

NFPA Medical Guidelines

Thomas Hales, MD, MPH
Senior Medical Epidemiologist
Team Leader, NIOSH Fire Fighter
Program – CVD component



Learning Objectives

NFPA 1582:

- Aerobic requirements of structural FF
- Medical Evaluation
 - Cardiac screening tests
- Medical clearance for candidates and members with cardiac conditions.



National Fire Protection Association

Quincy

- Non-profit
Mission - Reduce burden of fire and other hazards by:
- Codes & Stds
 - Research
 - Training & Education



Standard Setting Process

- ANSI
 - Consensus based
 - 5 Steps to Develop/Revise
 - Public input at each step
- Fire Service OSH Committee
 - 30 members
- Open Meetings



FSOSH Committee

- 1500 Series
 - 1500 – OSH Program
 - 1521 – FD Safety Officers
 - 1561 – Incident Mgmt
 - 1581 – Infectious Disease
 - 1582 - Medical Program
 - 1583 - Fitness Program
 - 1584 - Rehab

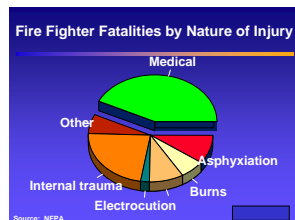


FSOSH Committee

- Format
 - Body or Text
 - required
 - Appendix
 - For “informational purposes only”
- Voluntary



Why Medical Stds for FF?



7

Outline

- Aerobic requirements of structural FF
- Medical Evaluation
 - Cardiac screening tests
- Medical clearance for candidates and members with cardiac conditions.



8

Essential Job Tasks - 1582

- FF tasks
- Wear SCBA
- Exposure to hazards
- Stairs w/ PPE (60lbs) & tools (40 lbs)
- Turnout Gear
- Carrying/dragging victims
- Advance hoselines
- Climb ladders
- Emergency setting
- Driver/operator
- Complex problem solving
- Communication
- Team member



9

Aerobic Demands

Essential Job Task	MVO ₂ (ml/kg/min)	METS
• High rise pack – stairs, PPE & tools (~80lbs)	44	12.5
• Carrying/dragging victims	20	6
• Ladders climb	33	9.3
• Hose Drag	36	10.2

OVERALL – 10-12 METs required.

Sources: Glenhill et al. Can J Spt Sci 1992;17(3):207-13.
Energy Costs of Firefighting: www.strengthcats.com/metstable.pdf



Physical Ability Assessment

- IAFF
- IAFC
- developed and validated

11

Outline

- Aerobic requirements of structural FF
- Medical Evaluation
 - Cardiac screening tests
- Medical clearance for candidates and members with cardiac conditions.



12

Candidate Evaluation

Standard

- Hx
- Exam
- Lab tests as indicated

Annex A

- Hx (Med, Occup, Fam, Social)
- PE with vision testing
- Blood tests (CBC, SMA-7, LFT, Lipids)
- Urine dipstick
- Audiogram
- Spirometry
- CXR (PA & Lat)
- EKG (resting)
- ID (PPD, BBP, DT booster, MMR booster)



Member Evaluation

Standard

- Annual
- Candidate Medical Evaluation Annex plus:
 - (resting EKG)
- Stress Test (as clinically indicated)



Member Evaluation

TEXT

- Resting EKG

Annex A (not part of STD, informational purposes only)

- “Periodic resting EKG have not been shown to be useful but can be reasonable as a member’s age increases.”



Member Evaluation

TEXT

- Stress Test (ST) (as clinically indicated by Hx & Sx) +/- echo or imaging

Annex A

Submax ST (85% MHR) to screen for aerobic capacity.

Diagnostic ST for

- 1) FF with + submax ST
- 2) Angina
- 3) M>45 and F>55
 - ≥2 CAD risk factors:
 - Total cholesterol >240
 - HTN (sys>140 or dias>90)
 - Smoking
 - DM
 - Family Hx MI or SCD (1st Deg Relative <60yrs)



Stress Tests (ST) T in Asymptomatic Individuals

USPHS - PSTF

- No ST in asymptomatic people
- “screening individuals in certain occupations (pilots, truck drivers, etc.) can be recommended on other grounds, including the possible benefits to public safety.” [1996]



Coronary Artery Calcium (CAC) Scoring by EBCT - Asx

ACC/AHA

- 2000 – no
- 2007 –
 - Lo risk – no
 - Intermed risk - maybe
 - Hi risk - no

USPSTF

- 2004 –
 - Lo risk – no
 - Hi risk - unclear

Source: Greenland, et al. JAmCollCardiol 2007;49:378-402
Fowler-Brown, et al. AnnIntMed 2004;140:569-72



Outline

- Aerobic requirements of structural FF
- Medical Evaluation
 - Cardiac screening tests
- Medical clearance for candidates and members with cardiac conditions.



19

Medical Conditions for:

Candidates

- Category A conditions
 - Precluding
- Category B conditions
 - Possibly precluding

Members

- Physician guidance regarding restrictions (if any) for the 13 essential job tasks.
- FD decision whether they can accommodate



20

CAD

(Angina, MI, Angioplasty, CABG)

Candidates

- Cat A

Members

- Cannot safely perform most EJT unless



21

CAD -Members

No Restrictions if:

- No angina
- No stenosis of major CA (>70% lumen)
- NI LVEF
- Exercise tolerance >12 METS during EST
- No exercise induced angina
- No ischemia or arrhythmias during EST (imaging)
- No persistent or modifiable RF for plaque rupture (tobacco, HBP, Chol >180, LDL>100, HgbA1c>7)

22

HTN

Candidates

- If end-organ damage
 - Cat A

End-organ damage – Not specified:
Eye - retinopathy
Kidney – nephropathy
Heart – CAD & LVH

Members

- Uncontrolled HTN - Cannot safely perform EJT 1,5,7,9,13

Uncontrolled HTN defined as:

- Sys >180
- Dia >100
- Mean Sys > 120
- End organ damage



23