BEEN THERE, DONE THAT

Medical support on a trans-atlantic sailing expedition

ED Nicol

Introduction

Sailing has a well established place in the Armed Forces adventurous training programme and all three services have participated in all forms of adventurous and competitive sailing for many years, with notable success. Taking place from September 2000 to July 2001, Exercise SOUTHERN TARTAN CHALLENGE was a joint services adventurous training expedition which sailed from the UK to South Georgia. After arriving at South Georgia, the vessel and part of the crew circumnavigated the island whilst other members simultaneously conquered Mt. Roots, a previously unclimbed peak, and then repeated Shackleton's historic crossing of the Island. The expedition then sailed up the east coast of South America and returned the "wrong way" across the Atlantic to the UK.

The expedition placed enormous demands on all its participants. Qualified Skippers had their navigation skills tested in technically demanding conditions in some of the remotest parts of the world. They also had to overcome significant logistical difficulties in maintaining the ship in often arduous conditions and in provisioning the ship for long legs using only supplies that were available locally. In addition, it was their task to nurture sailing skills in the crew, many members of which had never sailed before, and ultimately to forge efficient and safe watches capable of sailing competently in difficult conditions. Crew members were subject to varying conditions from mountainous southern seas in Antarctic waters to tropical heat in a poorly ventilated ship. Cramped conditions often led to little sleep.

The provision of medical support to the expedition was dictated by the specific leg being undertaken. The geographical proximity to land and the climatic influences that were likely to be faced, as well as the possibility of re-supply, all had to be considered. Many of the legs did not have a doctor on board and the skipper would take overall responsibility in the absence of a fully trained medical practitioner. This article will describe the preparations undertaken prior to the leg of the expedition in which I took part, namely the reverse Trans-Atlantic leg, from Barbados to the small group of Portuguese Islands of The Azores. The selection of medical supplies will be considered. Finally, an account of the

medical complaints encountered on the leg and the management difficulties which resulted is given.

Preparation

The initial crew were selected approximately a year before the expedition was due to depart. The skipper Lt Col Rob Shuler, First Mate Lt Col Pete Davies, both Royal Engineers from HQ Land, the author as the token Royal Air Force member and nine members of 1 Scots Guards (1 SG) were to take the 50 foot yacht ICE MAIDEN from Barbados the wrong way across the Atlantic to the Azores. The expedition would last for five weeks and for most of the crew this would be their first introduction to large yacht sailing. ICE MAIDEN is a fifty foot steel cutter displacing 33 tons, is chartered with 12 berths and designed to withstand the arduous Antarctic Southern Seas. Communications and advice about the make up of the ship's medical supplies that might be available were patchy and limited by the fact that any of the equipment might have already been used in a previous "leg" before we took over the yacht in Barbados.

The initial preparation was hampered by the fact I was then based in RAF Akrotiri in Cyprus whilst the rest of the crew were in the UK. Unfortunately, due to operational commitments, 1 SG were forced to withdraw from the expedition and the final make up of the crew was only decided a week before departure. The Second Mate, Lt Commander Mick Finn Retd. was only added to the crew 48hrs prior to departure.

As someone who has led medical expeditions to the Himalayas in the past, I had already prepared a pre-expedition questionnaire (Annex A) providing me with past medical histories, current medications and any known allergies as well as any ongoing medical problems that might cause problems. I also enclosed a basic list of individual medical supplies I wished members of the crew to request from their own units prior to the expedition (Annex B). In my experience, medical centres are much more likely to provide individual supplies than be happy to supply an entire expedition.

Armed with this basic information about the crew, I contacted Capt Marcus Stutt, RMO 2nd Battalion The Royal Green Jackets, who had been the attending Doctor on a previous leg in South Georgia several months previously. He was able to furnish

Flt Lt ED Nicol RAF
Senior House Officer in
Medicine,
MDHU Peterborough,
Thorpe Road,
Peterborough,
PE3 6DA

Email:
cyprusdoc@doctors.org.uk

me with a basic outline of medical supplies on board but was unable to tell me of any further kit that may have been eroded or expired. This left me in a dilemma as to what medical equipment to take and, given the short notice to the crew in which they might obtain individual supplies, what additional drugs to take. As on many remote medical expeditions the content of my supplies was limited by the fact that they would need to be carried and that space is usually very limited on a yacht.

After much discussion with colleagues in all fields of medicine a general consensus was reached and a medical pack fitting into one Army Supply Medical back pack was assembled (Annex C).

What to take and Why

One of the most difficult aspects of planning a medical kit for any remote medical support is trying to predict what might happen (almost anything in my experience), how likely it is to happen (usually not likely) and what can be taken to prevent or treat any eventuality. This must be done within the restrictions upon the medical officer. The expedition members will usually have to carry this equipment and so bulk and weight are often crucial. Obviously every eventuality cannot be covered, but with thought and discussion most common complaints and many more serious problems can be provided for. This must also be done within the level of competency of the medical officer. It is important to know what specific local problems are likely to occur (for example local GI pathogens and local resistance to antibiotics) . Finally contacts within the UK, Tactical Medical Wing for Air Evacuation and a contact for initiating a sea rescue must be arranged before departure. The expedition leader must also be aware what can and cannot be provided. A heated discussion on the mountainside or in the middle of the Atlantic is not conducive to the

care of the patient. Table 1 lists some of the equipment I felt I needed, and why.

There are many documented episodes of appendicitis at sea and it is something all medical officers fear but the availability of intravenous antibiotics and an evacuation plan make this a lot less daunting.

Legal Requirements

The Maritime and Coastguard Agency of the United Kingdom provides:

- i) MSN 1726 (M+F) - Detailed legal requirements to commercial vessels and minimum standards for ships' medical stores (1)
- ii) Ships' Captains' Medical Guide (2) which gives skippers detailed medical advice in the absence of a medical practitioner.
- iii) An obligation on commercial owners to provide medical equipment as part of charter agreement.

The Medical Stores Regulations provide a list of the detailed medical equipment expected for a ten person crew and should provide the basis for the medical store on any expedition. The Regulations also categorise the type of trip the vessel carries out:

Category A No limitation on length of trip.

Category B 175 nautical miles from the nearest port with adequate medical supplies and within range of helicopter rescue services.

Category C Harbour Vessels, boats and crafts staying close to shore.

The ship's master holds the responsibility (which may be delegated) for the medical attention given in the absence of a doctor.

Medical Management

During the 34 day Leg 11 of exercise SOUTHERN TARTAN CHALLENGE I was called on to provide active medical care to approximately half of the crew. In addition, I was also tasked with simple

Table 1. Medical kit

	Notes
ANALGESIA	remember NSAIDs and Asthmatics, Legality of Opiates
ANTIBIOTICS	wide variety, remember allergies and local microbes
ANAPHYLAXIS	life threatening but potentially treatable
ANTIEMETICS	obvious on a sailing expedition, different routes of administration
BURNS	cling film, flamazine, limited fluids
FLUID RESUSCITATION	limited, don't forget giving sets
GENERAL MEDICAL	Asthma, Diabetes, GTN
MINOR SURGERY	scalpels, steristrips, sutures and suture kits, local anaesthetics
SPINAL INJURIES	C-collar, improvised splints
WOUNDS	dressings and creams, vital and often forgotten
SUNSCREEN/AFTERSUN

Fig 1. The crew on leg 11, Exercise Southern Tartan Challenge (author centre rear row).

environmental health matters such as determining the suitability of the fresh water from our freshwater pumps and deciding whether meat and other perishables were still fit for human consumption. In effect I was the final arbiter for health associated issues.

Described below are three cases that could have had potentially serious consequences. Areas of difficulty are highlighted, emphasising what makes this type of medicine so different from everyday practice in the UK.

Case 1

A crew member needed to climb a 15m mast to replace the foresail halyard and on reaching the top of the mast became detached from the safety life. Contact caused ripping of the mainsail and, spinning around the mast, they collided with the upper spreader bar on the main mast. The crew member sustained a heavy impact against his legs and back which left him shocked and frozen on the upper spreader bar, with reduced sensation and tingling in the lower limbs.

The injured crew member was removed by sending a second crew member up the mast and winching them both down to a soft deck landing. On assessment, the casualty's blood pressure was 110/60 mmHg and pulse 130. There was very marked tenderness over the left lumbar region and over the arms and legs, with severe anxiety and hyperventilation. No focal neurological signs were present. The blood pressure remained 100-110 systolic for eight hours after the event and for the following seven days the casualty required high dose ibuprofen and co-codamol for analgesia.

Case 2

This casualty sustained severe blistering sunburn through a white T-Shirt after using local brand factor 50 sunscreen. The cabin temperature was 41°C and the outside temperature 38°C with no shade on deck.

His symptoms consisted of severe headache, nausea and vomiting. The casualty was hypotensive, (blood pressure 94/40, pulse 120). The symptoms settled with oral rehydration salts and rest. An uneventful recovery followed with no further sunburn after using UK brand sunscreen.

Case 3

This crewmember suffered mild nausea and diarrhoea on ingestion of food left on the side in the galley. All observations were normal. The 24 hour diarrhoeal illness spontaneously resolved.

Discussion

Trauma is perhaps the worst case scenario in a remote setting with limited available equipment and supplies and little possibility of definitive treatment without a lengthy evacuation procedure and a resulting poor prognosis.

Case 1 fortunately did not result in any major trauma, however, it would be easy to imagine a worse outcome in this case and there was a definite risk of a severe spinal injury, head trauma, a ruptured spleen or renal damage.

The simple mechanics of handling a casualty safely on a moving yacht in mounting swell provided practical problems. The initial assessment and basic observations were difficult in hot cramped conditions with the background noise of the engine making auscultation and blood pressure measurements difficult. Continuing observation and optimising the environment for a casualty can impact on expedition requirements: a need for quiet and cool oppose the need to keep moving and avoid exposure. Concern amongst other crewmembers and team morale are often difficult to manage whilst maintaining patient confidentiality. Early discussion with the expedition leader as to continuation with the expedition or initiation of a casevac should be carried out and plans must remain

Fig 2. The mast on Ice Maiden giving an idea of its height

flexible in the early stages. Regular progress reports should keep the expedition leader informed.

Cases 2 and 3 highlight the potential of relatively minor complaints to become more difficult to manage in an expedition environment. A severe case of sunburn can usually be managed with intravenous fluid rehydration and avoidance of further exposure. However, on a deck there is relatively little shade and the excessive heat below deck combined with poor ventilation made this case more difficult to manage. With a very limited supply of intravenous fluids, oral rehydration was preferred. Use of local sunscreen proved to be a contributory factor and the same caveat should be applied as a warning regarding any locally purchased medical supplies: if a reliable local supply cannot be guaranteed, UK purchased goods should be taken and used.

Case 3 was of particular relevance from a public health point of view as communal use of all cutlery and bowls was usual, combined with less than perfect washing up in seawater. The need to isolate potential outbreaks of gastrointestinal upset is obviously paramount as fresh water was already restricted and further dehydration would have quickly overwhelmed supplies of fluid, especially against the background of chronic mild dehydration most of the crew were suffering. A debilitated crew would have had serious consequences medically and for the future of the expedition.

Conclusions

I have tried to outline some practical information for doctors who may find themselves in remote locations. Most of the advice is salient for all remote environments. I have also provided some specific advice for sailing expeditions.

Having had some experience of remote medicine prior to this expedition I still found that common ailments will occur commonly and the rather more worrying serious problems are fortunately rare. This should be remembered when medical kits are being prepared.

References

1. MSN 1726 (M+F) The Merchant Shipping and Fishing Vessels (Medical Stores) Regulations 1995 SI No.1802 and the Merchant Shipping and Medical Vessels (Medical Stores) (Amendment) Regulations 1996 SI No.2821
2. Ships Captain's Medical Guide – accompanies above document

ANNEX A:

MEDICAL IN CONFIDENCE WHEN COMPLETE

MEDICAL MATTERS

EXERCISE SOUTHERN TARTAN CHALLENGE 2001.

NAME:

AGE:

Do you have any CURRENT medical problems?	
Have you had any illnesses or operations in the past year?	
Are you ALLERGIC to anything?	
Do you take any MEDICATION regularly?	
Have you ever experienced any problems at sea?	
Have you ever suffered from Motion sickness?	
Do you have any DENTAL problems? *	

IF YOU ANSWERED 'YES' TO ANY OF THE ABOVE, PLEASE GIVE DETAILS BELOW:

ANY OTHER COMMENTS:

**Everyone must see a dentist to ensure that any dental work e.g. Fillings/ bridges is completed prior to departure.*

ANNEX B

Medication	Use	Duration of use
Ibuprofen 400mg Three times a day	Moderate to severe pain Beware in Asthmatics	As needed up to 7-10 days
Paracetamol 500mg Two tablets up to 4 times a day	Moderate pain - Beware other paracetamol based painkillers	As needed up to 7-10 days
CoDydramol Two tablets upto 4 times a day	Moderate pain - Beware paracetamol based painkillers	As needed up to 7-10 days
Dioralyte oral sachets 4 sachets per Litre	For moderate dehydration	As long as dehydrated
Prochlorperazine 5mg Up to 3 times a day	Usually wait 24 hrs before use, good for motion sickness	No more than 3-4 days
Claritin 10mg Once daily	Rashes, Itching, heat rash, bites and stings	For as long a symptoms persist from bite or sting
*Amoxycillin 500mg one tablet three times a day	Chest infections, sinusitis, urine infections	7-10 days
Ciprofloxacin 250mg Twice daily	Travellers diarrhoea and other stomach complaints	5 days
*Flucloxacillin 500mg four times a day	Skin infections	7-10days
'Erythromycin 250mg four times a day	Use if allergic to Penicillin	7days
Metronidazole 400mg Three times a day	Giardia-eggy burps and foul eggy stool, Bloody diarrhoea, can use with Ciprofloxacin	7 days
Mycota dusting powder	Athletes foot	As needed
Zovirax cream 5 %	Herpes sores (cold sores)	As needed
Canesten cream	Fungal infections Groin and foot rot	As needed
Imodium capsules 2mg	Initially two tablets after first diarrhoea and then one with each bout of diarrhoea thereafter, usually wait 24hrs before use, if more than 2-3 days seek advice	As notes
Also note for expedition ALL participants should have high factor sunscreen including a block and aftersun A Sun Hat is compulsory *Not for Penicillin Allergy 'Instead of Penicillins Check whether anti-malarials are needed and if high altitude medicine is needed		

ANNEX C: Exercise Southern Tartan Medical Supplies May 2001.

1. Analgesia		6. Fluids (cont.)	
Diclofenac 75mg/3ml	2	NaCl 0.9% Flushes/Venflons	20
Diamorphine 10mg/10ml	10	Dioralyte sachets	80
Naloxone 400mcg IV	10		
Cocodamol 8/500mg	120	7. General Medical	
Ibuprofen 400mg	200	Prednisolone 5mg EC	56
Paracetamol 500mg	200	GTN 400mcg Spray	1
Aspirin 300mg	100	Omeprazole 20mg	56
		Salbutamol 100mcg inhaler	2
2. Antibiotics		Beclomethasone 100mcg	2
Amoxycillin 250mg tab	105	Diazepam 5mg/2ml	10
Flucloxacillin 250mg tab	112	Loperamide 2mg	30
Ciprofloxacin 250mg tab	100	Chrotamiton 10% 30mg	1
Metronidazole 400mg tab	50		
Metronidazole 500mg IV	9	8. Minor Surgery	
Cefuroxime 750mg IV	15	Gloves Sterile	3
Benzyl Penicillin 600mg IV	25	Examination gloves	10
Chloramphenicol eye		Fine Suture Set	1
0.5% drops	3	Sutures Various	20
		Glue	3
3. Anaphylaxis		Steristrips various	5
Epinephrine 0.3ml 1/1000	2	Dressings assorted	15
Epinephrine 10ml 1/10000	3	Saline Sachets	20
Hydrocortisone 100mg IV	8	Syringes 2ml/5ml/10ml	20
Chlorpherinamine 10mg/ml	5	Bandages Various/Tapes	10
		Small sharps Bin	1
4. Antiemetics		Lignocaine 1% 10ml	5
Prochlorperazine maleate		Lignocaine/Epinephrine	5
5mg tablets	84		
Hyoscine 1.5mg patch	5	9. Spinal/Trauma	
Cinnarazine 15mg tablet	84	Set of stiff neck collars	1
Hyoscine 300mg tablet	24	Guedel Airways	6
		Oxygen – aboard ship	1
5. Burns		Laerdal Mask	1
Flamazine	4		
Jellnet gauze	4	10. Miscellaneous	
		Stethoscope	1
6. Fluid Resuscitation		Sphygmomanometer	1
Normal Saline 0.9%	2L	Pulse Oximeter	1
Gelofuscin 500ml	2	Auroscope/Otoscope	1
Giving sets	2		