

Analysis of musculoskeletal status of fighter pilots and candidates.

Baseline, retrospective study of the last 10 years

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Why conduct this study? HUNAF

- No available research results on musculoskeletal issues amongst pilot crew (HUN)
- No available research results on medical disqualifications (HUN)
- Baseline needed for further research on musculoskeletal status and development



Why is this important?

If recognized early and treated well musculoskeletal dysfunctions can be managed easier/cheaper/faster/better.

PREhab can also prevent further damage



The study

- Paper based documentations from the last 10 years.
- Analyzing results from pilot candidates and active pilots
- Separation and classification of the different groups of examination.
- 3 main groups: Fit pilot candidates, Unfit pilot candidates, active pilots



Method of study:

- Based on the medical documentation on HUNAF pilots and pilot candidates 2008-2017
- In total, 382 persons documentation was analyzed, from which
 - 29 pilot, end of flying career
 - 353 candidate.
- From the candidates:
 - 202 Unfit (surgical reasons)
 - 91 Unfit (other reasons)
 - 60 fit to fly



Pilot candidate:

Disqualifying Surgical Diagnosis

| Number | Percent | Diagnosis |
|--------|---------|--|
| 121 | 60 | Schmorl herniation on multiple vertebrae |
| 111 | 55 | end plate dysfunction on multiple vertebrae |
| 109 | 54 | wedge shape deformity |
| 96 | 48 | decreased intervertebral space on multiple segment |
| 91 | 45 | scoliosis less than 8° |
| 78 | 39 | increased or decreased kyphosis |
| 45 | 22 | right convex scoliosis |



Pilot candidate:

Non-disqualifying Diagnosis:

| Number | Percent | Diagnosis |
|--------|---------|------------------------|
| 30 | 28 | scoliosis less than 8° |
| 22 | 21 | right convex scoliosis |
| 18 | 17 | left convex scoliosis |
| 16 | 15 | end plate dysfunction |

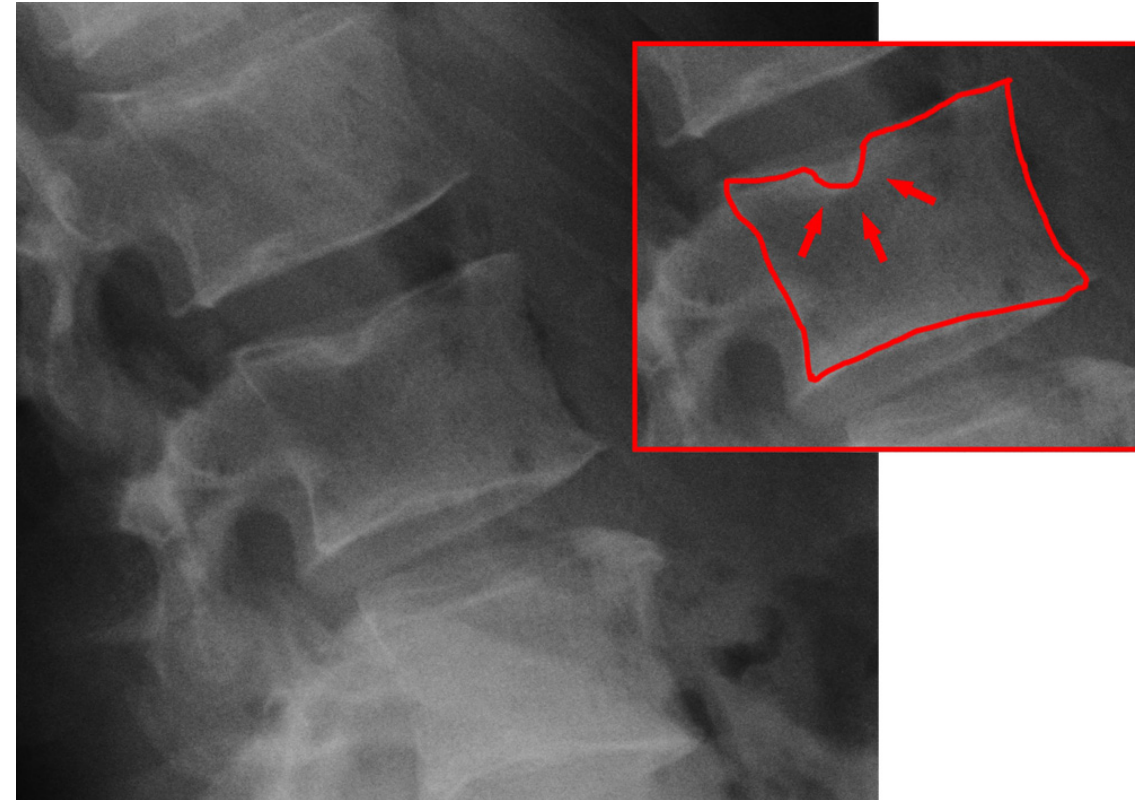


HUNAF regulations:

Schmorl's nodes

- often cause no symptoms
- may simply reflect that "wear and tear" of the spine
- may reflect compromised bone strength
- There is also a strong heritability of Schmorl's Nodes (>70%)
- Schmorl's nodes occur more often in spinal deformity, specifically Scheuermann's disease.

Scheuermann: considered to be a form of juvenile osteochondrosis of the spine.



Active pilots:

29 pilots disqualified due to ongoing symptoms

| Number | Percent | Diagnosis |
|--------|---------|---|
| 15 | 52 | spondylolysis |
| 15 | 52 | Disc degeneration |
| 9 | 31 | disc protrusion, lumbago and radiculopathia |
| 8 | 28 | scoliosis |
| 6 | 21 | discopathia |



Most common findings

Unfit:

- Most common: Schmorl herniation on multiple vertebrae
- End plate dysfunction

Fit:

- Most common: small right convex scoliosis

Pilot:

- Most common: Spondylolysis
- Disc degeneration



Other Pilot candidate:

Disqualified for non-surgical risk factors

| Number | Percent | Area |
|--------|---------|-------------------|
| 38 | 42 | Ophthalmology |
| 28 | 32 | Psychology |
| 10 | 11 | Internal medicine |
| 7 | 8 | Otolaryngology |
| 3 | 3 | Anthropometry |
| 3 | 3 | Neurology |
| 2 | 2 | Cardiology |



Result discussion:

- Complex exercise method is needed, tailor made for flight crew.
- Regular functional check of musculoskeletal status of aircrew.
- A well equipped and easy to access gym is essential for all soldiers including pilots!





Thank you for your attention!