

# REALITY TV AND THE WORLD'S TOUGHEST RACE

## FIJI ECO CHALLENGE: RISK ASSESSMENT, PLANNING AND ENVIRONMENTAL CONSIDERATIONS

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Eco challenge is a televised multi-day expedition length adventure race which originally ran from 1995 to 2002.

International teams of adventure athletes race non-stop, 24 hours a day, across hundreds of miles of rugged backcountry terrain complete with mountains, jungles and oceans. Each team is comprised of a racing team of four competitors and includes at least one member of the opposite sex, plus one assistant crew member.

In 2019 it was decided to reboot the race, returning to Fiji where the 2002 event had taken place. 66 teams raced from one side of Fiji to the other non-stop for eleven days, utilising a variety of transport methods including mountain bikes traditional sailing boats, bamboo rafts, whitewater rafting, climbing and rappelling.

### MEDICAL PROVISION

This event provided a significant challenge in terms of medical provision. As well as

over 250 athletes competing, there was also 66 race team support crew and 700 general race support crew.

One of the first things to do from a planning point of view was to define the aims of the medical team in conjunction with the production company and race technical crew. This is important, particularly when working on a large project to ensure everyone is clear what they are responsible for. The medical team were responsible for the following:

- To provide immediate medical care for seriously ill and injured crew and competitors and continue care until handed over to an appropriate medical facility in Fiji or abroad
- To provide background Medical Information to competitors, volunteers and event staff
- To provide medical escort and patient advocacy during inpatient treatment, liaising with local and international

medical facilities as required

- To provide 24hr medical cover for crew and competitors for the duration of the race
- To assist in searches/rescue of competitors
- To collect data on patterns of illness and injury in order to identify potentially preventable future cases which can be fed back to the relevant departments
- To work in conjunction with other departments to protect the public health of the crew and athletes
- Any other tasks requested by the production team that fall under the medical team remit.

When planning medical cover for a project such as this it is important to be aware of the residual risk. This is the risk that will remain despite all mitigation measures. Organisers and participants must be aware that due to the remote nature and difficult logistics, serious illness or injury during an



**Image 1:** Route of Eco Challenge.

event like this may have a worse outcome compared to the same incident back home. The job of the medical team is to provide the highest level of care possible within constraints such as terrain, weather, access and budget. Ultimately, the medical director must be confident that the planning and provision of medical care would stand up to scrutiny should the worst happen.

When planning for a medical project it is useful to consider 3 factors: people, activity and environment.

#### PEOPLE

For eco challenge this was primarily the athletes. All competitors were required to fill out a medical form to flag any pre-existing conditions. In the months leading up to the race regular newsletters were sent to all athletes which provided the opportunity to give some background and information about potential medical issues they might face during the race and mandatory medical kit that each team needed to carry at all times. During the pre-race period all

athletes had a one to one with one of the medical team to run through the medical forms. This provided the opportunity to discuss things like glucose monitoring for diabetics, managing medicines, checking team medical kits and talks on anticipated problems such as heat injury.

Eco challenge staff: With such a large staff supporting the race much of our clinical work involved treating the staff. There were a number of issues related to the environment

Medical team – The makeup of the medical team was dependent on a number of factors such as course layout and access, proximity and quality of local medical facilities and budgets. If the course was designed as a circular route with easy road access to most areas then less medical staff would be needed. However the Fiji course was more of a linear route with very difficult access for large sections of it, this meant parts of the medical team had to be pre-placed in potentially risky sections and then moved on once all athletes had passed. The medical team was made up of five doctors (including medical director), 4 paramedics, 2 winch / search and rescue paramedics and five medically trained volunteers. The team was then divided up. The medical director remained at race control for the duration of the race and four mobile medical teams were created each containing a doctor a



**Image 2:** The medical team.



paramedic and a volunteer. One of the rescue paramedics spent the majority of the race at Vuwa Falls and the remaining search and rescue paramedic was helicopter based for emergencies.

### ACTIVITY

The race involved a wide variety of activities; sailing traditional sailing catamarans (camakaus), paddleboarding, mountain biking, bamboo rafts, swimming, whitewater rafting, ascending and descending ropes and of course plenty of time on foot. We expected casualties from both heat but also from the cold on the higher sections of the course. We knew they would be lots of issues related to people's feet and minor cuts and grazes. We knew there was the potential for significant trauma due to falls or crashes. There were also a huge amount of road moves for staff and support teams which created considerable risk.

### ENVIRONMENT

This includes issue such as the climate, the terrain, local medical facilities, local hazards and infectious disease and modes of transport.

### Climate

We knew that the climate would predominantly be hot and the risk of heat

illness or injury was reasonably high so staff and athletes were briefed about this prior to the event. From course recce we were also aware that there was the risk of cold injury on the high sections of the course where the athletes would be moving slowly. Generally speaking cold injuries are easier to treat in remote environments than heat injuries. We carried blizzard bags with self-heating elements which are fairly lightweight and there were gas powered heaters available for some of the colder sections of the course. For areas of the course accessible by 4x4, vehicle heaters could also be utilised.

Many of the options for treating hyperthermic casualties require large volumes of cold water. This presents a couple of challenges, firstly the weight of the water required, and secondly the ability to keep the water cold. Many medical teams working on endurance events have an ice bath available to dunk hyperthermic casualties into which provides rapid and safe treatment for heat injured casualties. This is useful when working in a static location but impractical for a mobile medical team. More portable systems have been developed but still require around 150 litres of cold water, too much to be carried by a 3-4 person team.

We reached a compromise with each mobile medical team carrying a large cool box full of ice which would last for several

days in a vehicle. Towels could be dunked into the cold water and laid onto hyperthermic casualties. This provided a good balance of cooling efficiency and portability. We also hypothesised that heat casualties were most likely to happen during daylight hours when temperatures were highest. In this case helicopters could be utilised to move medics and cool boxes to the casualty and onwards to hospital if necessary.

### Local infectious diseases

All athletes and staff were informed of the necessary immunisations for travel to Fiji prior to the event. Leptospirosis was a concern, particularly with the amount of time teams would be spending in contact with fresh water. Dengue fever and Zika are both present in Fiji and although the teams would be exposed to mosquitoes, these diseases tend to concentrate around urban areas so the risk was fairly low.

### Medical facilities

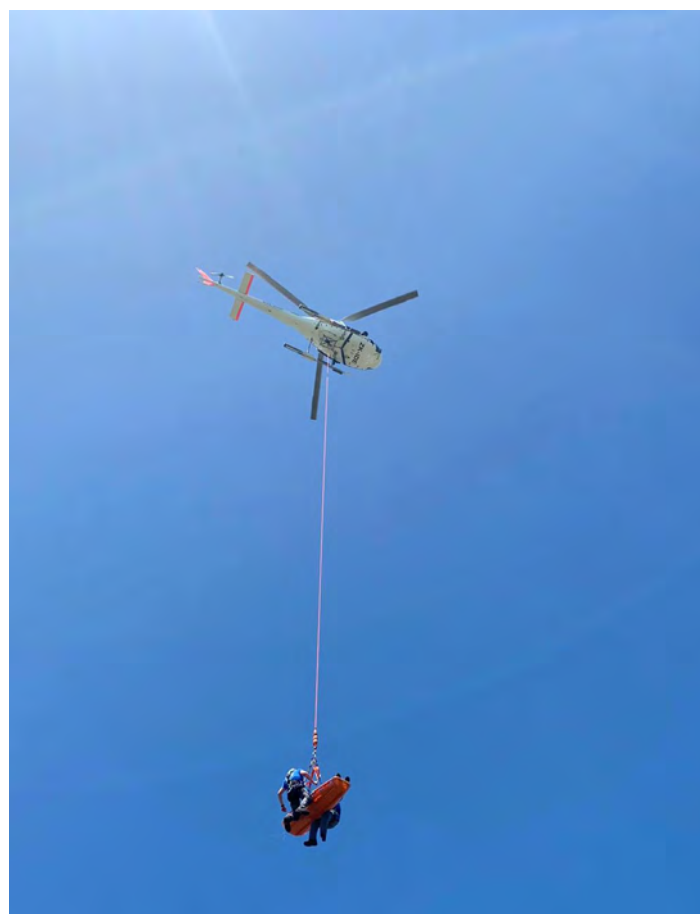
Several of the medical team had operated in Fiji before so had some knowledge of the medical facilities available. These are generally of lower quality and one would find in the UK or the United States. There is no coordinated prehospital care service in Fiji so we would be responsible for the primary transport of unwell athletes to



Image 3: Organising medical kit.

	September 10th	September 11th	September 12th	September 13th	September 14th	September 15th	September 16th	September 17th	September 18th	September 19th	September 20th	September 21st	September 22nd
Start	Craight @ Inoua 9th & 10th - safety boat												
Ovalau - in place evening of 9th	? Heli transfer 1500 Team 2 1200 ? Heli /boat transfer to self drive vehicle												
CP7	0000 Team 3 0800 Self drive to CP 22												
Camp 1	Start medic Self drive from start 1200 Team 4 0600 self drive to camp 4												
Camp 2	Self drive from start 0900 Team 1 2310 Self drive to Denerau - boat to Mana												
Camp 3	Heli from Ovalau then self drive to camp 3 0700 Team 2 2100 self drive to denerau, boat to mana												
Vuwa falls	? Heli insert 1500 Self drive 0600 hot water available @ CP22 Team 3 Team 3 ? Heli exit to camp 4/mana												
CP22 single medic	Self drive 0700 Team 3 Team 3 1200 Self drive to CP30 Mike C depart 1000 21st												
CP 23 - med team	Self drive 0600 Team 4 Team 4 Team 4 Team 4 1600 Self drive to CP30												
Camp 4	Self drive 0600 Team 4 Team 4 Team 4 Team 4 0600 Sweep up behind MTB - to pullman												
Mana Island	? Boat 1200 Team 1 Team 1 Team 1 Team 1 1200 To pullman												
	MREs required @ 3 meals pppd inc drivers												
Med team 1 Naki, Leah and matt	48 Standard landcruiser												
Med team 2 James S, Rupert, Charlotte	56 Disco plus mke												
Med team 3 Mike C, Foin, Janet, Islay, Lizzie	130 Landcruiser ambulance plus black nissan												
Med team 4 - Roger, Laura, Nina	40												
Gary Robertson	20												
Mike Beamish ? Bear winch op	20												
Total	374												

**Table 1:** Medical team movements.



**Images 4a and b:** Helicopter training.

hospital. We would also need to maintain a degree of oversight of their hospital treatment and provide advocacy during any inpatient stays.

#### Medical equipment

Selecting the medical equipment required consideration of a number of factors. Portability, weight, durability, availability and cost but all had to be considered. Each mobile medical team had to be able to carry the medical equipment on their backs, potentially for up to 10 kilometres. They needed to be able to manage traumatic

injuries acute medical problems as well as primary care and minor injuries. The kit needed to be protected from the environment particularly during heavy rain.

The search and rescue paramedic who was based at Vuwa Falls for the race carried a smaller medical kit with less primary care equipment but also required full rope access kit.

On top of the medical equipment each mobile medical team also needed to carry their own personal equipment including tents sleeping bags MREs, stoves and clothing for both hot and cold environments.

#### Terrain and transport

One of the reasons Fiji is such an attractive destination for an adventure race is the wide variety and spectacular nature of the terrain. Unfortunately this made it very challenging to access many parts of the course easily. The marine legs were fairly straightforward as we had excellent backup from the marine transport team, all the teams had GPS trackers so could be located and reached quickly if necessary. A reasonable proportion of the mountain biking legs were accessible by 4 wheel drive vehicle and all of the camps had pre marked

helicopter landing sites. We knew that the jungle and waterfall sections in the centre of the course would be the most challenging to access. It would have been over six hours walking from the nearest roadhead. They were very few suitable helicopter landing sites although we did have a winch capability with the helicopters however the helicopters were restricted to flying in daylight hours which unfortunately was 50% of the race duration.

#### Helicopters and training

The race organisers decided to ship 3 helicopters (BK117, AS350 squirrel and an EC135) over from New Zealand along with a pilot team with extensive search and rescue experience. Both the BK117 and the squirrel were equipped with winches. Prior to the race starting the medical team was able to spend a day with the Helicopter team practising rescues using the winch, long line and also a rescue net. One of the paramedics with extensive search and rescue and winch experience was helicopter based for the duration of the race.

Each team was made up of four athletes plus one support team member. The support team would self-drive between camps, this involved a lot of driving and we were aware that with this amount of road moves there was a real risk of road traffic accidents.

#### RACE STATISTICS

There were 281 patient contacts during the race, 50 for crew and local staff, 231 for athletes. Minor wounds and footcare made up the majority of cases. The mountain biking legs accounted for the majority of injuries, although most were minor (see Figures 1-3).

There was only 1 fracture during the race. The patient slipped while jumping between rocks on the section above Vuwa falls and sustained a knee injury. A helicopter was able to lower a rescue paramedic and extricate with a rescue net. Xray performed at a local hospital (see below) was reported as normal but demonstrated a fairly obvious lateral tibial plateau fracture. Patient's leg was immobilised for a commercial flight back to the US for surgical fixation. This was not considered a preventable incident.

There were 2 patients with near identical presentations that required international evacuation via air ambulance. Both sustained multiple lower leg lacerations during the race which became infected,

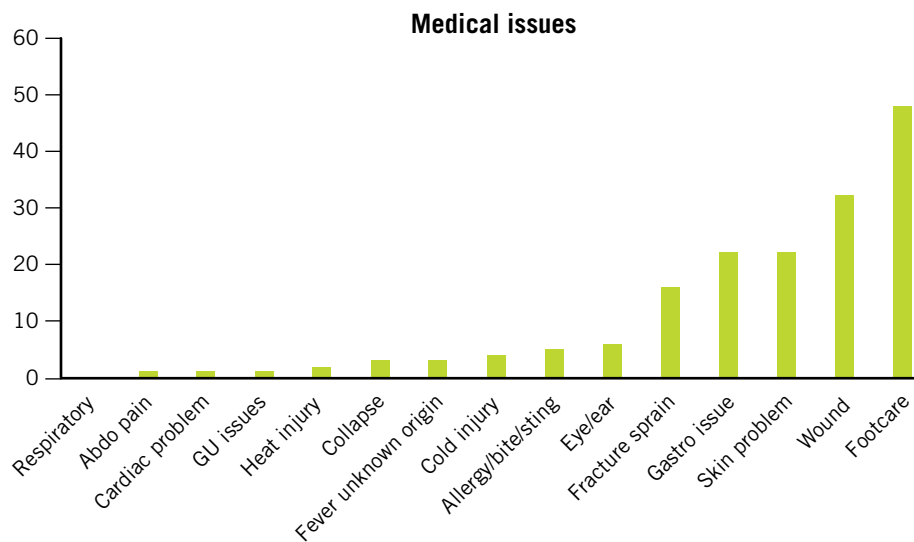


Figure 1: Medical issues encountered during the race.

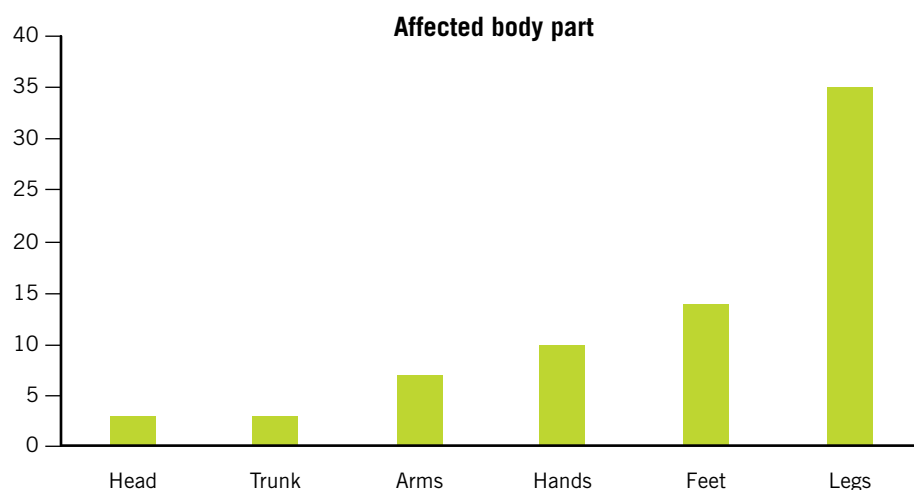


Figure 2: Most injuries and wounds affected the lower legs and seemed to be caused by slips and trips.

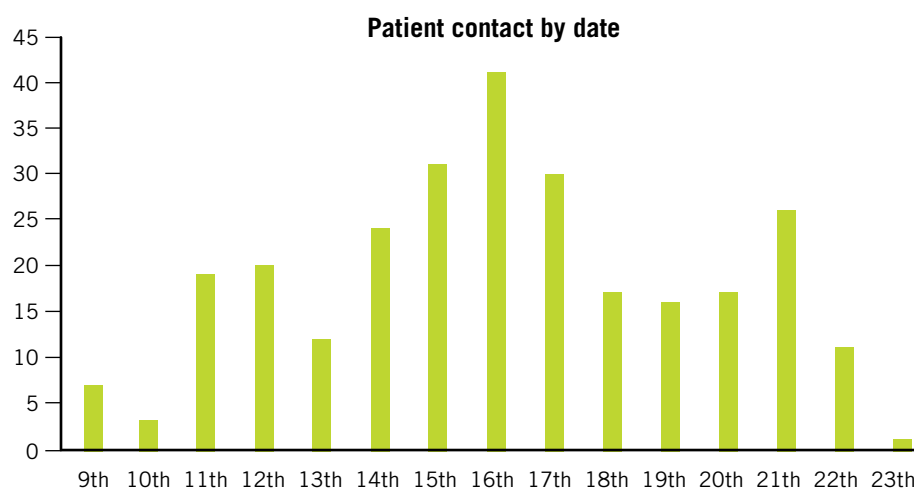


Figure 3: Patient contacts by date showed an almost symmetrical pattern with the highest number mid-race. Many athletes continued to require medical attention for several days after finishing the race.





**Image 5:** Knee Xray with tibial plateau fracture.



**Image 6:** Rescue paramedic assisting casualty into net for extrication.

leading to signs of sepsis. Both were treated with antibiotics and fluids on the course before transfer to Lautoka hospital. Blood cultures were taken on admission but unfortunately grew no pathogens. Both patients were treated with Penicillin g, cloxacillin and metronidazole. After treatment in New Zealand both made a good recovery and were able to fly home. The severity and frequency of skin infections during the race was unexpected.

There was a car vs cyclist incident which luckily did not cause any injury. The car did not stop, local villagers claim the driver was drunk.

While driving between camps one assistant crew vehicle slid off the road, off a bridge and into a river. Miraculously the driver was uninjured, managed to self-extricate and did not require any medical attention.

One athlete required transport to hospital for a minor head injury after a crash which did not involve any other vehicles. He was discharged the same day after a CT head scan revealed no injuries.

There were no heat or cold injuries that required withdrawal from the race.

#### LESSONS LEARNED

This was a complex project which had the potential for serious injury in remote areas with challenging access and logistics, however there were relatively few serious incidents. This was probably due to a combination of factors. Regular newsletters had been sent out to teams with information about first aid kits, the kind of challenges they should be prepared for and tips on the correct type and use of equipment they



**Image 6:** Assistant crew vehicle accident.



**Image 7:** Challenging landing to extricate casualty.

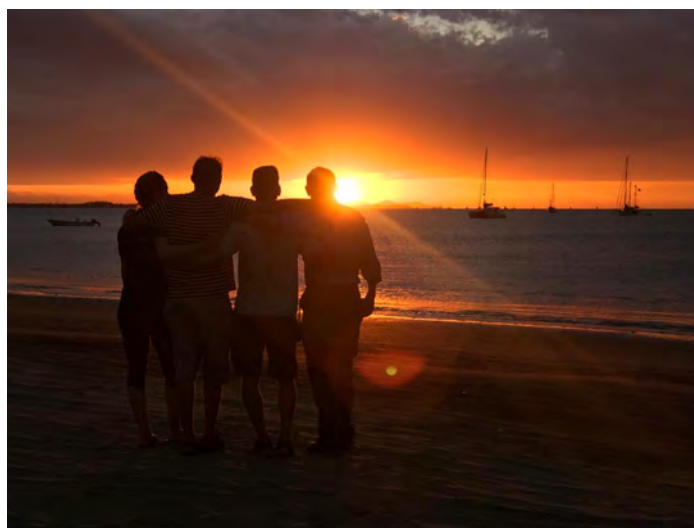




**Image 8:** A very common presentation.



**Image 9:** Medical equipment for distribution.



**Images:** Not your everyday clinic!

**“Treating patients on camera has the potential to be quite stressful for medical staff. Medical issues on TV shows often make good ‘content’ so producers and camera operators are keen to film as much as possible, particularly when dealing with serious illness or injury.”**

would need. The course design was a huge undertaking. Over 400 miles of varied terrain that needed to be challenging while minimising risk to athletes. The lack of serious injury was a testament to good risk assessment and mitigation.

A surprising number of athletes seemed unprepared for, and had difficulty dealing with foot related issues. The medical team spent many hours cleaning, dressing, taping and strapping athletes' feet.

As mentioned previously the number of skin infections was unexpected. Having a lower threshold to start antibiotic therapy may have prevented some of the more serious infections.

Treating patients on camera has the potential to be quite stressful for medical staff. Medical issues on TV shows often make good 'content' so producers and camera operators are keen to film as much as possible, particularly when dealing with serious illness or injury. The producers and camera crews on Eco Challenge all had experience in endurance/outdoor events as well as reality TV which allowed them to film good content without being intrusive or obstructive. This meant the medical team could concentrate on providing care without worrying about film crews getting in the way.

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