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PART 1.4

Analysis and Findings

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TABLE OF CONTENTS – PART 1.4

List of Tables	iii
List of Figures	iv
Introduction	1
Methodology	1
Accident factors	1
Accident factors modelling – the Australian Transport Safety Bureau (ATSB) model	2
Probabilistic terminology	5
Available evidence	5
Services	6
Army Recruitment	7
Background to the Recruiting Partnering Project	7
The Recruiting Partnering Project	8
Army Recruiting Organisational Command Structure	9
Medical Factors	11
Introduction	11
Medical Screening	11
The medical pre-screening process	11
The Pre-Service Medical Assessment (PSMA)	13
Assurance of the RG doctors employed to conduct the PSMA	16
The PSMA for Commonwealth Candidates	18
Medical equipment used to conduct the PSMA	21
Sickle Cell Trait (SCT) and Exertional Collapse	22
SCT	22
Exertional Collapse Associated with SCT (ECAST)	23
Accidents involving Soldier Selection Candidates	25
The accident involving Candidate 1	25
The accident involving Candidate 2	26
Risk factors for exertional collapse and ECAST	29
Similar previous accidents	36
Clinical review of the accidents involving Candidates 3 and 4	40
Hypothermia	45
Role Fitness Test (Entry) (RFT (E)) Factors	47
Introduction	47
Physical Training (PT) in the Army	47
PT guidance and research	47
Army PT progression	48
Implementation of the RFT (E)	49

OFFICIAL SENSITIVE

The RFT (E) in the Soldier Selection process	50
RFT (E) Staff and Staff Training	51
The Physical Training Instructors (PTIs).....	51
Medical provision during the RFT (E) 2km run	52
PTI first aid training	54
Wet Bulb Globe Temperature monitor training.....	59
PTI Career and Personal Development	61
Staff Disclosure and Barring Service clearance	63
The Conduct of the RFT (E) 2km run	64
Roles and responsibilities	64
RFT (E) equipment	65
The RFT (E) 2km run communication plan.....	67
The safety vehicle on the RFT (E) 2km run route.....	69
The RFT (E) 2km running route	71
RFT (E) risk assessments.....	75
Internal PT Assurance Audits	76
Suitability of the RFT (E) 2km run in Soldier Selection	77
Reporting Factors	80
Introduction.....	80
Definitions.....	80
Reporting Policy.....	81
UK legislation.....	83
Pan-Defence policy.....	83
Army policy	84
Army Recruiting and Initial Training Command policy	85
Recruiting Group policy.....	85
Reporting Actions Required by Policy	86
Report forms.....	86
Notification of the Army Incident Notification Cell.....	89
Notification of the Defence Accident Investigation Branch (DAIB)	89
Notification of the Secretary of State for Defence (SofS).....	90
Additional Organisations Involved in Reporting	91
Accident Reporting Timelines.....	92
The accident involving Candidate 3	92
The accident involving Candidate 4	95
The accident involving Candidate 1	97
The accident involving Candidate 2	100
Analysis of the Reporting Issues	101
Notification of the DAIB.....	101
Notification of the SofS	107
Definitions of incidents and accidents	111

OFFICIAL SENSITIVE

Use of the incident report (INCREP) form	112
INCREP version use	113
Report formats	115
Incident categories.....	116
Organisational Factors	120
The Increase in Commonwealth Recruiting.....	120
Trend Analysis and Recognition.....	124
The Organisational Relationship Between ARITC and RG	126
A Review of ECAST and Potential Measures to Prevent Reoccurrence	130
Introduction.....	130
Historical ECAST Deaths in the UK Military	130
The Regulation 28 (Reg 28) Report to Prevent Future Deaths.....	134
The Reg 28 report.....	134
The initial Army response to the Reg 28 report.	135
The Ongoing Challenges of SCT Risk Management.....	137
SCT screening.....	138
The identification of personnel with SCT	141
Universal Training Precautions	143
A 'Bad Day' physical activity opt-out policy.....	146
Reducing the Risk of ECAST Reoccurrence	148
Lessons identified from the United States	148
The recognition of and the education and training about ECAST	152
Treatment algorithms for ECAST	156
Summary of Findings	160
Causal Factors.....	160
Contributory Factors	160
Aggravating Factors.....	161
Other Factors.....	162
Observations.....	163

List of Tables

Table 1.4-1 – A reproduction of the pertinent results referred to in the medical report from University Hospitals Birmingham NHS Trust.	28
Table 1.4-2 – Comparison of risk factors for exertional collapse.	32
Table 1.4-3 – JSP 375 Accident / Incident definitions.	80
Table 1.4-4 – JSP 375 injury severity definitions.	81
Table 1.4-5 – Reporting actions for Candidate 3.	94

OFFICIAL SENSITIVE

Table 1.4-6 – Reporting actions for Candidate 4.	96
Table 1.4-7 – Reporting actions for Candidate 1.	99
Table 1.4-8 – Reporting actions for Candidate 2.	101
Table 1.4-9 – Army implementation order data assumptions.	120
Table 1.4-10 – The phased implementation of Commonwealth recruiting targets.	121
Table 1.4-11 – Commonwealth recruiting numbers (2016/2017 to 2019/2020).	121
Table 1.4-12 – Tri-Service role forward of unused allocations.	122

List of Figures

Figure 1.4-1 – The Australian Transport Safety Bureau analysis model.	4
Figure 1.4-2 – Probabilistic terminology.	5
Figure 1.4-3 – Regular Army recruitment against targets.	8
Figure 1.4-4 – ARITC organisational command structure.	10
Figure 1.4-5 – The PSMA run-ups and WRQ.	14
Figure 1.4-6 – The PSMA examination process with a doctor.	15
Figure 1.4-7 – The timetable of training for new doctors starting work in ACs.	17
Figure 1.4-8 – Normal and sickled red blood cells and typical inheritance of the sickle cell gene. .	23
Figure 1.4-9 – Illustration of the PT pipeline.	48
Figure 1.4-10 – Exercises and minimum standards for the RFT (E).	50
Figure 1.4-11 – The MTP platforms in the PD suite.	66
Figure 1.4-12 – The MBT area in the PD suite.	66
Figure 1.4-13 – The RFT (E) run finish point.	68
Figure 1.4-14 – The RFT (E) route at AC (L).	68
Figure 1.4-15 – The safety vehicle.	70
Figure 1.4-16 – The PSS (R) route used at AC (L) prior to April 2019.	72
Figure 1.4-17 – The uphill slope on the RFT (E) 2km run route up to Coltman House.	73
Figure 1.4-18 – The top of the uphill slope on the RFT (E) 2km run route alongside Coltman House.	74

OFFICIAL SENSITIVE

Figure 1.4-19 – Hierarchy of documentation. 82

Figure 1.4-20 – Accident reporting forms directed by policy..... 87

Figure 1.4-21 – Direction to contact the DAIB in levels of policy. 90

Figure 1.4-22 – DAIB Deployment Decision Support Matrix. 105

Figure 1.4-23 – RG accident reporting flow chart. 118

Figure 1.4-24 – Examples of identification methods for individuals with SCT in the US Navy. 142

Figure 1.4-25 – CHAMP treatment algorithm for ECAST. 157

PART 1.4 – ANALYSIS AND FINDINGS

All times are local and approximate unless otherwise stated.

Introduction

1.4.1. The Lichfield Service Inquiry (SI) was convened on 11 December 2019 to investigate the circumstances surrounding the deaths of Mr Kamil Iddrisu (Candidate 1) and Mr Youngson John Jumbe Nkhoma (Candidate 2), who collapsed whilst participating in a 2km run on 17 November and 27 November 2019, respectively, at the Recruiting Group (RG) Assessment Centre (Lichfield) (AC (L)). Both subsequently died in Good Hope Hospital (GHH), Sutton Coldfield. The SI Panel reviewed the processes involved in joining the Army, the planning, preparation and execution of the 2km run, the medical factors which may have influenced these accidents, and the post-accident reporting procedures, in order to make recommendations to prevent reoccurrence.

1.4.2. The SI Panel had access to all those involved in the planning and execution of the Soldier Selection process at AC (L) as well as those who delivered the 2km runs. Due to the nature of the accidents much of the evidence was drawn from interviews conducted by the SI Panel which were cross-referenced against existing policies, procedures, direction and guidance provided by higher authorities within the Armed Forces. In addition, the SI Panel visited United States (US) military medical experts in Washington DC, to learn about the medical conditions discussed in this report and to learn how the US military screened for and managed Service personnel with these medical conditions.

Methodology

Accident factors

1.4.3. Once an accident factor had been determined to have been present it was then assigned to one the following categories:

- a. **Causal factors.** 'Causal factors' were those factors which, in isolation or in combination with other causal factors and contextual details, led directly to the incident or accident. Therefore, if a causal factor was removed from the accident sequence, the accident would not have occurred.
- b. **Contributory factors.** 'Contributory factors' were those factors which made the accident more likely to happen. That is, they did not directly cause the accident. Therefore, if a contributory factor was removed from the accident sequence, the accident may still have occurred.

Exhibit 135

- c. **Aggravating factors.** 'Aggravating factors' were those factors which made the outcome of the accident worse. However, aggravating factors did not cause or contribute to the accident. That is, in the absence of the aggravating factor, the accident would still have occurred.
- d. **Other factors.** 'Other factors' were those factors which, whilst shown to have been present played no part in the accident in question but were noteworthy in that they could contribute to or cause a future accident. Typically, other factors would provide the basis for additional recommendations or observations.
- e. **Observations** were points or issues identified during the investigation that were worthy of note to improve working practices, but which did not relate to the accident being investigated and which could not contribute to or cause future accidents.

Accident factors modelling – the Australian Transport Safety Bureau (ATSB) model

1.4.4. The SI Panel recognised that incidents or accidents were usually the result of individual acts or omissions or technical events but that these generally occurred in the context of a complex operational system with established defences against accidents. In investigating the broader factors influencing the accidents, the SI Panel used the ATSB analysis model (Figure 1.4-1) in its analysis of the accidents, assessing evidence across the following five categories:

Exhibit 134

- a. **Safety indicators: Occurrence events.** Occurrence events were the key events, including technical problems, which best describe an incident or accident, or which ultimately needed to be explained by an investigation. Essentially, they were the safety factors that described what happened in relation to the incident or accident.
- b. **Safety indicators: Individual actions.** Individual actions were the observable behaviours of operational personnel. Operational personnel were those individuals who could have had a relatively direct impact on system safety. In relation to these two specific incidents or accidents, the SI Panel included characteristics of the individuals in this section, when analysing the medical factors. Unsafe actions could also be errors or violations which were task-related in relation to the presence of a hazard. Errors comprised slips, lapses, mistakes and violations, and were grouped as follows:

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(1) **Unintentional actions:**

a. **Slips.** Errors by commission; where a well-practised skill, requiring little cognition, was carried out incorrectly.

b. **Lapses.** Errors by omission; where a well-practised skill, requiring little cognition, was not carried out.

(2) **Intentional actions:**

a. **Mistakes.** Deficiencies in judgement and / or failing to formulate the right plan based on flawed knowledge and / or incorrect comprehension of rules.

b. **Violations.** Deliberate and conscious departures from established rules or procedures, although often with no intent to cause harm.

c. **Safety indicators: Local conditions.** Local conditions were conditions which existed in the immediate environment or context in which individual actions or technical events took place, and which could have influenced the individual actions or technical events. Local conditions included characteristics of the equipment involved, as well as the nature of the task and the physical environment.

d. **Safety issues: Risk controls.** Risk controls were the measures created by an organisation to facilitate and assure the safe performance of operational system components such as operational personnel and equipment. They could have been viewed as the outputs of the organisation's safety management system and could have been categorised as 'preventative' or 'recovery'. Preventative risk controls were designed to minimise the likelihood of undesirable local conditions, individual actions and occurrence events. These controls facilitated and guided performance at the operational level and could have included procedures, training, equipment design and work rosters. Recovery controls were put in place to detect and correct (or otherwise minimise) the adverse effects of local conditions, individual actions and occurrence events. These 'last line' controls included warning systems, emergency equipment and emergency procedures.



Figure 1.4-1 – The Australian Transport Safety Bureau analysis model.

Exhibit 135

1.4.5. The use of the ATSB analysis model allowed the SI Panel to analyse the accidents and identify and understand the critical factors in order to categorise them as Causal, Contributory, Aggravating or Other factors and in order to make recommendations to prevent reoccurrence or observations. Having used the ATSB analysis model to understand and identify the critical factors of the accidents, the SI Panel then grouped them into four domains as detailed below. The SI Panel then used these four domains to construct this report:

- a. Medical factors.
- b. Role Fitness Test (Entry) (RFT (E)) factors.
- c. Reporting factors.
- d. Organisational factors.

1.4.6. The SI Panel decided that separate consideration of these four domains was the most appropriate means of discussing and explaining the critical factors identified by the initial use of the ATSB analysis model, in order to place this analysis within the most appropriate context and in the most logical sequence. Part 1.4 of this report is therefore presented in four main parts.

1.4.7. Due to the nature of these accidents, an awareness of Human Factors was essential to understand why they occurred. A Human Factors report was commissioned and used to aid the analysis of what

Exhibit 130
Exhibit 284

happened and to better understand why these accidents occurred. In doing so, the SI Panel made recommendations that would, if implemented, put in place control measures which should reduce the risk of reoccurrence.

Probabilistic terminology

1.4.8. Probabilistic terminology (detailed below in Figure 1.4-2) clarified the terms used to communicate levels of uncertainty within this report. It was based on terms published by the Intergovernmental Panel on Climate Change in their Guidance Note for Consistent Treatment of Uncertainties as well as the ATSB in their paper on Analysis, Causality and Proof in Safety Investigations.

Exhibit 136

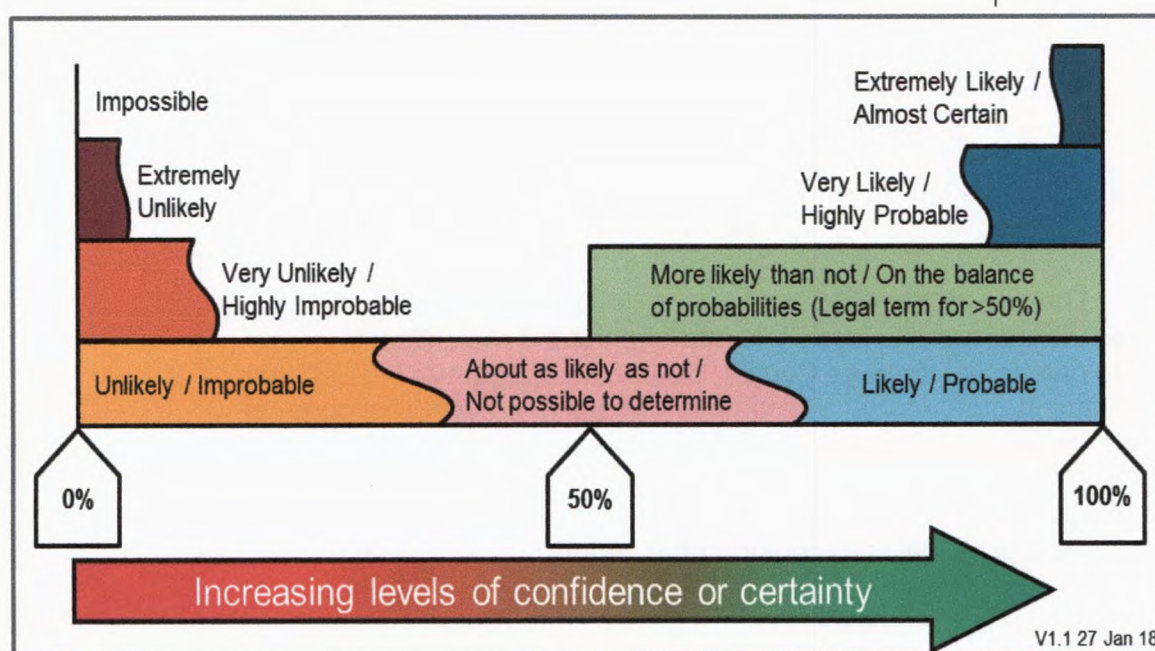


Figure 1.4-2 – Probabilistic terminology.

Exhibit 136

Available evidence

1.4.9. The SI Panel had access to the following evidence:

- a. Interviews with AC (L) staff and other witnesses.
- b. Relevant pan-Defence, Army, Army Recruiting and Initial Training Command (ARITC), and Recruiting Group (RG) policies.
- c. Evidence obtained from medical experts in the US military.
- d. A Human Factors report.

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- e. Independent, academic medical papers.
- f. Relevant Government reports.
- g. Emails and statements from relevant individuals and subject matter experts.

Services

1.4.10. The SI Panel was assisted by the following personnel and agencies:

- a. The Defence Accident Investigation Branch (DAIB).
- b. Human Factors specialists assigned to assist the SI Panel.
- c. ARITC.
- d. RG.
- e. Senior Health Advisor (Army) and their team.
- f. Army Personnel Services Group (APSG).
- g. US military personnel.
- h. Relevant medical experts.

Army Recruitment

Background to the Recruiting Partnering Project

1.4.11. In 2011 the Ministry of Defence (MOD) approved the business case for the modernisation of the Army recruitment process for three key reasons:

Exhibit 131

- a. 'The Army had not met its recruitment targets for soldiers or officers in the previous decade, with an average shortfall of 1,500 recruits per year.
- b. The Army expected it to get harder to recruit as the UK economy improved and wanted to bring in external recruitment expertise.
- c. The recruitment IT systems for the Army, Royal Navy and Royal Air Force were nearing the end of their useful lives and required replacement.'

1.4.12. In 2012 the Army sought to transform and modernise its recruitment process by the establishment of the Recruiting Partnering Project (RPP), a collaboration between Capita and the MOD. Prior to this the Army had operated a system based on local Army Careers Information Offices and Armed Forces Recruiting Offices across the UK. This system had seen little change since the end of National Service in 1960 and lacked coordination and information about the efficiency of the recruitment process.

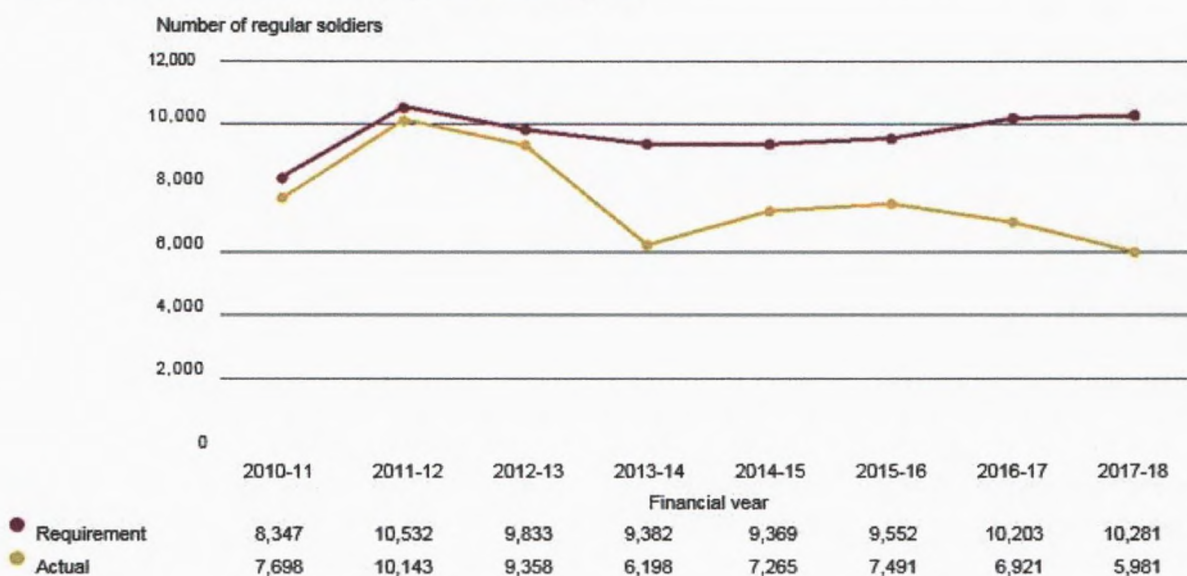
Exhibit 131

1.4.13. The aim of the RPP was to establish a centralised, automated approach to recruitment based at the National Recruiting Centre (NRC), Upavon, using Candidate Support Managers and an automated IT system provided by Capita. During the implementation of the RPP both the Army and Capita experienced issues implementing the contract which resulted in recruitment targets not being met. Figure 1.4-3 shows the recruitment performance against the Army recruitment targets.

Exhibit 131

Figure 1
Regular soldiers – performance against Army recruitment targets, 2010-11 to 2017-18

Capita has not met its targets for recruiting regular soldiers in any year



- Notes**
- 1 Excludes Gurkhas, re-joiners, Commonwealth and Full Time Reserve Service.
 - 2 Requirement is set by the Army.

Source: National Audit Office analysis of Departmental data

hFigure 1.4-3 – Regular Army recruitment against targets (2010/11 to 2017/18).

Exhibit 131

The Recruiting Partnering Project

1.4.14. To meet its objectives, the Army required the right number and quality of Regular and Reserve forces. The Government set the Army a target size of 82,000 Regulars and 30,000 Reserves by 2020. From 2012 to 2018, Capita missed the Army’s annual targets for recruiting new soldiers and officers, with the total shortfall each year ranging from 21% to 45% of the Army’s requirement. During the period 2012 to 2018, Capita missed the Army’s annual target for Regular Soldiers by an average of 30%. However, they performed better in recruiting Regular Officers, achieving 95% of the Army’s requirement in 2017/18.

Exhibit 131

1.4.15. Prior to 2018, the Army had not reduced the time it took to complete the recruitment process. In April 2018, the Army and Capita launched a new project to reduce recruitment times and improve conversion rates.

Exhibit 131

Army Recruiting Organisational Command Structure

1.4.16. **Army Recruiting and Initial Training Command (ARITC).** Formed in 2018, ARITC was a subordinate element of the three-star Army headquarters called Home Command. ARITC was a two-star organisation which was led by an Army Officer at the rank of Major General who was known as the General Officer Commanding (GOC) ARITC. Located at Upavon, ARITC consisted of five delivery elements which, in military terminology, were known as Operating Groups: Recruiting Group (RG)²; Initial Training Group (ITG); Royal Military Academy Sandhurst (RMAS) Group; Adventurous Training Group (ATG) (Army); and the School of Infantry (SCHINF). ITG and RMAS were commanded at the one-star level, ATG (Army) and SCHINF were commanded at the OF5 level and RG was led by a civilian Chief Executive Officer (CEO). For the purpose of the SI, this report will focus on ARITC and RG and their role in the recruiting process.

Exhibit 137
Exhibit 434
Exhibit 435

1.4.17. **Recruiting Group.** RG was the civilian organisation formed to deliver the RPP. Led by a civilian CEO, who was a Capita employee, and based at the NRC at Upavon, RG consisted of approximately 1,200 personnel (two thirds Capita-employed civilians and one third military personnel). The military personnel were described as being 'embedded within the operation, under the direction and control of Capita'. RG personnel were based across the NRC, the four ACs used for Soldier Selection and 68 Army Careers Centres across the country. RG was responsible for all activity relating to Regular and Reserve recruitment, from attracting potential candidates, right the way through to when candidates started Basic Training (BT).

Exhibit 133
Exhibit 434

1.4.18. The organisational command structure of these organisations, from Home Command through ARITC, RG and the individual ACs can be seen at Figure 1.4-4 below. It details the four ACs that delivered Soldier Selection (AC (Lichfield), AC (Pirbright), AC (Belfast) and AC (Glencorse)), the NRC and the Army Officer Selection Board (AOSB) at Westbury, which was previously under the command of RG but later moved to be under the command of the RMAS Group. The organisational command relationship between ARITC and RG was asymmetrical rather than hierarchical. RG were a civilian organisation, with embedded military personnel, which operated under the governance mechanisms and requirements of the RPP contract. Therefore, ARITC used the mechanisms of the RPP contract to request or require action from RG, as opposed to issuing orders, as they did to the other Operating Groups within their command structure.

Exhibit 138
Exhibit 434

² Whilst not a military Operating Group like other parts of ARITC, during routine meetings of the GOC ARITC's Command Group, the RG CEO acted in a role which was most easily compared to that of an Operating Group Commander.

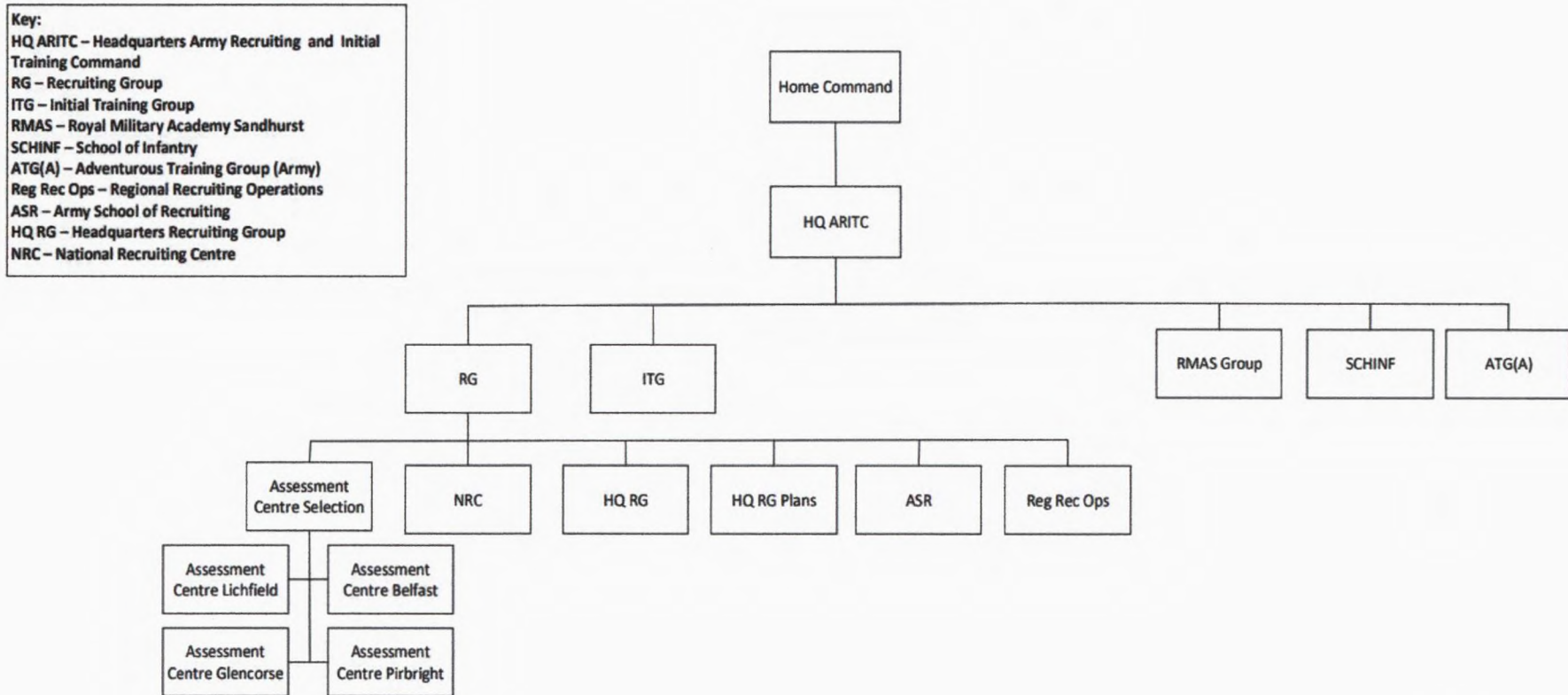


Figure 1.4-4 – ARITC organisational command structure.

Exhibit 138

Medical Factors

Introduction

1.4.19. This section of the SI report will examine and analyse the medical pre-screening processes involved in the recruitment of candidates for Soldier Selection, including the Pre-Service Medical Assessment (PSMA) that occurred during Soldier Selection. It will discuss the medical aspects of the accidents involving Candidate 1 and Candidate 2, the conclusions the SI Panel came to in relation to the cause of death for Candidate 1 and Candidate 2 and explore the risk factors associated with these conclusions. It will also examine and analyse similar previous accidents and analyse what review of these took place at the time.

1.4.20. The post-mortem reports for Candidate 1 and Candidate 2 had not been published at the time of writing this SI report. Therefore, the SI Panel used the evidence from the candidates' RG medical records, the evidence from the medical report produced for the Medical Director of University Hospitals Birmingham NHS Trust and the evidence from the report to prevent future deaths that was issued under Regulation 28 of the Coroners (Investigations) Regulations 2013 by HM Senior Coroner, Birmingham and Solihull Areas. The Senior Coroner's report stated: 'Both [Candidate 1 and Candidate 2] were found to be suffering from metabolic acidosis, acute kidney injury and Rhabdomyolysis with each man dying on 17/11/19 and 27/11/19 respectively. Both were found to have sickle cell trait. Both men came from abroad for the selection process [Candidate 1] from Ghana and [Candidate 2] from Malawi. Forensic post-mortem examinations were conducted on 04/12/19. The final cause of death remains under investigation however it has been confirmed by the forensic pathologist that the most likely cause of each man's collapse was the sickle cell trait in combination with military exercise. The forensic pathologist has advised that there is a link in the literature between sickle cell trait and deaths during military exercise.'

1.4.21. Based on this evidence, the SI Panel concluded that it was very likely that both Candidate 1 and Candidate 2 suffered very serious medical complications (exertional rhabdomyolysis and acute kidney injury (AKI)) as a direct result of a pathological, metabolic event known as Exertional Collapse Associated with Sickle Cell Trait (ECAST), and this section of the report will seek to explain these medical terms and conditions in more detail.

Medical Screening

The medical pre-screening process

1.4.22. There were 32 schedules (elements) in the Recruiting Partnering Project (RPP) contract between the MOD and Capita governing the

Exhibit 72
Exhibit 90
Exhibit 104
Exhibit 141
Exhibit 370-371

Exhibit 14
Exhibit 139

recruitment and selection of personnel for the Army. The governance of the medical and physical assessment components of the selection process was covered in Schedule 11, Annex 7, Appendix 17: Medical and Physical Assessment. This schedule directed how the Service Provider, Capita, should provide services to assess candidates in line with the MOD's Medical and Physical Eligibility Criteria in Joint Service Publication (JSP) 950 (Medical Policy) Part 6 (Occupational Health / Medicine) Chapter 7 (Medical Employment Standards Policy).

Exhibit 142

1.4.23. The medical pre-screening process is described in Part 1.3 of this report and the screening process for Commonwealth (CW) candidates was shown to be subtly different to the screening process for UK-based candidates. UK-based candidates completed the Online Medical Questionnaire (OMQ), a Clinical Triage process over the telephone and then Regular Soldier candidates underwent a review of their National Health Service (NHS) Primary Healthcare Record (PHCR) by an RG doctor. Regular Officer candidates and all Reserve candidates submitted the Recruiting Group Medical Declaration (RGMD) (in place of the PHCR) for review, after it was completed by the candidate's own doctor. CW candidates also completed the OMQ, but not the Clinical Triage process and, because the vast majority did not have an NHS PHCR, they were issued with an RGMD. This document was completed by a medical doctor in the CW candidate's home country and then signed and returned to RG by post or email.

Exhibit 14
Exhibit 28
Exhibit 32
Exhibit 143

1.4.24. The SI Panel asked ARITC why CW candidates were not required to go through the Clinical Triage process. ARITC stated that the Clinical Triage call took place prior to candidates attending their Army Brief and Initial Career Discussion and that it was not clear that there had been a deliberate decision to exclude CW candidates from Clinical Triage.

Exhibit 144

1.4.25. The SI Panel also asked ARITC how the information provided by CW candidates through completion of the RGMD could be verified. ARITC stated that due to the existence of different healthcare systems across the world, they required a mixture of self-declaration and medical history from GPs or family doctors wherever the candidate was residing. This meant that they relied on the integrity of the candidates and they had to trust the information provided by their medical professionals.

Exhibit 145

1.4.26. As acknowledged above by ARITC, the medical pre-screening process (the OMQ and the RGMD) relied heavily on the integrity of the CW candidates and trust in the medical professionals from a CW candidate's home country. It was the opinion of the SI Panel that, in the absence of a Clinical Triage process (alongside the absence of an NHS PHCR review), there was the potential that medical information received about CW candidates might not be complete.

1.4.27. In addition, because the Clinical Triage process was conducted by telephone, it allowed a two-way discussion and amplification and clarification of candidates' answers by RG medical staff. Therefore, it was the opinion of the SI Panel that including the Clinical Triage process for CW candidates would provide an additional level of assurance to the medical pre-screening process.

1.4.28. The Service Inquiry Panel finds that the absence of a Clinical Triage process for Commonwealth candidates was an **Other Factor**.

1.4.29. Recommendation. The General Officer Commanding Army Recruiting and Initial Training Command should extend Clinical Triage to include Commonwealth (CW) candidates, in order to ensure that the medical information received from CW candidates is sufficient to assess their suitability for military service in the Army.

1.4.30. In addition, the SI Panel was concerned that there was the potential for important medical information to be missed because the RGMD medical pre-screening process for CW candidates relied so heavily on the integrity of the candidates to self-declare all medical conditions and treatment. Furthermore, the information within the RGMD was provided by medical professionals in CW candidates' home countries, whose qualifications, clinical practice and knowledge of the candidates could not be easily verified. The SI Panel concluded that these factors could have resulted in an inaccurate assessment of a CW candidate's medical fitness to join the Army.

1.4.31. The Service Inquiry Panel finds, therefore, that the Recruiting Group Medical Declaration medical pre-screening process for Commonwealth candidates was an **Other Factor**.

1.4.32. Recommendation. The General Officer Commanding Army Recruiting and Initial Training Command should improve the Recruiting Group Medical Declaration medical pre-screening process for Commonwealth candidates, in order to ensure that the information received can be verified and assured.

The Pre-Service Medical Assessment (PSMA)

1.4.33. Once candidates passed through the initial screening processes, they were invited to attend an AC for Soldier Selection. At Soldier Selection they undertook the PSMA. The PSMA was conducted in accordance with the direction in Schedule 11, Annex 7, Appendix 17: Medical and Physical Assessment and against the Medical Employment Standards policy within JSP 950 Leaflet 6-7-7. Immediately prior to the PSMA the candidates had to provide a urine sample (which was tested for blood, protein and glucose) and they completed the Waiting Room Questionnaire (WRQ). During the PSMA, height and weight were

Exhibit 14
Exhibit 22
Exhibit 28
Exhibit 32
Exhibit 72
Exhibit 104
Exhibit 139
Exhibit 143
Exhibit 146

measured (in order to calculate the candidate's Body Mass Index³ (BMI)), alongside leg length, blood pressure and Peak Expiratory Flow Rate⁴ (PEFR). At the PSMA, all candidates were questioned about their medical history, with the examining doctor revisiting any conditions which may have been indicated in the medical pre-screening process or in the WRQ. The candidates went through a series of tests and examinations including an electrocardiogram⁵ (ECG), an audiogram (a test of hearing), examination of the cardiovascular, respiratory, nervous and musculoskeletal systems, and examination of the abdomen, the neck, the ears, the nose and the throat. Other tests, such as an echocardiogram⁶ and exercise spirometry⁷ (a test of lung function), were sometimes required depending on the results of the candidate's ECG and PEFR. Visual acuity and colour perception were also tested. The PSMA process is shown in Figure 1.4-5 and Figure 1.4-6 below.

Exhibit 174

PSMA

RUN UPS AND WRQ

Run Ups - Completion of:

- Urine dip with repeats in event of positive findings
- Visual acuity with colour perception
- Height, weight and waist circumference if necessary
- Audiogram
- ECG

*Looking for any abnormalities or measurements outside ranges for Army Medical Standards.

Waiting Room Questionnaire (WRQ)

- Completed by the candidate and signed. It is a declaration about health conditions. (This is checked and signed by the examining doctor)
- Consent for – Examination along with chaperone consideration

Figure 1.4-5 – The PSMA run-ups and WRQ.

Exhibit 140

³ Body Mass Index (BMI) was calculated by dividing the weight (in kilograms) by the square of the height (in metres) and it was used to estimate if the body weight was healthy. For most adults, an ideal BMI was considered as being in the 18.5 kg/m² to 24.9 kg/m² range. Source - National Health Service (NHS) website [accessed on 21 October 2020].

⁴ Peak Expiratory Flow Rate (PEFR) was a test to measure how quickly someone could blow air out of their lungs. It was used to help diagnose and monitor asthma, and it could indicate whether the airways were narrowed. Source - NHS website [accessed on 21 October 2020].

⁵ An electrocardiogram (ECG) was a test used to check the rhythm and electrical activity of the heart. Source - NHS website [accessed on 21 October 2020].

⁶ An echocardiogram was a type of ultrasound scan used to look at the heart and nearby blood vessels. Source - NHS website [accessed on 21 October 2020].

⁷ Spirometry was a test of lung function used to rule out respiratory conditions such as asthma and lung scarring in some candidates. Exercise spirometry was spirometry performed before and after exercise. It was used to rule out exercise-induced asthma. Source - NHS website [accessed on 21 October 2020].

PSMA

EXAMINATION WITH A DOCTOR

Examination with a Doctor

- History
- Introduction
- Review of run-ups
- Enquiry about current health
- Specific review of any positive disclosures in WRQ
- Specific review of any relevant medical issues from telephone triage report/RGMD/PHCR
- Confirmation of negatives in WRQ and discussion of social/family history

Examination

- Candidate invited to strip to underwear (Females remain in sports bra)

Blood Pressure

Eyes

- Visual acuity
- Red reflex

Figure 1.4-6 – The PSMA examination process with a doctor. (Note. Details of the individual systems’ examinations have not been included).

Exhibit 140

1.4.34. The PSMA was designed to detect medical conditions that might preclude an individual from military service and it was conducted in accordance with the direction in Schedule 11, Annex 7, Appendix 17: Medical and Physical Assessment and against the Medical Employment Standards policy within JSP 950 Leaflet 6-7-7. Based on a review of the PSMA process, it was the opinion of the SI Panel that the PSMA was thorough and it was very likely to detect the majority of medical conditions that might preclude an individual from military service. Therefore, the SI Panel concluded that the PSMA process was appropriate, fit for purpose and was **not a factor** in the accidents involving Candidate 1 and Candidate 2.

Exhibit 14
Exhibit 22
Exhibit 139
Exhibit 170

1.4.35. However, one discrepancy was identified where the PSMA did not follow the RPP contract. Schedule 11, Annex 7, Appendix 17, Paragraph 9.2 of the RPP contract stated: ‘The PSMA shall occur before a candidate proceeds to the Physical Assessment section of the Assessment Centre Physical Selection Standards (Recruit) (PSS (R))⁸.’

Exhibit 14
Exhibit 139

1.4.36. As per the schedule of events at AC (L), the Medicine Ball Throw (MBT) and the Mid-Thigh Pull (MTP) elements of the physical assessment (the RFT (E)) often took place prior to candidates

Exhibit 24
Exhibit 173

⁸ The PSS (R) is discussed in more detail in paragraphs 1.4.141 to 1.4.143.

completing the PSMA. This was contrary to the RPP contract. There was evidence to suggest that some members of the clinical team at AC (L) had concerns about candidates attempting these two elements of the RFT (E) prior to completing the PSMA as undiagnosed medical conditions or injuries might have been exacerbated. Although the MBT and the MTP were not maximal aerobic tests, they did test a candidate's maximal muscle power which involved significant force being applied through major joints and, as such, involved a degree of risk of musculoskeletal injury.

1.4.37. Based on this evidence, the SI Panel was initially concerned that conducting physical assessments prior to completing the PSMA had the potential to place a candidate at a slightly increased (and unnecessary) level of risk as a previously undeclared or undiagnosed medical condition or injury might have been exacerbated by these physical assessments.

Exhibit 147

1.4.38. However, the SI Panel were provided evidence from the ARITC Physical Development Department, who described (in April 2019) these tests as low risk, and from the Army Personnel Occupational Health Department, who agreed with this risk analysis. This evidence demonstrated that RG had sought and obtained approval from Home Command to conduct the MBT and the MTP prior to candidates completing the PSMA.

1.4.39. Although low risk is different from no risk, it was the opinion of the SI Panel that RG had taken the appropriate steps to obtain approval to conduct the MBT and the MTP prior to candidates completing the PSMA. Therefore, although RG had deviated from the RPP contract with regards to conducting the PSMA before a candidate proceeded to the physical assessment section of the Soldier Selection process, the SI Panel concluded that this was **not a factor** in the accidents involving Candidate 1 and Candidate 2. However, this deviation from the RPP contract was noted as **an Observation**.

Assurance of the RG doctors employed to conduct the PSMA

1.4.40. RG employed doctors to conduct face-to-face medical assessments with candidates at each AC. These doctors were overseen by doctors in the Lead Clinician role at each AC, and further supported by three doctors in the Chief Medical Officer (CMO), Deputy CMO and Clinical Auditor roles at the NRC in Upavon. All AC doctors had to have full registration with the General Medical Council (GMC) in the UK, had to hold a current GMC licence to practise and had to have been qualified with at least 5 years post-qualification clinical experience in varied clinical settings. Applicants for these roles underwent a formal interview, reference checks, Baseline Personnel Security Standard and enhanced

Exhibit 148

OFFICIAL SENSITIVE

Disclosure and Barring Services checks before being appointed as an RG doctor.

1.4.41. All RG doctors underwent a formal training schedule over 10 days as detailed in the Capita RPP Employed Doctors' Training Guide 2018. This schedule is detailed in Figure 1.4-7 below. In addition, all the doctors were a part of the Competency Assessment Process which ran throughout the year. This was an assessment where the Lead Clinician communicated with the Medical Officer⁹ in order to provide feedback on the Medical Officer's performance on their day-to-day activities. The information for this assessment was gathered through quality assurance exercises such as audit.

Exhibit 148-149

Timetable of training

Day 1	Day 2	Day 3	Day 4	Day 5
Morning <ul style="list-style-type: none"> Welcome and introductions Tour of Assessment centre (A/C) Intro to Training manual Intro to BMI Rules Intro to JSP 950 	Morning Sit- in with Medical Officer Name: _____ Review with Lead Clinician	Morning Sit- in with Medical Officer Name: _____ Review with Lead Clinician	Morning PSMA session with Lead Clinician- review of 2 candidates RGMD review with Lead Clinician	Morning Solo PSMA Session review of 3 candidates
Afternoon <ul style="list-style-type: none"> Further JSP with test Sit-in with Lead Clinician for 2 Medical Assessments Review of Process Review of minimum requirements for PSMA 	Afternoon Sit- in with Medical Officer Name: _____ Review with Lead Clinician	Afternoon Sit- in with Medical Officer Name: _____ Review with Lead Clinician	Afternoon Solo PSMA Session, outcome to be reviewed by Lead Clinician before submission. Lead Clinician available for feedback/questions- review of 2 candidates	Afternoon Solo RGMD and appeal session
Day 6	Day 7	Day 8	Day 9	Day 10
Morning Green day- watching the rest of the selection process. N.B- Wear warm clothes/ waterproofs	Morning Solo PSMA session Review 4 candidates Review with Lead Clinician	Morning Solo PSMA session Review 4 candidates Review with Lead Clinician	Morning Solo PSMA session Review 5 candidates Review with Lead Clinician	Morning Solo PSMA session Review 5 candidates
Afternoon Green day- watching the rest of the selection process. N.B- Wear warm clothes/ waterproofs	Afternoon Solo PSMA session Paperwork session with Lead Clinician	Afternoon Solo PSMA session Paperwork session with Lead Clinician	Afternoon Solo PSMA session Solo Paperwork session	Afternoon RGMD Session Review with Lead Clinician 100% Audit of output, RGMD and PSMA Training sign off to continue solo until 5 consecutive A grades a) RGMD b) PSMA achieved at Audit.

Figure 1.4-7 – The timetable of training for new doctors starting work in ACs.

Exhibit 149

1.4.42. Once training was completed, initial medicals conducted by new doctors were subject to 100% audit by the Lead Clinician or Auditor until approved against the clinical standard. Following this, the newly

Exhibit 148

⁹ The terms 'RG doctor', 'doctor' and 'Medical Officer' were used interchangeably in the evidence provided to the SI Panel by RG and ARITC and they are used in this report interchangeably to reflect this. The terms mean the same thing and do not reflect additional training or seniority.

appointed doctors were able to conduct medicals, however 25% of their work was subject to continued supervision audit. Once supervision audit results were considered to have met the overall clinical standard, Medical Officers were able to conduct medicals unsupervised. There remained a continuous requirement for 'rolling audit' (1-10% of medicals conducted).

1.4.43. RG stated that they carried out daily checks with the GMC as to any work restrictions that had been placed onto their doctors' records. Any complaints, appeals or poor 'rolling audit' scores resulted in a 'targeted audit' of 100% of medicals conducted until the Auditor was satisfied that quality of the medicals was at the required standard.

Exhibit 150

1.4.44. The Lead Clinician at each AC provided training, supervision and guidance to the Medical Officers. All AC doctors had annual 'sit-in' sessions where a senior doctor observed their method of questioning and examining candidates. Twice a year, candidates were asked to complete a validated professional survey to comment on their doctor's manner and professionalism.

Exhibit 150

1.4.45. Based on this evidence, it was the opinion of the SI Panel that the training, assessment, supervision and assurance processes described above would have provided RG with a suitable level of assurance that their doctors were safe and competent to undertake the PSMA process.

1.4.46. The RG doctors at AC (L) were employed specifically in order to conduct PSMA's on candidates attending Soldier Selection, based on their relevant qualifications and experience. It was the opinion of the SI Panel that, during the Soldier Selection events attended by Candidate 1 and Candidate 2, the RG doctors were acting in the normal course of their duties.

1.4.47. The SI Panel concluded that the RG doctors employed to conduct the PSMA were suitably qualified to undertake their duties in terms of relevant qualifications, competencies, currency and levels of supervision. However, this was caveated by the fact that there was no evidence identified by the SI Panel that they had received specific training or experience in identifying the effects of diseases common in other parts of the world.

The PSMA for Commonwealth Candidates

1.4.48. Schedule 11, Annex 7, Appendix 17, Paragraph 9.2 of the RPP contract stated: 'All Foreign and Commonwealth Candidates (soldier and officer) shall be invited to attend Pirbright Assessment Centre where the Service Provider shall ensure that there are Health Technicians and Examining Medical Officers with specific training and experience in identifying the effects of diseases common in other parts of the world,

Exhibit 14
Exhibit 139

OFFICIAL SENSITIVE

and the impact of childhood trauma. These medical staff shall frame their assessments based on an understanding of the additional risks associated with having lived in foreign countries, and the potentially reduced reliability of medical reports, where provided. For Foreign and Commonwealth Candidates where it has not been possible to obtain an RGMD, the Candidate will be assessed on the basis of their PSMA and declared data, having also been seen by medical staff with specialist skills during the Assessment Centre.'

1.4.49. The accidents involving Candidate 1 and Candidate 2 took place at AC (L). In addition, the SI Panel were made aware of two earlier accidents involving two other CW candidates, one at AC (L) and one at AC (Glencorse). These two accidents resulted in the two CW candidates being hospitalised following the RFT (E) 2km run and are discussed in more detail in paragraphs 1.4.102 to 1.4.115. None of these candidates attended AC (Pirbright), as directed in the RPP contract, and, in addition, in the opinion of the SI Panel, none of the candidates were assessed by Health Technicians and Examining Medical Officers (doctors) with specific training and experience in identifying the effects of diseases common in other parts of the world.

Exhibit 150

1.4.50. When questioned on the use of other ACs to conduct Soldier Selection for CW candidates, the response from ARITC stated that due to the increase in CW recruiting in 2018/2019 a change request that authorised, amongst other things, the assessment of CW candidates at any of the four ACs had been approved. However, this did not lead to a change in the wording of the original contract.

Exhibit 150-151

1.4.51. When questioned on the specific training provided to identify the effects of disease common in other parts of the world, the response from ARITC stated that both Health Technicians and doctors received training that enabled them to apply clinical judgement regarding the medical entry standards laid down in JSP 950 Leaflet 6-7-7. ARITC confirmed that the training received was the same across all four ACs. The SI Panel identified that, at the time of all four accidents, JSP 950 Leaflet 6-7-7 did detail the link between SCT and exertional rhabdomyolysis and AKI, and this will be discussed further in paragraph 1.4.128.

Exhibit 151
Exhibit 171

1.4.52. RG later clarified their position in a document sent to the SI Panel in October 2020 in which they explained that their Examining Medical Officers were not specifically trained in identifying common diseases in other parts of the world as they felt this would be the equivalent of training them in a whole new speciality in medicine. RG stated that the role of their doctors was to conduct screening activity, not diagnosis, and the intent of the PSMA was to screen candidates against the medical entry standards in JSP 950 Leaflet 6-7-7, not to diagnose illnesses. However, a later response from RG in a document sent to the SI Panel in February 2021 stated: 'Our Examining Medical Officers are all fully trained doctors who are required by their profession to conduct

Exhibit 150
Exhibit 427-428

continuous professional development. They all as part of their medical training received training on diseases common in other parts of the world.' Although RG stated that 'there is no individual evidence of the sub-speciality training our medical staff have gone through', they assessed that the combination of generic medical school training, alongside ongoing CPD activities and training in the interpretation of the Waiting Room Questionnaire was sufficient training and experience.

1.4.53. However, it was the opinion of the SI Panel that specific training and experience in identifying the effects of diseases common in other parts of the world was substantially different both from the generic medical school training typically provided to doctors in training and from training that would enable the application of clinical judgement regarding the medical entry standards in JSP 950 Leaflet 6-7-7. During the 5-year period 2015 to 2019, 93% of the CW candidates that attended Soldier Selection came from only ten countries. In addition, 97% of CW candidates came from three geographical regions, with approximately 37% of all CW candidates from Fiji, 34% from the Caribbean area and 26% from Africa. It was the opinion of the SI Panel that providing medical training in specific diseases that were common in these parts of the world, and which would have been relevant to the PSMA process and the medical entry standards in JSP 950 Leaflet 6-7-7, would have been feasible. In addition, had all CW candidates been assessed at the same AC, it would have made it easier to identify any trends in injury or illness suffered by CW candidates. It was the opinion of the SI Panel that the change request introduced a foreseeable risk for CW candidates which was not mitigated by additional training and support for medical staff at the other ACs.

1.4.54. The SI Panel concluded that had these candidates all collapsed at the same AC, and had there been clinicians at that AC with specific training and experience in identifying the effects of disease common in other parts of the world (such as SCT), it was more likely than not that the trend of CW candidates collapsing during the RFT (E) 2km run secondary to ECAST would have been recognised earlier. It was the opinion of the SI Panel that it was likely that this would have reduced the risk of the accident involving Candidate 2 from happening.

1.4.55. The Service Inquiry Panel finds that the absence of Health Technicians and Examining Medical Officers with specific training and experience in identifying the effects of diseases common in other parts of the world at Assessment Centres assessing Commonwealth Candidates was a **Contributory Factor** in the accident involving Candidate 2.

1.4.56. **Recommendation. The Chief Executive Officer Recruiting Group should ensure that Commonwealth (CW) candidates are assessed by Health Technicians and Examining Medical Officers with specific training and experience in identifying the effects of**

Exhibit 171
Exhibit 175

diseases common in other parts of the world, in order to reduce the risk of illness or injury to CW candidates.

Medical equipment used to conduct the PSMA

1.4.57. The specialist medical equipment used to conduct the PSMA was reviewed by the SI Panel during their visits to AC (L). This included the following:

Exhibit 152
Exhibit 185

- a. Amplivox CA850 Series 4 audiogram machines (and headphones) and Acoustic Metrology Ltd audiogram booths to assess the candidates' hearing.
- b. GE MAC1600 ECG machines to conduct ECGs.
- c. A GE Vivid-q echocardiogram / ultrasound machine to conduct echocardiograms.
- d. Weighing scales and a height measurement device to calculate the candidates' BMIs.
- e. Snellen charts to assess the candidates' vision.
- f. Ishihara charts and a Holmes Wright colour test lantern to assess the candidates' colour vision.
- g. Welch Allyn Ophthalmoscopes and Otoscopes to examine the candidates' eyes and ears.
- h. Standard peak expiratory flow meters to measure the candidates' PEFRs.
- i. Blood pressure machines.
- j. Stethoscopes.
- k. Urine analysis pots and test strips to assess the candidates' urine samples for blood, protein and glucose.

1.4.58. The SI Panel received evidence from RG pertaining to the calibration, testing and servicing records of all the relevant medical equipment used to conduct the PSMA. These were reviewed by the SI Panel and all medical equipment used in the delivery of the PSMA was found to be in-date for calibration, testing and servicing, where these were appropriate for that equipment. It was the opinion of the SI Panel, therefore, that all the medical equipment used in the delivery of the PSMA was fit for purpose.

Exhibit 152

1.4.59. In addition, it was the opinion of the SI Panel that the specialist medical equipment listed above would have enabled the Health

Exhibit 139
Exhibit 170

Technicians, nurses and doctors employed at AC (L) to conduct the PSMA in accordance with the military medical policy within JSP 950 Leaflet 6-7-7 and in accordance with the direction in Schedule 11, Annex 7, Appendix 17: Medical and Physical Assessment, in order to ensure that the PSMA detected medical conditions that might preclude an individual from military service.

1.4.60. Based on the records and evidence provided, the SI Panel concluded that all of the medical equipment used in the delivery of the PSMA process at AC (L) was appropriate, sufficient and fit for purpose and, therefore, was **not a factor** in the accidents involving Candidate 1 and Candidate 2.

Sickle Cell Trait (SCT) and Exertional Collapse

SCT

1.4.61. SCT is a genetic condition in which an individual acquires an abnormal (sickle) gene from one of their parents and a normal gene from the other parent. The more serious condition of Sickle Cell Disease (SCD) is when an individual inherits two abnormal genes, one from each parent. SCT leads to the production of both normal (HbA) and abnormal (HbS) haemoglobin. Someone with both normal haemoglobin genes will be given the abbreviation HbAA. The amount of HbA produced is variable in SCT, but enough to prevent the 'sickling' complications of SCD (known as HbSS) so SCT (known as HbAS) is usually considered to be a harmless 'carrier' condition. The genetic inheritance of the sickle cell gene is demonstrated in Figure 1.4-8 below. However, SCT has been associated with haematuria (blood in the urine), hyposthenuria (the inability of the kidneys to concentrate the urine), other significant kidney conditions, compromised blood flow to the spleen at high altitude, exertional collapse, exertional rhabdomyolysis (the breakdown of damaged skeletal muscle) and sudden death on exertion. At the time of the two accidents, and at the time of writing this report, SCT did not prevent entry into the UK Armed Forces.

Exhibit 176-
177

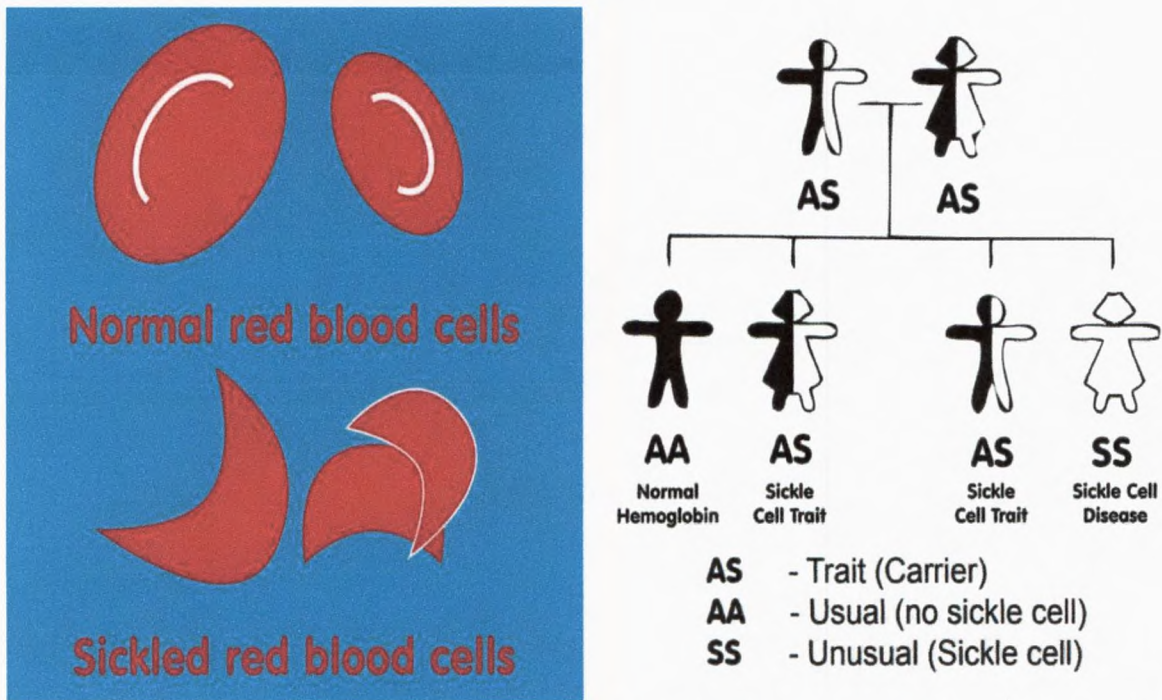


Figure 1.4-8 – Normal and sickled red blood cells and typical inheritance of the sickle cell gene.

Exhibit 178

1.4.62. SCT is found more commonly in certain populations (eg 1:4 West Africans, 1:10 Caribbeans and 1:625 Caucasians). It is also more common in those with Mediterranean, Middle Eastern and Indian family origins. In the United States, SCT is found in 8% of African-Americans, 0.5% of Hispanics, and 0.2% of Caucasians. The prevalence of SCT is high throughout large areas of sub-Saharan Africa, the Mediterranean basin, the Middle East, and India partly because it provides a degree of protection against malaria. Modern population movement has now distributed SCT far beyond its origins. Since 2007, all babies born in the UK (2003 in Scotland) have been given a 'heel prick test' in their first few days of life, which is screened for a range of conditions, including SCT. SCT has been found to be present in 1 in 76 of all babies born in the UK (of all ethnicities).

Exhibit 176
 Exhibit 181-183

Exertional Collapse Associated with SCT (ECAST)

1.4.63. Exertional Collapse Associated with SCT (ECAST) is a rare but recognised cause of collapse during exertion both in military and civilian populations. A significant number of the published academic and research papers on ECAST are by authors from the US. One of these authors, a leading expert on ECAST, had worked closely with the National Collegiate Athletic Association (NCAA) to study ECAST in young athletes. Another one of these authors, also a leading expert in ECAST, had worked closely with the US military to study ECAST in Service personnel (known as Warfighters in the US military). The SI Panel engaged with both these authors and with leading medical experts

from four branches¹⁰ of the US military, in order to learn as much as possible about ECAST and its implications for the UK military. The SI Panel also visited Washington DC in March 2020 to meet with these medical experts and to learn how they managed ECAST and exertional heat illness casualties. Many of the papers and guidelines referred to in this report were highlighted to the SI Panel as a result of these engagements. The SI Panel focused predominantly on the experiences of ECAST amongst US military and civilian populations as these dominated the published academic literature on ECAST. In addition, the US military experienced several deaths linked to ECAST during 2019 and they had introduced new evidence-based policies and mitigations to reduce the risk of ECAST amongst their Warfighters, prior to the accidents involving Candidate 1 and Candidate 2.

1.4.64. An ECAST summit held in the US in 2019 described the typical clinical presentation of ECAST as being 'distinguished by a antecedent extraordinary effort, unusual muscle weakness and pain (most commonly legs and lower back), normal to modest temperature elevation, and initial conscious state with no significant evidence of central nervous system dysfunction. ECAST can rapidly progress to obtundation, unconsciousness, and exertional sudden death without appropriate intervention. Cardiac arrest may initially present with pulseless electrical activity.' It was generally considered to be the result of an intense, individual, 'maximal exertional' effort, which could result in a spectrum of clinical presentations, varying from muscle pain to collapse. In academic literature, the collapse is often termed a 'conscious collapse' (ie slumping to the ground while maintaining the ability to speak initially) as opposed to a sudden fall into unconsciousness.

Exhibit 429

1.4.65. Exertional collapse and exercise-related sudden death in US athletes and US military personnel has been associated with SCT for several years. The risk factors underlying ECAST remain controversial in the sports medicine community. Multiple case presentations and anecdotal reports suggest the role of extraordinary exercise intensity, but other risk factors including dehydration, heat, previous exertional rhabdomyolysis, genetic cofactors, and dietary supplements have been cited as potential contributors. Others have hypothesised that some of these factors combine in a 'perfect storm' to trigger ECAST with a resultant, potentially fatal, 'metabolic crisis'.

Exhibit 182

1.4.66. The physiological changes and mechanisms associated with ECAST remain controversial. One suggested mechanism of ECAST involves exertional sickling due to four major factors: profound lactic

Exhibit 182

¹⁰ The US Army, the US Navy, the US Air Force and the US Marine Corps.

acidosis¹¹, extreme hypoxia¹² in the circulation of the working muscles, increased temperature within the working muscles, and dehydration of red cells flowing through those muscles. While this hypothesis remains unproven, some believe that these four factors in concert precipitate sickling in the microcirculation of working muscles. Another hypothesis suggests that an exertional surge in adrenaline may make SCT red cells 'sticky', resulting in them sticking together. The resultant logjam of these cells in the microcirculation could lead to a fatal 'metabolic crisis' from explosive, exertional rhabdomyolysis.

1.4.67. Exertional rhabdomyolysis is the breakdown of damaged skeletal muscle causing the release of their contents into the blood stream, as the result of strenuous exertion. This can result in serious complications such as acute kidney injury (AKI) and kidney failure. Exertional rhabdomyolysis is a condition that has been documented within US military training and operations. It typically occurs when the level of exertional stress is greater than the soldier is accustomed to. This can be precipitated by several factors, often working in parallel, and can occur alongside exertional heat illness, particularly heat stroke. It can also occur as the result of ECAST, in those who have SCT.

Exhibit 180

1.4.68. In the US military, the reported risk of exercise-related sudden death is 11.2 per 100,000 person-years in basic military training and 4.3 per 100,000 person-years in active duty personnel. The reported risk of exertional rhabdomyolysis is 291 per 100,000 person-years in active-duty black personnel and it is not influenced by the physical fitness of individuals. SCT is reported to increase the relative risk of exertional rhabdomyolysis between 17-fold and 54-fold, and exercise related death between 23-fold and 40-fold in basic military training. The relative risk of exercise-related death in SCT increases with age and exercise intensity. In the US military, the risk of exercise-related death after basic training is low and is not different between individuals with and without SCT.

Exhibit 179

Accidents involving Soldier Selection Candidates

The accident involving Candidate 1

1.4.69. On Sunday 17 November 2019, Candidate 1 stopped approximately 400m from the finish of the RFT (E) 2km run. Due to concerns about his condition he was transported, in the safety vehicle, to the Spirometry Room within AC (L). His condition was described as responsive but with erratic and aggressive behaviour and with moaning, seemingly in pain. Following further assessment by AC (L) staff an ambulance was called and he was transported to Good Hope Hospital

Exhibit 78-79

¹¹ Lactic acidosis occurs when lactic acid accumulates in the blood due to over production and the body's inability to metabolise it quickly enough. It results in the pH of the blood falling.

¹² Hypoxia is an inadequate supply of oxygen in a body's tissue.

(GHH). He received no specific medical treatment prior to the arrival of the ambulance, and he remained conscious throughout.

1.4.70. The medical report produced for the Medical Director of University Hospitals Birmingham NHS Trust stated that Candidate 1 arrived at the Emergency Department at 09:28 on 17 November 2019. His initial observations were as shown in Table 1.4-1. He was confused but there were no other abnormal signs. He denied taking any medications apart from protein supplements. His blood results were as shown in Table 1.4-1 and he was found to have SCT. His ECGs were unremarkable and although an initial echocardiogram was suggestive of [REDACTED], this diagnosis was later refuted. His [REDACTED] function deteriorated despite intensive care treatment. [REDACTED], Candidate 1 deteriorated further and died the following day.

Exhibit 90

1.4.71. At GHH, Candidate 1's temperature was recorded as [REDACTED] (making heat illness very unlikely), while his blood results showed a [REDACTED]. It was the opinion of the SI Panel that these results, alongside the history of exertional collapse and the other details in the hospital medical report, were consistent with exertional rhabdomyolysis and AKI following an episode of ECAST.

Exhibit 90

1.4.72. The Service Inquiry Panel finds that Exertional Collapse Associated with Sickle Cell Trait was a **Causal Factor**.

The accident involving Candidate 2

1.4.73. On Wednesday 27 November 2019, Candidate 2 collapsed approximately 200m from the finish line of the RFT (E) 2km run. Due to concerns about his condition an ambulance was called and, while awaiting the arrival of the ambulance, he received first aid at the scene of the collapse, which consisted of being kept warm whilst ensuring his airway was open and he was breathing. However, he received no other specific medical treatment. He did initially respond to a painful stimulus (a pinch) but was otherwise unresponsive when assessed by a medically trained bystander (a Specialist Instructional Officer (Medical) from the Defence Medical Services, Whittington Barracks). He was then transported to GHH by ambulance.

Exhibit 113
Exhibit 116

1.4.74. The medical report produced for the Medical Director of University Hospitals Birmingham NHS Trust stated that Candidate 2 arrived at the Emergency Department at 09:53 on 27 November 2019. His initial observations were as shown in Table 1.4-1 below. He was unresponsive with a [REDACTED].

Exhibit 90

~~OFFICIAL SENSITIVE~~

His arterial blood gas and venous blood results were as shown in Table 1.4-1 and he was found to be have SCT. [REDACTED]
[REDACTED]. [REDACTED]
[REDACTED] deteriorated further. Despite intensive care treatment, Candidate 2 died later that day.

1.4.75. At GHH, Candidate 2's temperature was recorded as [REDACTED] (making heat illness very unlikely), while his blood results [REDACTED]
[REDACTED]. It was the opinion of the SI Panel that these results, alongside the history of exertional collapse and the other details in the hospital medical report, were consistent with exertional rhabdomyolysis and AKI following an episode of ECAST.

1.4.76. The Service Inquiry Panel finds that Exertional Collapse Associated with Sickle Cell Trait was a **Causal Factor**.

Exhibit 90

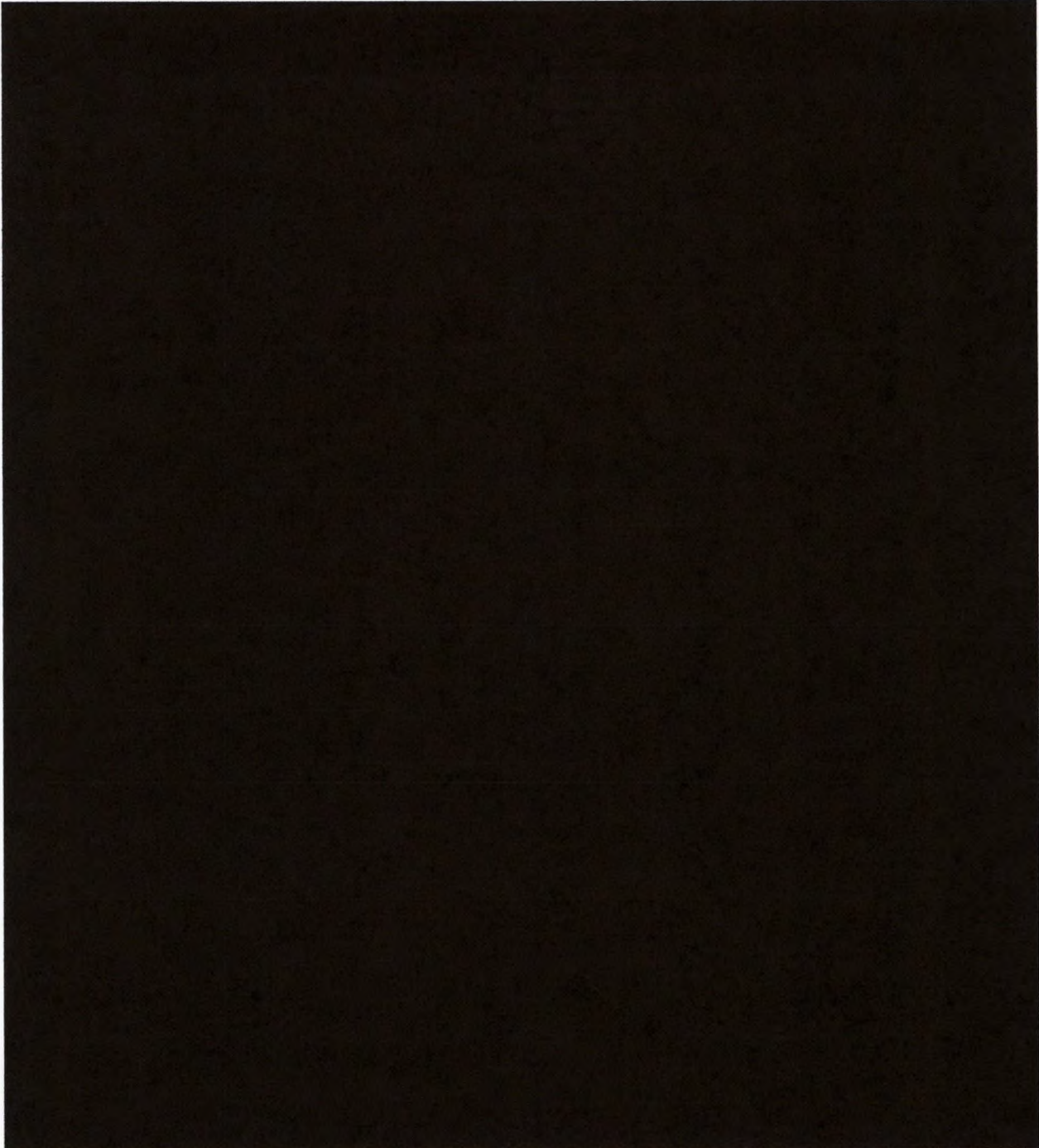


Table 1.4-1 – A reproduction of the pertinent results referred to in the medical report from University Hospitals Birmingham NHS Trust. (Key: **XX = higher than normal value, **XX** = lower than normal value).**

Exhibit 90

¹³ Candidate 3 was a CW candidate who collapsed during the RFT (E) 2km run on 6 June 2019 and was admitted to hospital. His case is discussed in more detail in paragraphs 1.4.104 to 1.4.108.

¹⁴ [Redacted]

Risk factors for exertional collapse and ECAST

1.4.77. A review of published academic literature (mostly from the US) in 2020 found that ECAST events typically occurred during:

Exhibit 179

- a. High-intensity exercise with maximal exertion, or during repeated maximal efforts, over a short-period of time (between 5 and 60 minutes).
- b. Basic military training during 1 to 2 mile timed runs, and in recruits who have repeatedly had difficulty passing physical tests.
- c. Runs conducted after military training exercises during the summer when there have been less than 48 hours between events.

1.4.78. These previous ECAST events included those which occurred:

Exhibit 179

- a. On day one of training.
- b. On newly arriving at altitude.
- c. On having just returned from holiday or after a sudden increase in exercise or training intensity.

Further proposed predisposing conditions for ECAST have included:

- a. Exercise in heat and / or high humidity.
- b. Dehydration.
- c. Exercise at altitude.
- d. Exercise-induced asthma.
- e. Pre-exercise fatigue due to illness or lack of sleep.
- f. Poor cardiovascular conditioning.

1.4.79. The British Army 'Commanders' Guide to Exertional Collapse', released via Army Briefing Note: 062/2020 following the accidents involving Candidate 1 and Candidate 2, listed the main risk factors for exertional collapse as follows:

Exhibit 184

- a. **'Personal risk factors (PRF).**
 - (1) Dehydration.

OFFICIAL SENSITIVE

- (2) Recent or current illness (including raised temperature).
- (3) Recent vaccination (within 24 hours).
- (4) Poor baseline conditioning / fitness level.
- (5) BMI >30 / Excess body fat.
- (6) Prior poor fitness test performance.
- (7) Prior exercise related collapse.
- (8) Accumulated fatigue.
- (9) An underlying cardiac condition.
- (10) Asthma.
- (11) Sickle cell trait.
- (12) Excessive motivation.

b. Environmental or external risk factors (ERF).

- (1) Lack of appropriate environmental acclimatisation.
- (2) Exercise at altitude.
- (3) High ambient temperature and humidity.
- (4) Certain medications.
- (5) Dietary supplements containing stimulants, including energy shots.'

1.4.80. In Table 1.4-2 below, the SI Panel assessed the probabilities that these 17 independent risk factors were relevant in the accidents involving Candidate 1 and Candidate 2. The probabilistic terminology in Figure 1.4-2 was used to assess and categorise each risk factor.

Exhibit 1
Exhibit 4
Exhibit 72
Exhibit 74
Exhibit 90
Exhibit 130
Exhibit 104
Exhibit 107
Exhibit 188
Exhibit 189

OFFICIAL SENSITIVE

Risk Factor	Candidate 1	Candidate 2
PRF (1) Dehydration	VERY UNLIKELY – Hydration was regularly encouraged throughout the Soldier Selection process at AC (L) and the weather was cool on 15 - 17 November 2019.	VERY UNLIKELY – Hydration was regularly encouraged throughout the Solder Selection process at AC (L) and the weather was cool on 25 - 27 November 2019.
PRF (2) Recent or current illness	UNLIKELY – No evidence of this in the PSMA medical records.	UNLIKELY – No evidence of this in the PSMA medical records.
PRF (3) Recent vaccination	EXTREMELY UNLIKELY – No evidence of this in the PSMA medical records.	EXTREMELY UNLIKELY – No evidence of this in the PSMA medical records.
PRF (4) Poor baseline conditioning or fitness level	ABOUT AS LIKELY AS NOT – Self-declared 11 - 15 hrs of exercise weekly in the WRQ (running, gym-exercises and weight-training) but some concerns expressed during SI Panel interviews with a member of AC (L) staff.	UNLIKELY – Self-declared 6 - 10 hrs of exercise weekly in the WRQ (running and gym-exercises) with no evidence to contradict this.
PRF (5) BMI >30 or excess body fat	IMPOSSIBLE – BMI 20.86 kg/m ² (lower end of the normal range) at PSMA.	UNLIKELY – BMI 25.16 kg/m ² (just over the upper limit of the normal range) at PSMA.
PRF (6) Prior poor fitness test performance	Not applicable to Candidate 1.	Not applicable to Candidate 2.
PRF (7) Prior exercise related collapse	VERY UNLIKELY – No evidence of this on the RGMD or at the PSMA.	VERY UNLIKELY – No evidence of this on the RGMD or at the PSMA.
PRF (8) Accumulated fatigue	MORE LIKELY THAN NOT – Difficult to assess given the lack of evidence (the potential role of accumulated mental and physical fatigue, alongside stress is discussed below).	MORE LIKELY THAN NOT – Difficult to assess given the lack of evidence (the potential role of accumulated mental and physical fatigue, alongside stress is discussed below).
PRF (9) An underlying cardiac condition	UNLIKELY – Their ECG (reported as 'Moderate voltage criteria for LVH [left ventricular hypertrophy], may be normal variant, borderline ECG' and 'Isolated LVH [left ventricular hypertrophy], normal variant within standards' ¹⁵) was acceptable at the PSMA (no echocardiogram was indicated).	EXTREMELY UNLIKELY – Their ECG (reported as 'Voltage criteria for left ventricular hypertrophy, abnormal ECG' ¹⁶) resulted in a referral for an echocardiogram which was acceptable at PSMA.
PRF (10) Asthma	EXTREMELY UNLIKELY – Their PEFR was greater than the predicted value at the PSMA.	EXTREMELY UNLIKELY – Their PEFR was the same as the predicted value at the PSMA.

¹⁵ 'Moderate voltage criteria for LVH [left ventricular hypertrophy], may be normal variant, borderline ECG' and 'Isolated LVH [left ventricular hypertrophy], normal variant within standards' were patterns of changes in the ECG tracings that could indicate enlargement (hypertrophy) of the ventricles of the heart. In isolation, this was a common physiological change in trained athletes, but it could sometimes be suggestive of an underlying pathological cardiac condition. These patterns of changes in the ECG tracings were very similar to 'Voltage criteria for left ventricular hypertrophy, abnormal ECG', which was demonstrated on Candidate 2's ECG.

¹⁶ 'Voltage criteria for left ventricular hypertrophy, abnormal ECG' was a pattern of changes in the ECG tracing that could indicate enlargement (hypertrophy) of the ventricles of the heart. In isolation, this was a common physiological change in trained athletes, but it could sometimes be suggestive of an underlying pathological cardiac condition. This pattern of changes in the ECG tracing was very similar to 'Moderate voltage criteria for LVH [left ventricular hypertrophy], may be normal variant, borderline ECG' and 'Isolated LVH [left ventricular hypertrophy], normal variant within standards', which were demonstrated on Candidate 1's ECG.

OFFICIAL SENSITIVE

Risk Factor	Candidate 1	Candidate 2
PRF (11) Sickle Cell Trait	CERTAIN – Candidate 1 had SCT.	CERTAIN – Candidate 2 had SCT.
PRF (12) Excessive motivation	MORE LIKELY THAN NOT – Consistently reported in CW candidates by AC (L) staff and detailed in the Human Factors report.	MORE LIKELY THAN NOT – Consistently reported in CW candidates by AC (L) staff and detailed in the Human Factors report.
ERF (1) Lack of appropriate environmental acclimatisation	UNLIKELY – Arrived in the UK on 30 October 2019 (16 days before Soldier Selection).	UNLIKELY – Arrived in the UK on 9 November 2019 (16 days before Soldier Selection).
ERF (2) Exercise at altitude	IMPOSSIBLE – DMS Whittington was approximately 100m above sea level.	IMPOSSIBLE – DMS Whittington was approximately 100m above sea level.
ERF (3) High ambient temperature and humidity	IMPOSSIBLE – The air temperature on the morning of 17 November 2019 was 7°C.	IMPOSSIBLE – The air temperature on the morning of 27 November 2019 was 9°C.
ERF (4) Certain medications	VERY UNLIKELY – None were declared on the RGMD or at the PSMA.	VERY UNLIKELY – None were declared on the RGMD or at the PSMA.
ERF (5) Dietary supplements	MORE LIKELY THAN NOT – He declared taking no dietary supplements on the WRQ, but he declared taking protein supplements while he was in GHH.	UNLIKELY – He declared taking no dietary supplements on the WRQ.

Table 1.4-2 – Comparison of risk factors for exertional collapse.

1.4.81. **Candidate 1.** Following a review of his RGMD and his PSMA, there was no evidence that Candidate 1 had a recent or current illness, a recent vaccination, a prior exercise related collapse, an underlying cardiac condition, or asthma. He declared taking no regular medications or dietary supplements. However, in the hospital report it stated that he had been using a protein supplement. Candidate 1 self-declared 11 - 15 hrs of exercise weekly at the PSMA (running, gym-exercises and weight-training) and his BMI was 20.86 kg/m², which was towards the lower end of the normal range (18.5 - 24.9 kg/m²). However, during one of the SI Panel's interviews with a member of staff from AC (L), some concerns were raised about Candidate 1's preparation for the RFT (E) and this is discussed in more detail below. During the PSMA, his ECG (reported as 'Moderate voltage criteria for LVH [left ventricular hypertrophy], may be normal variant, borderline ECG' and 'Isolated LVH [left ventricular hypertrophy], normal variant within standards') and cardiological examination were both reported as acceptable. His PEFR (a test used to check for obstructive airways disease such as asthma) was ■■■■, which was normal and above the predicted value. From the hospital report it was known with certainty that Candidate 1 had SCT.

Exhibit 72
Exhibit 90
Exhibit 189

1.4.82. **Candidate 2.** Following a review of his RGMD and his PSMA, there was no evidence that Candidate 2 had a recent or current illness, a recent vaccination, a prior exercise related collapse, an underlying cardiac condition, or asthma. He declared taking no regular medications

Exhibit 90
Exhibit 104

or dietary supplements. Candidate 2 self-declared 6 - 10 hrs of exercise weekly at the PSMA (running and gym-exercises) and his BMI was 25.13 kg/m² which was just above the upper end of the normal range (18.5 - 24.9 kg/m²). During the SI Panel's interviews at AC (L) there was no additional evidence to be able to make a judgement on his baseline conditioning / fitness level. During the PSMA, his ECG was reported as 'Voltage criteria for left ventricular hypertrophy, abnormal ECG' and this resulted in him being referred for an echocardiogram. Both the echocardiogram and cardiological examination were reported as normal. His PEFR was ■■■■, which was normal and the same as the predicted value. From the hospital report it was known with certainty that Candidate 2 had SCT.

1.4.83. Based on the evidence and observations from two visits to AC (L) summarised in the table above, several of these risk factors were not present. AC (L) was not located at a significant altitude, being between 69m and 130m above sea level. The temperatures on both mornings were not excessively hot or cold. It was clear from the SI Panel's visits to AC (L) that hydration was emphasised throughout the 48-hour Soldier Selection process. This was facilitated by each candidate being issued an individually numbered, clear plastic water bottle, which they were required to have with them at all events. Therefore, it was the opinion of the SI Panel that dehydration was very unlikely to be a significant risk factor, especially given the weather conditions at the time. It was difficult to comment on appropriate acclimatisation as, although both candidates arrived in the UK 16 days before they attended AC (L), it was not known how they spent those 16 days or how much exercise they conducted or how much time they spent outdoors. RG confirmed that no specific acclimatisation advice was given to any of the candidates. In addition, the Human Factors report stated that 'Not having a clear and well defined protocol runs the risk of the individual not being able to measure whether or when they have been acclimatised enough for the necessary physiological or behavioural changes to take place to allow their best performance without any detrimental effects.' However, given both candidates spent 16 days in the UK before attending AC (L) (longer than the mandatory period in RG policy at the time), it was the opinion of the SI Panel that there was insufficient evidence to conclude that the lack of appropriate environmental acclimatisation (or acclimatisation advice) was a significant risk factor in these accidents.

1.4.84. During the interviews at AC (L), the SI Panel heard several reports that CW candidates were typically extremely highly motivated, often due to their personal circumstances. This was supported by the evidence in the Human Factors report, which identified CW candidates as being highly motivated. The Human Factors report stated that the motivations of CW candidates were 'seemingly more heavily invested in wide-ranging consequences, hence possibly making them more influential' and they were 'likely to experience high levels [of] or excessive motivation as a result of the extrinsic pressures of firstly

Exhibit 72
Exhibit 74
Exhibit 104
Exhibit 107
Exhibit 153-154
Exhibit 190
Exhibit 235
Exhibit 284

Exhibit 150
Exhibit 188
Exhibit 236
Exhibit 284

having made a significant investment in time and money and secondly having a lot depending on their success in terms of livelihood and families.' In addition, the Human Factors report concluded that the more challenging application process for CW candidates inherently added more pressure to perform successfully, whatever the costs, and pass Soldier Selection first time. The Human Factors report also concluded that it was likely that Candidate 1 and Candidate 2 were excessively motivated and had additional concerns driving them. The Human Factors report concluded that these adverse mental states were likely to have been contributory factors in their accidents.

1.4.85. Based on the evidence provided by several of the staff members from AC (L) during interview and the evidence in the Human Factors report, the SI Panel concluded that both candidates were more likely than not to have had a degree of excessive motivation, which would have caused them to push themselves on the RFT (E) 2km run beyond the limits of their fitness level.

1.4.86. The Service Inquiry Panel finds that excessive motivation was a **Contributory Factor**.

1.4.87. **Recommendation. The Senior Health Advisor (Army) should conduct further research to better understand the potential effects of excessive motivation amongst Commonwealth candidates engaged in the Soldier Selection process, in order to reduce the risk of Exertional Collapse Associated with Sickle Cell Trait to as low as reasonably practicable.**

1.4.88. Based on the SI Panel's interviews, visits to AC (L), the Soldier Selection timetable and some of the evidence from the Human Factors report, the SI Panel assessed that the 48-hour Soldier Selection process was likely to have been a busy and stressful period for CW candidates. It was the opinion of the SI Panel that the combination of unfamiliar surroundings, the pressure to succeed, self-induced stress, the busy programme during which candidates were constantly under scrutiny and sleeping arrangements which involved sharing a dormitory room with around a dozen other candidates would, more likely than not, have led to accumulated mental and physical fatigue over their 2-night stay at AC (L). The Human Factors report noted the additional pressure on CW candidates due to the fact that many of them only had 'one shot' at the Soldier Selection process due to visa limitations and financial and logistical considerations. It stated that while there was no substantive evidence that Candidate 1 and Candidate 2 had felt the additional pressure of a 'one-shot' attempt, it was a likely contributory factor.

1.4.89. The Human Factors report also noted that mental fatigue due to external pressures or stressors could affect performance. In addition, the report did suggest that adverse mental states were likely to have been contributory factors in both accidents, although, as discussed above, this

Exhibit 24
Exhibit 191-
192
Exhibit 284

Exhibit 193
Exhibit 284

was more in relation to excessive motivation and additional concerns that may have been driving them. While the Human Factors report could find no evidence that a lack of sleep or fatigue was an issue for either CW candidates or UK-based candidates on Soldier Selection, it noted that these issues could affect performance.

1.4.90. The SI Panel assessed that the role of accumulated fatigue, and how mental fatigue and physical fatigue may interact, during the Soldier Selection process, was not fully understood. Notwithstanding the limited evidence in the Human Factors report, the SI Panel concluded that both candidates were more likely than not to have had some degree of accumulated mental and physical fatigue by the second morning of the Soldier Selection process.

1.4.91. The Service Inquiry Panel finds that accumulated mental and physical fatigue was a **Contributory Factor**.

1.4.92. **Recommendation. The Senior Health Advisor (Army) should conduct further research to better understand the potential effects of accumulated mental and physical fatigue amongst candidates engaged in the Soldier Selection process, in order to reduce the risk of Exertional Collapse Associated with Sickle Cell Trait to as low as reasonably practicable.**

1.4.93. It was the opinion of the SI Panel that, after analysing the 17 independent risk factors for exertional collapse, the only risk factor that could be stated with certainty to have been present in the accidents involving Candidate 1 and Candidate 2 was having SCT.

Exhibit 90

1.4.94. Based on the evidence that both Candidate 1 and Candidate 2 had Sickle Cell Trait, the Service Inquiry Panel finds that this was a **Causal Factor** in both accidents.

1.4.95. Candidate 1 declared taking no regular medications or dietary supplements in his WRQ. However, the hospital report stated that he declared that he had been taking a protein supplement. It was the opinion of the SI Panel that, on the balance of probabilities, the declaration made while seriously unwell in hospital was likely to be more reliable than the one made in the WRQ. Therefore, the SI Panel concluded that it was more likely than not that Candidate 1 had been taking a protein supplement.

Exhibit 72
Exhibit 90

1.4.96. While the Commanders' Guide to Exertional Collapse listed 'Dietary supplements containing stimulants, including energy shots.' as an 'Environmental or external risk factor' (ERF (5)) for exertional collapse, the SI Panel noted that 'dietary supplements' was listed as a risk factor for ECAST in the case report and literature review in Current Sports Medicine Report in 2015. The role of protein / dietary supplements as a risk factor for ECAST is not well understood, so the SI

Exhibit 182
Exhibit 184

OFFICIAL SENSITIVE

Panel concluded that further research should be considered in this area, in order to potentially reduce the risk of ECAST in the future. While there was insufficient evidence to determine whether or not taking dietary supplements was a factor in the accident involving Candidate 1, the SI Panel concluded that it was noteworthy in that it could contribute to or cause a future accident.

1.4.97. The Service Inquiry Panel finds that taking dietary supplements was an **Other Factor**.

1.4.98. Recommendation. The Senior Health Advisor (Army) should conduct further research to better understand the potential effects of dietary supplements on candidates engaged in the Soldier Selection process, in order to reduce the risk of Exertional Collapse Associated with Sickle Cell Trait to as low as reasonably practicable.

1.4.99. Based on the evidence in their medical records, it was the opinion of the SI Panel that PRF (2), a recent or current illness (including a raised temperature), was unlikely to have been a significant factor in either accident. However, although both candidates self-declared no recent or current illnesses neither had their temperature checked as this was usually not recorded as part of the PSMA process. One way to rule out a current illness (including a raised temperature) would be to check each candidate's temperature during the PSMA run-ups. It was the opinion of the SI Panel that a temperature check would be a useful addition to the PSMA run-ups as a current illness (including a raised temperature) was a risk factor for both exertional heat illness and ECAST. Whilst the lack of a temperature check during the PSMA process was unlikely to have played a part in the accidents in question, it was the opinion of the SI Panel that it was noteworthy as it has the potential to prevent a future accident.

1.4.100. The Service Inquiry Panel finds that the lack of a temperature check during the Pre-Service Medical Assessment process was an **Other Factor**.

1.4.101. Recommendation. The Chief Executive Officer Recruiting Group should include a temperature check in the Pre-Service Medical Assessment, in order to reduce the risk of a candidate with a current illness attempting the Role Fitness Test (Entry) 2km run.

Similar previous accidents

1.4.102. ARITC provided the SI Panel with four Learning Accounts (LAs) which related to six candidates who collapsed during the RFT (E) 2km run. One LA related to the accident involving Candidate 1 and another LA related to the accident involving Candidate 2. The other two LAs related to four additional CW candidates, all of whom had collapsed

Exhibit 74
Exhibit 107
Exhibit 172
Exhibit 186

during the RFT (E) 2km run and had been taken to hospital. These additional four accidents occurred during the period 6 June to 19 September 2019.

1.4.103. The SI Panel reviewed the other two LAs and the RG medical records of these four additional CW candidates. Two of these four CW candidates appeared to have suffered from medical conditions unrelated to SCT and ECAST and this was supported by additional written evidence provided by the Deputy CMO at the NRC, Upavon; they will not be discussed further in this report. However, following careful review of the additional LAs and the RG medical records, there was evidence to suggest that two of these additional CW candidates (referred to as Candidate 3 and Candidate 4) may have suffered with exertional rhabdomyolysis following an episode of ECAST.

Exhibit 167-169
Exhibit 172
Exhibit 186
Exhibit 194-195

1.4.104. **Candidate 3.** Candidate 3 was [REDACTED] and attended Soldier Selection over the period 4 to 6 June 2019 at AC (L). He received a 'Pass' at the PSMA on 5 June 2019, following an ECG which was reported as [REDACTED]. His BMI was at the lower end of the normal range. His PEFR was [REDACTED], which was normal and above the predicted value. On his WRQ, Candidate 3 stated that he regularly conducted running, gym exercises and swimming, averaging 14 hours per week carrying out these activities. He stated that he was not taking any regular medications and he did not have any of the listed health problems. He also stated that he smoked an average of three cigarettes a day.

Exhibit 154
Exhibit 167
Exhibit 172

1.4.105. On the morning of 6 June 2019, the air temperature readings were 11.2°C at 06:00 and 10.9°C at 08:00. Following the 800m warm-up, Candidate 3 began the RFT (E) 2km run. According to their PSMA, Candidate 3's preferred Army role was Environmental Health Technician (Royal Army Medical Corps) which required a RFT (E) run time of 11 minutes 15 seconds or less. Approximately 200m from the finishing line Candidate 3 was observed to be struggling to stay on his feet and subsequently collapsed. First aid was provided by the Candidate Assessor and Physical Training Instructor (PTI) team managing the run and Candidate 3 was taken to the AC (L) medical department where he was examined by one of the AC (L) doctors. An ambulance was called and Candidate 3 was taken to GHH.

Exhibit 155
Exhibit 167
Exhibit 172

¹⁷ [REDACTED]

1.4.106. The medical report produced for the Medical Director of University Hospitals Birmingham NHS Trust stated that Candidate 3 was from Cameroon, was 27 years old and had no reported medical problems. During the RFT (E) 2km run at AC (L) he suddenly developed severe bilateral quadriceps muscle pain and a loss of power in his lower limbs, which led to him collapsing to the ground. There was no significant trauma nor any cardiac or other neurological symptoms. He arrived at the Emergency Department at 09:39 and his initial observations were as shown in Table 1.4-1 above. There were no other abnormal signs apart from severe quadriceps tenderness and there was no evidence of a compartment syndrome (increased pressure within a muscle compartment of the arm or leg). His blood results were as shown in Table 1.4-1. The diagnosis was said to be [REDACTED]
[REDACTED]
[REDACTED] He seemed to make a good recovery [REDACTED] when discharged on 25 June 2019.

Exhibit 90

1.4.107. At GHH, Candidate 3's temperature was recorded as [REDACTED] (making heat illness very unlikely), and his blood results showed a [REDACTED]. It was the opinion of the SI Panel that these results, alongside the details in the hospital medical report, were consistent with [REDACTED]

Exhibit 90

1.4.108. Therefore, the SI Panel concluded that Candidate 3 suffered a very similar pathological, metabolic event ([REDACTED]) to Candidate 1 and Candidate 2.

1.4.109. **Candidate 4.** Candidate 4 [REDACTED] and attended Soldier Selection over the period 17 to 19 September 2019 at AC (Glencorse) near Edinburgh. He received a 'Defer' at the PSMA on 18 September 2019, for [REDACTED], but he was found fit to proceed to assessment (including the RFT (E)). His ECG was reported as [REDACTED], otherwise normal ECG' and his BMI was slightly above the normal range. His PEFR was [REDACTED], which was normal but very slightly below the predicted value. On his WRQ, Candidate 4 stated that he regularly conducted running, gym exercises and weight training and swimming, averaging 14 hours per week carrying out these activities. He stated that he was not taking any regular medications and he did not

Exhibit 168
Exhibit 186-187

¹⁸ [REDACTED]
[REDACTED]
[REDACTED]

OFFICIAL SENSITIVE

have any of the listed health problems. He also stated that he was a non-smoker.

1.4.110. According to his RGMD, Candidate 4 wanted to join the infantry which required an RFT (E) 2km run time of 10 minutes 15 seconds or less but according to his WRQ, Candidate 4's preferred Army role was Support and Logistics which required an RFT (E) 2km run time of 11 minutes 15 seconds or less. It was later confirmed by staff at AC (Glencorse) that he was most likely aiming for a run time of 10 minutes and 15 seconds or less. On the morning of 19 September 2019, following the 800m warm-up, Candidate 4 undertook the RFT (E) 2km run. No temperature readings were recorded that day. Candidate 4 completed the RFT (E) 2km run in 10 minutes and 43 seconds.

Exhibit 168
Exhibit 186
Exhibit 196-198

1.4.111. Immediately after completing the run, one of the PTIs noticed Candidate 4 appeared disorientated. He was conscious and responsive but was moving slowly and he was helped into the safety vehicle in order to be driven to the AC for medical review. During this short journey his condition started to deteriorate and he began to lose consciousness. As soon as the safety vehicle arrived at the AC, the medical team were notified and they began to assess Candidate 4 while, at approximately 10:15, an ambulance was called.

Exhibit 187

1.4.112. On arrival at the AC, one of the AC doctors took over the medical care of Candidate 4. Candidate 4 was laid flat on a stretcher on the ground outside the safety vehicle and his legs were elevated. Due to Candidate 4 having [REDACTED]

Exhibit 168

1.4.113. The ambulance arrived at approximately 10:30, by which time Candidate 4's condition had slightly improved. He was responding to voice but he still seemed very confused and disorientated. At approximately 11:00, the ambulance left to take Candidate 4 to the Royal Infirmary of Edinburgh (RIE). On 15 October 2019 Candidate 4 was discharged from hospital.

Exhibit 156
Exhibit 168
Exhibit 187
Exhibit 199

1.4.114. On 10 January 2020, RG received an email from the Consultant Haematologist who was following up Candidate 4, which confirmed that he had [REDACTED]

Exhibit 156
Exhibit 168
Exhibit 200

[REDACTED] following his collapse after the RFT (E) 2km run. Subsequently, on 15 January 2020, an RG doctor from AC (G) wrote to Candidate 4 to explain that he had [REDACTED] [REDACTED]. The letter also explained that [REDACTED] was more likely to occur in people who have [REDACTED] particularly with the high levels of physical exertion found in military training environments. It

was the opinion of the SI Panel that these results, alongside the history described above, were consistent with [REDACTED]

1.4.115. Therefore, the SI Panel concluded that Candidate 4 suffered a very similar pathological, metabolic event ([REDACTED]) to Candidate 1, Candidate 2 and Candidate 3.

Clinical review of the accidents involving Candidates 3 and 4

1.4.116. On 6 June 2019, Candidate 3 collapsed and was admitted to GHH. The AC (L) doctor who examined him prior to the arrival of the ambulance, stated in his medical notes that his medical issue seemed metabolic in nature and wondered whether or not [REDACTED] was a factor. On 25 June 2019 Candidate 3 was discharged from hospital and within the next few days a copy of his discharge letter was sent to RG. This stated that he had suffered [REDACTED]. There was no mention of [REDACTED] on his discharge letter. On 1 July 2019 one of the AC (L) doctors wrote to Candidate 3 to explain that he did not meet the current medical entry standard for the Army because he had a history of [REDACTED].

Exhibit 156
Exhibit 166-
167

1.4.117. On 22 October 2019, Candidate 3's UK-based GP wrote to provide further medical information to help aid his application to join the Army as a part of an initial appeal process. The GP explained that during the investigations for Candidate 3's [REDACTED] he had been found to have [REDACTED]. The GP suggested that this may have accounted for Candidate 3's recent [REDACTED]. On 31 October 2019, one of the AC (L) doctors wrote to Candidate 3 to explain that the letter from his GP had been reviewed and his appeal to be reconsidered for the Army had not been successful due to the fact that he had [REDACTED] following a small amount of exercise. The letter explained that Candidate 3 was at great risk of this happening again with future physical stress and therefore he was found medically unfit for military service.

Exhibit 156
Exhibit 167

1.4.118. The SI Panel asked ARITC what clinical review of Candidate 3's case had taken place following his hospitalisation. Their written response stated that the case was discussed between two of the doctors at AC (L) and then discussed over the phone with the RG CMO, who asked for all the information to be summarised and sent to the CMO's office at the NRC, Upavon. This information was sent to the CMO's office via email as a summary. Candidate 3 was subsequently assessed as being P8 (medically unfit for military service) on 27 June 2019 by one of the doctors at AC (L), following the review of the medical notes received from the hospital. After Candidate 3's appeal was declined on 31 October 2019, no further information was sent to the CMO's office until his file was posted there on 20 November 2019, following the death

Exhibit 157-
159
Exhibit 167

OFFICIAL SENSITIVE

of Candidate 1. This was as a part of the review process for all the hospitalised candidates. This review was to investigate whether there were any abnormalities missed during the PSMA that could have contributed to the candidates' collapses. RG considered the use of performance enhancers and, as a result, this was included as a question in the WRQ.

1.4.119. From the evidence discussed above the SI Panel determined that the medical team at AC (L) were aware, at the end of October 2019, that Candidate 3 had [REDACTED], following a small amount of exercise. Reviewing the evidence discussed above, and considering how very seriously unwell Candidate 3 was before his eventual discharge from hospital on 25 June 2019, following 19 nights in hospital, it was the opinion of the SI Panel that a more thorough clinical review of this serious 'near miss' would more likely than not have identified a diagnosis of [REDACTED] in a CW candidate [REDACTED] before the accidents involving Candidate 1 and Candidate 2 in November 2019.

1.4.120. On 19 September 2019 Candidate 4 collapsed and was admitted to RIE. On 25 September 2019 the ACM at AC (Glencorse) (AC (G)) spoke with the hospital to request an update on his condition. This update was documented as Candidate 4 being stable but critically unwell. It stated that he was [REDACTED]. On 11 October 2019, the Second-in-Command (2IC) at AC (G) visited Candidate 4 in hospital. At that time, he had been transferred to a [REDACTED] ward and he was showing a significant improvement in his medical condition, although his consultants were still unsure as to the original cause of the collapse and any underlying medical issues. The evidence above demonstrates that by the middle of October 2019 RG staff were aware that Candidate 4 had suffered a [REDACTED], following an exertional collapse after a small amount of exercise.

1.4.121. On 15 October 2019 Candidate 4 was discharged from hospital. Between 17 and 29 October 2019, the AC (G) 2IC made several attempts to obtain additional medical information from the RIE but without success. On 20 November 2019 AC (G) received a copy of Candidate 4's medical records from his GP and this was forwarded to the CMO's office at the NRC in Upavon who received it on 25 November 2019. These medical records did not mention [REDACTED]

1.4.122. The SI Panel asked ARITC what clinical review of Candidate 4's case had taken place following his hospitalisation. Their initial written response stated that the CMO was informed about his illness on 2 October 2019. However, information sent to the SI Panel from RG later in the investigation stated that the AC (G) Lead Clinician informed the CMO's office of the accident involving Candidate 4 on 20 September

Exhibit 156
Exhibit 168
Exhibit 199

Exhibit 156
Exhibit 168
Exhibit 199

Exhibit 156
Exhibit 160
Exhibit 168

OFFICIAL SENSITIVE

2019. Staff within the CMO's office advised collecting as much information as possible from the hospital. Both RG and ARITC commented on how difficult it had been to get medical information from the NHS about Candidate 4's diagnosis and treatment and they stated that they only found out information on his case considerably later.

1.4.123. Although no clinical review of Candidate 4's case was undertaken by RG at the time of the accident, both Candidate 3's and Candidate 4's cases were reviewed, on or around 25 September 2019, as part of a three case review of candidates who were hospitalised following collapses on the RFT (E) 2km run. This three case review involved Candidate 3, Candidate 4 and an additional CW candidate (who collapsed and was hospitalised but not, in the opinion of the SI Panel, as a result of ECAST) and it was discussed in an email sent by the RG Head of Selection on 26 September 2019. In this email it was noted that all three CW candidates had passed their RGMD screening, had passed their PSMA on Day One, had been in the UK for longer than 7 days prior to attending the ACs, and were of African / Caribbean ethnicity. While an emerging trend of CW candidates collapsing during or following the RFT (E) 2km run had been identified at this point by the RG Head of Selection, a non-clinician, no clinical conclusions had been established.

Exhibit 160
Exhibit 161
Exhibit 167-
169

1.4.124. From the evidence discussed above the SI Panel determined that by the end of October 2019 the medical team at AC (G) were aware that Candidate 4's exertional collapse had led to him being very seriously unwell [REDACTED], following a small amount of exercise. However, the RG medical team only became aware of his [REDACTED] on 10 January 2020. Reviewing the evidence discussed above and considering how very seriously unwell Candidate 4 was before his eventual discharge from hospital on 15 October 2019, following 26 nights in hospital, it was the opinion of the SI Panel that a more thorough clinical review of this serious 'near miss' would more likely than not have identified a second diagnosis [REDACTED] following exertional collapse in a CW candidate before the accidents involving Candidate 1 and Candidate 2 in November 2019.

Exhibit 200

1.4.125. ARITC stated that although no clinical reviews happened at the time, since the accidents involving Candidate 1 and Candidate 2, they had recognised the omission in process and approach. ARITC stated that a further review (further to the review mentioned above in paragraph 1.4.123) of all three cases (Candidate 3, Candidate 4 and an additional CW candidate) was conducted on 20 November 2019, following the accident involving Candidate 1, as part of an overall review of candidates who were hospitalised following collapse at an AC. One outcome of this review was that ARITC implemented a revised accident reporting process, that all staff were aware of, which automatically would notify the correct people and, as a result, would initiate a clinical review.

Exhibit 160
Exhibit 161

OFFICIAL SENSITIVE

ARITC explained that previously cases were always discussed as soon as they came to light, which was through notification via an Incident Report. The findings were communicated to Lead Clinicians either via email or team meetings which were urgently scheduled as the case dictated. ARITC explained that since the accidents involving Candidate 1 and Candidate 2, RG had revised its incident and accident reporting process, triggering an automatic review of serious medical cases. Any future incident or accident that had a medical involvement would result in COS RG escalating it to the CMO immediately upon notification of the Incident Report.

1.4.126. The trend of CW candidates collapsing on the RFT (E) 2km run was raised during the RG Safety, Health and Environmental Committee meeting on 14 October 2019, following the hospitalisation of Candidate 4. The Selection Business Planning Manager representing the ACs, stated that all medical procedures were in place and this trend was being attributed to acclimatisation. At the time of the meeting, the acclimatisation period was set at 10 days which had been increased from 7 days in September 2019. Discussions were held at Senior Leadership Team (SLT) level in response to the RG Health and Safety (H&S) Manager's report and they concluded that there were no commonalities between all four previous collapses. The only procedural change felt necessary was the extension of the acclimatisation period for CW candidates which had already occurred in September 2019.

Exhibit 98
Exhibit 162

1.4.127. Following the accidents involving Candidate 1 and Candidate 2, RG acknowledged that the linkage between the ACs, their medical team at the NRC, and the SLT was not as robust as it should have been in order to identify connections between accidents and trends which might have helped prevent these accidents. Several changes were implemented following the accidents involving Candidate 1 and Candidate 2 which included the previously discussed revision of the incident reporting process, review of the RG H&S Board to include the CMO as a standing attendee, and the implementation of an RG Clinical Oversight Board, which initially sat on a monthly basis. The findings of the RG Clinical Oversight Board were fed into the quarterly RG H&S Board so that any appropriate actions could be taken.

Exhibit 163-
164

1.4.128. At the time of all four accidents, JSP 950 Leaflet 6-7-7 stated the following in relation to SCT and medical entry standards for the military: 'All candidates should be asked about sickle cell trait. However, individuals with sickle cell trait have a higher risk of developing acute exertional rhabdomyolysis, which may lead to renal failure and death in severe cases.' However, no link was made, prior to the accident involving Candidate 2, between the exertional collapses (and subsequent [REDACTED] and, in the case of Candidate 1, death) of the three CW candidates despite the evidence available at the time. The link with SCT was perhaps more tenuous as only Candidate 3 was [REDACTED] by the RG medical team prior

Exhibit 171

to the accident involving Candidate 2. However, given the direction in JSP 950 Leaflet 6-7-7, the nationalities of the candidates meaning they were more likely to have SCT and the similarities between their clinical presentations it was the opinion of the SI Panel that it was more likely than not that a connection could have been made between all three cases prior to the accident involving Candidate 2.

1.4.129. Candidate 3 was discharged from hospital on 25 June 2019, following 19 nights in hospital and Candidate 4 was discharged from hospital on 15 October 2019, following 26 nights in hospital. Both candidates had spent prolonged periods in Intensive Therapy / Treatment Units and were seriously unwell during their time in hospital. Both accidents happened before the accidents involving Candidate 1 (17 November 2019) and Candidate 2 (27 November 2019). From the evidence discussed above, the SI assessed that RG medical staff were aware of both accidents before the end of October 2019. In addition, by the end of October 2019, RG medical staff were aware that both Candidate 3 and Candidate 4 had suffered [REDACTED] following a small amount of exercise which had resulted in them both suffering [REDACTED] while Candidate 3 [REDACTED]. It was the opinion of the SI Panel that had a more thorough clinical review of the accidents involving Candidates 3 and Candidate 4 occurred before the accidents involving Candidate 1 and Candidate 2, it would more likely than not have identified two diagnoses [REDACTED] following exertional collapse in CW candidates ([REDACTED]).

1.4.130. The SI Panel assessed that the circumstances of the accident involving Candidate 1 were very similar to the circumstances of the accidents involving Candidate 3 and Candidate 4. It was the opinion of the SI Panel that a prompt and thorough clinical review of the circumstances of Candidate 1's death, in liaison with GHH, would very likely have confirmed these similarities and would very likely have identified [REDACTED] following exertional collapse in CW candidates. The SI Panel concluded that had this occurred prior to the accident involving Candidate 2, risk mitigation measures could have been put in place which would have made the accident involving Candidate 2 less likely to happen.

1.4.131. While acknowledging the challenges of obtaining medical information from the NHS, the Service Inquiry Panel finds that the lack of a more thorough clinical review of the accidents involving Candidate 3 (on 6 June 2019), Candidate 4 (on 19 September 2019) and Candidate 1 (on 17 November 2019) was a **Contributory Factor** in the accident involving Candidate 2.

1.4.132. **Recommendation. The Chief Executive Officer Recruiting Group should improve the process used to medically review the**

cases of candidates who suffer serious injury or illness during Soldier Selection so that lessons and trends are promptly identified, in order to reduce the risk of reoccurrence.

Hypothermia

1.4.133. Hypothermia is a dangerous drop in body temperature below 35°C. The normal body temperature is around 37°C. As demonstrated in Table 1.4-1, Candidate 2 (██████) was mildly hypothermic when he had his temperature recorded in the Emergency Department at GHH. In addition, Candidate 1 (██████) had body temperatures below the normal body temperature when they were admitted to GHH. This was supported by a written response to the SI Panel from ARITC which stated (in relation to Candidate 1 and Candidate 2) that 'the 2 CW candidates were both shown to have hypothermia upon admission to hospital'.

Exhibit 90
Exhibit 165
Exhibit 202

1.4.134. ARITC stated that the Army Senior Health Advisor's team had noted that there had been no known deaths or suspected ECAST events in the summer months. ARITC stated that 'It was conjectured that cold caused worsening of SCT symptoms' and also stated that 'It was conjectured that SCT, maximal effort testing, cold and possibly intercurrent viral infection were factors contributing to ECAST.' However, the SI Panel were unable to find definitive evidence in published academic literature regarding any potential links between hypothermia and ECAST, but the SI Panel concluded that, in general, candidates should be prevented from becoming hypothermic whilst unwell prior to their admission to hospital. This was also noted in the report from the internal Capita review that followed the accidents involving Candidate 1 and Candidate 2 (named Project Glass) which recommended 'Action should be taken to review measures to prevent extreme cold in candidates, especially those who become unwell.' The advice given to candidates on what to bring with them was subsequently amended to include warm clothing (eg hats and gloves) for the run in cold weather and a 'Safety Vehicle Checklist' was added as Appendix 1 to Annex A of Assessment & Selection Standard Operating Instruction (SOI) 7 – Delivery of Role Fitness Testing (Entry), after the rewrite of the SOI in early 2020, which included two space blankets and eight woollen blankets.

Exhibit 166
Exhibit 204

1.4.135. Although action was subsequently taken by RG, following the re-write of the SOI in early 2020 it was the opinion of the SI Panel that the fact that Candidate 2 was mildly hypothermic, and Candidates 1 (██████) had lower than normal body temperatures when they had their temperature recorded on admission to hospital was an avoidable situation.

1.4.136. While it could not be directly linked to an increased risk of Exertional Collapse Associated with Sickle Cell Trait (ECAST) or an

OFFICIAL SENSITIVE

increased risk of death following ECAST, the Service Inquiry Panel finds that candidates developing lowered body temperatures whilst unwell prior to their admission to hospital was an **Other Factor**.

1.4.137. **Recommendation.** The Chief Executive Officer Recruiting Group should ensure that all candidates, and especially Commonwealth candidates, are given appropriate advice on the clothing to be worn while undertaking the Role Fitness Test (Entry) 2km run in cold weather and should ensure that the safety vehicle is suitably equipped, in order to prevent hypothermia in all candidates.

Role Fitness Test (Entry) (RFT (E)) Factors

Introduction

1.4.138. This section will identify the factors, or observations, related to the Role Fitness Test (Entry) (RFT (E)) on 17 and 27 November 2019, relating to the accidents involving Candidate 1 and Candidate 2. It will provide an explanation of the various Role Fitness Tests (RFTs) that were used within the Army and an overview of the supporting documents that provided direction and guidance. It will determine if the staff involved were acting in the normal course of their duties during the RFT (E), if they were suitably qualified, and discuss the safety procedures of the RFT (E). It will identify the level of compliance with the RG Standard Operating Instruction (SOI) and compare policy and practice. It will consider if the equipment used during the RFT (E) was appropriate, sufficient and fit for purpose and comment on the fatigue implications of each individual's activities prior to the start of the 2km run element of the RFT (E). Finally, it will discuss whether lessons learned in previous accidents have been acted upon.

Physical Training (PT) in the Army

PT guidance and research

1.4.139. Army General and Administrative Instructions Volume 1 Chapter 7 (AGAI Vol 1 Chap 7) provided specific guidance for the delivery of physical education and training within the Army. The aim of AGAI Vol 1 Chap 7 was 'to direct the requirement to conduct Physical Training (PT) in line with MOD policy'. Paragraph 7.00.1 stated: 'Success on operations is influenced by the physical ability and performance of the individual officer and soldier in every role. The purpose of Physical Training is to ensure personnel are able to withstand the rigours of Service life and supports a good level of health.'

Exhibit 205

1.4.140. Physical Employment Standards (PES) were implemented as a method of physical testing across the Army. The PES study conducted a Job Task Analysis¹⁹ (JTA) to quantify the physically demanding tasks performed in job roles. The JTA was undertaken to develop PES for Ground Close Combat²⁰ (GCC) and Non-Ground Close Combat²¹ (NGCC) roles that measured the physical demands of Common Soldiering and Role Tasks. The aim was to modernise and define the specific work-related physical demands that Service personnel were required to perform in specific Army roles. The PES study incorporated a

Exhibit 206-208

Exhibit 212

¹⁹ A Job Task Analysis was an examination and breakdown of the demands specific to a particular task within the workplace.

²⁰ Ground Close Combat roles were infantry or Royal Armoured Corps roles. [AGAI Vol 1 Chap 7 p.7-8].

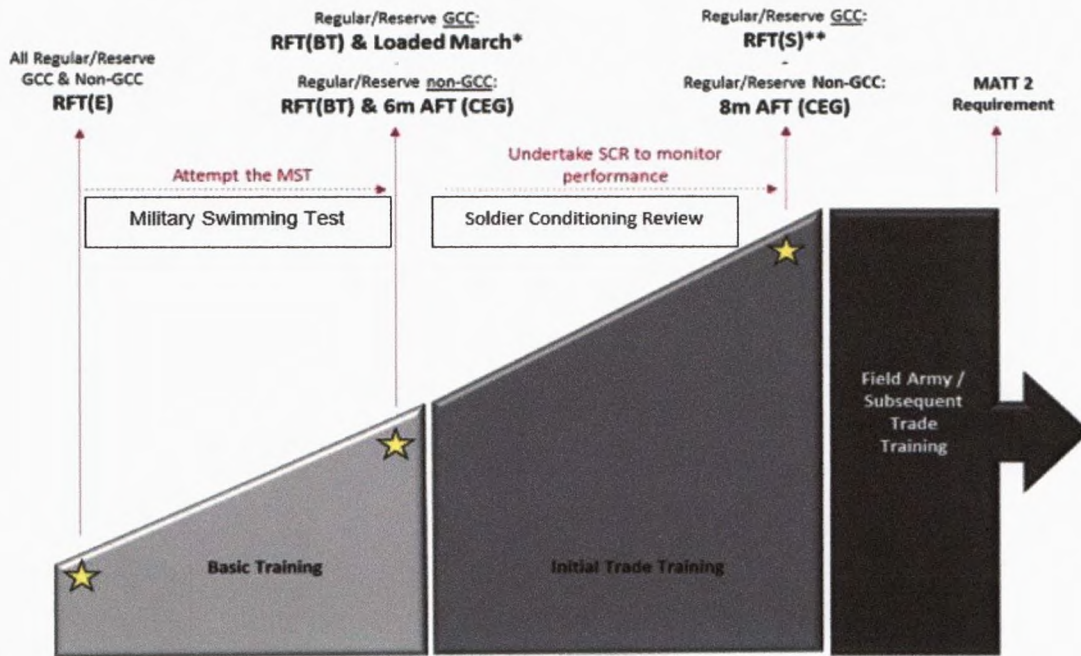
²¹ Non-Ground Close Combat roles were all other Army roles. [AGAI Vol 1 Chap 7 p.7-8].

structured suite of RFTs, which included the RFT (E). This was defined by the Army as the modern measurement for physical fitness for Army personnel and it was evidence-based and legally defensible. PES testing standards were divided into two areas: GCC and NGCC.

Army PT progression

1.4.141. A generic illustration of the PT training pipeline is at Figure 1.4-9. The RFT (E) was the first PT test in the training pipeline that was endorsed by the Army. The test was conducted during Soldier Selection and in Basic Training (BT). The RFT (E) was the physical entry standard that was to be achieved by all those that wanted to serve in the Army. The RFT (BT) was the second test in the RFT series and had to be completed by recruits in BT. From 1 April 2019, the RFT (E) and the RFT (BT) were introduced into BT as input and output standards, replacing the previous Physical Selection Standards (Recruit) (PSS (R)). The progression of tests from the RFT (E), to the RFT (BT) and to the RFT (Soldier) (RFT (S)) was the endorsed measurement to assess if Army personnel had the physical ability required for their role so they could safely and satisfactorily complete essential tasks. None of the candidates discussed in this report took part in the RFT (BT).

Exhibit 206
Exhibit 209-210



* Specific standards for the Loaded March are contained within MATT 2
** Specific standards for Regular and Reserve personnel are contained within MATT 2

Figure 1.4-9 – Illustration of the PT pipeline.

Exhibit 209

1.4.142. From 1 April 2019, the RFT (S) replaced the Annual Fitness Test (AFT) and became the in-Service Military Annual Training Test

Exhibit 208
Exhibit 211-212

(MATT) for Regular and Reserve GCC²² personnel. MATTs were a set of training activities that had to be completed annually by every soldier and officer in the Army. MATTs were divided into ten topics²³ that covered a range of subjects, of which PT was MATT 2. MATT 2 mandated that all GCC personnel completed it as the in-Service fitness requirement. Between April 2019 and September 2019, a transition period was in place to permit all GCC personnel to prepare for the implementation of the RFT (S) in October 2019. Specific standards for Regular and Reserve personnel were contained within MATT 2 as shown at Figure 1.4-10. None of the candidates discussed in this report took part in the RFT (S).

Implementation of the RFT (E)

1.4.143. Prior to the implementation of the RFT (E), a 'Commander Home Command Decision Brief' was published on 12 December 2018 to endorse the implementation of the RFT (E) on 1 April 2019 in the ACs. Commander Home Command was responsible for recruiting and BT in the Army. The RFT (E) replaced the PSS (R) on 1 April 2019, within the Soldier Selection process at ACs. The PSS (R) consisted of a power bag lift, jerry-can carry and 2.4km run. The RFT (E) was implemented after a study of the PES and it was a gender and age neutral strength and conditioning assessment. The specific role-related standards could be found in AGAI Vol 2 Chap 40, Annex C for GCC and Non-GCC. A summary of the minimum standards of the RFT (E) is shown in Figure 1.4-10.

Exhibit 208
Exhibit 210
Exhibit 212-
215

²² Reserve GCC personnel completed the RFT (S) Interim up to 31 March 2021, before transitioning to the full RFT (S) requirements from 1 April 2021.

²³ Military Annual Training Tests (MATTs) were: MATT 1 - Personal Weapon Training, MATT 2 - Physical Fitness, MATT 3 - Battlefield Casualty Drills (BCD), MATT 4 - Chemical, Biological, Radiological and Nuclear, MATT 5 - Navigation, MATT 6 - Operational Law, Ethical Behaviour and Security training which underpinned the moral component of fighting power, MATT 8 - Survive Evade Resist Extract (SERE), MATT 9 - Countering the Explosive Ordnance Threat, MATT 10 - used to train all ranks of the British Army who deployed on Op TEMPERER in accordance with Defence and legal obligations.

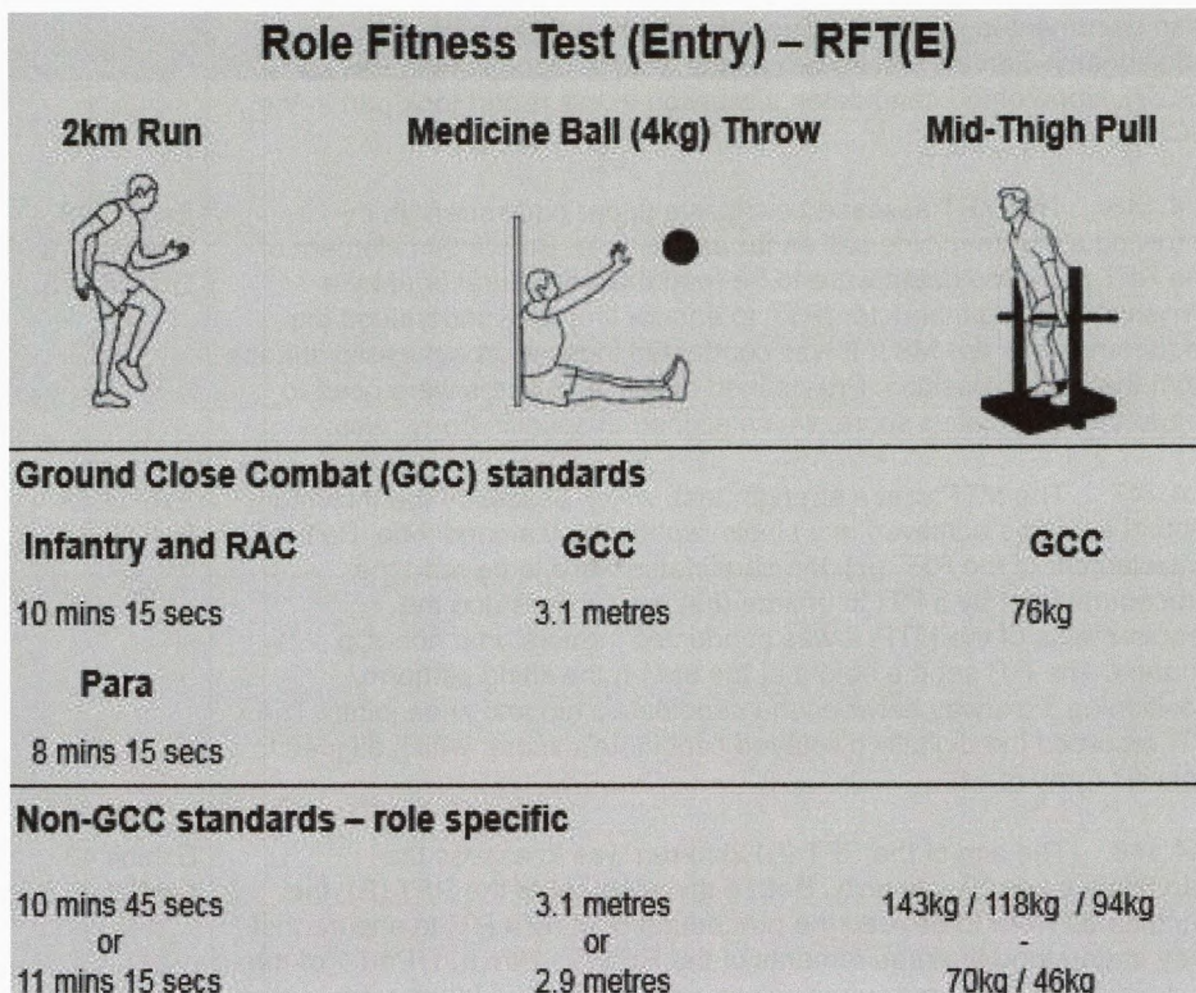


Figure 1.4-10 – Exercises and minimum standards for the RFT (E).

Exhibit 216

The RFT (E) in the Soldier Selection process

1.4.144. AGAI Volume 2 Chapter 40 (AGAI Vol 2 Chap 40) was the recruitment policy that detailed the standards of the RFT (E). It stated: 'The Army entry test (RFT (E)) will be used at Army Selection Centres²⁴ and at the start of BT to ensure recruits and officer cadets are at the appropriate level of fitness to commence BT.'

Exhibit 206
Exhibit 210

1.4.145. The RFT (E), used during the Soldier Selection process, consisted of a seated Medicine Ball Throw (MBT), a Mid-Thigh Pull (MTP) and a timed 2km run. The two gym-based exercises were the MBT and the MTP and they were completed, at AC (L), the day before the 2km run. The guidance on the delivery of the test was contained in RG Standing Operating Instruction 7 (SOI 7), dated July 2019. The rationale for two of the elements of the test (the MBT and 2km run) was

Exhibit 43
Exhibit 217

²⁴ The term Army Selection Centres refers to Assessment Centres.

OFFICIAL SENSITIVE

also documented in MATT2. They were also used as part of an additional in-Service test known as the Soldier Conditioning Review (SCR). None of the candidates discussed in this report took part in the SCR.

1.4.146. The MBT assessed explosive upper body strength by throwing a 4kg medicine ball as far as possible. Before this element of the RFT (E), candidates were to be read the procedural brief by a Physical Training Instructor (PTI) to ensure that they understood the requirements of the MBT. It was conducted indoors on a non-slip surface from the seated position. Pre-defined distance markers were used to grade the candidate's score, which aligned to specific Army roles.

Exhibit 43
Exhibit 210
Exhibit 215

1.4.147. The MTP was a strength test, which assessed the maximum lift that could be achieved in a single repetition by a candidate. Before this element of the RFT (E), the candidates were to be read the procedural brief by a PTI to ensure that they understood the requirements of the MTP. It was conducted indoors on a non-slip surface. The PTI set the height of the bar on the lifting platform, positioning it midway between the candidate's hip and knee joints. The PTI recorded the digitally displayed candidate's score, which aligned to specific Army roles.

Exhibit 43
Exhibit 210

1.4.148. The aim of the RFT (E) 2km run was to assess the candidate's aerobic capacity. Before this element of the RFT (E), the candidates were to be read the procedural brief by a PTI to ensure that they understood the requirements of the RFT (E) 2km run. Part 1 of the test was a PTI-led warm-up consisting of a measured 800m route, which was to be completed within a minimum time of 6 minutes 30 seconds and within a maximum time of 7 minutes. Part 2 was an individual best-effort 2km run, with times which aligned to specific Army roles.

Exhibit 43
Exhibit 217

RFT (E) Staff and Staff Training

The Physical Training Instructors (PTIs)

1.4.149. PTI1 and PTI2 were present during the accident involving Candidate 1, whereas PTI1 and PTI3 were present during the accident involving Candidate 2.

- a. PTI1 was a civilian employee who had previously been a Regular Army PTI. He had completed the Physical Training Instructor Class 3 course²⁵ in 1990. PTI1 had been employed at

Exhibit 63-65
Exhibit 77-78
Exhibit 81
Exhibit 108-109
Exhibit 218-219
Exhibit 222-224

²⁵ The Physical Training Instructor Class 3 course was an older version of, and equivalent to, the All Arms Physical Training Instructor (AAPT) course.

AC (L) as a PTI since 2001. He had held an accredited civilian PT qualification since 2007.

b. PTI2 was a civilian employee who had previously been a Regular Army PTI. He had completed the All Arms Physical Training Instructors (AAPTI) course in 2010. PTI2 had been employed at AC (L) as a PTI since 2016. He had held an accredited civilian PT qualification since 2015.

c. PTI3 was a Junior Non-Commissioned Officer (JNCO) in the Army. He had completed the AAPTI Course in 2017, which had a 10-year validity, so he was in-date to deliver Army PT.

1.4.150. All three PTIs were employed by AC (L) in defined PTI roles. During the accidents involving Candidate 1 and Candidate 2, they were conducting the duties expected of PTIs during the RFT (E) 2km run. All three PTIs had completed a PTI course, and the two civilian PTIs held in-date, accredited PT qualifications. Therefore, the SI Panel concluded that all three PTIs were qualified to deliver PT at AC (L) and that they were acting in the normal course of their duties, in-line with their PT qualifications, during the RFT (E) 2km runs on which Candidate 1 and Candidate 2 became unwell.

Exhibit 218
Exhibit 220
Exhibit 224

Medical provision during the RFT (E) 2km run

1.4.151. The items held on the safety vehicle during the RFT (E) 2km run during both accidents were a basic vehicle first aid kit, an Automated External Defibrillator (AED), bottled water and several blankets. The SI Panel were unable to confirm the contents of the first aid kit, how many bottles of water or how many blankets were carried at the time of the accidents. At that time there was no requirement from RG to carry a dedicated list of items on the vehicle and no requirement to audit the kit daily before undertaking the RFT (E) 2km run. The SI Panel were unable to find evidence that the direction in JSP 375 (Management of Health and Safety in Defence) Ch 5 that 'the minimum contents of the First Aid kits in Defence establishments are to conform to British Standard 8599-1' and 'the kits' contents should be enhanced as necessary to reflect the risk profile of the area in which they are located, transported or hazards exist' was followed. A 'Safety Vehicle Checklist' was added as Appendix 1 to Annex A of Assessment & Selection Standard Operating Instruction (SOI) 7 – Delivery of RFT (E) after the rewrite of the SOI in early 2020, and this demonstrated one of several changes implemented by RG soon after the two accidents.

Exhibit 43
Exhibit 204
Exhibit 225-
226

1.4.152. The only medical equipment carried at the time of the two accidents was a basic vehicle first aid kit and an AED. The AED underwent inspection and testing on 13 August 2019 (which was an

Exhibit 221
Exhibit 227-
229

annual requirement) and both PTIs had completed AED training on 9 April 2018 (which had a 3-year currency).

1.4.153. The AED was usually located in the safety vehicle during the RFT (E) 2km run at AC (L) but it was noted in the Project Glass report that 'it is common practice that the last person who stays with the last candidate during the run [the 'Rearmarker'²⁶ PTI] carries the defibrillator.' The SI Panel observed that this occurred during the visit to AC (Glencorse), where the 'Rearmarker' PTI ran with the AED while the safety vehicle remained close to the start-finish line.

Exhibit 81
Exhibit 230-
232

1.4.154. No other AED was available at AC (L) and this was also commented on in the Project Glass report. The Project Glass report recommended that 'A minimum of two defibrillators (one located in the recovery vehicle [safety vehicle], and one in the assessment centre building), should be provided at each of the assessment centres to increase speed of access when needed', and a second AED was provided for each AC from April 2020. The SI Panel observed that this was a good example of a change in safety procedures implemented by RG following the two accidents.

Exhibit 230
231

1.4.155. There was a single, emergency oxygen cylinder in the medical reception at AC (L) at the time of both accidents. However, it was the opinion of the SI Panel that because at the time of the accidents, the staff at AC (L) were not trained to administer oxygen, and neither the use of oxygen to treat ECAST nor the condition itself were widely understood within the UK military, not using oxygen to treat Candidate 1 and Candidate 2 following their exertional collapses was understandable. Using oxygen to treat people suffering with exertional collapse was introduced into three Army documents published in January 2020, after the two accidents occurred.

Exhibit 232
Exhibit 241
Exhibit 261

1.4.156. The SI Panel were unable to find evidence, from the time of the accidents involving Candidate 1 and Candidate 2, of a medical plan or SOI in place for the management of candidates who became unwell at any point during the Soldier Selection process. In addition, at the time of the two accidents, no training other than Basic Life Support (BLS) and AED training was routinely provided to staff at ACs to enable them to manage candidates who became unwell at any point during the Soldier Selection process. These concerns were also raised in the Project Glass report recommendations and a new SOI was agreed in May 2020. At that time, training (including candidate collapse simulation exercises) was being considered but had not yet been implemented.

Exhibit 43
Exhibit 231

²⁶ The term 'Rearmarker' PTI was used in RG policy to denote the PTI tasked with following the last candidate taking part in the RFT (E) 2km run.