

BACK PAIN

INDIVIDUAL AND GENETIC FACTORS

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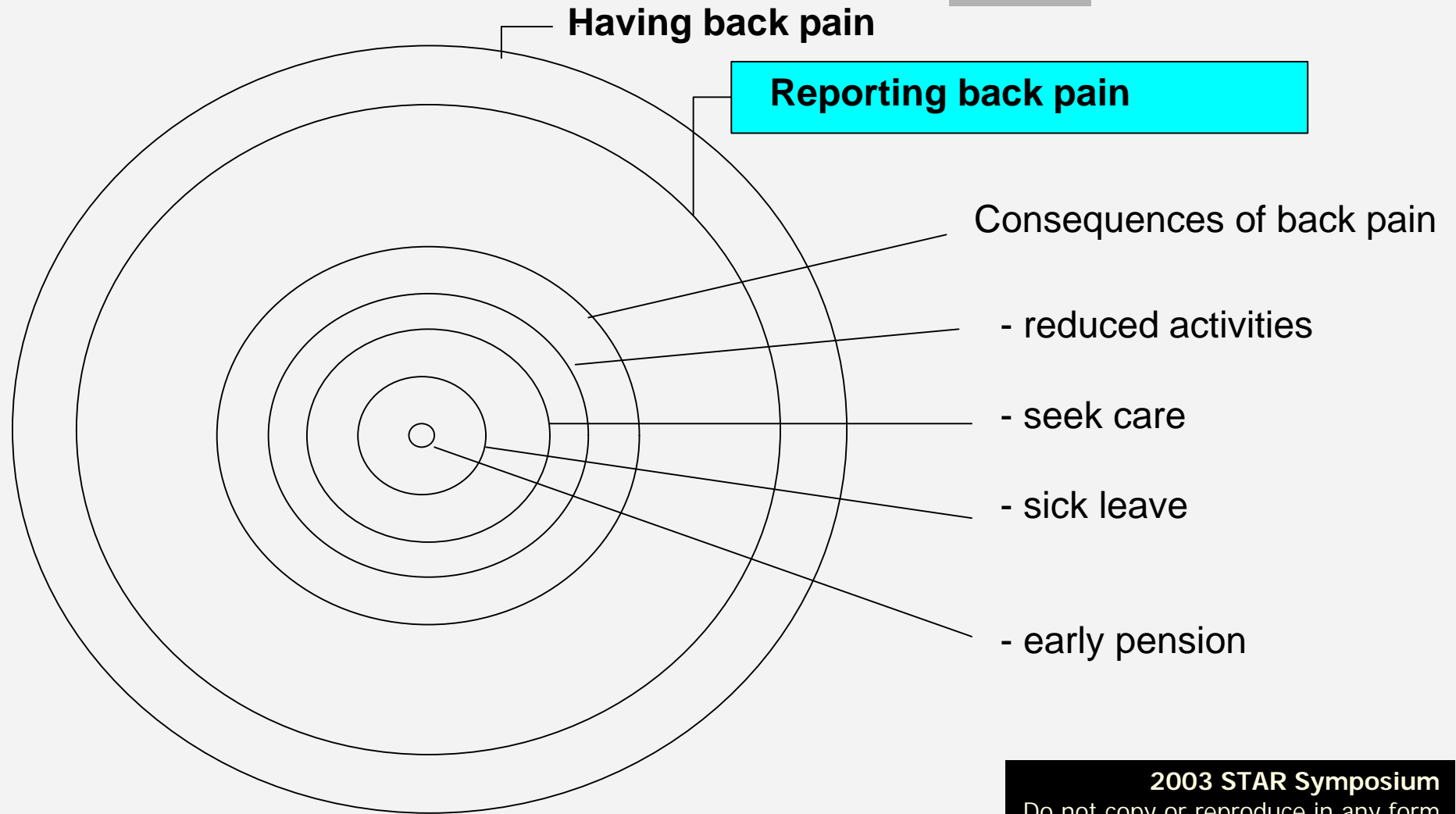
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WHAT IS BACK PAIN?



CLASSIFICATIONS OF "INDIVIDUAL FACTORS"

Cause

Genetic - Acquired

Expression

- Anatomy / morphology
- Personality / psychology
- Behavior

WHAT CAUSES WHAT AND WHEN?

Infant → Child → Adolescent → Adult → Senior Citizen



MY SOURCES OF EVIDENCE

1. Systematic critical literature reviews
2. Epidemiologic studies
3. Genetic epidemiologic studies

1. SYSTEMATIC CRITICAL LITERATURE REVIEW

- ▶ **high ascertainment of articles**
- ▶ **explicit inclusion/exclusion criteria**
- ▶ **objective assessment of quality and outcome**
- ▶ **quantification of results**

2. EPIDEMIOLOGY

- ▶ **large study samples**

- ▶ **representative of the general population**

- The Danish twin registry N=30.000 (12-41 yrs)
- The Swedish military conscript database N=50.000 (18yrs)
- The Odense school study
N=500 (11yrs)
N=300 (15 yrs)
- The Odense MRI study
N=450 (14 yrs)
N=400 (40 yrs)

3a. GENETIC EPIDEMIOLOGY: HERITABILITY

- ▶ Comparison of concordance rates of a finding in MZ vs. DZ twins

MZ = MONOZYGOTIC = IDENTICAL

DZ = DIZYGOTIC = NON-IDENTICAL

- ▶ The concordance rate is higher in MZ pairs than in DZ pairs, if the finding is genetically determined.

3b. GENETIC EPIDEMIOLOGY:

TWIN CONTROL METHOD

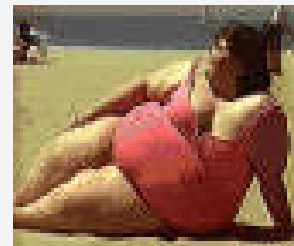
- ▶ If an external factor really causes a disease,
then the MZ twin **with** this factor **will have** the disease
and the co-twin **without** this factor **will not** have the disease.

MYTHS OR REALITY?

Sedentary life style

yes

- physical inactivity
- office work
- obesity
- smoking

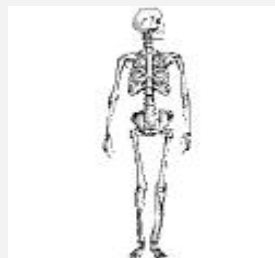


BUT ALSO

Hard physical work.....?



Radiologic findings irrelevant



The evidence

BACK PAIN IN CHILDREN / ADOLESCENTS

	<u>LR</u>	<u>Epid</u>	<u>G Epid</u>
Frail babies	-	No	No
Genetics	-	-	Yes
Lumbar pathology (MRI)	-	Yes	-
Early disc degeneration	-	Yes	-
Co-morbidity	-	Yes	Yes
Height	-	Yes...but	-
Weight	-	Yes...but	No
Social class	Mixed	No	-
Intellectual capacity	-	Yes...but	-
Type of education	-	Yes...but	-
Coping	-	Yes!	-
Alcohol	-	Yes...but	No
Smoking	-	Yes...but	No
Physical inactivity	Mixed	Yes...but	-

The evidence

BACK PAIN IN ADULTS

	<u>Lit. review</u>	<u>Epid.</u>	<u>G. Epid</u>
Genetics	-	-	Yes
Lumbar pathology	-	No...but	-
Disc degeneration	-	Yes	-
Weight	Mixed	Yes...but	No
Smoke	Mixed	Yes...but	No
Hard work	Yes	Yes	Yes
Sitting work	No	No	No

METHODOLOGICAL IMPROVEMENTS

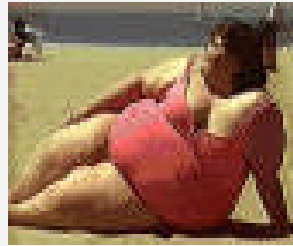
- ▶ Definition of "cause" and effect need to be uniform
- ▶ Large scale studies of general population needed in order to:
 - prevent bias
 - allow for multi variable analyses.
- ▶ Statistical associations not sufficient to establish cause:
Remember the Bradford Hill criteria for causality!
- ▶ Analysis for confounding must be evidence-based and not just a statistical exercise.

CONCLUSIONS

MYTHS or REALITY, revisited

Sedentary lifestyle

NO



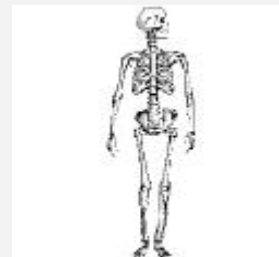
Hard work

YES



Radiologic findings

SOME



BUT ALSO.....

- ▶ genetics, co-morbidity and poor coping
- ▶ weak physiological and psychological construction

NEW POSSIBLE MODEL

Persons at risk
rather than
risk factors

CLINICAL SIGNIFICANCE

- ▶ Early identification of a **high risk population**

would allow for a **selective** preventive approach

