

EMF and Symptoms

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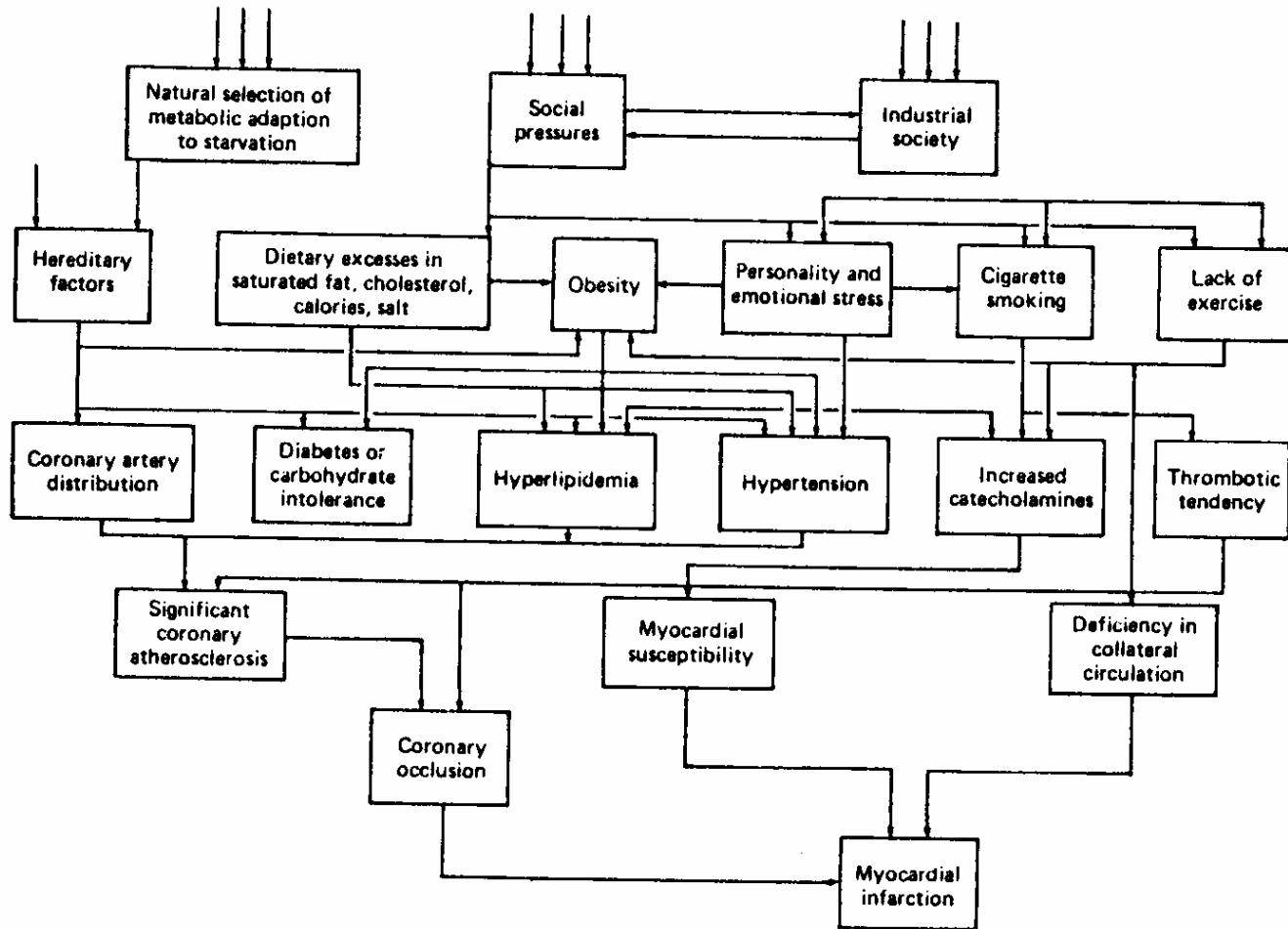
Electrical Hypersensitivity?

Re: Subset of population experiences symptoms in relation to EMF exposure

- Individuals are convinced they suffer from EHS
- Thus, scientists should test hypothesis that EHS exists;
- This is equivalent to test for association between EMF- exposure and symptoms

- Implicated symptoms not well defined, but resemble asthenia
- These symptoms have high prevalence and are multifactorial
- There is no biological marker

Web of causation

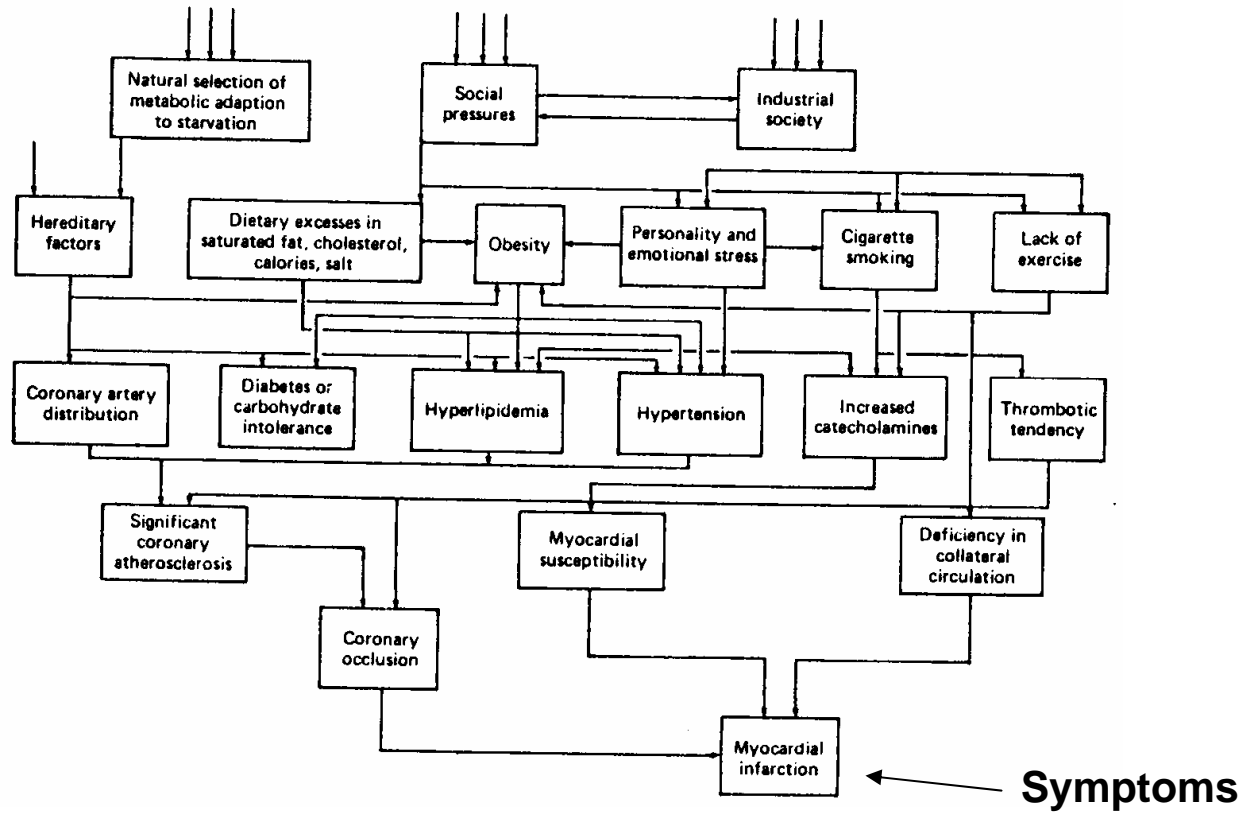


In other words

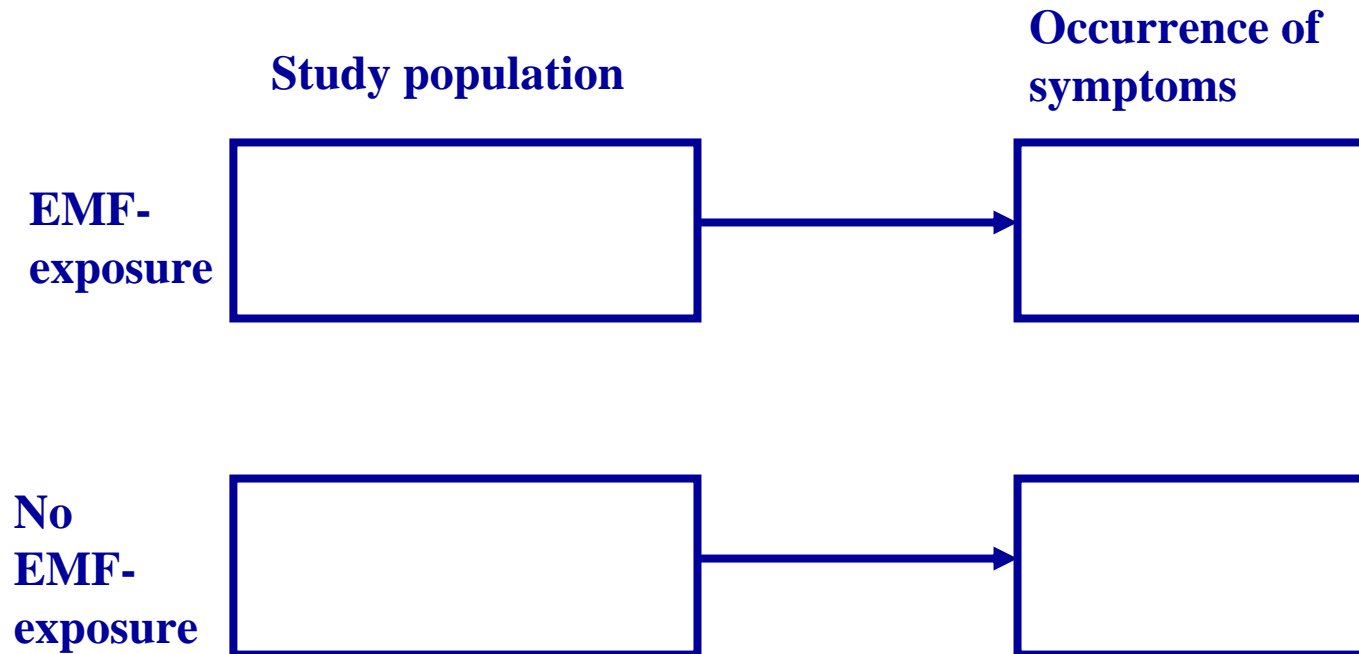
- A set of conditions are required for the outcome to occur
 - Explains why not everyone exposed gets outcome
- More than one route can lead to outcome
 - Explains why not everyone with outcome has been exposed

- Even if a subject with outcome is exposed to a causal factor, this must not necessarily have played a role in this particular case

Is any of these boxes EMF?



Designing study



Difference in symptom frequency?

Exposure and outcome must be assessed independently of each other

Note: Self reported EHS must not be used as outcome!

Some design options

- Experimental (provocational)
Exposure is randomized and blinded
- Epidemiological (observational)
Recall bias is concern
- Natural experiments
E.g., deenergized power lines, inactive transmitters

Some other options

- General population
- Population who report they are EHS
 - In principle easier to detect effect

More options

- ELF
- RF
 - Phone strength
 - Base station strength
- Etc...

Epidemiological studies on RF

- Base stations
 - Santini 2002, 2002, 2003
 - Navarro 2003
- Phones
 - Oftedal 2000
 - Chia 2000
 - Santini 2002

Comments

- All studies cross-sectional
- Response rates low or unreported
- Selection bias?
- Recall bias?

Experimental studies on RF

- Phones
 - Koivisto 2000, 2001
 - Hietanen 2002
- Base stations
 - Swamborn 2003

Comments

- Three different designs
- Association seen in one study, but only for newly introduced system
- Not strong basis to reject existence of EHS

Further studies:

- Experimental design (provocational) obvious choice, for short term effects
- Epidemiological studies may be used for long term effects and when adequate control can be made
- Begin with basic question of association or not