Lifestyle Medicine and Chronic Disease

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Chronic disease categories with lifestyle/environmental determinants

1. Cardio and cerebro-vascular disease
2. Cancers with lifestyle component
3. Endocrine/metabolic disorders
4. Gastrointestinal diseases
5. Kidney disease
6. Mental/CNS health
7. Musculoskeletal disorders
8. Respiratory diseases
9. Reproductive disorders
10. Dermatological disorders
Our inflammatory internal environment

Classical Inflammation vs ‘Metaflammation’

Ref: Egger G, Dixon J. Should obesity be the main game?...Obes Rev 2009
**Determinants in Chronic Disease**

**Lifestyle**
- Smoking
- Starvation
- Excess Alcohol
- Over-nutrition
- Inactivity
- Drug use
- Sleep
- Pollution
- Stress/Depression

**Environment**
- Pollution
- Metaflammation
- Other Mechanisms (e.g., oxidative stress, insulin resistance etc)

**Metaflammation**

**Chronic (Non-Communicable) Disease**


Egger G.
“Anthropogens”: "Man-made environments, their by-products and lifestyles encouraged by these, some of which may be detrimental to human health."

Egger G. P.

‘Clearly, if disease is man-made, it can be man-prevented’
Inflammation:
“a reaction to... injurious agents
...characterised by disturbed function.”

Can be:
- **biological** (‘metaflammation’)*
- **ecological** (‘ecofflammation’)

*Ref: Hotomisligil G. Nature Dec. 2006; 444
Egger G. Obesity Reviews 2008
“Ecoflammation”

“I am a planetary physician whose patient, the living earth, complains of fever.”

James Lovelock; The Revenge of Gaia, 2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Carbon Level (ppm)</th>
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<tbody>
<tr>
<td>1950</td>
<td>250</td>
</tr>
<tr>
<td>2005</td>
<td>370</td>
</tr>
<tr>
<td>2014</td>
<td>400</td>
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Growth rate: ~3ppm/yr (accelerating)

Predicted ‘point of no return’: 500ppm

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Greenhouse gases, the ‘sweet spot’ and climate change

- GHG ‘Sources’
- GHG ‘Sinks’
- Environmental ‘sweet spot’ (sequestration)

Greenhouse Gas buildup leading to climate change
An ‘inflamed’ body in an ‘inflamed’ environment: Part of the same syndrome?


The epidemiology of inflammation

<table>
<thead>
<tr>
<th>Distal Causes</th>
<th>Medial Causes</th>
<th>Proximal Causes</th>
<th>Risk factors/Markers</th>
<th>Dis-ease</th>
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</thead>
<tbody>
<tr>
<td>Industrialization</td>
<td>Energy use Over-consumption Lifestyle</td>
<td>Over-nutrition Inactivity</td>
<td>‘Metaflammation’ Insulin resistance Obesity etc.</td>
<td>Biological Pathology</td>
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<td>Population growth</td>
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<td>-Diabetes</td>
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<td>Economic Growth</td>
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<td>-Sea level rise</td>
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<td>-Extinctions</td>
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</tbody>
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- Energy use Over-production Lifestyle
- Industrial waste Pollution
- ‘Ecoflammation’ Carbon resistance Global warming etc.
Association between economic growth & health (proposed)

**Association between economic growth & health (actual)**

- **Per Capita Gross Domestic product**
- **Year**
- **Benefits (Health & Well-being)**


"From birth to puberty a hamster doubles its weight each week. If, then, instead of leveling-off in maturity as animals do, the hamster continued to double its weight each week, on its first birthday we would be facing a nine billion tonne hamster…… There is a reason that in nature things do not grow indefinitely."


"Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist."

Kenneth E. Boulding Economist and co-founder of General Systems Theory
“...the increase of wealth is not boundless. The end of growth leads to a stationary state. The stationary state of capital and wealth ... would be a very considerable improvement on our present condition.”

“We may need to grow for the next 100 years. But after that a different system will be needed, as nothing can grow forever.”

“Growth beyond maturity is either obesity or cancer.”

So what can be done?

Or is it all doom and gloom?
Lifestyle/Environmental Medicine: ‘More than just ‘blaming the victim"