INTRODUCTION: Multiple daily missions and G-force induced stress are remarkable challenges for a fighter pilot’s physical performance. Severe physical fitness related health threads are present: G-induced loss of consciousness, spinal shrinkage due to G-forces, soft tissue injuries around spinal column and cervical premature degeneration caused by airspace monitoring. Since 1996, Finnish Air Force has used an experimental, specific occupational fitness test pattern to assess the pilot candidate’s baseline physical performance before the basic flight training syllabi.

METHODS: Physical performance in air combat missions consists of aerobic endurance (long lasting, recurrent missions; recovery), anaerobic power (G-tolerance, Anti-G straining maneuver), maximal isometric strength (G-tolerance, spinal protection) and coordination (muscular control). These factors were measured in the Aeromedical Center during pilot selections between 1997 and 2004. Indirect maximal bicycle ergometer, contact mat jumping, isometric maximal neck and trunk force dynamometer and ball throw (through IR curtain) tests were used. Also BMI was determined. Two youngest 5 year cohorts and their development were followed up.

RESULTS: 326 male conscripts (age mean 20, SD 2) entered to basic flight training. 29 young pilots were followed up. Mean aerobic endurance was 4,0 W/kg (SD 0.5), anaerobic power 23.6 W/kg (7.2), neck flexion 21.2 kg (5.2), neck extension 29.4 kg (4.8), trunk flexion 70.8 kg (15.6), trunk extension 96.2 kg (14.6) and ball throw time 195 ms (14.5). Mean BMI was 24.1 (2.3). Fitness evolved during the conscript time and BMI decreased slightly. During the cadet training period no more positive development occurred, instead minor decrease of performance existed.

CONCLUSIONS: Occupational physical performance does not develop favorably during early years of career. Especially advanced flight training period is currently feasible in fitness enhancing point of view. Pilots tend to regress back to the selection level just, when the physically demanding phase is about to begin. High educational and social demands at early phase together with hard flight duty load might be explanations to the descent. Operational importance of the occupational physical performance might be insufficient compared to other pilot training issues, too. For the time being the demand for high fitness under pilot selection is the only factor to maintain the operational physical performance. More studies are needed to clarify the connections between occupational musculoskeletal morbidity, in-flight exhaustion, success in flight training and physical performance.

Keywords: Testing, Military, Fitness