



Current and future physical test regime of the Norwegian Armed Forces



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Current tests and minimum requirements

Primary tests

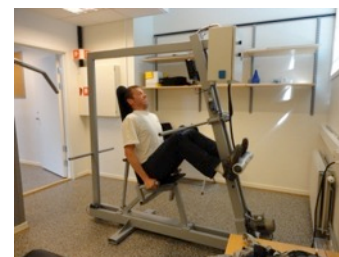


Alternative tests for officers



+ other aerobic fitness tests

Tests at medical screening ("sesjon")



Minimum fitness requirements

- Lower fitness requirements for women and older personnel
- Not much differentiation between different positions
- SOF have their own tests and gender/age neutral requirements

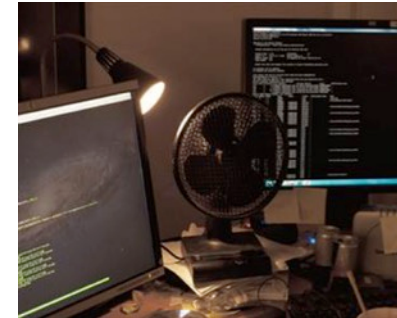


Main challenges with current test regime

Work demands	• Not based on any recent work demand analysis
Tests	• The muscle strength tests are in fact all muscular endurance tests • Validity of strength tests are doubtful • Validity of some endurance tests are doubtful
Minimum requirements	• Not much differentiation between different type of services/jobs • Some tests are more easy to pass than others • No muscle strength requirements for officers



Physical work demands – test methods – minimum requirements

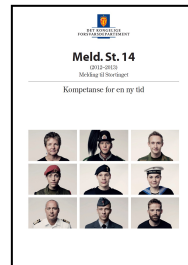


Identify job tasks

Identify the physiological demands related to the job tasks

Decide the minimum requirements

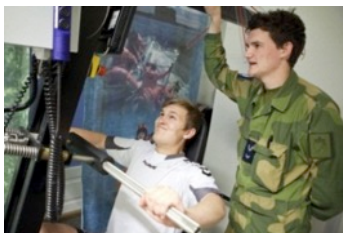
Develop/
select reliable,
valid &
practical tests





Methods

	Work demands	Physical tests	Test requirements
Questionnaire & scenario descriptions	✓	✓	✓
Literature review	✓	✓	✓
Visit military branches (Nordic workshop)	✓	✓	✓
Exposure draft and inputs from the NOAF	✓	✓	✓
Investigate other countries' test regime		✓	✓
Develop new tests/"pre-testing"		✓	
Measure capable soldiers			✓





Questionnaire

Self-reported physical work demands

Military personnel's

- Perceptions, opinions and attitudes
- Physical tests, physical requirements and physical work demands
- Everyday work





Sample

- All NoAF units
- 2134 military personnel
- 47.4 % response rate → n= 1011
- 92.8 % male, 9.8 % female
- 53 % of male and 42 % of female respondents have served in an international operation





Mandatory Annual Physical Test

- **All military personnel:**

90 % agrees - mandatory physical tests annually.

- **Civilian personnel:**

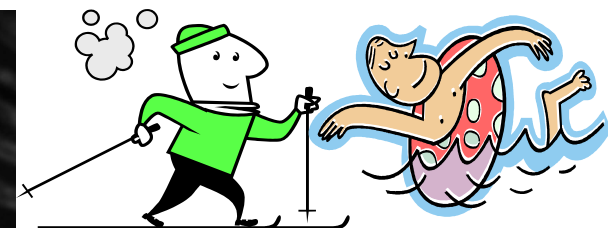
Nearly 60 % answered - they should have physical tests

- **Gender neutral minimum requirements:**

Male (29 %) more positive compared to female (11%).

- **Age:**

Older personnel lower fitness requirements





Studies

Forfattere	Beskrivelse utvalg	Avhengig variabel (kriteria)	Uavhengig variabel (test)	Uavhengig variabel (fysisk egenskap)	Korrelasjon (r) test. vs. kriteria
Bilzon et al. ⁴	Britisk militært sjø-personell. 52 menn (28±5 år) 41 kvinner (29±6 år)	Evakuering av dukke (halv-kropp; 37 kg) i en løype på skipsdekk. Prestasjonsmål: hastighet (m/sek)	BIA-LBM/fettmasse+dukkevekt (ratio)	Antropometri	0,87**
			Stille lengde (cm)	Styrke	0,84**
			1 RM isometrisk løft; upright pull, (N)	Styrke	0,77**
			BIA-LBM (kg)	Antropometri	0,76**
			BIA-fettprosent (%)	Antropometri	0,75**
			Pull-ups (n)	Muskulær utholdenhet	0,72**
			Gripestyrke (N)	Styrke	0,71**
			Push-ups (n)	Muskulær utholdenhet	0,69**
			20 m SRT (est. VO_{2max} i $ml \cdot kg^{-1} \cdot min^{-1}$)	Aerob kapasitet	0,67**
			Kroppshøyde (cm)	Antropometri	0,64**
			2,4 km løp (est. VO_{2max} i $ml \cdot kg^{-1} \cdot min^{-1}$)	Aerob kapasitet	0,62**
			20 m sprints i løpet av 2 min. (n)	Anaerob kapasitet	0,60**
			Sit-ups (n)	Muskulær utholdenhet	0,56**
			Kroppsvekt (kg)	Antropometri	0,40**
			Wingate anaerob overkropp (peak W)	Anaerob kapasitet	0,46**
			Wingate anaerob overkropp (gj.snitt W)	Anaerob kapasitet	0,43**
Knapik et al. ⁹	Amerikanske infanterisoldater. 34 menn (22±3 år)	Kvalitativ vurdering av hver enkelt soldats prestasjon under en 5-dagers øvelse. Prestasjonsmål: rating 1-10	Skyte-test med rifle (antall treff)	Koordinasjon	0,41*
			1 RM isometrisk styrke bryst (N)	Styrke	0,36*
			1 RM isometrisk løft; upright pull, (N)	Styrke	0,36*
			1 RM dynamisk markløft i maskin (N)	Styrke	0,36*
			Direkte målt VO_{2max} ($ml \cdot kg^{-1} \cdot min^{-1}$)	Aerob kapasitet	N.S
			UVV-fettprosent (%)	Antropometri	N.S
			1 RM isometrisk styrke legg/hofter (N)	Styrke	N.S
			1 RM isometrisk styrke ryggstrekk (N)	Styrke	N.S
			APFT score (sit-ups, push-ups, 3,2 km løp)	Diverse	N.S
			Thorstensson anaerob bein (peak & gj.snitt W)	Anaerob kapasitet	N.S
			Wingate anaerob bein (peak & gj.snitt W)	Anaerob kapasitet	N.S
			1 RM isokinetisk arm (N)	Styrke	N.S
			1 RM isokinetisk bein (N)	Styrke	N.S
			Kroppsvekt (kg)	Antropometri	0,59(*)
			Hudfold-fettprosent (%)	Antropometri	0,54(*)
			VO_{2peak} bein ($ml \cdot kg^{-1} \cdot min^{-1}$)	Aerob kapasitet	0,53(*)
Bishop et al. ⁸	Amerikanske Hær-kadetter 47 menn (20 ±1 år)	Hinderløype som bestod av mange ulike bevegelser slik som løping, klatring, kryping, balansering. Meste parten av aktivitetene innebar kun flytting av egen kroppsvekt. Prestasjonsmål: tid (sek.)	VO_{2peak} overkropp ($ml \cdot kg^{-1} \cdot min^{-1}$)	Aerob kapasitet	0,51(*)
			Wingate anaerob armer peak power/KV (W/kg)	Anaerob kapasitet	0,48
			Wingate anaerob bein mean power/KV (W/kg)	Anaerob kapasitet	0,48
			Wingate anaerob bein mean power/KV (W/kg)	Anaerob kapasitet	0,43
			Høyde (cm)	Antropometri	0,38
			VO_{2peak} bein ($L \cdot min^{-1}$)	Aerob kapasitet	0,35

Other countries Test-regime

Land	Gren/bransje	1-4 km løp	4-8 km løp	Cooper test	Pakningsløp / marsj	20 m SRT	Tredemølle- test	Ergometer- sykkel test	Push- ups	Sits- ups	Pull- ups	Alternativ pull-ups	Rygg- hev	Spent- hopp	1 RM test	Sprint / agility	Svømme- test	Fleks- ibilitet	BMI/Bod- y comp	Andre/Punk. rel. tester	Ref.
Norge	Sesjon	•					•								•						13
Norge	VPI, GBU, GOU	•							•	•	♂	♀								•A	9
Norge	Årlig befalstest	○															○			•B	10
Norge	FSK opptak	•			•				•	•	•		•				•				11
Norge	MUK opptak		•						•	•	•						•			□C	14,15,16
Sverige	Sesjon				•			•	•	•	♂		♂		•						17
Sverige	Rekrutt/befal				•				•	•	♂		♂	•							12
Sverige	Befal Hær	○			○	○		○	•	•	♂		♂	•			•				17
Sverige	Opptak GOU					•			•	•	♂		♂	•			•				17
Danmark	Alle			○	□*	○				♂	•		♂							••D	17
Finland	Alle			○				○	•	•				•					•	○E	17
Finland	Prof. soldater			•	○				•	•				•			□			••F	17
USA	Army basic	•							•	•									•		5
USA	Army Read. (forslag)	•							•	•				•		•			•		4
USA	Army Comb. (forslag)															•				•R	4
USA	Army Ranger	•	•		•				•	•	•						•		•		6
USA	Navy Seal	•							•	•	•						•		•		1
USA	Navy basic	○							•	•							○		•		2
USA	Air basic	•							•	•									•		7
USA	Marine corps		•						•	•	♂	♀							•		3
USA	Coast Guard	•							•	•							•	•	•		8
Tyskland	Spesialstyrker			•	•				•	•				•			•	•		•I	
Tyskland	Gr.løp. soldatutd.	•										•				•					32
Tyskland	Gr.løp. offiserutd.			•					•	•				•		•				•N	36
Sveits	Inntak hær basic					♂M								•	•						31
Australia	Inntak alle grener					•			•	•											26
Australia	Inntak GOU	•							•	•											27
Australia	Inntak spesialstyrke					•			•	•											28
New Zealand	Inntak alle grener					•			•	•											29
Canada	Alle					•			•	•				•							18
Canada	Alle (ny)																			•G	19
Canada	spesialstyrker				•	•			•	•	•				•		•			•H	20
Storbritannia	Hær GOU					•			•	•											21
Storbritannia	Hær rekrutter	•										□			•□					•J	22
Storbritannia	Sje rekrutter	•							•	•										•K	23
Storbritannia	Sje offiserer/vervede	○				○													○L		25
Storbritannia	Luft GOU	○				○			•	•											24
Storbritannia	Spesialstyrker	•			•				•	•							•				20
Irland	Inntak alle grener	•							•										•		30
India	Opptak hærsoldater	•									•									•	35
Frankrike																					
Østerrike	Inntak yrkessoldat	○						○	•		•			•							33
Østerrike	Opptak jegerstyrke	•															•			•O	34
Østerrike	Opptak falkskjermj.	•							•		•									•P	34
Nederland	Generell basic			•					•	•											



Endurance

	3000 m løp	10 km langrenn	500 m svømming	20 km sykling	8 min. ro- test	20 m SRT	8 km pakningsløp	Sesjon trede- mølletest	Ferdighets- merker
Content validity	Green	Red	Red	Yellow	Green	Green	Green	Green	Yellow
Criterion validity	Green	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Green
Face validity	Yellow	Red	Yellow	Red	Red	Yellow	Green	Yellow	Green
Reliabilitet	Yellow	Red	Green	Yellow	Green	Green	Yellow	Green	Red
Sensitivitet	Yellow	Red	Red	Yellow	Green	Green	Yellow	Green	Red
Tidseffektiv	Green	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Red	Yellow
Enkel for testledere	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Red
Utmattelse	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow
Ressurser/ utstyr	Green	Red	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow
Skaderisiko	Green	Green	Green	Green	Green	Green	Yellow	Green	Yellow



Preliminary conclusions

- Include muscle strength testing also for officers
- Include maximal strength/power tests (exclude one or more of the muscular endurance tests)
- Muscle strength and aerobic fitness tests are prioritized (no body composition, anaerobic fitness, speed, flexibility tests etc.)
- Some of the endurance tests should be removed, or only made available for officers in jobs with low physical requirements
- 3000 meter run will still be the main endurance test
- More differentiation on fitness minimum requirements in relation to individual job tasks
 - Positions with **high** physical demands: min. requirements not adjusted for gender and age
 - Positions with **medium** physical demands: min. requirements partly adjusted for gender and age
 - Positions with **low** physical demands: min. requirements fully adjusted for gender and age



Deadline for our work: November 2014



Defence staff will take the final decision



Implementation 2015/2016?



THE NORWEGIAN DEFENCE UNIVERSITY COLLEGE



NORWEGIAN SCHOOL OF SPORT SCIENCES
Defence Institute

Thank You!