



**Ministry
of Defence**

JSP 539

**HEAT ILLNESS AND COLD INJURY:
PREVENTION AND MANAGEMENT**

Part 1: Directive

JSP 539 Part 1 V3.1 Feb 19

Foreword

1. Heat illness and cold injury are serious issues for the Armed Forces, with cases regularly occurring in the temperate climate of the UK. The incidence of heat illness and cold injury depends on numbers exposed to the risk¹ and how well that risk is managed. The overall incidence rate of heat illness² and cold injury³ cases has not changed over the past 5 years and 3 soldiers died from heat illness on exercise in the UK in 2013. For both heat illness and cold injury, rates are higher in the untrained and the young (16-19 years)⁴.

2. The significant impact on life and health as a result of heat illness and cold injuries sustained in the UK and overseas is nearly all preventable, provided the risk factors are assessed properly and appropriately managed. This prevention requires greater awareness of the risk by Commanders and Defence Personnel at all levels, as well as training in assessment of the risk and putting in place the right control measures. Whilst prevention is the primary means of reducing heat illness and cold injury, where cases do occur, their impact may be reduced if appropriate first aid measures and evacuation to effective medical care are carried out efficiently and promptly.

Aim

3. The aim of this JSP is to educate all MOD personnel in the prevention and treatment of cases of heat illness and cold injury in order to minimise the risks of injury or death. The procedures to minimise the risk of developing heat and cold casualties and the immediate management of anyone who develops a heat illness or cold injury are described.

Surgeon General
Defence Authority for Healthcare and Medical

¹ For example there may be a higher incidence of cold injury after a large exercise in the Arctic.

² Defence Statistics (Health) Report to Heat Illness Working Group, 5 Jan 17; rate of cases reported for the first time by UK Regular Armed Forces personnel only 2011/12-2015/16.

³ Defence Statistics (Health) report to Cold Injuries Working Group, 5Jan17; rate of cases reported for the first time by UK Regular Armed Forces personnel only 2011/12-2015/16.

⁴ Defence Statistics (Health) Report to Heat Illness Working Group, 5 Jan 17; based on the average number of UK Regular Armed Forces personnel on strength.

Preface

How to use this JSP

1. This JSP is the Joint Service code of practice for the prevention, through Force Protection measures, of heat illness and cold injury either due to the direct effects of hot or cold environments or heat illness from physical activity in any environment. Whilst primarily written for land based activities, including training, exercises and operations, the principles are to be applied to the air and maritime environments. The JSP will be supported, where necessary by single Service and Defence Primary Healthcare instructions. It cannot cover every possible eventuality; however it states the principles which should be applied at all times in order to minimise the risks of heat illness and cold injury in accordance with Defence Safety Authority policy¹. Commanders should note that it is entirely possible to be at risk from both heat illness and cold injury within the same theatre of operations and during the same activity.
2. The JSP also contains guidance on the initial medical management and treatment of heat illness and cold injury casualties, including medical grading at Primary Health Care level. The management of heat illness and cold injury casualties by Secondary Health Care, is beyond the scope or intent of this JSP.
3. The JSP is structured in two parts:
 - a. Part 1- Directive, which provides the direction that must be followed in accordance with statute or policy mandated by Defence or on Defence by Central Government.
 - b. Part 2 - Guidance, which provides the guidance and best practice that will assist the user to comply with the Directive(s) detailed in Part 1.

Training

4. **All personnel** are to be made aware of:
 - a. Heat illness.
 - b. Cold Injury.
 - c. Methods of prevention.
 - d. Identification.
 - e. First-aid management.
5. **Individuals** are to receive education and training during:
 - a. Basic training.

¹ [DSA 01.1 - Defence Policy for Health, Safety and Environmental Protection.](#)

- b. Periodic mandatory training in accordance with single Service policy.
- c. Targeted refresher training to be conducted immediately prior to operating in hot or cold environments, including in the UK and other temperate areas, where there is a risk of heat illness or cold injury.

6. **Commanders and training staff** at all levels should receive appropriate update training:

- a. During leadership courses.
- b. Prior to assignment to a training post.

7. **Defence Medical Service (DMS) personnel** are to be trained in the prevention and management of heat illness and cold injury, including medical planning (appropriate to their level of competency and responsibility). This should be part of initial medical training for DMS personnel, with appropriate refresher training periodically thereafter, targeted by Career Employment Group and clinical speciality.

8. **Wet Bulb Globe Temperature (WBGT)**. Training on the use of the WBGT monitor is provided during the following courses:

- a. DMS Defence Medic training².
- b. All Arms Physical Training Instructors Course.
- c. Specialist Training for RN, RM, Army and RAF Physical Training Qualifying Courses.
- d. BSc Environmental Health for Environmental Health Technicians.

9. **Mounting instructions and planning directives**. JSP 539 is to be incorporated as a mandatory reference in Exercise and Operational mounting instructions and planning directives. It should be emphasised that heat illness and cold injury frequently occur in the temperate environment of the UK and Northern Europe.

Coherence with other Defence Authority policy and guidance

10. Where applicable, this document contains links to other relevant JSPs, some of which may be published by different Defence Authorities. Where particular dependencies exist, these other Defence Authorities have been consulted in the formulation of the policy and guidance detailed in this publication.

Further advice and feedback – contacts

11. For further information on any aspect of this guide, or questions not answered within the subsequent sections, or to provide feedback on the content, contact:

² After Jan 18 there will be no further Defence Medic courses delivered. Training requirements for replacement course being scoped by DHET.

Job title/email	Domain	Telephone
HQ JMG Medical Policy, SO1 Occupational Medicine SG-DMed-Med-Pol-GpMailbox@mod.gov.uk	Policy	Mil 94422 4647 Civ 01543 434647

Amendments table	Version
Update of contact details and other minor amendments to Part 2 (see Part 2 amendments table)	3.1 Feb 19
Major review – to include change of title and restructure into Part 1 Direction and Part 2 Guidance	3.0 May 17
Reformatted in accordance with the Defence Reform Unit requirements	2.5 May 16
Chapter order revised	2.5 May 16
Inclusion of Coroners' recommendations from the Brecon and Williams Inquests	2.5 May 16
Chapter 1 Direction for Commanders revised	2.5 May 16
Meteorological Office Planning Forecasts revised	2.5 May 16
Table 1 WBGT Index Limits revised	2.5 May 16
Figure 4 Cold Injury First Aid devised	2.5 May 16
Chapter 5 Reporting and Recording revised	2.5 May 16

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SECTION 1 - HEAT ILLNESS AND COLD INJURY DIRECTION

Introduction

1. Hot and Cold environments represent a serious hazard to the unprepared. The consequences range from impaired performance to serious heat illness and cold injury, and even death. Despite efforts to reduce occurrences (through education, training and risk assessment), heat illness and cold injury remain a significant and largely preventable cause of illness and injury in Defence Personnel (DP). This risk of heat illness is not exclusive to operations in hot environments; most cases occur in temperate climates such as the UK and serious heat illness may arise from physical activity in cool conditions. In the military environment the vast majority of cases of heat illness or injury are exertional in nature, rather than the classical heat illness or injury seen in the general population. For the purposes of clarity and consistency all cases will be referred to in this policy as heat illness. Commanders should note that it is entirely possible to be at risk from both heat illness and cold injury within the same theatre of operations.

2. DP are at risk from heat illness and cold injury due to the unavoidable need to expose them to adverse environmental conditions on operations and exercises both in the UK and abroad. DP are at risk of heat illness due to high intensity physical exertion, working in hot climates and wearing protective clothing such as Chemical, Biological, Radiological and Nuclear (CBRN) Individual Protective Equipment and combat body armour. Commanders have a duty to assess the risks of heat illness and cold injury arising from military training or operations and to ensure that these risks are minimised in accordance with Defence Safety Authority policy¹. Failure to manage this risk may expose individuals to harm and affect the operational efficiency of the force.

Prevention of heat illness and cold injury

3. The key to preventing heat illness and cold injury is the assessment and management of risk by commanders. Commanders should ensure that they are fully aware of the conditions to which their subordinates are exposed. Any operational, training or recreational task involving physical activity, the wearing of protective clothing (particularly CBRN, body armour, fire retardant or impermeable clothing) or exposure to a raised environmental temperature should be considered to be an activity with a risk of heat illness. In cold environments, the aim of preventive measures is to maintain a normal core temperature and protect vulnerable body parts. This will minimise the risk of hypothermia and helps maintain a good peripheral blood flow to mitigate the risk of local non-freezing cold injury.

Risk management

4. Commanders at all levels are to ensure that a suitable and sufficient risk assessment² is undertaken prior to every activity carrying a risk of heat illness or cold injury, whether involving a single individual or multiple personnel. Risk may be tolerated, treated, transferred or terminated. Commanders must consider seeking medical input for all aspects of the risk management process.

¹ [DSA 01.1 - Defence Policy for Health, Safety and Environmental Protection.](#)

² [JSP 892 Risk Management, JSP 375 Part 2 Vol 1 Chapter 40 Military Training](#)

a. **Assess the risk associated with the planned activity.** It is every commander's duty to ensure that they have sufficient information to undertake an appropriate risk assessment. All factors must be considered together in order to obtain a meaningful overall assessment. It is inappropriate just to consider one factor, such as the environmental conditions in isolation. Commanders must consider as a minimum:

(1) Work type, rate and duration of the planned activity. To include provision of adequate rest periods for cooling or rewarming.

(2) Environmental/thermal conditions including the Wet Bulb Globe Thermometer Index (heat) and Still Air Temperature (cold), coupled with the effects of wind chill.

(3) Individual risk factors. Consider these risks factors on an individual basis and across the group as a whole.

(4) Clothing, equipment and load to be carried for the activity.

(5) Food and water - has the appropriate food and water intake/availability been planned?

(6) In relation to heat illness, the acclimatisation status of the group/individuals, including their familiarity with the specific environment and behavioural adaptation to it.

b. **Reduce the risk.** Commanders must assess whether the same objectives could be achieved (with less risk) by rescheduling or modifying the activity. They are to plan and put in place appropriate control measures to reduce the risk. Commanders should consider additional control measures that may need to be employed in the event of changing circumstances.

c. **Effective preparation.** Commanders must ensure that all personnel taking part are adequately briefed and prepared. Briefing must include the warning signs of heat illness and cold injury and avoidance measures. Ensure that any standing orders or instructions regarding training restrictions are understood by all participants.

d. **Record risk assessment and report residual risk.** On completion of the risk assessment the residual risk must be understood by the commander and a decision made whether the objectives of that activity justifies the risk to be taken and raise this to the Chain of Command. Tasks with operational imperative might reasonably attract a higher tolerance of risk than routine training activities. If the residual risk cannot be justified by the objectives or is unacceptably high **the activity is not to proceed**. Further advice may be sought from environmental health staff or other Suitably Qualified and Experienced Personnel.

e. **Supervision.** Commanders are responsible for the adequate supervision of all DP for the duration of the activity including control measures such as food, water and provision of shelter and rest periods.

f. **Medical Plan.** When developing the medical plan for an activity, commanders must ensure that the activity is covered by an appropriate degree of first aid/medical

cover, including the necessary real life medical support, and that a clear and efficient means of evacuation is agreed in the event of a medical emergency. Every individual is to be aware of and able to apply the first aid measures and casualty response detailed in Part 2. Medical personnel should be involved in the medical planning and empowered to raise concerns regarding heat illness or cold injury before and during any planned activity.

g **Continuous review.** Risk assessments must be dynamic and reviewed throughout the activity as circumstances can change.

Duty Holders

5. DSA policy³ requires the appointment of Duty Holders where it has been assessed that there is credible and reasonably foreseeable Risk to Life from a Defence activity.

Medical personnel

6. Medical personnel are required to assist commanders with:

- a. Risk assessment.
- b. The medical plan.
- c. Prevention of heat illness and cold injury.
- d. Training and education on the prevention and treatment of heat illness and cold injury.

7. Medical personnel are required to treat and manage cases of heat illness and cold injury in accordance with the guidance provided in Part 2.

Reporting and recording

8. Reporting and recording of heat illness and cold injury is known to be an area of poor compliance in both Command and Medical chains. All cases of heat illness and cold injury must be reported and recorded by both the Chain of Command and the medical chain.

9. **Reporting threshold.** All cases must be reported; this includes cases where individuals develop temporary or permanent incapacitation, ie are unable to continue with their duties/training because of heat illness or cold injury with or without the involvement of Defence Medical Services or other medical assets. Where there are multiple heat illness and cold injury casualties or any fatalities an appropriate investigation must be undertaken. A functional, rapid, local alert mechanism, whereby all local units undertaking similar activities are made aware of all incidents of heat illness and cold injury as they arise, must be incorporated into the dynamic risk assessment process. Unit medical centres are to be notified by the Chain of Command of all reported cases of heat illness or cold injury to ensure appropriate medical follow-up and recording takes place.

³ [DSA 01.1 - Defence Policy for Health, Safety and Environmental Protection.](#)