

PHYSICAL TRAINING IN THE SOUTH AFRICAN ARMY DURING THE LAST 15 YEARS

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INTRODUCTION

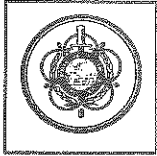
1. During the early eighties injuries amongst South African Army fighting soldiers during initial training became a major problem. At that stage the South African Army was engaged in a counter insurgency war on its borders and the fighting force consisted mainly of young men between the age of eighteen and twenty years of age doing compulsory military training. Most of the soldiers were involved in bush operations and had to cover large distances on foot and carry personal equipment weighting up to thirty kilograms. Under these conditions it soon became obvious that a fighting unit is as fit as its unfittest member, especially during contacts and follow up operations.
2. To prepare for these conditions recruits were pressed to their limits during initial training to enable them to meet with the required standards. Time was also a major limiting factor to prepare for war which made the issue even worse.
3. Incidentally this all came at a stage when television was introduced to the country ten years previously. Although it is not suggested that the television was the major cause that led to physically under developed youth, it was however interesting to note that more than eighty percent of injuries occurred in the lower limbs, especially in the knee and tibia.
4. It must also be noted that at that stage the only means of evaluating fitness was the Cooper test (2,4 Km pass rate 12 minutes). Chief of Army instituted an annual fitness competition and especially fighting units competed vigorously for the honours. The Army's fitness policy was very vague and physical training concentrated mainly on training for the Cooper Test.
5. Against this background it was obvious that the scene was set for injuries to occur during initial training.

AIM

6. The aim of this paper is to indicate how the South African Army successfully managed the injury problem amongst its fighting soldiers and still maintained a high standard of physical fitness.

SCOPE

7. The stress fracture crisis.
8. A new approach and programmes.
9. The effect of physical activities on scholars prior to initial military training.
10. SA Army physical training instructors course.
11. Fitness tests.
12. Video.



THE STRESS FRACTURE CRISES

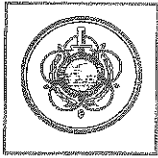
13. In 1982 the incidence and nature of exertion related injuries were studied at a South African Army basic training centre. A total of 404 separate injuries were sustained by 359 of 947 recruits during the 10 week basic training cycle. Of these injuries 18,3% were sustained with (group 1) and 81,7% without (group 2) and obvious sudden precipitating event. Exertion related injuries were responsible for a loss of 2.711 recruits days of basic training. While the knee sustained the largest number of group 2 injuries, lower leg trauma resulted in the greatest loss of basic training time. Forty-two separate radiographically confirmed stress fractures were incurred by 39 recruits, an incidence of 4,12% which is considerably higher than in the US Army. These data leave little doubt that the present training programme is costly in terms of training time lost and may prevent large numbers of recruits from deriving the optimum conditioning benefits. (SA Med J 1986:491-494).
14. In 1984 the South African Army reported a 4,7% stress fracture incidence compared to a 1,3% incidence in the US Army in 1980 and a 2,6% incidence in the UK in 1983.

A NEW APPROACH AND PROGRAMMES

15. Apart from revised physical training programmes a new approach was adopted. The most difficult part of the implementing of a new system was a change in attitude amongst commanders and instructors. The syndrome of "break down first and built up of what remains" had to be removed. The main factors identified as causes for injuries were "too fast, too much, too soon" as well as excessive running in boots especially during initial training. The next approach and programmes mainly entail the following:
 - a. A compulsory cyclic progressive programme for basic and advanced training at all training units.
 - b. The implementing of new fitness tests, which not only was a better indicator, but finally removed the "2,4 km syndrome" as a means of physical training.
 - c. The execution of all physical training in running shoes instead of boots.
 - d. The use of grass surfaces during physical training.
 - e. The banning of physical training as a means of punishment.
 - f. A well planned training and implementing strategy at commanders and instructors level.
 - h. The support of the top structure of the Army and expertise of the Surgeon General biocinetic personal.
16. The new approach and programmes formulated in the Army's strategy were implemented in 1985. The immediate result after completion of the first basic training programme was a decrease in stress fracture to a mere 1,19% in the entire South African Army.
17. The current stress fracture incidence in the South African Army is less than 0,10%. Although this is an extremely low incidence it must be noted that the current fighting force of the South African Army consists of merely black members amongst which stress fractures appear to be most uncommon.

THE EFFECT OF PHYSICAL ACTIVITIES ON SCHOLARS PRIOR TO INITIAL MILITARY TRAINING

18. Introduction. During 1988 the South African Army conducted a research regarding the physical activities of scholars one year prior to reporting for compulsory military training, in order to determine whether such activities could have an effect on the Army's physical training standards. Although the conscription policy is no longer applicable in South Africa the result of the research could be of some value.
19. Summary. 973 White recruits completed a questionnaire regarding physical activities prior to initial



military training and were subjected to the Army's fitness test for members under the age of 25.

- a. 2,4 km test (Cooper) required pass rate 12:00 mins.
- b. Pull-ups required pass rate 8.
- c. Sit-ups required pass rate 60.
- d. Push-ups required pass rate 45.

20. Only 11,5% of the total number of recruits could pass all four components of the test. The average repetitions per component were as follows:

- a. 7 Pull-ups.
- b. 49 Sit-ups.
- c. 37 Push-ups.
- d. 12 Min 30 sec run.

21. 11,9 of recruits from urban areas passed the test and 11% of recruits from rural areas passed the test. This came as a total surprise because a much higher pass rate of rural recruits were expected.

22. The following interesting data also emanated:

- a. 11,1% of recruits who were submitted to formal physical training during the last year at school (82,2%) could pass the test whilst 13,4% of recruits who were not submitted to formal physical training (17,7%) could pass the test.
- b. The frequency of physical training periods during the last 6 months was 4,6 periods per month.
- c. 40,2% reported that they were not tired at all during the physical period.
- d. 12% who participated in organised sports could pass the test whilst 10,6% who did not participate in sports could pass the test.
- e. 10,6% who either walked or cycled to school could pass the test whilst 12,7 who travelled to school by mechanical means passed the test.

23. Conclusion. Physical activities currently conducted at school level contribute very little if anything to physical preparedness in the military. It is not suggested that it is the school's responsibility but emphasizes the fact that the modern young soldier must physically be properly prepared for his military task to minimize injuries and still achieve the required fitness standard.

SA ARMY PHYSICAL TRAINING INSTRUCTORS COURSES

24. The South African Army presents two kinds of physical Training Instructors (PTI) Courses, namely the Advanced PTI Course and the Assistant PTI Course. The Advanced PTI Course is presented only at the Physical Training Branch of the Army based at the Army Gymnasium - Heidelberg, while the Assistant PTI Course is presented at different Commands HQ's units throughout South Africa. The two courses mentioned will not be discussed in detail.

ADVANCED PHYSICAL TRAINING INSTRUCTORS COURSE

AIM

25. The aim of the Advanced PTI Course is to equip the students with the necessary knowledge, skills and attitudes which are essential in utilization as an Advanced PTI.



TARGET GROUP

26. Members are nominated by their units according to the needs of the Army but any member who complies with the set entry requirements may also nominate him or herself. The Advanced PTI does not only present PT, but is also expected him/her to manage PT at command and unit levels. There must preferably be at least one Advanced PTI at sub-unit level throughout the SA Army.

ENTRY REQUIREMENTS

27. Members are only permitted to participate in the course if they can meet the following entry requirements:
- All members must be medically fit to execute all stipulated exercises.
 - All members must pass an entrance fitness test which consists of the following:

MEN		WOMEN	
Pull-ups	8		
Sit-ups	55	Sit-ups	35
Push-ups	38	Push-ups	35
SPEED		SPEED	
Shuffle kicks	100	Shuffle kicks	70
Shuttle-relays	10x25 m in 62 sec	Shuttle-relays	10x25 m in 65 sec
2,4 km run	11 min/30 sec	2,4 km run	12 min/30 sec

Members are only allowed to fail one component per category. Two minutes are allowed to complete each exercise, except for the Shuttle-relay and 2,4 km run. The dress for fitness test for men is combat boots, combat trousers and a T-shirt; and for women PT dress and running shoes.

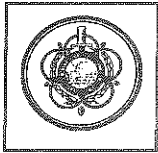
- All members must have a school qualification of standard eight or higher.
- All members must be qualified in Methods of Instruction Part One.

DURATION

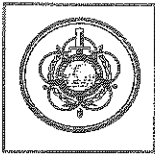
28. Six weeks are used to train male Advanced PTI's for the Army, and four weeks for female Advanced PTI's.

CONTENTS

29. Three modules, which consist of theory, practical PT and sport are presented on the course:
- Anatomy. Students must have a sound background of the main muscle groups found in the human body, anatomical terms, classification of bones, etc.
 - Cyclic Progressive PT. The applicability of cyclic progressive PT is important for all the PTI's and on completing the course students must be able to set up a twelve week cyclic progressive PT programme.



- c. Fitness test. All aspects of fitness tests are dealt with during the course, starting with the fitness test order, preparations for the fitness test, the fitness test itself, the calculation of results and submitting results to the higher HQ.
 - d. Sport Injuries. A knowledge of the physiology of sports injuries that could occur during physical activity, as well as appropriate treatment to be rendered to relieve the symptoms of such injuries.
 - e. Legal aspects of PT. It is important for all PTI's to know exactly what nature of PT can be presented under certain circumstances in order to avoid of law actions against them due to irregularities.
 - f. Assistant PTI Courses. All advanced PTI's have authority to train Assistant PTI's at unit level to assist in the presentation of PT. For this reason it is important for all Advanced PTI's to know the aim and the contents of the Assistant PTI Course.
 - g. Warming up and Cooling off. The physiology of warming up and cooling off must be familiar to all PTI's because of the importance of this during physical activities.
 - h. Management and Monitoring of PT. Because the advanced PTI is the manager of PT it is of utmost importance for him/her to be familiar with all the administration aspects of PT. This includes the compiling of a PT-plan and monitoring of PT at unit level.
 - i. Heat stroke. Heat stroke is a very important subject for all South African Army PTI's because of the severe temperatures experienced at most of the training units in South Africa.
 - j. PT Instructor as Leader. Most students participating in the Advanced PTI Course are in the rank groups of Corporal to Staff Sergeant, and 2nd Lieutenant to Captain. It is however expected of them to present PT to all ranks, and therefore they must have good leadership abilities in order to control members more senior in rank, with the necessary diplomacy.
31. The practical module consists of the following:
- a. Recruit PT (Men) and Freestanding Exercises (Women).
Recruit PT and freestanding exercises are the most basic forms of PT presented to all soldiers in the SA Army. Most soldiers entering the Army are unfit and liable to sustain injuries if PT is presented incorrectly during this critical phase of soldiers fitness, The PTI therefore must ensure that PT is done in the correct way and that personal progression of each soldier is taken into account.
 - b. Combat PT (Men). This includes Buddy PT, rifle PT and pole PT which are used to make the soldier fit for combat. If combat PT is presented incorrectly the possibility of sustaining injuries is very high with a loss of many man hours. All PTI's are made aware of the safety precautions for successful execution of combat PT.
 - c. Aerobic exercises (Women). Aerobic exercises are done only by female members on the Advanced PT Courses. They are trained to present a complete aerobics class including the correct selection of music and exercises. This subject is specially important for the more senior women in uniform.
 - d. Class Competitions. PTI's are taught a variety of techniques in executing class competitions to further military leadership and team work skills under difficult physical circumstances.



32. The Sports module consists of the following:

a. Military Pentathlon, Orienteering, Soccer, Netball, Volleyball and Soft Ball.

Students are taught how to organise, referee and partake in these sports themselves. Advanced PTI's can be utilized as sports officers at their units.

ASSISTANT PHYSICAL TRAINING INSTRUCTORS COURSE

AIM

33. The aim of the Assistant PTI Course is to equip students with the necessary practical skills which would enable them to assist Advanced PTI's in the execution of their practical task.

TARGET GROUP

34. It is compulsory for all junior leaders in the SA Army to complete the Assistant PTI Course. The main task of the Assistant PTI is to present all kinds of practical PT and to assist with the administration of fitness tests. There must preferably be at least one Assistant PTI at sub-sub unit level.

ENTRY REQUIREMENTS

35. All members who complete the Assistant PTI Course must be found medically fit to do the prescribed physical training of the SA Army.

DURATION

36. The Assistant PTI Course is a one week (5 days) course presented at the command or unit where the students are based.

CONTENTS

37. Two modules, which consist of theory and practical PT are presented on the course.

a. Anatomy. The students are taught the placement of the main muscle groups and what exercises can be done to strengthen these muscles.

b. Cyclic Progressive PT. It is important for the students to realise the importance of the building-up process of PT, and not to adapt the attitude of breaking down first before instituting progressive PT.

c. Final Tests. Assistant PTI's are utilized in the notation of fitness tests and therefore it is important for them to have a good theoretical knowledge of such.

d. Legal Aspects of PT. It is essential for all PTI's to know how to conduct themselves in a human and constructive way to ensure that PT is presented according to the PT policy of the SA Army.

e. Heat Stroke. It is important for the Assistant PTI to have a good knowledge of the symptoms and treatment of heat stroke.

39. The practical module consists of the following:

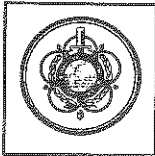


a. Recruit PT (Men) Freestanding Exercises (Women) and Combat PT.

The main task of the Assistant PTI is to assist the Advanced PTI's in the practical aspects of PT such as presentation of recruit and combat PT. For this reason it is essential that all students doing the Assistant PT Course have a sound knowledge of the correct presentation of all kinds of PT conducted in the SA Army. Of the five days available for the Assistant PTI Course, four days are allocated for recruit and combat PT.

FITNESS TESTS

40. Two kinds of fitness tests are done in the SA Army. The one is the command/unit fitness test aimed to determining the number of medically fit members in the command/unit who meet the minimum physical requirements prescribed.
41. The second kind of fitness tests is the individual fitness test aimed at determining the physical abilities of an individual soldier.
42. All components of the fitness test must be done consecutively on the same day. The components of the fitness test include push-ups, sit-ups, pull-ups, shuttle-relays and shuffle kicks. These components make up the battery tests. The fitness tests further comprise of the 2,4 km running test and a route march.
43. The man are divided into three categories for their fitness tests namely:
 - Category A. Infantry and Engineer units.
 - Category B. Armour, Artillery and Anti-Aircraft units.
 - Category C. All other units.
44. The differences in the components of the tests as well as the differences in dress are shown on the attached chart.
45. The maximum execution time for the component of the battery test (except shuttle-relays) is two minutes, with two minutes rest inbetween components. A participant can commence with either the battery test or the 2,4 km running test, but the last component of the fitness test must be the route march.
46. It is compulsory for training units to complete at least three fitness tests a year. Non-training units are bound to do at least two fitness tests annually.
47. The detail of the components of the fitness tests per age group as well as the dress regulations can be seen on the attached chart.
48. Six hundred points are awarded if the prescribed number and times per component is achieved. If more than the prescribed number of exercises, or faster times are achieved, bonus points are awarded. If less than the prescribed number of exercises or slower times is achieved, penalty points are subtracted for each attempt done less, or slower time set. There is no restriction on the number of attempts after the minimum prescribed number is achieved. Bonus points may be gained by the participants in the components he/she is strong in, to compensate for his/her poorer components.



49. The participant fails the fitness test if:
- He/she achieved less than six hundred points in more than one component.
 - He/she achieved less than five hundred points in any one component.
 - He/she does not achieved the minimum total required for the whole test.

50. Components per age group:

	24	25-29	30-35	36-40	41-45	46-50	Above 50
Pull-ups	8 (30 pts/pull-up)	6 (30 pts/pull-up)	-	-	-	-	-
Sit-ups	60 (10pts/sit-up)	50 (10 pts/sit-up)	45 (10pts/sit-up)	40 (10 pts/sit-up)	37 (14 pts/sit-up)	32(14 pts/sit-up)	30 (16 pts/sit-up)
Push-ups	45 (12 pts/puschup)	35 (12 pts/push-up)	30 (12 pts/push-up)	25 (12 pts/push-up)	20 (25 pts/push-up)	16 (27pts/push-up)	14 (30 pts/ push up)
2,4 km	12 min (10 pts/6 sec)	12 min (10 pts/ 6 sec)	12 min (10 pts/ 6 sec)	12 min (10 pts/ 6 sec)	12 min/ 30 sec (10 pts/ 6 sec)	13 min (10 pts/6 sec)	13 min/ 30 sec (10 pts/6 sec)
Route March 15 km	140 min (7 pts/ min)						
Route March 8 km	60 min (14 pts/ min)	60 min (14 pts/ min)	65 min (14 pts/min)	68 min (14 pts/ min)	70 min (14 pts/min)	75 min (14 pts/min)	80 min (14 pts/min)
Shuffle kicks	-	-	-	-	80 (4 pts/kick)	70 (4 pts/kick)	55 (4 pts/kick)
Shuttle Relay	-	-	-	-	62 sec (25 pts/sec)	67 sec (25 pts/sec)	72 sec (25 pts/sec)

Up to 29 years: Pull-ups/sit-ups, push-ups, 2,4 km, route march.

30 to 35 years: Push -ups, sit-ups, 2,4 km, route march.

36 to 40 years: Battery test (push-ups, sit-ups, shuffle kicks, shuttle-relays) or 2,4 km or route march.



51. Dress for fitness tests.

	Battery Test	2,4 km	Route March
/29	Boots, Nutria, trousers, T-shirt	Cat A : As battery test + R4 + skeleton webbing + empty water bottle	Cat A : /24 - As 2,4 km + full water bottle + big bag + 1 set nutria + 2 blankets + 1 pair boots. 25-20 - As 2,4 km
		Cat B : As battery test + R4	Cat B : As 2,4 km
		Cat C : As battery test	Cat C : As 2,4 km
30 + above	Running shoes, rugby shorts, T-shirt	As battery test	Boots, nutria trousers, T-shirts

52. Women's Fitness Tests. Components per age groups.

	/29	30-35	36-40	41-45	46-50	Above 50
Sit-ups	31 (10 pts/sit-up)	27 (10 pts/sit-up)	23 (10 pts/sit-up)	21 (14 pts/sit-up)	19 (14 pts/sit-up)	17 (14 pts/sit-up)
Push-up	38 (215 pts/push-up)	28 (25 pts/push-up)	24 (25 pts/push-up)	18 (25 pts/push-up)	16 (25 pts/push-up)	14 (25 pts/push-up)
2,4 km	13 min (10 pts/6 sec)	14 min (10 pts/6 sec)	14 min/30 sec (10 pts/6 sec)	14 min/30 sec (10 pts/6 sec)	15 min (10 pts/6 sec)	15 min/30 sec (10 pts/6 sec)
Route march 3,2 km	26 min (50 pts/min)	27 min (50 pts/min)	28 min (50 pts/min)	30 min (50 pts/min)	32 min (50 pts/min)	33 min (50 pts/min)
Shuffle kicks	75 (10 pts/kick)	50 (10 pts/kick)	40 (10 pts/kick)	30 (10 pts/kick)	20 (10 pts/kick)	15 (10 pts/kick)
Shuttle relay (10x25 meters)	65 sec (25 pts/sec)	68 sec (25 pts/sec)	76 sec (25 pts/sec)	86 sec (25 pts/sec)	96 sec (25 pts/sec)	102 sec (25 pts/sec)

Up to 29 years: Push-ups, sit-ups, shuffle kicks, shuttle relays, 2,4 km run or 3,2 km route march.
 30 years and older: Battery test (push-ups, sit-ups, shuffle kicks, shuttle relays) or 2,4 km run or 3,2 km route march.

53. Dress for fitness tests. PT dress (track suit and T-shirt) and running shoes for all age groups and tests.
