

University of Glasgow

Post Graduate Diploma in Travel Medicine

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WHAT MAKES A GOOD EXPEDITION MEDIC?

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Abstract

This study considers the roles of the expedition medic. These are divided into three areas:

1. **Clinical skills.** This includes the issue of what professional background is preferred.
2. **Technical skills.** This relates to the ability to survive in the field.
3. **Process skills.** This focuses on inter-personnel skills such as the ability to get on with people, to listen and to lead.

Its main purpose is to consider how important these three aspects are and to explore if they are adequately discussed in the literature. This would aid the selection of medics for expeditions and allow the potential medic for an expedition to prepare himself accordingly.

A literature search was performed and reviewed prior to a small series (N-10) of semi-structured interviews with a variety of expedition leaders, expeditioners, doctors and experienced outdoor enthusiasts.

Themes from the interviews were identified and categorised accordingly. At the end of each interview the participants were introduced to the three competencies and asked how they would rate each skills' importance on a percentage scale

The results show that all three skills are very important although the literature only focuses on clinical preparation with little mention of technical or process skills.

The results from this small study would indicate that to be an effective medic one must be competent in all three areas and that the technical and process skills competencies should be discussed in greater depth in the literature.

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Introduction

The role of the expedition medic is a demanding one. Tekⁱ defines the mission of the medical team:

"To keep as many of the expedition members healthy enough to perform their assigned tasks for as long as possible while minimising mortality and morbidity in the event of injury or illness."

Given that expeditions by their nature involve exposure to greater environmental extremes and hazards it is clearly not a job for the faint-hearted and provides a formidable challenge to anyone undertaking this responsibility.

It was my initial intention when starting this project specifically to look at the medical infrastructure and medical challenges of Raleigh International. However they were unable to allocate time to talk to me due to pressure of work and therefore I had to change the direction of my study.

One of the areas I had been particularly interested in was the selection of the Raleigh medics and what they looked for when recruiting them.

When I was unable to follow this line of investigation I decided to look at this subject in the wider context of expedition medicine. Effectively I wanted to answer the following:

- 1) A leader of an expedition needs a medic but he has no expedition experience. What does he need to consider in terms of capabilities and experience and what background should he look for clinically?
- 2) A person who has little expedition experience has had the offer to be a medic on an expedition. How can he prepare himself so that he can deliver the best care?

But what is an expedition? It can mean many things to different people. Cashelⁱⁱ defines it as:

"A group undertaking a journey of some length and difficulty in the outdoors for a definite purpose. This would include recreational, social, recreational and adventure journeys"

The Oxford dictionary defines it as:

"A journey or voyage for a particular purpose"ⁱⁱⁱ

It is extremely hard to break this definition down any further. The Duke of Edinburgh Award has expeditions in low-lying country in the UK. To the individuals concerned this is I feel a fair description. However in the context of this project it will mean overseas trips with a definite purpose that lead the group into isolated environments for three weeks or more.

There are many texts and courses available today on expedition medicine. As a speciality it is developing a considerable following. However an initial assessment of the literature reveals a lot of information on clinical skills yet very little on technical and process skills.

Wilderness expeditions, in their many forms are becoming increasingly popular due to their perceived benefits to the participant, especially young people.^{iv v} It is important for a successful outcome of these expeditions that their medical needs are adequately met.

It is this project's aim to consider the entire expedition medic's role so that the leader of an expedition, if looking for a medic, could read this project and have a higher chance of selecting the best person for his expedition. Likewise the prospective medic could prepare themselves more thoroughly in all the competencies required.

Aims and Objectives

The principal aim of this project is to establish what core abilities are required to be an effective expedition medic and use that information to:

- 1) Enable the leader of an expedition to select the appropriate person for an expedition.
- 2) Help a prospective medic prepare themselves to give the best possible service to the expedition, thus making it a safer, more positive and successful venture

There are two core competencies for any expedition member as defined by Cashel^{vi} which are:

- Technical skills (Physical abilities)
- Process skills (Getting along with others)

Swiderski^{vii} defined technical skills as specific procedures and methods and procedures needed for outdoor pursuits. These include:

First Aid	Sanitation	Weather monitoring
Risk management	Climbing	River crossing
Establishing contracts	Schedules	

For the sake of this project technical skills will mean an ability for a person to survive in the field for several weeks at a time, in all weather conditions and keep their equipment and themselves in good order .

He defines process skills as interpersonal abilities and group dynamics. The components are:

Conflict resolution	Trust building	Communication
Maintaining a supportive social climate		

Maintaining harmony through conscious use of process skills protects the goal attainment and safety of the group.^{viii} The 1992 annual report of Accidents in North American Mountaineering^{ix} states that technical deficiencies, poor relationships and communication were the cause of many accidents. For example inexperience, exceeding abilities, failure to communicate previous medical conditions, fatigue and overconfidence are listed as frequent causes of accidents. Each of these cases could be prevented by open, honest communication and decision making by each participant of the group.

Specialists in an expedition will then require their own unique skill. In the context of this study this will be their clinical knowledge, which for the purpose of this study is treated as a third competence.

At a clinical level the medic's first function is to prevent people becoming ill, but if they do fall ill to ensure the best possible outcome.^x They will therefore need to prepare themselves accordingly.

Literature Review

In carrying out the literature review for this project I considered relevant texts, with one exception, that were easily available. I chose these books, as these are the most likely sources of information to be read. I supplemented this with Raleigh International's Medical Guide and performed a literature search using Medline, Embase and Cochrane using the key words: field medicine, expedition and Operation Raleigh.

Whilst I review the three competencies of technical skills, clinical skills and process skills separately there is an element of overlap. I was reviewing books that were focusing largely on expedition medicine so inevitably all three competencies merge on occasions. This reinforces the importance of all three roles and that the medic needs all three.

My literature search gave 50 results although many were very specific such as clinical trials^{xi} or were very military based.^{xii} ^{xiii} The military papers include some comprehensive advice in their text but are biased towards their differing needs, which include a higher incidence of trauma injuries.^{xiv} They also have a vast infrastructure to support their front line medics, which is not normally available to civilian expeditions.

Clinical Skills

There are many books and courses on how to administer first aid in the outdoors. It must also be recognised that there is a distinction between short-term care in the UK and long-term care in isolated environments. This therefore reduces the number of relevant books.

Of the many wilderness medicine books available, most of them come from the USA, where there is a high level of wilderness medical interest, possibly as a result of the amount of very isolated backcountry compared to Europe.

I have selected five texts all of which make excellent reading and which contain an enormous amount of information. Four of these could be taken into a base camp and one is an expensive reference book. Clearly on a lightweight trip a group will not always take a medical book with them although the material, if read beforehand should improve casualty treatment.

As mentioned previously I also did an extensive literature search. It must be borne in mind that randomised controlled clinical trials are impossible in some areas of wilderness medicine due to the low number of incidents and need to evacuate the patient rapidly in demanding circumstances; for example the management of hypovolaemic shock in the wilderness. Therefore evidence may often be subjective and based on hospital experiences. There may be also be a reluctance to commit an experience to the journals for this reason.

"Expedition Medicine" by The Royal Geographical Society^{xv} covers all aspects of the expedition medic's role and has an excellent section on psychological issues. It has many references and useful addresses and would be particularly useful prior to the trip. It should be regarded as essential reading.

"Medicine for Mountaineering"^{xvi} is an American book with chapters written by various physicians. It discusses treatment at a sophisticated level when a long way from help. It considers many ways of improvisation and should be in any expedition medic's tent. It focuses more on the group of friends out in the wilderness rather than specifically the expedition medic although it does look at the most common conditions that may be encountered on an expedition. It has a useful section on post traumatic stress disorder and its effect on the rescuer and an excellent algorithm for abdominal pain. The section on nursing the casualty is also excellent. The main negative aspect of this text is that it makes no mention of how the medic of a trip should prepare physically and makes no mention of process skills.

The Medical Handbook for Mountaineers^{xvii} is a compact PVC coated book and is written with both the doctor and layman in mind. Very clear, it is lighter than Medicine for Mountaineering although it does not go into such depth. In its introduction it raises two interesting and pertinent points:

1. That emergency doctors can do little outside of a hospital. A well-trained first-aid-er may be more useful in the wilderness than a doctor who is ignorant of the special problems of remote places. An MB (or whatever) after his name does not mean he is any better than a competent outdoors man who has learned the basic medical skills.^{xviii}
2. In a characteristically down to earth fashion the author discusses liability. Pointing out that rescuers 'are unlikely to fall foul of the law..... Provided they have conscientiously applied skills learnt and *stick within their capabilities.*' (my italics) He continues 'rescuing like adventure carries risk but we still attempt both'^{xix}

It has a very clear diagnosis and treatment layout with sections in parenthesis for medically qualified readers. It makes no mention of psychological issues and the

need for practical preparation in terms of fitness and outdoor skills. It is a treatment book for clinical conditions and as such is ideal for taking on any expedition.

"Wilderness Medicine. Beyond First Aid"^{xx} is another American text. It is a carefully thought out text that gives a comprehensive guidance on all aspects of expedition medicine. In its first chapter entitled 'Preparation,' it considers issues such as personal relationships, schedules, pre-trip physical conditioning and pre-trip medical assessments including dental examinations. There is a theme throughout the book of preparation being appropriate to the environment in which the expedition is heading. The author also makes the suggestion of taking a pregnancy testing kit on long term expeditions or wilderness treks, the only book to do so!

Two of the most useful features of this book are the cross-referencing system where the page number of a related topic is given throughout the book and its excellent first-aid kit guidelines.

The major problem with this book is that it is not completely clear who it is aimed at. There are some advanced techniques discussed in detail such as cricothyroid stabs and suturing although the author steers clear of giving guidance on how to diagnose and relieve a tension pneumothorax with a cannula. I was interested to note that there was no definitive guidance on replacing fluid due to hypovolaemic shock relating to fractures or internal bleeding although it does discuss it in detail with regard to diarrhoea. The writing style throughout the whole book is direct and there is an assumption that if deep in the wilderness you have no choice but to be proactive in treatment.

This book is practical and hard-hitting. It is more orientated to the interested and well-trained first aider. On that basis it is well worth having in the designated expedition medic's rucksack.

"Wilderness Medicine. Management of Wilderness and Environmental Emergencies"^{xxi} is aimed at physicians with an interest in wilderness medicine. It is 1446 pages in length and has 56 chapters some with 304 references. It goes into academic depth in most chapter although always gives specific diagnosis and treatment protocols. It has some excellent chapters on survival and environmental issues.

It is an excellent reference guide and although expensive it will answer just about any clinical question on wilderness medicine with references to support. Unfortunately it makes no mention of process issues and the role of the expedition medic.

"How to do it: Doctor on a mountaineering expedition"^{xxii} is an excellent paper that is based on the author's experiences of large and small expeditions lasting up to three months in Alaska, the Andes, the Arctic and Everest in winter. It is described as a ragbag of useful advice yet presents much useful information including the less obvious issues such as water purification, personal and camp hygiene. It has lists of equipment taken on the 1992 Everest winter expedition.

An interesting and important point is made with regard to accountability. The paper explains that there may be reluctance for a member to descend from, for example, a

mountain, if the circumstances are marginal due to the consumption of resources yet emphasises that this must not prejudice the medic's decision. An important point given the determination of climbers and the effort that has gone to getting to that point.

It concludes with a section entitled adaptability. The authors state that:

"a successful expedition depends on teamwork and adaptability. An ability to get involved, to listen and to ease tensions may be the most important contribution that a doctor makes to an expedition"^{xxiii}

This pertinent summary concludes an excellent paper.

"Medical planning for expeditions"^{xxiv} is another very useful paper that puts a logical framework behind what most medics will do subconsciously. Following an inspirational introduction which clearly comes from the heart in which the author refers to expedition doctors as:

"educators, advisors and diplomats.....those few who have a love of remote places, an old fashioned sense of adventure and a willingness to enter unfamiliar new worlds where comforts and security are few, but rewards are many"

this paper has an underpinning theme of the involvement of the doctor in all areas of the expedition, partly I feel because of the author's desire to give a first class service, but also because of his enthusiasm for expeditions.

The idea of formalising a medical plan is important and it is discussed how this must tie in the expedition objectives, which must be clearly defined. These in turn must fit in with the plans for areas such as transport, communications, equipment and so on.

This is a very useful paper that looks at all the practicalities of being the doctor on an expedition whilst also encouraging a more formal risk analysis approach.

The Raleigh International Medical Guide^{xxv} is a document written for Raleigh Medical staff. It is based on their previous experiences and does not represent hard and fast rules. It is a good document that includes hygiene, psychological issues, casualty evacuation and many other areas. It is a good guide for Raleigh medics, as it is intended to be, with some good guidance in the various chapters although it is not intended as a definitive treatment guide. As long as it is read with that in mind it has a lot of useful information.

Summary

It can be seen from the above that there is a plethora of information available for both the inexperienced and experienced expedition medic. There can be no excuse for not obtaining the relevant theoretical clinical knowledge as information can also be supplemented with information from papers written specifically for the area being visited.

There are some areas of wilderness medicine with many texts written about them and an enormous amount of papers; high altitude medicine and travellers diarrhoea are good examples.

Technical Skills

There are many books on outdoor skills although there is virtually no reference to the outdoor skills of the medic in the expedition medicine literature. The only article to mention specifically this aspect of the expedition medic's profile was Sinclair^{xxvi} in which she states in a Nursing Times article:

"The ideal expedition nurse needs to be knowledgeable and well prepared both in general expedition terms - fitness, campcraft, navigation and so on - and in specific expedition nursing terms. A nurse who cannot reach a patient because she cannot read a map or is unfit is a liability."

"Expedition Medicine" published by the Royal Geographical Society^{xxvii} considers the preparation required for the many different environments that the potential expedition medic may be faced with. It could place more emphasis on the importance of the medic to be able to survive in the given environment; it is very much assumed.

This is the case in two papers by Tek^{xxviii} and Court^{xxix} where the importance of contacting previous doctors and researching the area is discussed but no mention is made of the fact that they must be able to deliver in any environment at any time. These papers are reviewed under Clinical Skills.

"Wilderness Medicine. Management of Wilderness and Environmental Emergencies"^{xxx} includes chapters on jungle survival, survival at sea, search and rescue and white water medicine and rescue. One would not necessarily expect wilderness medical literature to contain such extensive technical skills information. However these chapters are well written and in depth. Unfortunately this book is hard to source and very expensive. It is reviewed in the previous section.

One slightly more unusual book that provides excellent information on outdoor skills whilst also containing a first-class medical section clearly borne out of much experience is the SAS survival handbook^{xxxi} which is available in a pocket sized version.

The importance of technical skills is underlined by a quote that I heard from a Radio 4 programme called "Diary of a Tax Collector". This chronicles a tax inspector's experience on Operation Raleigh. She records how on a particularly demanding trek they were choosing the ten fittest people to take part. First on the list, without any thought was the medic. He /she had no choice. In the event it was a demanding trek that did require a lot of stamina and initiative.

Process skills

Very little mention is made in any of the texts discussed above with the exception of Court^{xxxii} and Sinclair^{xxxiii}. It is inferred in all the texts.

"Mountaineering and Leadership"^{xxxiv} is a book written as a text book for those people undertaking their summer Mountain Leadership Certificate. Very well written there is an excellent section on party leadership where many wise words are written. It finishes

"Whilst your responsibilities may be the safety, comfort and enjoyment (in that order of priority) of your party, they should feel it is happening in reverse order"

This chapter is written in the middle of a book that describes all the technical skills required and is therefore somewhat hidden.

Cashel^{xxxv} writes in the Journal of Wilderness Medicine an extensive paper about group dynamics and leadership skills on expeditions. It is a paper that every expedition staff member should read. In it Petzoldt defines poor expedition behaviour as:^{xxxvi}

"A breakdown in human relations caused by selfishness, rationalisation, ignorance of personal faults, dodging blame or responsibility, physical weakness and in extreme cases not being able to risk one's own survival to ensure that of a companion"

And good expedition behaviour as:

"An awareness of the relationship of individual to individual, individual to group, group to the individual, group to other groups, individual and group to the multiple uses of the region, individual and group to administrative agencies, and individual and group to the local populace"

These two statements which represent the two ends of the spectrum demonstrate awareness of how important relationship issues are. By being both aware and sensitive to these issues the medic can subtly keep the expedition running smoothly.

Summary

It can be seen from the above that there is a lot of excellent information available for the expedition medic. Obviously this can be expected at the clinical level. There are more books available from the USA that I was unable to source.

No one text is ideal and the prospective medic should try and access most of the above to become well read and focused as every author and subject area gives a different angle on the same issue, with all being well worth reading.

They can then plan their medical support infrastructure and prepare themselves physically according to the experiences of other people coupled with the knowledge they have of their expedition and their own experience.

Sadly lacking is the emphasis on the people skills. Court^{xxxvii} mentions it in his summary whilst Sinclair mentions it in the beginning of her article. The Cashel^{xxxviii} paper whilst a definitive work on group dynamics and expeditions is not easy to

source, as at the present time no libraries in London hold the Journal of Wilderness Medicine.

The excellent chapter on leadership in *Mountaineering and Leadership* is discussed in a mountaineering book and the prospective medic may not associate the two. Likewise it is assumed in all the medical literature that the medic will have the physical and campcraft skills and only Sinclair mentions this.

Design and Implementation

In order to establish what makes the ideal expedition medic I decided to interview a variety of expedition leaders, expeditioners, doctors and experienced outdoor enthusiasts. My aim was to get as many experienced people from as wide a background as possible to obtain as many different opinions on the subject as possible. The above group was chosen from people I know or whose names mutual friends have given to me. Time constraints and the fact that many suitably experienced people are abroad restricted my numbers.

I used a qualitative methodology through a semi-structured interview protocol and then identified themes and categorised accordingly. Additional information that fell into no category was identified separately.

The interviews were done either on a face to face basis where practical or by phone. The interviews were arranged in advance to give the interviewees time to consider the subject and to ensure the interview wasn't rushed. The breakdown is as follows:

- Four doctors with expedition experience
- Two expedition leaders with extensive experience
- One full-time mountaineering instructor
- Three very experienced outdoors enthusiasts. They have considerable experience in teaching and travelling abroad.

The interviews were semi structured around the four areas listed below so that the interviewee felt able to express themselves freely yet followed a line of questions as highlighted below. They were not led into any answers.

- Background and experience
- Experience with expedition medics
- What they consider are the key skill's and what background the medic should have
- How they would consider each skill's importance on a percentage scale. They were not introduced to the three competencies until the interview had finished

This project essentially takes the form of a pilot study in order to identify areas of competence which are not often discussed in the literature available to expedition medics. It is not a full blown epidemiological study and does not pretend to be. This would require a much larger group with a more precise person specification (s) and a questionnaire that has undergone a pilot study.

Results

Subject No 1. Interview Time 50 minutes. Telephone. Mike

Biography

Mike has a professional soldiering background having served in the Special Air Service (SAS) for 29 years. He served in mountain troop and went from trooper to Major which included two years as Regimental Sergeant Major. In his military capacity he lived for many months in small groups in very isolated situations from jungle to desert to the high mountains. He was involved in four Himalayan mountaineering expeditions including one to Nuptse and three trips to Mount Everest, on one of which he climbed to its summit.

He passed the patrol medic's course, which involves six week's intensive classroom work followed by a month long hospital attachment.

Opinion

His life has been virtually one long expedition. Since retiring from regular army service he has also been involved in various expeditions including several to the Antarctic which were for young people.

Interestingly he explained that even in the four man patrols of the SAS the medic had a responsibility to monitor the health of the patrol, would pick up the vibes of the group and would feed the information to the patrol commander as appropriate. This is more than just administer to their physical needs. Whilst these soldiers are extremely hard and fit and did not require the listening ear that is needed on civilian expeditions there was still an element of process skills required to keep the patrol an effective force.

He highlighted the need to duplicate skills as often as possible, not only at patrol level but also on expeditions. On one occasion he lost his doctor who was involved in evacuating a serious neck injury when a gas cylinder exploded giving flash burns to several expedition members including the two qualified patrol medics.

He felt it was important that they kept confidences but must be prepared to break this on health and safety grounds. This he has found a problem with some medics who took confidentiality too far and compromised the expedition.

He identified the key skills of the medic as:

1. Common sense approach. Ability to lead and improvise. Maturity and self-confidence.
2. Preventive philosophy to healthcare
3. Ability to gain knowledge of area including the medical conditions prevalent, including altitude, climate and urban safety issuers
4. Knowledge of field hygiene
5. Trauma experience
6. Knowledge of dehydration and heat illnesses

7. Sense of humour and compatibility

He felt the background of the person was irrelevant, doctor, nurse, paramedic were all suitable as long as they were motivated and had the above abilities.

In the context of the objectives of this project he felt the order of importance of the three broad categories was as follows:

Clinical skills	33%
Technical skills	33%
Process skills	33%

Subject No 2. Interview Time 40 minutes. Face to Face. Phil

Biography

Phil is an accident and emergency consultant at a major teaching hospital. He has always had an enjoyment of adventure starting at school with scouts and the Duke of Edinburgh Award which continued through his university years.

Following SHO positions in general medicine and accident and emergency he applied to the British Antarctic Survey for one of four positions as base doctors.

Subsequently he has been the doctor on several month long expeditions to Africa and South America.

Opinion

The selection was based on personality and suitability first and technical skills second. The training took four months and included survival skills as well as medical training. He felt the selection procedure run by the British Antarctic Survey was good and effective. He went to the Antarctic in 1991.

Of the four doctors selected who each were split around different bases three including himself were regarded as easy going but one "drove his colleagues mad" due to his obsession with detail. Phil felt the key attribute needed was the ability to be easy going and not be bothered about trivial issues.

He felt that once on base that his main job was listening to people at the bar. The practical skills of his job were straightforward and were more nursing orientated than doctor based. During the summer months the most major injuries dealt with by the four doctors were a fractured tibia and fibula and fractured zygoma both of which were evacuated.

One man went missing for two days in the winter due to stress which necessitated a search party with the UK being informed. He was found hiding and given suitable counselling.

Since his return he has been on expeditions to Africa and South America and has supplied medical kit and advice to Greenpeace.

He feels the key skills required for an expedition medic are:

1. Medical skills, particularly general practice knowledge and accident and emergency experience
2. The grade does not matter; they can be nurse doctor or paramedic
3. They must be a team player who is reliable, has integrity, can counsel and listen
4. They must not be gung ho. They must have management ability
5. They must be authoritative when needed
6. They must be able to survive in the outdoors

In the context of the objectives of this project he felt the order of importance of the three broad categories was as follows:

Clinical skills	20%
Technical skills	20%
Process skills	60%

Subject No 3. Interview Time 60 minutes. Face to Face. Sue

Biography

Sue is an experienced expedition leader and adventurer who currently divides her time between motivational speaking and new expeditions.

In 1988 she went on an Operation Raleigh expedition to Kenya which was the start of her adventurous lifestyle. Since then she has travelled extensively and obtained a master degree in Quality Management.

Her expedition background includes deputy leader of the 1996 Raleigh International Chile expedition and expeditions to the Magnetic North Pole, Antarctic, Geographic North pole and Greenland Ice Cap. She has also worked for the UN in Yugoslavia.

Opinion

In Kenya, the patrols operated in small groups of 12 with a medic assigned to each group. Her group had a Scottish doctor who was a very keen and capable outdoorsman. He took on a leadership role due to experience and personality and as a result was seen as an integral member of the team as well as the medic. She remembers him as an excellent person. She can still remember how on one occasion he stopped bad practice with regard to personal sanitation at one campsite.

She has found that the best medics are the ones who became part of the team and did not see themselves in a single specialist role. If they did not act as part of the team then they were much less effective and team dynamics could be affected

She feels that wise medics can deal with sensitive problems particularly if they involve relationship issues. This is why she feels medics who do have counselling skills in addition to the other requirements are so valuable. The wise medic is listened to when offering advice on expedition policy and they would try and stop cliques developing.

She has found that 80% of nurse medics are good and 20% are average as opposed to doctors where 60% are good and 40% are average.

She felt that communication skills represent 90% of the role.

Her selection criteria if selecting a medic are as follows:

- 1) Previous experience of wilderness and / or expeditions
- 2) Process skills. Can they communicate and listen? Are they a team player and adaptable? Can they take the lead when required and do they possess counselling skills?
- 3) Medical skills are a core skill but whether doctor nurse or paramedic is not important.

In the context of the objectives of this project she felt the order of importance of the three broad categories was as follows:

Clinical skills	33%
Technical skills	33%
Process skills	33%

Subject No 4. Interview Time 40 minutes. Face to Face. Tom

Biography

Tom recently qualified as a doctor. Prior to this he had been an operating department assistant. He has worked part time for 12 years for an outdoor adventure based personal development company that specialises in courses for medical staff. This exposed him at an early age (17), on numerous occasions to Royal Army Medical Corps paramedics who specialised in casualty management in isolated environments.

He has always had an adventurous tendency. He was an active venture scout and venture scout leader and took part or led many expeditions to Norway and Romania. He travelled, at 19 years of age from London to South Africa on an organised truck safari. By default he became the trip medic.

Opinion

Tom had found that as an expedition medic, people would automatically talk to him with problems that were not necessarily purely medical. Having been made a medic by default on a safari, with little more than first aid knowledge, where the group was sometimes two weeks' travel from the nearest hospital, he felt that it was vital that the medic remembered to stay within their own limits. He has found that common sense

and first-aid could treat many injuries and conditions, with recourse to doctors when conditions necessitated.

Linked to this experience he felt that for a large and remote expedition, a doctor with adequate outdoors' experience was the ideal medic, as non-doctors are not generally trained in diagnosis and management to the same degree, nor can they legally give medicines. However, for many expeditions he felt that a paramedic or nurse with appropriate outdoor experience, wilderness medical training and the right attitude would be sufficient.

He had found that on one expedition to Norway, the designated medic would probably not have been able to respond to caving or climbing accidents quickly enough, as he lacked the physical skills in these areas.

In Romania, he felt that the members of one expedition had respected him as a leader as well as a medic because he discussed and communicated decisions with them. He felt that overall, the medic's attitude and communication gave as much respect as their grade or title. However, he stressed that some appropriate clinical knowledge, and the confidence to apply it with competence, was a prerequisite for any expedition medic.

He felt the key skills needed for a medic were:

1. Appropriate clinical knowledge for the area and type of expedition
2. Practical skills to deal with minor injuries and as first response for more major trauma
3. Outdoor skills commensurate with the physical activities of the expedition
4. The ability to communicate, to listen, and to keep a confidence
5. Authority to make decisions, but not a dictatorial style
6. Flexibility and a willingness to fit in with the expedition team
7. Knowledge of one's own limitations and capabilities

In the context of this project he felt that the three competencies ranked in importance as follows:

Clinical skills	30%
Technical skills	30%
Process skills	40%

Subject No 5. Interview Time 40 minutes. Telephone. Paul

Biography

Paul is a partner in a GP practice with an interest in travel medicine. He has always had an interest in adventure and has an extensive background of expeditions, having been on 4 Himalayan trips, climbed and travelled in Europe and North and Central Africa. He was the medical officer on two Trekforce expeditions to Indonesia and Belize.

Opinion

Paul felt that the role of the medic is a demanding one. They need to be confident in their own clinical ability as everyone looks up to the medic.

He felt that the medic must attain and keep the respect of the group. Initially he feels being a doctor helps this process but that at the end of the day you must get on with people if you are going to provide the best standard of care. He felt you could get by as "just a doc" but that this was not ideal.

He felt that the medic can pick up the tone of an expedition and can influence issues by his own behaviour and personal authority. This raises issues of confidentiality.

He feels that being physically fit and being able to look after oneself in the field is very important. He described a case where he had to assist in the evacuation of a High Altitude Cerebral Oedema case which meant he had to climb up 500m of powder snow at 5000m in the dark to treat and bring down the casualty. He also quoted an example where his group had been out for two weeks in heavy rain in the Indonesian jungle, and he found he was having to work hard at maintaining morale.

The medic needs to be involved at the planning stage of the expedition including the selection of members if possible and do a thorough risk analysis as part of their preparation.

He felt most of the clinical challenges were of a general practice nature.

In terms of grade of medical staff he felt this depended on the expedition. He felt nurses were less able to prescribe as this was not their background and tended to be algorithm based in their treatment. He has no experience of paramedics although has found vets quite useful!

In the context of the objectives of this project he felt the order of importance of the three broad categories was as follows:

Clinical skills	50%
Technical Skills	30%
Process skills	20%

Subject No 6. Interview Time 40 minutes. Telephone. David

Biography

David is a partner in a GP practice. He has climbed and travelled all over the world including the Himalayas and the Andes on numerous occasions. He has an active interest in teaching wilderness medicine to the layperson and writes regularly in climbing magazines.

Opinion

David on all of his expeditions has been a climber first and doctor second. Our discussion focused at first on what is an expedition? He came up with the idea that if you arrange a trip yourself it is an expedition but if someone else arranges it for you it is an adventure experience.

He felt that any person going on an expedition as a medic must be an enthusiast in the activity that is being carried out, although they don't need to be an expert. They must also be able to look after themselves.

He felt that the mental attitude of the medic was very important.

In terms of grade of the medic he favoured doctors on the basis that they were experienced in making medical decisions. However he was very keen to point out that any other grade such as nurses or paramedics would be fine, as long as they did their homework and were confident in their abilities.

In the context of the objectives of this project he was somewhat reluctant to answer, as it is a question that can be hard to quantify. He felt the order of importance of the three broad categories was as follows:

Clinical skills	90%
Technical Skills	5%
Process skills	5%

He commented that at that end of the day if you can't get on with people and don't have the technical skills if you are competent clinically you can still do your job.

The following sequence of interviews were to people with extensive adventure experience but no medical knowledge other than advanced first aid certificates.

Subject No 7 Interview Time 45 minutes. Telephone. Geordie

Biography

Geordie is a firearms instructor in the police. He is a very keen outdoorsman and is a climbing leader for the scouts. He regularly teaches for an adventure training company in his holidays. He has a high level of first aid knowledge due to his work.

Opinion

If sourcing an expedition medic Geordie felt he would contact people he knew. He would be after a doctor or nurse that could relate to youngsters and had some experience in this area. Alternatively he felt he would contact an army medic with experience in expeditions. If unable to find someone he would contact the Royal Geographical Society to see if they had names of people who were suitable and available for this role.

He would expect the medic to have up to date clinical skills, particularly in general health issues and knowledge of local health conditions.

He felt it was very important that they had good technical skills and were a team player.

In the context of this project he felt that the three competencies ranked in importance as follows:

Clinical	65 %
Technical	17.5%
Process	17.5%

Subject No 8. Interview Time 35 minutes. Telephone. Andy

Biography

Andy is a keen climber and mountaineer. He regularly helps out his local scout troop on outdoor activities and teaches for an adventure training company in his spare time.

Opinion

Andy felt that if he needed a medic he would initially ask friends if they knew anyone suitable. Should that not succeed he would possibly use the Internet or contact the Royal Geographical Society and British Mountaineering Council. He would assume they had the relevant clinical skills and had the theoretical knowledge to support it.

He would try and find someone who has experience in expedition medicine. They would need to fit into the team and work well with the other staff and expedition members

He felt it very important that they had a good bedside manner and could make friends easily. They would need an aura of professionalism about them, as they may need to be an arbitrator.

He did not feel the grade of the medic was significant as long as they had experience, although this was after some thought. They would need to be able to look after themselves

In the context of this project he felt that the three competencies ranked in importance as follows:

Clinical skills	50%
Technical skills	20%
Process skills	30%

Subject No 9. Interview Time 35 minutes. Telephone. Dave

Biography

Dave has travelled extensively in Africa, Europe, Norway and the USA climbing, exploring and teaching outdoor pursuits. He is now a mature student.

Opinion

Dave felt that if he was looking for a medic he would ask around his friends, possibly use the internet and contact the Royal Geographical Society.

He didn't mind what background they had as long as they could work in an unfamiliar environment. He felt paramedics may have a particular strength in this area.

He felt they needed authority as they would need to be able to lead in a crisis and that it was vital they were fit and capable of looking after themselves in the outdoors.

He felt they must have good listening and communication skills and have a lot of common sense, as the medic is always trusted and therefore very important.

In the context of this project he felt that the three competencies ranked in importance as follows:

Clinical skills	25%
Technical skills	30%
Process skills	45%

Subject No 10. Interview Time 55 minutes. Telephone. Dave

Biography

Dave is a full time mountaineering instructor who runs a centre in the Lake District. He has travelled extensively and regularly runs adventure holidays to Europe. He is a European Mountain Leader, holds the summer and winter mountaineering certificate and is an assessor for Single Pitch Supervisor Award.

Opinion

Dave immediately felt that the designated medic for an expedition should have "way above a first aid qualification". Whether doctor nurse or paramedic did not matter.

He described a friend who he felt was ideal as a "good guy", a European Mountain Leader and a male nurse who is now in NHS management.

He felt it very important that they must be prepared to research the expedition area for relevant medical problems, prepare the equipment and access suitable drugs, including getting Home Office approval if appropriate.

It was extremely important to him that they really wanted to come, were well motivated and wanted to contribute to the trip.

They needed to be able to get on with people and be a team player. He must be able to work well with the leader. He felt the ability to pick up the "vibes" of the expedition was very important.

Her did not think that technical skills were so important as long as the medic was motivated. He said that whilst they must be comfortable going outdoors he would take the medic away for a weekend to train them.

In the context of this project he felt that the three competencies ranked in importance as follows:

Clinical skills	65%
Technical skills	10%
Process skills	25%

Data Analysis

Despite being a small-scale study, as discussed earlier, I do believe that this data does show up areas which require more attention in the literature and books.

It represents 4 hours 20 minutes of interview time. I have analysed the data in four ways:

1. An overall breakdown of the three competency percentage figures that concluded each interview
2. I have looked at each interview and taken key statements and broken them down into themes. I have used a very simple percentage system to highlight any underpinning trends.
3. I have compared the results from one and two above.
4. What grade of medic would they ideally require? A doctor, nurse or paramedic?

1) Statistical Breakdown

The importance of the three broad categories as defined by the interviewees was as follows:

Clinical skills	46%	(Range 20-90%)
Technical skills	23%	(Range 5-33%)
Process skills	31%	(Range 5-60%)

This is represented by the bar chart below:

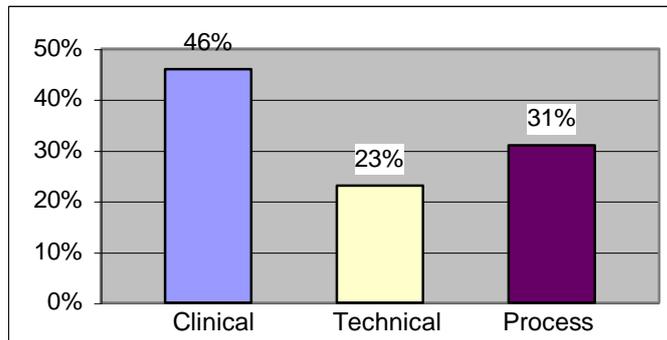


Fig 1. Competency importance as defined by interviewees

2) Thematic Analysis

Having studied the interviews I have concluded that six themes emerge:

- 1) The personal qualities of the medic
- 2) Communication skills
- 3) Motivation and enthusiasm
- 4) Project management and leadership skills
- 5) Clinical skills and experience
- 6) Technical skills

I have then taken key statements and allocated them to one of the above themes.

1) The personal qualities of the medic

- 1) Pick up the vibes of the group
- 2) Drove his colleagues mad due to his obsession for detail
- 3) Key attribute is to be easy going and not be bothered by trivial issues
- 4) Wise medics can deal with sensitive problems
- 5) Keep respect of the rest of the group
- 6) Confident in their abilities
- 7) Look after themselves
- 8) Lots of common sense
- 9) Be trustworthy
- 10) Sense of humour
- 11) Try and stop cliques developing
- 12) A demanding role
- 13) Must have integrity

- 14) The medic's attitude and communication gave as much respect as their grade or title
- 15) Knowledge of limitations
- 16) Flexibility to fit in with the team
- 17) "a good guy"

2) Communication Skills

- 1) Feed information to patrol commander
- 2) Best medics become part of the team
- 3) Can they communicate and listen
- 4) Preventative philosophy to healthcare
- 5) Felt communication is 90% of the role
- 6) Main job is listening to people at the bar
- 7) Good listening and communication skills
- 8) Require bedside manner
- 9) Act as arbitrator
- 10) Be a friend
- 11) Counselling skills valuable
- 12) Automatically talk to him with problems that were not necessarily medical
- 13) Ability to communicate and listen
- 14) "Able to pick up vibes of expedition"

3) Motivation and enthusiasm

- 1) The medic must be an enthusiast of the expedition activity. They do not need to be an expert
- 2) Background of person irrelevant
- 3) He took on a leadership role due to his experience and personality and as a result was seen as an integral member of the team as well as the medic.
- 4) Find someone who has done it before
- 5) Were well motivated
- 6) Wanted to come and contribute

4) Project management / leadership skills

- 1) More than just administer to their physical needs
- 2) Need to duplicate skills
- 3) He stopped bad practise
- 4) Involved at planning stage
- 5) Thorough risk analysis
- 6) Authority and ability to lead in a crises
- 7) Can influence issues by his own behaviour
- 8) Is listened to when offering advice on expedition policy
- 9) Respected as leader and medic because decisions were discussed and communicated
- 10) Must be a team player
- 11) Must get on with the leader

5) Clinical Skills and Experience

- 1) A responsibility to monitor the health of the patrol
- 2) Most of the clinical challenges were of a general practice nature
- 3) Paramedics are used to working in an unfamiliar environment
- 4) Medical skills are a core skill
- 5) Confidentiality must be remembered
- 6) Trauma experience
- 7) Knowledge of dehydration and heat illness
- 8) Assessment of local medical conditions
- 9) Preventative philosophy to healthcare
- 10) Medical role was more nursing orientated
- 11) Medic is always trusted
- 12) Confidentiality can be taken too far
- 13) Confident in their own medical ability
- 14) Clinical background unimportant as long as they are motivated
- 15) Medic must stay within their own limits
- 16) Common sense and first aid can treat many injuries with recourse to doctors when needed.
- 17) Clinical knowledge and the confidence to apply it is a prerequisite
- 18) Practical skills to deal with minor injuries or first response to major trauma
- 19) Ability to maintain confidentiality
- 20) Way above a first aid qualification
- 21) Research the area for relevant medical problems
- 22) Prepare medical equipment and drugs

6) Technical Skills

- 1) Previous experience of living in the field very important
- 2) Must be fit
- 3) Previous experience of expeditions
- 4) They must be able to survive in the outdoors
- 5) A doctor who was a very keen outdoorsman
- 6) Climber first and doctor second
- 7) Must have good outdoor skills
- 8) Physically fit
- 9) On one expedition he felt the designated medic would not have been able to respond quickly enough as he lacked the physical capability.
- 10) Outdoor skills commensurate with the expedition
- 11) Must be comfortable in the outdoors

Referring back to Swiderski^{xxxix} and Cashel^{xl} I identified the three competency skills as technical, clinical and process.

I have therefore allocated the six themes describes above to these three categories and then considered the number of key statements made about each one.

I have simply totalled the number of key comments made and broken them in to a percentage for each competency. This provides a comparison to the results above

where each person was asked to give a value on each competency at the end of the interview.

Competency	Theme	% Value (No)
Technical	Technical	14% (11)
Clinical	Clinical	27% (22)
Process	<ul style="list-style-type: none"> • Personal Qualities • Communication skills • Motivation and enthusiasm • Project management and leadership 	59% (48)

This information can be seen below represented in a bar chart:

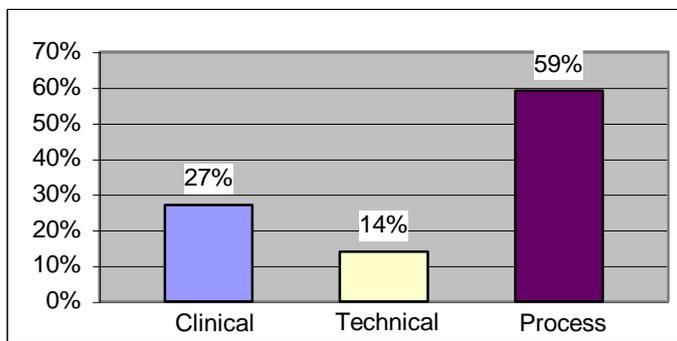


Fig 2. Competency importance based on key interview points

3) The comparison between the interview competencies and thematic competencies

The information in figure one which represents the interviewees opinion on the importance of each competency on a simple percentage scale is compared with the information in figure two which represents an analysis of the key themes from the interviews below.

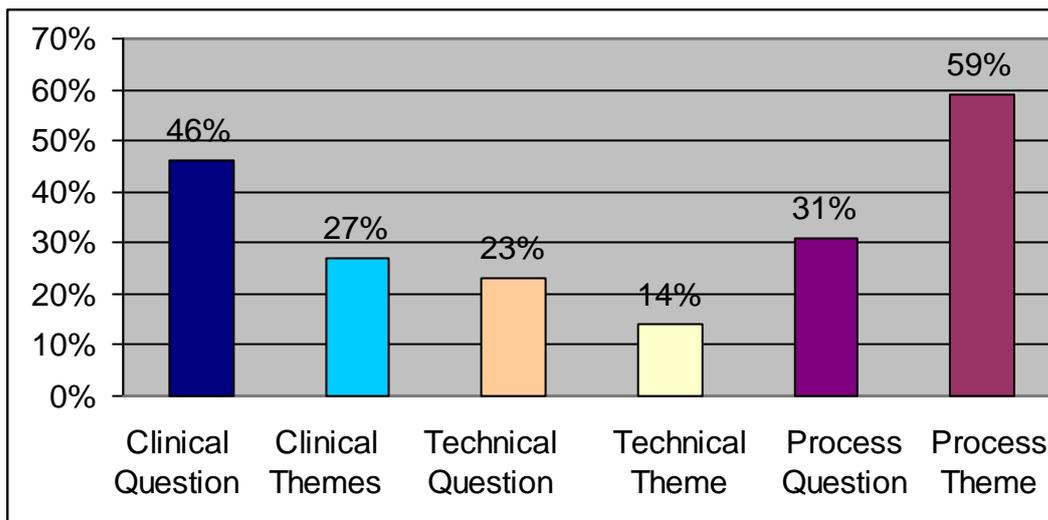


Fig 3. A comparison between question and thematic responses

4) Doctor? Nurse? Paramedic?

Of the ten people questioned six felt the clinical background of the medic did not matter. One doctor, David, tended towards doctors as expedition medics although felt that as long as the nurse or paramedic did their homework they would be fine. One doctor, Paul, felt it depended on the expedition. Tom felt that for a long and remote expedition a doctor with adequate outdoor experience was ideal as non-doctors are not trained in diagnosis and management to the same degree. The other two doctors echoed this. Tom also said that non-doctors cannot legally give medicines.

However Tom felt that for many expeditions a paramedic or nurses with the appropriate wilderness medical training, outdoor experience and attitude would be sufficient. Both these doctors were slightly concerned at the lack of experience of the nurse in making clinical decisions.

I contacted an organisation that takes 16 - 18 year old children on month long expeditions abroad. They take no medic although the expedition leaders have been well trained. They have a nurse that visits once a week and a medical consultant on call in the UK. Unfortunately I was unable to access the nurse.

Discussion and Recommendations

It is evident from the literature reviews that the main area of emphasis on expedition medicine is that of the clinical skills. "Expedition Medicine" by the Royal Geographical Society quite rightly places a lot of emphasis on preparation, such as immunisation, medical kits, liability and insurance together with the challenge of different environments and is the only book to take a holistic view of the expedition medic's role.

This clinical competency is clearly a very important part of the medic's role as without the relevant core knowledge and experience they are not going to be much use to anybody! Therefore not surprisingly this is reflected in the interviews where it

was given a high rating of importance of 46% when they were asked to categorise the importance of the competency as a straight percentage score. This compares with a 23% score for technical skills and 31% for process skills.

However when the interviews are broken down into themes another picture starts to emerge. A summary of the key statements can be seen in the previous section. These reflect the content of the interviews and whilst showing clinical competency is still very important its rating drops by 19% to 27%. The rating for technical skills also drops by 9% to 14% but the rating for process skills increases by 28% from 31% to 59%.

These figures reflect doctor's training where the importance of communication and process skills is not seen as any less important than clinical skills.

Of course there are many limitations to this study. Had I in any way steered a discussion onto clinical issues then the thematic results would have been very different as certainly the doctors could have spoken for hours on this area! This may indicate why the technical skills are low in percentage points. The medic either has them or doesn't and therefore the discussion areas on this topic are somewhat limited. Likewise one could take each key statement and give it a value as to its importance.

The way I structured each interview was to try and keep it balanced so that the core competencies and views were, as far as humanly possible, balanced. I believe I did so. There may well be observer bias in the study as some of the people questioned know I have an interest in process skills in medicine although to the best of my knowledge I did not push this aspect; I let the interviewee do the talking with little interruption. Despite this there is still enough evidence to highlight the importance of all three areas.

I would recommend that any expedition leader should be aware that the medic needs excellent process skills if they are going to contribute significantly to the expedition. They also need to be able to look after themselves in the great outdoors and within reason get to a casualty wherever they are. Only then can they start treatment.

Likewise the prospective medic must realise how important the process skills are as they undertake this role. Yes, they do need to be prepared for a major trauma incident, know how to deal with malaria and so on but the quiet chat, the listening ear to an individual or leader could have just as an important effect and yet no one will ever know it took place.

The debate over who should be a medic is interesting. The non-doctors interviewed did not mind who came as long as they had good core knowledge and experience. Indeed subject 1, Mike added almost as an afterthought that they needed medical experience as well!

I believe as long as the medic is well motivated, mature, is aware of his own limitations has technical and process skills his clinical background is not important as all start off with their own strengths and weaknesses. This will ultimately need to be balanced against the size of the expedition and its length.

For instance a doctor clearly has a wide range of diagnostic and treatment experience (in his speciality) but a nurse has more nursing experience which includes counselling on more day to day issues. Operating Department Assistants have an extensive knowledge base that is largely unrecognised (in some countries they anaesthetise patients) and a paramedic has extensive trauma experience outdoors. Army combat medical technicians are superb particularly if you are fortunate to find one who has been attached to the Special Forces. All of the above may have spent many years in healthcare in differing departments and given the limitations of treatment in the field are capable of offering a quality standard of care.

What the expedition medic must do is become competent in areas that he feels he is weak in. This is part of the preparation process for the trip alongside getting fit and researching local medical conditions. The amount of literature available eases this process. This includes being aware of their influence on the expedition as the medic; they hold a unique role.

Mention has been made of medico-legal implications. This is discussed in depth in "Expedition Medicine" by the Royal Geographic Society. It states that medico legal issues normally resolve around the issue of negligence. For someone to prove this they must first of all show that the actual care received fell short of this standard. They must also show that because of this inadequate care demonstrable injury resulted. They can then sue for damages^{xli}

It continues that training, patient consent and facilities and equipment largely dictate the level and range of treatment that an individual in a remote situation can provide.^{xlii}

There are also issues with duty of care that must be considered in this equation.

The reality is that if stuck in a tent with a casualty who has a compound tibial fracture then you as the medic are going to have to deal with it. This would mean cleaning it, immobilising the limb and commencing on antibiotics and painkillers if available. You are also inevitably going to be involved in the rescue and are going to have to liaise with local medical services. The medic will therefore be taking a lead role and is going to be working hard. As medic one would expect you to have prepared yourself for this type of eventuality.

Reflecting on the results of this project despite its previously mentioned limitations I feel it demonstrates the following:

- 1) There needs to be an increased focus on process and technical skills in the expedition medical literature. The vast majority of the literature is focussed on clinical conditions but in reality the process skills are just as important and will be used the most.
- 2) The medic needs to be physically fit and capable of looking after themselves in the field.
- 3) The above two points need to be understood by expedition medics and leaders alike. The inadequate coverage of these issues needs to be rectified in the literature

Recommendations for Future Study

The results of this limited study have highlighted a weakness in the literature. A large scale, questionnaire based study to equal numbers of expedition leaders and their staff, expedition organisations, expedition members, expedition medics of all grades and expedition medical course organisers should be carried out. It should also include a full study of the range of courses available, statistics on expedition related illnesses and accidents and look at the medico-legal issues in expedition medicine.

This information could then be correlated to highlight specific strengths and weaknesses in the area of expedition medicine to aid future education.

Conclusion

The expedition medic plays a vital role in the infrastructure of an expedition. The extent of this role outside of the clinical responsibilities may not always be apparent to either expedition leaders or the medic themselves.

It is essential that they are aware of the process and technical skills of the role and prepare themselves accordingly as it has been demonstrated that these attributes are as important as the more obvious clinical skills. Expedition leaders need to be aware of the importance of these skills in the entire team, not just the medic.

In doing so a given expedition will be more likely to be a successful and fulfilling adventure with minimal medical problems to deal with; the only thought on peoples mind after they return home will be, “when do we go again?”

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