abstract

The concept of telemedicine, or rather the mechanism behind the idea of patient consultation at a distance, has been around for many decades. However, it wasn’t until recent years that the Oil & Gas industry has started to derive major benefit out of it. Considering that activities in the Oil & Gas industry are moving more and more towards remote and geographically challenging areas, the role of telemedicine is immense\(^1\). In order to ensure that the transition is made from theory to practice, Saipem embraced Tele-cardiology in its daily practice back in 2007 when a selected number of projects were piloted. Since then, there has been huge expansion in it covering more than one third of Saipem employees worldwide, spread over 45 worksites. Not only did it solve the problem of specialised cardiac consultation or a second opinion, more importantly, it literally opened the door to a new level of employee satisfaction in terms of healthcare, in Saipem’s primary care set up. Its employees are encouraged to take an active role in their own health and wellbeing\(^2\). The Tele-cardiology program has become an integral part of the successful “Health Management System” of Saipem which has the roles of illness prevention, health promotion and health surveillance in addition to the management of medical emergencies.

The article presents insight and some more in depth analysis and experience of Saipem in the implementation of Tele-cardiology in its work premises.

Introduction

In Saipem, Tele-cardiology is one of a core program of Health Management Systems employed for the purposes of medical assessment, diagnosis, treatment and even disease prevention related to the circulatory system. In this regard, the use of Telbios services for ECG recording, further scrutinising and obtaining a professional consultation is what we have called earlier “the technology of future” and in reality, has been implemented now.

In Saipem, work activities often take place in remote locations where medical care appears limited and specialist treatment centres may be a considerable distance away. This can result in a poor outcome for cardiovascular events. The large prevalence among onsite deaths, the demand for hospital care during the acute episode, the need for rehabilitation and longer-term residentially-based care and the pool of chronic disability, created make Cardio Vascular Diseases (CVD) a major problem worldwide. On the other hand, workplaces are often the first place where cardiovascular disease risk factors are recognized and treatment and follow up provided.

Cardiovascular diseases impose major risks to human health\(^3\), with heart attacks and strokes being a primary cause of non-occupational fatalities and disabilities in the oil and gas industry. Health costs to the oil and gas companies are ever increasing, and a large portion of the industry’s health bill is a direct or indirect consequence of CVD risk issues. Increasingly, Company health programs are seeking to promote health and to prevent illness and minimise the need for repatriation\(^4\).

Tele-cardiology was initially introduced in Saipem in 2007 with a view to expanding access to quality health care. However, other benefits have become evident. Cardiovascular disease prevention, cardiac emergency care and rehabilitation are now fully integrated into the Saipem illness prevention program and tele-cardiology has a vital role to play.
Its capabilities in the diagnosis, treatment and follow up of cardiovascular disease have extended the possibilities of providing the kind of care that Saipem has always sought for its employees.

Furthermore, the Tele-cardiology program in Saipem empowers the remote exchange of data between worksite physicians and specialised cardiologists based in the TelBios cardio Centre, Milan to facilitate diagnosis, monitoring, and management advice on treatment of Saipem employees[5].

The company medical management, in agreement with TelBios, has developed a service for assistance in cardiovascular pathology in remote areas to be used both in emergency cases and for prevention of cardiovascular disease among employees[1].

Filling the gap

The capabilities of the primary care infrastructure in company clinics at peripheral and remotely located sites are restricted in terms of specialised diagnosis and treatment. They are equipped to deal mostly with primary care issues and a few emergencies but they are not trained to provide highly specialised care in case of heart attack or stroke, nor do they have enhanced equipment to give echocardiography or round the clock Holter monitoring.

Ever since the launch of the Tele-cardiology program in Saipem, it enabled care gaps to be filled. It allows the remote exchange of data between company physicians from 45 worksites and specialist cardiologist based in Milan to facilitate diagnosis, monitoring, and management of challenging cardiovascular conditions.

Description and application of processes

Data collection processes and annual reporting processes are in place from the beginning. The Tele-cardiology program process is divided in two phases[7]:

1. Data Collection

Pre-processing: Both urgent and non-urgent cases with possible cardiovascular pathologies ultimately come to site clinics where the company physician takes ECG recordings along with routine clinical examination (picture 1). In addition to this, company physicians are pro-actively engaged with employees having pre-existing cardiovascular pathologies through ongoing cardio-monitoring. The Tele-cardiology program is available 24/7 hours 365 days in both real time “online” and store and forward “offline” format[8]

Recording: Company physicians on duty take the ECGs of the employees/patients, using a high reliability trans telephonic “Heartview” compact ECG recorder (picture 2). This device records and transmits 1/12 ECG derivations.

Transmission: The recorded ECG signals are transmitted through landline telephone or mobile phone to Milan, where a PC-based ECG receiving station receives the transmitted ECG and displays it for analysis and evaluation. The company physicians have to identify themselves stating the code of the trans telephonic ECG machine to the operator in the TelBios centre who will then automatically involve the relevant specialist cardiologist[5, 8]
2. Topside support

At TelBios, Milan, a team of cardiology experts provide a 24 Hr. telephone and email consultation service for our company physicians assigned on worksites worldwide. The service is designed to support and complement our company physicians on site providing assistance with diagnosis, patient management and clinical governance.

Reports: After the cardiologist’s interpretation the report is sent back to the company physician in .pdf format. If an ECG report of a patient indicates the need for immediate action, alerts can be generated and sent to the company physician on duty. However, all results whether urgent or not urgent are ultimately sent electronically to those clinically involved within 24 hours. The receivers of the reports are:

1. Physician on duty,
2. Program coordinator, corporate based who is also a medical doctor and
3. GIPSI, electronic data base system, accessible through smart card and passcode only to medical personnel, for automatic archiving in the employee’s medical file identified through their ‘badge number’. The company physicians incorporate this information along with any diagnosis and treatment.

Along with this, data is also gathered at corporate level for trend analysis and to ensure continuity of the program. The whole process is represented in diagram 1:

Diagram 1: Flow diagram of Tele-cardiology implementation process
Statistical Analysis

Since its inception, Tele-cardiology demonstrates significant improvements in the quality of care as well as huge potential cost savings. Every year new work sites are being included in the Tele-cardiology program making it available to a total of 45 as shown in Graph 1.

The vast majority of worksites were very proficient in implementing this program. In the last year alone, a total of 3073 ECGs were transmitted to Tel-Bios for specialist interpretation and out of these 121 ECG’s were sent in “ONLINE” mode. These 121 cases were considered at that time potential cardiac emergencies or were related to known cardiovascular disease. 8 cases out of the 121 emergency ECG’s were considered MEDEVAC worthy.

Thanks to Tele-cardiology, a total of 113 cases were managed on worksites. The remaining 2952 cases were part of constant monitoring and follow up under the cardiovascular disease prevention program (CVDPP).

We further reviewed the last three years ECG transmission data which illustrated a trend in the number of cases managed with tele-cardiology support on company worksites as shown in Graph 2.

Last year alone, there was an increase of 75.5% in the total number cases referred to Tele-cardiology service (2012 – 1751 cases, 2013 – 3073 cases). However, in part, these results were anticipated considering the number of worksites increased. In addition to this though, efficient monitoring and management of the program played contributed to a net increase in the “usage rate”.

Usage rate

A target usage rate since the launch of the program in 2007 was set to be 90 ECG transmittals per device per year for those sites applying the tele-cardiology program. As shown in the graph below, during first three years there was linear growth in terms of usage rate however we then observed a rapid increase at that point. The average Tele-cardiology program usage rate in year 2013 was 87.54 (highest ever – as shown in the graph 3).
Cardiovascular disease prevention in SAIPEM: Role of Tel-cardiology

Employees with Cardiovascular Illness have quite complex pathways of care over their working life in work settings. Worldwide, the leading cause of mortality is due to cardiovascular diseases[9]. It is estimated that CVD is responsible for around 1 in 3 premature deaths in men and 1 in 5 premature deaths in women. Most risk factors for CVD are linked, which means that if a person has one risk factor he will probably have others as well. Therefore, Saipem’s Cardiovascular Disease Prevention Program (CVDPP) that targets healthy behaviours among employees, can reduce illness, emergencies and disability from CVD in our employees and the Tele-cardiology program thus has a great role to play. In the year 2013, 2952 (96.07%) of ECG transmissions were carried out in non-urgent “Offline mode” and were sent to Telbios, Milan, for specialist interpretation and advice. These 2952 cases were part of the constant monitoring and follow up under CVDP program.

Tele-cardiology case management models tested in several randomized trials of secondary prevention have shown significant improvements in risk factors along with decreases in cardiac events and mortality and improved patient perception of health compared with usual care[10]. In Saipem primary care settings, Tele-cardiology is most commonly used with patients suffering from coronary heart diseases (acute MI), arrhythmia, hypertension, pacemaker review as well as with patients suffering from chronic heart failure.

From a medical point of view, it is important to assess the clinical situation without delay as well as to take necessary therapeutic measures timely and efficiently, over a longer period of time.

Consequently, the Tele-cardiology program includes ongoing monitoring of patients with known increased or high risk of cardiovascular incidents.

Socioeconomic evaluation of the Tele-cardiology Program

Indicators were defined to assess short and long term benefits and their influences in a cost-effective way. They go beyond the sole monitoring of patients/employees with cardiovascular pathologies and aim at gaining knowledge concerning the ongoing changes in the lives of the target population of the Company as well as providing them with a safer working environment. An analysis done within Saipem considers 10,000 Euro as an average cost of emergency medical evacuation. This sum includes direct costs of the services accessed during an emergency medical evacuation, transport by helicopter, ambulance services, third party medical personnel involved in evacuation costs, specialised medical attention ashore and specialised examinations and eventual hospitalisation.

We accept that not all of them are activated in the management of every case. Apart from these direct costs, we have to considered additional hidden financial losses. Thus we assumed that all 121 online (emergency) Tele-cardiology referrals done in 2013 had the potential to represent the same number of cases for medevac. This would have implied a total cost of 1,210,000 Euro. Looking at data presented earlier, only 8 cases were finally considered “evacuation worthy”. At its most extreme, Tele-cardiology has the potential to have saved in 2013, expenses for medical attention worth 1,130,000 Euro. If we consider that the complete Tele-cardiology service cost in 2013 was 105,000 Euro, the resulting financial saving would be 1,025,000 Euro.
Euro, it has brought potential net optimisation of 1,025,000 Euro. Additional hidden “savings” occur in better outcome of an acute event due to immediate recognition of the problem and early application of appropriate treatment. The million Euros savings could be reallocated by the health department to other activities. The Company will have an advantage in transforming the budget into better health, and Tele-cardiology will not be a cost but an investment[3].

In addition to the cost benefit, the positive impacts have been well documented as seen in the table below[9]

<table>
<thead>
<tr>
<th>Economic</th>
<th>Non-Economic</th>
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<td>Reduced health care cost</td>
<td>Improved employees health</td>
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<td>Cardiovascular emergency</td>
<td>Better employees job performance</td>
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<td>Insurance claims</td>
<td>Enhanced morale</td>
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<td>Disability costs (STD &amp; LTD)</td>
<td>Sense of security in remote and hostile work environment</td>
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<tr>
<td>Repatriation costs</td>
<td>Peace of mind for Company doctors</td>
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<td>Decreased absenteeism, disability, decreased employee recruiting, training and induction costs, Litigation costs</td>
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**Barriers to Tele-Cardiology Program implementation and achieving targets**

To ensure cardiovascular health protection, a variety of factors need to be understood to determine whether aim of the program was fulfilled. Although the lives of the employees with cardiovascular pathologies have changed, the improved awareness of use of the Tele-cardiology program endured.

Continuing efforts to encourage people to visit for cardiovascular check-ups are still warranted. A wider approach towards the program and deeper understanding of potential benefits in monitoring, cardiac emergency prevention and CVD risk factors by company physicians is still needed on some worksites.

**Conclusion – A fit for purpose approach**

The Tele-cardiology program has become an integral part of the successful health management system of Saipem over past few years. This is one of the most successful examples of innovative technology practice and has resulted in substantial quality of life gains for employees with cardiovascular pathology. Evidence gathered in recent years about the introduction of Tele-cardiology from company physicians and employees were not just positive but also very encouraging[8]. Not only did participation in the Tele-cardiology program grow, but the overall perception of clinical care increased in terms of employees’ health. It has become an important tool for supporting clinical decision making and inappropriate MEDEVACs are being minimised.

‘WORK CARE’

Considering the fact that an employee spends a major part of his/her life on a work site away from home and the family physician, Saipem initiated the concept of “Work Care” for its employees aiming to improve the general health and well-being of the employees, support more employees with health conditions to stay in work and return to their employment after illness[1].

We do this by educating employees and raising health awareness, improving the range and capacity of occupational health support, and Tele-cardiology has its role to play in all of this.

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Abstract

The Gulf Cooperation Council (GCC) is the political and economic union of six Arab countries located in the Arabian Peninsula: Bahrain, Kingdom of Saudi Arabia, Kuwait, Qatar, Republic of Yemen, Sultanate of Oman, and the United Arab Emirates. Following the investment of oil and gas revenues by the leadership of individual member states, the GCC countries have experienced tremendous economic and industrial growth. The majority of the GCC countries have adopted a mass recruitment strategy of low skilled or unskilled labourers from less-developed countries to satisfy the manpower demands of these fast paced industrial developments. The inward flux of multinational expatriate workers, with varying educational qualifications, work experience, religious beliefs, cultural practices, and native languages poses a challenge for occupational health professionals tasked with ensuring that the safety, health and wellbeing of these workers progresses at the same rate as industrial and economic development. The pace of development of occupational health within the GCC countries varies, and the experience within the United Arab Emirates is a useful case study.

Key Words: Arabia, Middle East, Occupational Diseases, Occupational Exposure, Occupational Health, Occupational Health Services, Occupational Medicine, United Arab Emirates.

Introduction

Gulf Cooperation Council Countries:

The Arabian Peninsula is located in the south-western region of the Asian Continent and consists of seven countries: Bahrain, Kingdom of Saudi Arabia, Kuwait, Qatar, Republic of Yemen, Sultanate of Oman, and the United Arab Emirates (UAE). Founded on 26 May 1981, these countries (excluding the Republic of Yemen) formed the Gulf Cooperation Council (GCC) with the collective mission of promoting co-ordination between member states in all fields to achieve unity. The overarching mission of the GCC is to promote co-ordination and cohesion between member states by formulating aligned regulations in various fields such as religion, trade, finance, tourism, legislation and administration. Many of the GCC countries did not establish independence until the 1970’s, for example, Bahrain, Qatar and the UAE did not declare independence from the United Kingdom until 1971. Revenues from oil and natural gas have contributed to rapid economic and industrial development, especially in the petroleum, airline,
The UAE

The UAE is a high-income developed country composed of a federation of seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah and Umm Al-Quwain) that vary in population size and structure, land mass, financial strength and are governed by both federal and local laws (Sharif, Blair, Taha and Loney 2013). Similar to other GCC countries, the UAE has witnessed considerable socio-economic and demographic change since its formation in 1971. Indeed, the industrial progress over the past 20 years is symbolised by several mega-projects including the construction of the world’s tallest building (Burj Khalifa) and largest shopping complex (Dubai Mall), Jebel Ali Port and Free Zone, Dubai International and Al Maktoum International Airports, and numerous artificial islands: Yas Island, Palm Dubai and a man-made archipelago called The World (Loney et al. 2013). Dubai recently won the bid to host the World Expo in 2020 and additional infra-structure and mega-projects are planned for the next six years. Moreover, the UAE has an expanding manufacturing and agricultural base with aluminium, steel, iron, textiles, and agricultural products (e.g. dates, fish, vegetables, poultry, eggs, dairy products, chocolate) contributing significantly to exports (Loney et al. 2013).

Labourers with varying skills and levels of formal education are often recruited from less developed countries to satisfy the manpower demands of many projects in the construction, agricultural and service industries. Consequently, the UAE population has increased substantially over the past four decades due to the high influx of expatriate workers attracted by the appealing economic work opportunities created by the fast paced industrial developments (Loney, Cooling and Aw 2012). The UAE population has grown from an estimated 287,000 in 1971 to approximately 4.1 million in 2005 and 8.3 million in 2010 (UAE National Bureau of Statistics 2011). Interestingly, expatriate workforce recruitment has created an unusual population composition, with the total UAE population comprising around 11% (950,000) Emiratis and the remainder being migrant workers from diverse socio-economic backgrounds (Blair and Sharif 2012; United Arab Emirates National Bureau of Statistics 2011). For example, the total population of Abu Dhabi (largest emirate) is estimated to be 2.3 million, of whom over 50% are expatriate males aged 20-59 years (Abu Dhabi Statistics Centre 2011). As such, the UAE is composed of a multinational population, with varying educational qualifications, work experience, religious beliefs, cultural practices, and native languages. Many of the expatriate workers in the UAE have left their immediate family back in their home country and only travel back to see their family once every year or two years which can have a significant psycho-social impact on the health of these workers. Overall, the expatriate population characteristics pose a challenge for occupational health professionals tasked with ensuring that the safety, health and wellbeing of these workers progresses alongside industrial and economic development.

Occupational Health in the UAE

Morbidity and Mortality of Occupational Injuries in the UAE

Injury is the second leading cause of mortality in the UAE for all age groups, with occupational related fatalities contributing to 16% of all injury deaths in Abu Dhabi in 2007 (Health Authority Abu Dhabi 2014). Consequently, occupational health has been included in the list of top public health priorities for the Health Authority of Abu Dhabi for the past five years (Grivna et al., 2012). Recent estimates indicate
that the burden of morbidity related to work-related injuries may be rising. The Health Authority Abu Dhabi (HAAD) reported that occupational injuries accounted for 22% of all injuries in the emirate of Abu Dhabi during 2010, including 101 fatal occupational-related incidents (Health Authority Abu Dhabi 2014). Barss and colleagues (2009) analysed surgical admission data from March 2003 to April 2005 at the main trauma hospital in Al Ain (second largest city in emirate of Abu Dhabi with a population of ≈ 450,000 in 2005) and reported 614 occupational injury hospitalisations during this time period, an incidence rate of 136 per 100,000 workers/year. Male expatriate workers aged between 22 and 44 years of age (69%) originating from South Asia (Bangladesh, 19%; India, 24%; Pakistan, 27%) accounted for the majority of incidents (Barss et al. 2009). Over half of occupational injuries were due to falls (51%) followed by falling objects (15%) and the mean hospitalisation duration was 9.4 days (SD 11.8), with 36% hospitalised for >1 week (Barss et al. 2009).

Low health and safety awareness regarding the potential risks associated with specific occupational hazards coupled with poor compliance with health and safety procedures partly explains the high incidence of occupational-related injuries in the UAE. For example, Ahmed and Newson-Smith (2010) investigated the knowledge, attitudes and practices related to occupational hazards among male cement workers (n=153) in the emirate of Ras Al Khaimah. The study revealed that less than a third of workers reported using personal safety masks at all times during work. All cement workers reported that they had been provided with masks to protect them from dust; however, only 12% of workers reported that they were trained on how and when to use them. Similar studies conducted in the UAE have reported poor compliance with health and safety measures, including foundry, farm and cement factory workers failing to wear appropriate full-body, hand, foot, eye, ear and respiratory protection resulting in impairments in visual acuity, hearing, lung function, and muscle function (Al-Neaimi, Gomes and Lloyd 2001; Gomes, Lloyd and Norman 2002; Gomes, Lloyd, Norman and Pahwa 2001; Gomes, Lloyd, Revitt and Basha 1998; Gomes, Lloyd and Revitt 1999). These studies highlight a common situation in the UAE; namely, that expatriate workers lack the awareness of the negative health effects of certain occupational exposures; and/or have not been trained or do not perceive the benefits of adhering to specific health and safety regulations (Loney, Cooling and Aw 2012).

Prioritising Occupational Health Issues in the UAE

The Health Authority Abu Dhabi (HAAD) had listed occupational health amongst the top 10 public health priorities for the UAE. However, the specific priority areas within occupational health have yet to be elucidated. Agreeing priorities is essential for planning occupational health in many countries, including rapidly developing areas such as those in the Middle East. A number of options are available for deciding on occupational health priorities. These include evidence-based reviews, expert opinion and expert panels, and consulting stakeholders. One effective method of consulting stakeholders is by conducting a Delphi study exercise, and this approach has been used to prioritise occupational health related issues in the United Kingdom, the Netherlands, Malaysia and Europe (Harrington 1994; MacDonald, Ritchie, Murray and Gilmour 2000; Reetoo, Harrington and Macdonald 2005; Sadhra, Beach, Aw and Sheikh Ahmad 2001; Van der Beek, Dressen-Frings, Van Dijk, et al. 1997). Researchers from the Institute of Public Health (College of Medicine and Health Sciences, UAE University) collaborated with HAAD to conduct a modified Delphi exercise involving health and safety stakeholders from all over the UAE including participants from government agencies (ministries and hospitals), industry (aviation, construction, and the petroleum industry), and academia. The modified Delphi method that was used for this project included a novel approach of including a wireless interactive computer-linked audience.
response system. This technology enabled individual participants to respond anonymously and quickly, allowing audience responses to be analysed rapidly, thus facilitating the provision of immediate feedback to the audience. The modified Delphi approach used involved a three-stage iterative process where stakeholders were asked to provide their views on occupational health priorities in three key areas of occupational health and safety in the emirate of Abu Dhabi and the UAE as a whole: (i) Specific Issues; (ii) Data Gaps; and (iii) Resources Needed.

The top 5 ranked priority specific occupational health issues were:

1. Occupational health and safety legislation
2. Guidelines on occupational health and safety
3. A central government body for occupational health strategy
4. Competency of occupational health professionals
5. Prevention of work-related illness.

The top 5 ranked priority data gaps were identified as:

1. Absence of workplace injury reporting system
2. Lack of accurate health and safety statistics
3. Data on extent and results of occupational health screening
4. Data on extent of occupational illnesses
5. Data on occupational exposure assessment findings.

The top 5 priority resources needs were identified as:

1. Governmental support and commitment for occupational health and safety
2. National guidelines on industry-specific health and safety standards
3. Education and training for different occupational health and safety practitioners
4. A central health and safety resource
5. System for accurate and complete data collection for occupational health and safety statistics.

The three lists of top ten priority occupational health issues resulting from the project have been used by various governmental agencies to develop occupational health and safety programs for the UAE. The lists can also be used to formulate policy and allocate research priorities. Repeating the same modified Delphi exercise at pre-specified time points (e.g. five year intervals) can enable trends to be described regarding perceived stakeholder priorities for occupational health in the GCC.

Occupational Health Training and Continued Professional Development in the UAE

Sufficient numbers of trained occupational health professionals are required to raise the occupational health standards in the UAE to be on par with other developed countries. At present, there is shortage of specialist occupational medicine physicians, occupational health nurses, industrial hygienists, toxicologists, ergonomists, and safety professionals trained in occupational health. Due to the lack of industrial hygienists and certified and accredited hygiene laboratories, it is not currently possible to accurately quantify the extent of exposure to hazardous materials in the GCC countries. There are already developments in place by universities and health organisations to facilitate and improve the occupational health training of clinical and public health specialists in the UAE. Both Emirates National Oil Company and Abu Dhabi National Oil Company hold free-to-attend annual CME-accredited occupational health conferences that allow occupational health practitioners from all over the Middle East to meet and discuss the progress of occupational health challenges facing the region.

The UAE University has been spearheading the provision and quality of occupational health training in the Middle East (Schneider and Aw 2012). For multinational companies seeking flexibility in their workforce, the recruitment of physicians (and other professionals in the field of occupational health) with internationally recognised qualifications have distinct
advantages. In the UAE, the Faculty of Occupational Medicine of the Royal College of Physicians of Ireland has designated the UAE University as an overseas exam centre for occupational medicine. This is now the second international centre, after Kuala Lumpur, Malaysia. Since 2010, candidates have been able to take the Royal College exam for Licentiate (LFOM) and Membership (MFOM) of the Faculty of Occupational Medicine (Royal College of Physicians of Ireland) at the exam centre in the UAE. The Al Ain examining centre currently attracts more LFOM and MFOM candidates than Dublin (Ireland) and Kuala Lumpur (Malaysia) combined with candidates travelling from all over the Middle East, Asia, Africa and Australasia for the examinations.

In collaboration with various industrial partners, UAE University has designed and delivered a range of graduate occupational health training courses in the UAE, Oman, Qatar, and Iraq. These educational activities are designed to prepare candidates from the Middle East and Africa regions for the Licentiate (LFOM) and Membership (MFOM) exams for the Faculty of Occupational Medicine Ireland. Activities include five-day occupational health courses, one-day exam preparation workshops, and the bi-annual occupational medicine video-conference. The Institute of Public Health at UAE University delivers over 20 hours of occupational health training during the undergraduate medical degree programme and provides occupational health courses for their Masters and PhD students. The Institute of Public Health also developed and delivers a 10-day ‘International Control of Hazardous Agents in the Workplace’ element of the NEBOSH International Diploma (six week course). This course is intended for individuals who want to progress their career in health and safety and develop in-depth knowledge and skills as health and safety practitioners.

There is an urgent need for specialist occupational health training for physicians and healthcare workers employed in remote areas, e.g., at offshore and inland oil and gas projects. However, the delivery of on-site/in-country training courses is problematic in some countries e.g., Iraq, where there is ongoing instability and conflict. In 2013, the Institute of Public Health at UAE University collaborated with Shell Middle East and North Africa to deliver an occupational health course using tele-education to physicians and healthcare workers employed in the Majnoon oil field project. A range of occupational health sessions were delivered via video link to more than 20 doctors and nurses from Shell’s partners - South Oil Company and the South Gas Company, and medical professionals from Basrah Gas Company, Majnoon Oil Field, Basrah University, Basrah Province Hospitals and the Iraq Directorate of Health. This model of remote tele-education has the potential to be implemented in other countries within the Middle East region (e.g., Syria, Afghanistan) where it may be problematic to conduct face-to-face courses in country.

The Institute of Public Health (College of Medicine and Health Sciences, UAE University) was designated as a World Health Organization Collaborating Centre for Occupational Health (WHO CC for OH) in November 2013. The WHO CC for OH in Al Ain is the first in the region for occupational health, and the centre has been contributing actively to WHO’s Global Occupational Health Programme focussing on training general practitioners and other specialty physicians to practice occupational and environmental medicine at a basic level. Specifically, the WHO CC for OH in Al Ain helped develop a guidance document titled ‘International requirements for health protection at the workplace’ that provides an analysis of the whole spectrum of international standards directly relating to protecting health at the work place, co-organising a five-day course in Doha, Qatar (23-27 March 2014) titled ‘Training of General Practitioners and Other speciality Physicians on Basic Occupational and Environmental Health Services’ and acting as WHO Temporary Advisors on health coverage for workers in the UAE at the International Consultation on ‘Caring for All Working People: Interventions, Indicators and Service Delivery’ organised by the WHO Regional Office for the Eastern Mediterranean in Semnan, Islamic Republic of Iran (28-30 April 2014).
An Institute of Remote Health Care (IRHC) has recently been established in Scotland with the main goal being to train healthcare professionals in the provision of clinical care in remote locations. This includes workplace locations such as offshore oil rigs, desert environments, and isolated forested areas. Occupational health competency is viewed as an important aspect of the training, and occupational health training centres such as the WHO CC for OH in the UAE, are working with IRHC to contribute to training and research in this area.

Conclusion

The UAE has experienced remarkable progress in occupational health services over the past 10 years. Expatriate workers in the UAE are no different from expatriates working in other GCC countries, in that they import their knowledge, attitudes, practices and beliefs into the workplace. The high incidence of occupational-related injuries in the UAE can be partly attributed to the mass recruitment of large numbers of expatriate workers outstripping the capacity of the health and labour ministries to implement, enforce and audit adequate health and safety regulations, training programs, and awareness campaigns. The major occupational health challenges facing the UAE are not limited to this country. They are part of a wider challenge in the Middle East and the action needed involves regional and international collaboration.

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Background

The term “remote” in the healthcare context covers a wide range of circumstances from Remote, Rural and Island populations in Scotland to remote communities of workers who may be located in hostile environments offshore, in the polar regions, in the desert or in mountainous regions.

The challenges of delivery of healthcare to remote communities are thus many and varied. Some are specific to the fundamental needs of populations and communities and others are constrained by geographical factors and to factors inherent in particular occupational groupings such as offshore workers and those in other potentially hostile environments. For some remote communities such as those in rural Scotland, the requirement for an adequate healthcare system is fundamental to the resilience and indeed the existence of that community. Modern healthcare is complex and no one individual, no matter how well trained, can be expected to provide all conceivable facets of care in every location so there is also a need to not only foster and support the first line management of illness, but facilitate access to expert advice and if necessary to arrange evacuation of the ill patient to a suitable facility. Effective communication is therefore essential, as well as a basic understanding of the dynamics of management of illness in remote environments. This communication and understanding must be a two-way process involving individuals in both the remote location and in the centre of expertise.

At the present time, those working in healthcare in remote areas come from a range of backgrounds spanning the spectrum of health expertise from first-aider, trained “First Responder” to GP and hospital consultant. They encompass the full range of health professionals including nursing, allied health professionals, physician’s assistants, pharmacists and paramedics. All these professionals have been trained to recognised standards within their professional sphere specific to their country of origin. Care is based on a model of delivery where a certain level of care is actively provided by the professional within the community working within their own professional boundaries, higher level care being provided in the hospital environment. Offshore, many of these personnel are ex-military and have been trained to work to a referral pattern straight to big city A&E for more serious illness. There is thus a wide range of individuals with varying expertise providing care in what may be very challenging environments. Care tends to be delivered according to protocols which of necessity are didactic, extremely comprehensive and somewhat proscriptive. There tends to be little emphasis on preventative, predictive and proactive care supporting self management within the community and more focus on “firefighting” incidents as they occur. Training tends to emphasise the skills of dealing with specific disorders from a medical perspective with less attention paid to clear lines of communication between professionals and to the generic skills required to effectively support healthcare in a remote community or the specific skills which may be required in different communities. There is thus a need to identify the specific skills required to be a remote area practitioner and to provide training to permit them to work safely in that environment which will include accessing necessary supporting expertise.

The healthcare needs of remote communities internationally are changing, partly as a result of demographic changes but also changing expectations of the population and the challenges of recruitment.
and retention of health professionals whose lifestyle expectations are different from previous generations. These changes are frequently not recognised by the communities in question who may require education and support to understand the challenges of modern healthcare. This is well illustrated by the changes in the workforce in the offshore industry from young fit males who presented healthcare challenges mainly in the management of acute trauma to the current workforce, made up largely of those same individuals who have aged by 20 to 30 years, who now present with the problems of middle age, including long term conditions such as cardiac disease, diabetes and arthritis, and also poor general fitness and obesity.

At present, the healthcare provision to remote communities worldwide is relatively patchy and ill-coordinated with an expectation that existing healthcare provision will prove adequate in times of need. However there are significant communities in rural, island, remote and hostile environments, including offshore islands and industrial installations whose healthcare needs are barely adequately met and there is a clear requirement that this be remedied.

**Requirements**

There is a need to provide specifically tailored training for work in the remote environment which will be in addition to the basic clinical knowledge which the health professional, regardless of background, will possess. A significant amount of work to address this has already been driven by the Remote & Rural Healthcare Alliance (RRHEAL), part of National Health Service Education for Scotland (NES) and includes documents on GP Acute Care Competencies, a proposal for a Generic Rural Health and Social Care Support Worker and for a Rural Advanced Nurse Practitioner. The training needs incorporate a detailed understanding of the needs of the population, risk factors to which they may be exposed and an understanding of the challenges of providing care in an environment where expert assistance may not be available for some hours if at all. This will include a clear understanding of lines of communication, the ability to communicate clearly, succinctly and accurately and an in depth understanding of the networks of care provision which are relevant to the community involved and also to the provider of more expert and complex care. Expertise and understanding will also be required for effective use of digital technology for communication and for the many aspects of telehealth and telecare, the latter including remote monitoring, transfer of complex medical information including imaging and also teleconsultation. It may also incorporate an element of predictive and preventative care and support for the overall health and wellbeing of the community in question and their occupational health requirements.

**Proposed Mechanism**

Currently within Scotland, the Institute of Remote Healthcare (IRHC), based in Aberdeen and the Scottish School for Rural Health and Wellbeing (SSRH&W) centered in Inverness are two organisations whose remit is to provide education and training, pursue relevant research and support the development of high quality healthcare to remote, rural, island and offshore populations.

The Institute of Remote Healthcare has strong links with the offshore oil industry, healthcare providers and others in remote and challenging healthcare environments in the Middle East as well as other international partners.

The Scottish School for Rural Health and Wellbeing is an overarching collaboration between a range of partners with an interest in this area. These include the three universities with a presence in the Highlands involved in healthcare education and delivery (Universities of Aberdeen, Highlands & Islands and Stirling), NHS Education for Scotland, NHS24 now integrated with the Scottish Ambulance Service, and Health Boards and Local Authorities with substantial rural communities to serve. (NHS Highland is now integrated with Highland Council social care services). The focus is on developing workstreams supporting education for remote areas through the Remote & Rural Healthcare Alliance (RRHEAL) and research specifically in areas relevant to
remote communities covering social care and conditions such as diabetes which present particular challenges in their management in the remote environment.

SSRH&W also has effective linkages with experts in providing telehealth and telecare and the research and development of digital technologies in healthcare.

These two organisations are working together to develop a curriculum of the relevant generic skills required by healthcare workers in remote areas which will form the backbone of a broad strategy to provide a clearly identifiable credential for a competent remote healthcare worker.

**Standard Setting and Validation**

Work is required by the various partners outlined above to clearly define and agree the contents of training packages which will meet the needs of a fully competent remote area healthcare worker. Organisations with suitable expertise and stature to provide support in the development of the standards required are the Medical and Surgical Royal Colleges and it would seem highly desirable if a collaborative approach could be taken to the credentialing of such training, ideally culminating in an intercollegiate diploma. This would have benefits not only for the remote communities in question but also for the Colleges and potentially for the Scottish Government who would be seen to be taking the issue of remote healthcare forward as a serious commitment.

**Next Steps**

1. Development of a detailed curriculum for the remote healthcare worker incorporating generic skills but perhaps with additional modules for specific situations such as diving medicine, high altitude medicine, management of long term conditions in the community, wellbeing of workers in remote communities etc.

2. Engage with industry, particularly the oil and gas industry regarding their needs for their workforce in remote off and onshore locations

3. Continue discussion with RCPsG and RCSeD about structure and content of curricula and to secure agreement for intercollegiate examining of the qualification based on the curriculum.

4. Liase with Scottish Government emphasising need to support this agenda.

5. Further develop international linkages to support healthcare in their remote and hard to reach communities focussing on their specific needs. (e.g. RTA management, diabetes management)

**Conclusion**

There is an evident need for a collaborative approach to developing standards for education and training of health workers in remote & rural areas which carry the imprimatur of recognised authorities in healthcare and also the confidence of residents and workers in those environments. Work is ongoing to develop this agenda supported by academic work in a range of relevant educational and research fields which potentially will carry international respect and recognition.

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Developments in Remote Health Care

The “Piper Alpha” Oil Rig Disaster - Some Lessons

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Introduction

On June 6 1988, the “Piper Alpha” Oil Rig Disaster in the North Sea claimed 166 live. There were only 61 survivors of whom 11 were seriously burnt.

The Disaster Unfolds

The following is a sequence of events that occurred on the Piper Alpha Oil Rig, 500 miles east of Aberdeen on a calm night in the often hostile environment of the North Sea.

21.40 The rig gas flare increased beyond normal levels and became noisy
21.53 The condensate container alarm sounded
21.56 Several gas alarms triggered
21.58 The first explosion occurred

Emergency shutdown took place

The first “Mayday” call was sent out – then all communications were lost with Piper.

22.07 The radio room was abandoned
22.22 A huge explosion occurred and a fireball engulfed Piper
22.30 There was a TV news flash announcing a “Big explosion in the North Sea” – this was seen by Professor Page who was duty Emergency Dept consultant for Aberdeen Royal Infirmary
22.35 The pipe deck dropped 30 feet

22.40 The duty consultant for the Emergency Department arrived in the department. There was no concrete information, but he decided to declare a “Major Incident” in order that the department prepare for a large influx of casualties.

Discussion took place with the rig owners “Occidental” and their doctors who were mobilised and helicoptered offshore.

The “Specialist Team” (A group of Aberdeen Royal Infirmary consultant surgeons and anaesthetists) was mobilised.

22.50 There was a further violent explosion – that engulfed the rig and a rescue boat
23.30 An RAF rescue helicopter arrived to collect the specialist team from Aberdeen Emergency Department helipad
23.30 The accommodation module started to tilt
00.30 The accommodation module dropped into the sea

00.56 The Company doctors arrived at “Tharos” – (“Tharos” was a semi-submersible fire fighting unit that just happened to be alongside “Piper Alpha” at that time)

02.10 The A&E specialist team arrived at “Tharos”

Between 03.30 and 08.45, the casualties arrived at Aberdeen Emergency department – in small groups (limited by the capacity of helicopters).
Some Lessons

- In a major incident on the UK continental shelf the coastguard should co-ordinate the rescue. Attempts by oil operators to manage the incident in-house are unwise.

- Communications are almost always a weak point in major incidents. In this incident the link with Piper were lost early in the incident. There was no official notification of a major incident to the Emergency department. The duty consultant activated the major incident plan following a news flash on ITV about 22.25.

- Back up communications should be available. Following the Piper Alpha explosion RAF Nimrod aircraft were deployed to establish communications above the stricken installation.

- Military or coastguard helicopters with winches and a skilled winch-man are essential since the installation affected may be too unstable and dangerous to land on. Civilian helicopters seldom have this facility. It was fortuitous that the Tharos was alongside so that casualties could be initially dealt with on board as well a fighting the fire.

- In a major incident offshore, casualties are not necessarily evacuated in-strict triage priority. Walking wounded may be evacuated with stretcher cases to make maximum use of the helicopter capacity. If necessary they can be used to help with seriously injured casualties.

- The Emergency department receiving casualties should have a properly equipped helicopter landing pad so that the injured can be conveyed directly to hospital.

- The police will assume responsibility for co-ordinating the incident once the casualties reach land. They will set up a Casually Information bureau at police headquarters and send officers to the Emergency Department to gather information.

The oil operator and contracting companies should join forces with the police for this task. The police have a statutory responsibility to notify the next of kin of the dead and injured. It should be remembered that oil workers live all over the UK and on the continent of Europe.

- There is usually a delay of several hours in an incident such as Piper before the casualties hit the shore. This can be an advantage to the receiving hospital in that there is time to clear beds, draw operating lists to a close, and notify the necessary additional staff and specialties likely to be required.

- It is important to deal efficiently with the media. Uncontrolled they will resort to subversive tactics and may invade the Emergency department to obtain information. The police and the hospital Director of Corporate Communications will take control of this very important aspect of management of the incident. There is a fine line between legitimate public interest and invasion of privacy. Publication and other deadlines should be respected and press conferences arranged to take account of this. This aspect of the incident management is time consuming but it can make the difference between a good or poor perception by the public as to how the incident was handled.

- Burns, inhalation injuries and carbon monoxide poisoning are common sequelae of oil installation explosions. The receiving Emergency department should have ready access to plastic surgeons, intensivists and hyperbaric oxygen chambers to deal with these injuries. Fluid resuscitation, analgesia and first aid dressing protocols should be agreed in advance. Following Piper Alpha a large number of Plastic surgeons flew into Aberdeen and the 11 seriously burnt patients were expeditiously managed with a technique called tangential excision and grafting.
Debriefing after an incident such as Piper Alpha is essential for staff and victims. This was most efficiently handled by Professor David Alexander (a world authority on the psychological sequelae of trauma) who explained the syndrome of post-traumatic stress to victims and what to expect in terms of psychological sequelae.

Reviews of the major incident plan after a disaster such as this one is prudent, but beware of altering it to mirror the last incident because the next one will be completely different.

The majority of those who died on Piper were those who had obeyed orders and retreated to the accommodation module. Death was mainly due to carbon monoxide poisoning. Most of those who that survived had jumped into the sea often from heights of 100 feet. The intense heat of the fire minimised the incidence of hypothermia.

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Introduction

In the June 2012 edition of the Journal of the Institute of Remote Health Care, an article was published exploring ‘The Productive Council’ exploring the stages of maturation of any small organisation, namely ‘storming’, ‘forming’ and ‘norming’ (appendix 1).

In many ways, reflection will illustrate that much has been done to take the IRHC through the first two stages and now may be the opportunity to start addressing the challenges of stage three. In the first paper, this is nominally entitled ‘forming’ reflecting Tuckman’s first use of the term. A more useful interpretation may be to adopt the term ‘continuation’ - the definition of this word being - the action of carrying something on over time or the state of being carried on - because that really is the essence of the challenge - how to continue all the good work so far achieved, how to build on this and how to develop the structures and systems that will sustain this beyond the roles of the individuals so far involved.

A number of activities have occurred towards the goal of continuation already. This paper intends to build a picture of how these now might integrate.

An organisational structure

Recent discussions, research and negotiations have taken place involving among others:

- The Royal College of Physicians and Surgeons of Glasgow (RCPSG)
- The Centre for Health Sciences, Inverness
- The Royal College of Surgeons of Edinburgh (RCSEd) - Faculty of Pre-Hospital Medicine
- Academy of Medical Royal Colleges of Scotland

In addition, work is being undertaken by Dr Abdulhalim Mohammed of Shell to further define the core competencies expected of Remote Health Care Practitioners (RHCPs) and this work is being taken forward by Dr Alastair Fraser of Shell International, in conjunction with the RCPSG to try to define the complexion of an accreditation and registration system for RHCPs.

In the midst of all this, the IRHC itself continues to function as a voluntary registration body and continues to have a productive output through its Journal, its annual conference and other activities. Current work is underway to establish an online Personal Portfolio to facilitate recording of personal CPD by its members.

Thus there is an eclectic mix of formal and informal activity now underway. This effort needs now to be defined in terms of the core activities represented - but also now needs definition in terms of the more formal activity (accreditation, registration, etc) occurring and the supportive activity to sustain this (provision, commissioning, R&D, etc).
Broadly speaking, it is suggested that the activities split into two streams of activity, under the umbrella of a Faculty of Remote and Rural Healthcare.

The definition of membership of a Council of such a Faculty can be deferred until such time as a Faculty is formed - but such a governing Council would be expected to represent the work and output of the Faculty itself - but also the partners with whom it would work and the lay people that it serves. At this stage, the broad definition of the two streams is more pertinent. The two streams comprise the formal systems needed for accreditation and registration and the less formal supportive structure to fulfil the needs that would arise from this.

The formal bit

It is becoming increasingly clear that a future home will be needed for the more formal elements of what the IRHC seeks to achieve. These elements comprise

- Establishing, agreeing, setting and maintenance of an identified set of standards for the RHCP
- Accreditation of the RHCP (including examination to an objective standard)
- Registration and maintenance of a register

It is now clear that the body with the most credibility and extant systems to support this is the Royal College of Physicians and Surgeons of Glasgow. The RCPSG has a legacy of being outward looking and inclusive. It has experience of working in international contexts. It has experience of the implementation of the above elements. It has a management structure that would ensure free-standing viability of these very necessary elements.

The supportive bit

It would not be possible to have the formal elements sustained without significant supportive activity. Such supportive activity includes (but would not be restricted to)

- Administration and communication with members of the Faculty
- Provision of learning - or commissioning where appropriate
- Accreditation of learning activities
- The provision of online CPD portfolio tools
- Audit, Research and Development
- Publications
- International outreach - including the Middle East group, etc

In other words, this would be the productive element of the organisation that would have the task of ensuring all the support necessary to ensure that RHCPs could maintain registration and that high quality remote health care was being researched and promoted both in the UK and internationally.

In future, this activity should be physically focussed on the Centre for Health Sciences in Inverness, but should be functionally focussed on an international virtual network of contributors and supporters, maximising all available modern communication modalities.

Summary

This paper seeks to clarify the work that has been ongoing to date and seeks to establish an understandable and integrated structure that would allow continuation of the work achieved by the IRHC and those associated with it to date.
Appendix 1:

Institute of Remote Healthcare (IRHC)

January 2012

‘The Productive Council’

The IRHC must continue to mature as an organisation, embed itself as a key leadership body for setting standards and development in remote health care and also ensure its continuity and continuation. This raises many challenges. The Council is the core element of the IRHC and it is the council that must provide the leadership for these challenges to be met.

The Council, as constituted, has many merits. It comprises many highly regarded individuals with a past record of leadership and in most cases, leadership that is particularly appropriate for remote health care. The members of council additionally provide connection to a very broad spectrum of organisations and interests both in the UK and around the world, thus generating a unique network upon which the IRHC can draw and explore. The council has succeeded in electing officers and establishing a constitution that provides it with good guidance and governance. The executive elements of the council are providing a service well beyond that which would reasonably have been expected with minimal infrastructure support.

There are however risks.

In any organisation, or group, development basically boils down to three phases, vis ‘Storming’, ‘Forming’ and ‘Norming’. It’s not complex to interpret these terms. Storming comprises that energetic phase of a new venture when a new idea is recognised and when it triggers the imagination of those involved. Much can be achieved in this phase and it is possible to reflect that the IRHC has indeed stormed the past 2 years or more in terms of its development and successes to date.

Forming is when things have to move on from being sustained by energy alone. Any group will require to establish structures and systems that allow its output to become more refined, coordinated and productive. Support needs to be built up and the foundations established to ensure that the organisation then becomes enduring. Greater clarity of purpose is needed. A vision of what is possible needs to be communicated. Broader support needs to be engineered. The desire to be involved needs to be encouraged.

Norming represents the maturation stage, when the group or organisation starts to embed for the longer term. It encompasses the naturalisation of systems and procedures. It includes planned and strategic growth and development. Above all, it represents the stage where the momentum of the organisation is greater than the momentum of its individual components. So changes can occur with personnel, leadership, purpose and systems that do not cause harm to the organisation’s continuation.

So where is the IRHC now and what does it have to do next?

Storming

The concept of the IRHC has been around for longer than the past 2 years or so since a Council was formed and activities began to happen. The main effort in terms of the ‘reach’ of the IRHC however, has been over the past 2 to 2½ years.

So far, IRHC success has included:

- The establishment of a Council with around 17 members representing many senior and experienced clinicians and academics and chaired by a particularly experienced and academically regarded chairman, Prof Sir Graeme Catto.
• The continued leadership and ‘hands on’ development by the IRHC founding President, Prof Nelson Norman

• The effective stewardship and executive management of Mr Alan Kennedy-Bolam

• Council meetings held every 6 months or so with good attendance and minuted output

• The establishment of an External Advisory Group and the incorporation of the chair of this group onto council

• Sound governance frameworks have been produced that ensure the organisation is properly managed and run – with great emphasis on probity

• The establishment of a core executive group

• Two symposia have been successfully held and a third is planned

• IRHC has contributed substantially to a new course development at RGU aimed at remote health care practitioners

• A journal has been established which publishes original material of reasonable quality encouraging academic reflection on remote health care

• A newsletter is regularly produced and circulated to members

• A quality assurance system for training activities has been developed – Training Assurance Certificate (TrAC) which will allow providers of training and education to apply for certification that their activity has been reviewed by IRHC to set criteria to ensure validity and worth to remote health care practitioners

• Membership structures have been established and a move will soon be made into a system of voluntary registration of remote health care practitioners. This will be an internationally recognised register

• Registration incorporates proposed criteria emerging from the Commission for Healthcare Regulatory Excellence with whom IRHC may yet be able to align

• IRHC through Prof Norman and Alan Kennedy-Bolam are heavily engaged into proposed developments in Sharjah, UAE and Libya

However, there are also some areas that still carry risks in terms of likely success at this stage:

• The core executive remains small and has limited time available to extend productive output beyond current levels

• The IRHC is still not financially viable – this depends on substantial expansion of membership, registration and cash raising TrAC activity

• The balance between commissioning, directing and providing is not clear

• The need to identify partners to work with (especially in terms of provision) has not yet been clarified

**Forming**

It is possible that the IRHC is already entering this phase – but there is limited recognition of this potential change and little yet in the way of clarity from council as to how this transition should be managed.

It is necessary for the IRHC to start to define its core role and the systems by which this can be sustained.

Forming will require a number of things to happen.

There is a need to describe and then deliver a core business structure that makes the organisation sustainable. This would need to comprise a description of the actual functions of

• The President (and any vice-president)

• The Chief Executive role

• The Chief Administrator role

• The role of the Council and what is expected of them

This assumes that there is an existing systems description that ensures the safe operation of the council in terms of its financial and business obligations.
The role of the officers of the council – particularly with regards to financial affairs and other matters of probity needs to be made clear.

Beyond this, there is a need to agree the eventual ‘method’ of the IRHC. This may stem from agreement around whether it is an academic body or whether it has a commercial element to it e.g. as a provider. As an academic body, consideration could be given into whether it could be constituted as an educational charity. As a commercial body, clarity needs to be achieved around its business model and how liability can be limited within its remit as an operating company. In truth, the likely need is for a hybrid approach – the two concepts are not mutually exclusive – but they should reflect a clear and widespread understanding of the core purpose of the IRHC.

Therefore, most fundamental of all, there is a need for the council to describe and agree its purpose. The council should be there to provide leadership and direction – but the expectation around this needs clarified. Most bodies with a core council would anticipate some active participation and productive output from council members. This would range from officer functions through to actual activity such as academic contributions, presentations and a contribution to quality assurance and registration activity. This may incur a true time contribution. However, a productive council is where this contribution is recognised and that the time commitment can be split fairly and realistically. Tasks are agreed and deadlines are adhered to. Communication is productive in seeking the achievement of the task at hand. A productive council will also seek to further the organisations goals through active use of networks. This again can comprise a number of outputs – but active encouragement towards registration and participation from others, active encouragement to engage in academic and quality assurance work and general networking would be the obvious ones.

Again, by ‘collective productivity’ more can be achieved than by focussing productive output on only a few individuals.

**Norming**

In this phase, an organisation becomes embedded and enduring.

Organisational structures and systems function fluently. Change is incremental and progressive. Terms of office are adhered to and new incumbents are identified and appointed into officer and leadership roles. The financial base is solid. There is risk awareness and risk mitigation can be easily implemented. There is an enduring productive output.

This is when a body is finally recognised for its net worth and contribution. If we reflect on all our involvement with the IRHC, there is a clear need for an umbrella body to bring together the academic and quality assurance needs of the Remote Health Care community – world-wide. Our engagement currently reflects a general desire to break down barriers and to encourage more professional sharing in order to heighten the general quality of care that is provided. But if we really mean ‘business’, then as a council, there is a need for leadership by all within individual and corporate networks to achieve this goal.

Norming remains an elusive phase at the moment – but it is a phase that should naturally flow from ‘forming’. At present there are clear indications that the IRHC is entering the forming phase of activity – but it is not yet clear that this is yet fully planned and far from clear that it is yet energetically supported. The thesis is that if the Council should subscribe to the support of forming, then at some point, norming should then follow on.
Summary

The IRHC Council is the leadership body for the organisation and has an obligation and duty to ensure the success of the organisation. There would appear to be acceptance that the IRHC has some worth – there is a gradual groundswell of support, a desire from RHC practitioners to become engaged, there has been productive output that has been welcomed in many quarters. The Council members must therefore have been party to this notion in becoming individually involved. It is now essential for the IRHC Council to debate and decide on what the next phase of development should be and then to actively support and engage into the process of delivery. There is a need for a productive council.


Malcolm Valentine
January 2012

Journal article submitted May 2014

This section is available for non-researched contributions that nevertheless would have merit in being printed. Practical innovations in remote health care can be included here. Successes – and failures – can be covered. Case reports are particularly valuable and should be anonymised and written in the third party style. Reference to available knowledge on the issue being addressed would be helpful. The Editor will review these contributions and seek clarification where necessary before publication. Articles here should be no more than 1500 words.

The journal continues to be keen to receive any worthwhile contributions and help can be given to get material to publishable standards. Contact editor@irhc.co.uk. Please contribute. There is a need for book reviews, equipment and diagnostics reviews and especially letters. The next edition is intended to be published January 2015.
‘Remotely Important’

This section is a sort of ‘soap box’ section that can include hints, tips, ideas, requests for people to respond to an idea or concept or a commentary on a current issue affecting Remote Health Care. Brief articles of up to 500 words can be included here (occasionally longer at the Editor’s discretion); they need to be honest and non-offensive, but not referenced.

‘Remotely Useful’

This section is available for book reviews, equipment reviews and links to other organisations that could provide some useful help to the readership. Content is a mixture of commissioned material and unsolicited contributions, the Editor having reviewed appropriateness for inclusion.

Letters

The letters section is available to readers to feedback on elements of the Journal or to respond to articles. Responses to articles would be expected to be evidence based and list appropriate references if disagreeing. ‘Me too’ publications are discouraged!

Footnote

The Journal of the Institute of Remote Health Care is a service to all levels of membership. Its aim is to encourage equity in the development of the speciality.

All communication should be to the Editor, Dr Malcolm J Valentine, via email

editor@irhc.co.uk

The Editors decision is final in all aspects of publication. If quoting articles from the Journal, we respectfully ask that the Journal’s role is acknowledged.

Editorial Board:

Dr Malcolm J Valentine (Editor)
Professor J N Norman, Aberdeen
Mr Harry Horsley, Aberdeen

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If you wish to make comments, why not email info@irhc.co.uk or post a blog on the IRHC website www.irhc.org.uk or visit the IRHC Facebook page http://www.facebook.com/pages/Institute-of-Remote-Health-Care/256189257738913?sk=wall
Notes for Contributors:

Leading Article

Leading Articles will either be commissioned to deal with a specific topic or a personal view on an issue of importance to remote health care. Commissioned articles would be preferably referenced. Personal views should be properly referenced in Vancouver style. A leading article should be in the range of 1000 – 2000 words.

Original Articles

Original Articles should be in the range of 1500 – 3000 words in length. They should be referenced in Vancouver style. For instance, a journal article:


A paper should represent original work preferably an item of research that contains an accepted method of evaluation. It may be possible to include a non-research paper if it was sufficiently critically self aware.

Developments in Remote Health Care

This section is available for non-researched contributions that nevertheless would have merit in being printed. Practical innovations in remote health care can be included here. Successes – and failures – can be covered. Case reports are particularly valuable and should be anonymised and written in the third party style. Reference to available knowledge on the issue being addressed would be helpful. The Editor will review these contributions and seek clarification where necessary before publication. Articles here should be no more than 1500 words.

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Clarion Events has partnered with the Institute of Remote Health Care to host their annual conference, bringing together national and international speakers and delegates from remote environments to share experiences and drive forward changes in the way in which healthcare is delivered.

The IRHC is delighted to announce Professor Sir Lewis Ritchie, Mackenzie Professor of General Practice, Centre of Academic Primary Care, University of Aberdeen as this year’s keynote speaker.

Speakers sharing their insight also include:

- **Professor Ian Murray**, Head of School for Nursing and Midwifery, Robert Gordon University, Aberdeen
- **Professor Neil Greenberg**, Professor of Defence Mental Health, Kings College London
- **Dr David Flower**, Senior Health Director, Safety and Operational Risk, BP

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*Alan Kennedy Bolam*
Chief Executive, IRHC

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