Swiss Re Institute

What is Metabolic Health? Financial burden and impact of metabolic ill-health

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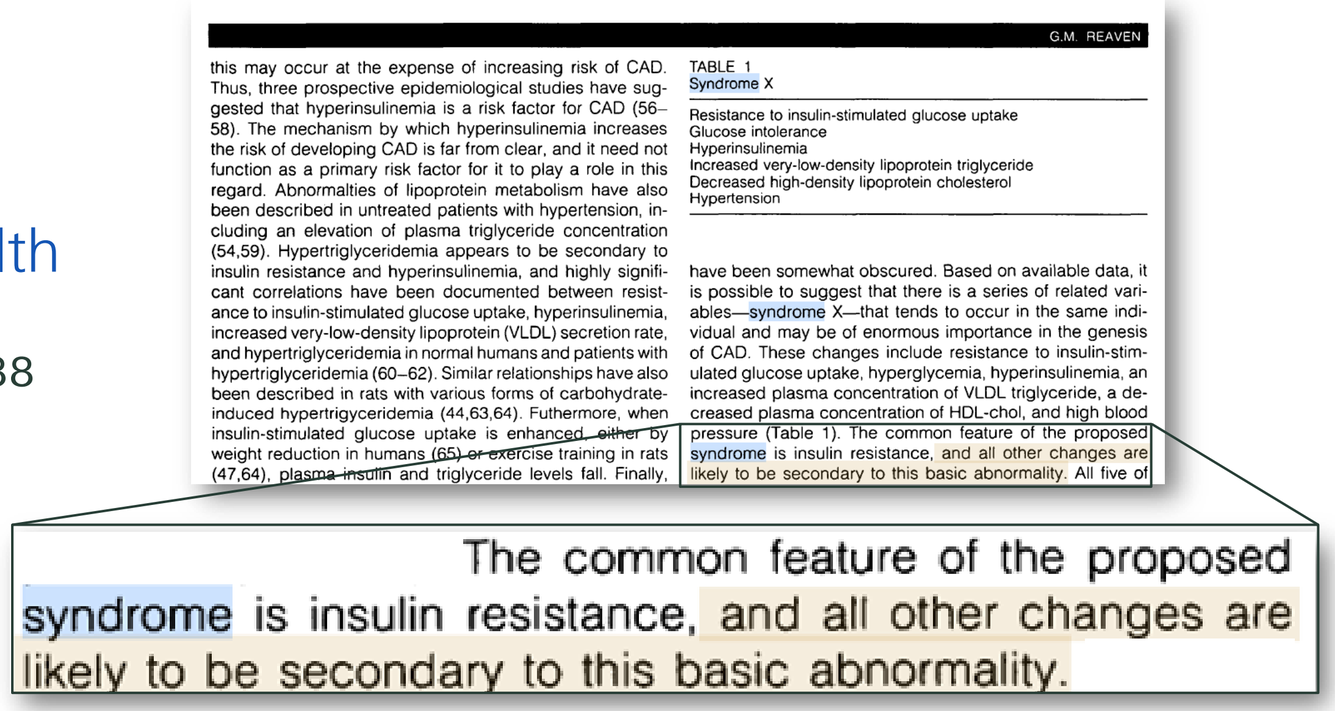
PANNKAKOR
& mjukglass
Säsongens dessert
99:-
All you can eat
129:-

Metabolic Health

- Gerald Reaven 1988



G.M. REAVEN

this may occur at the expense of increasing risk of CAD. Thus, three prospective epidemiological studies have suggested that hyperinsulinemia is a risk factor for CAD (56–58). The mechanism by which hyperinsulinemia increases the risk of developing CAD is far from clear, and it need not function as a primary risk factor for it to play a role in this regard. Abnormalties of lipoprotein metabolism have also been described in untreated patients with hypertension, including an elevation of plasma triglyceride concentration (54,59). Hypertriglyceridemia appears to be secondary to insulin resistance and hyperinsulinemia, and highly significant correlations have been documented between resistance to insulin-stimulated glucose uptake, hyperinsulinemia, increased very-low-density lipoprotein (VLDL) secretion rate, and hypertriglyceridemia in normal humans and patients with hypertriglyceridemia (60–62). Similar relationships have also been described in rats with various forms of carbohydrate-induced hypertrigyceridemia (44,63,64). Futhermore, when insulin-stimulated glucose uptake is enhanced, either by weight reduction in humans (65) or exercise training in rats (47,64), plasma insulin and triglyceride levels fall. Finally,

TABLE 1
Syndrome X

Resistance to insulin-stimulated glucose uptake
Glucose intolerance
Hyperinsulinemia
Increased very-low-density lipoprotein triglyceride
Decreased high-density lipoprotein cholesterol
Hypertension

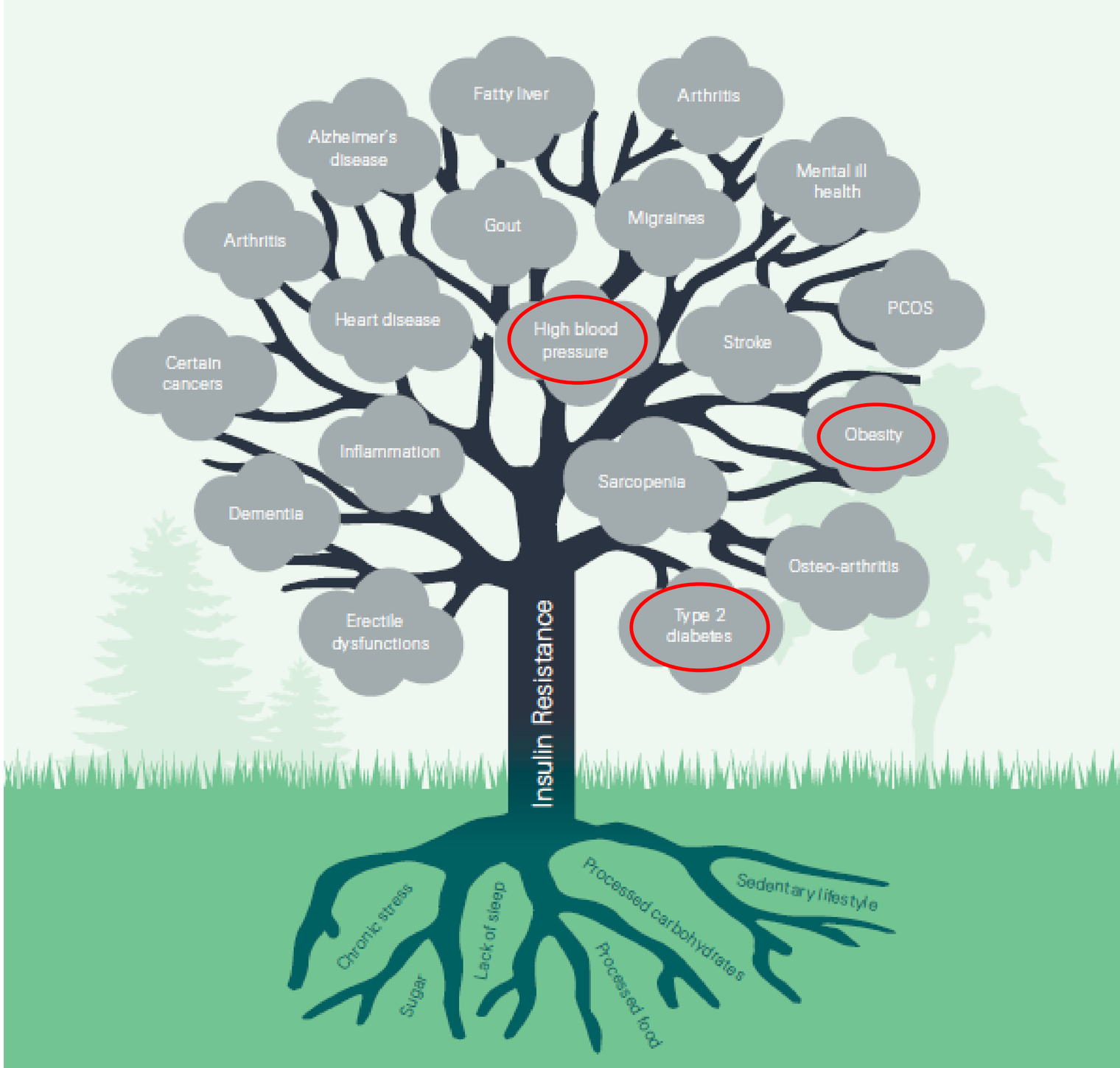
have been somewhat obscured. Based on available data, it is possible to suggest that there is a series of related variables—syndrome X—that tends to occur in the same individual and may be of enormous importance in the genesis of CAD. These changes include resistance to insulin-stimulated glucose uptake, hyperglycemia, hyperinsulinemia, an increased plasma concentration of VLDL triglyceride, a decreased plasma concentration of HDL-chol, and high blood pressure (Table 1). The common feature of the proposed syndrome is insulin resistance, and all other changes are likely to be secondary to this basic abnormality. All five of

The common feature of the proposed syndrome is insulin resistance, and all other changes are likely to be secondary to this basic abnormality.

- “metabolic syndrome” is therefore defined by **insulin resistance**

Insulin resistance is a root cause of many NCDs, not just CVD

→ *Metabolic health requires insulin sensitivity*



Individual mortality impact modelled by Swiss Re

Basic Info

Age	62
Sex	M
Smoker	NS
Term	20
Term left	20
Sum assured	$ 1'000'000

	Baseline (mean)	Difference at 6 months
BMI	31.3	-2.4
Systolic BP	140	-11
Diastolic BP	81	-5
Trigs	199	-66
TC/HDL	5.5	-1.1
HbA1c	7.5	-1.3

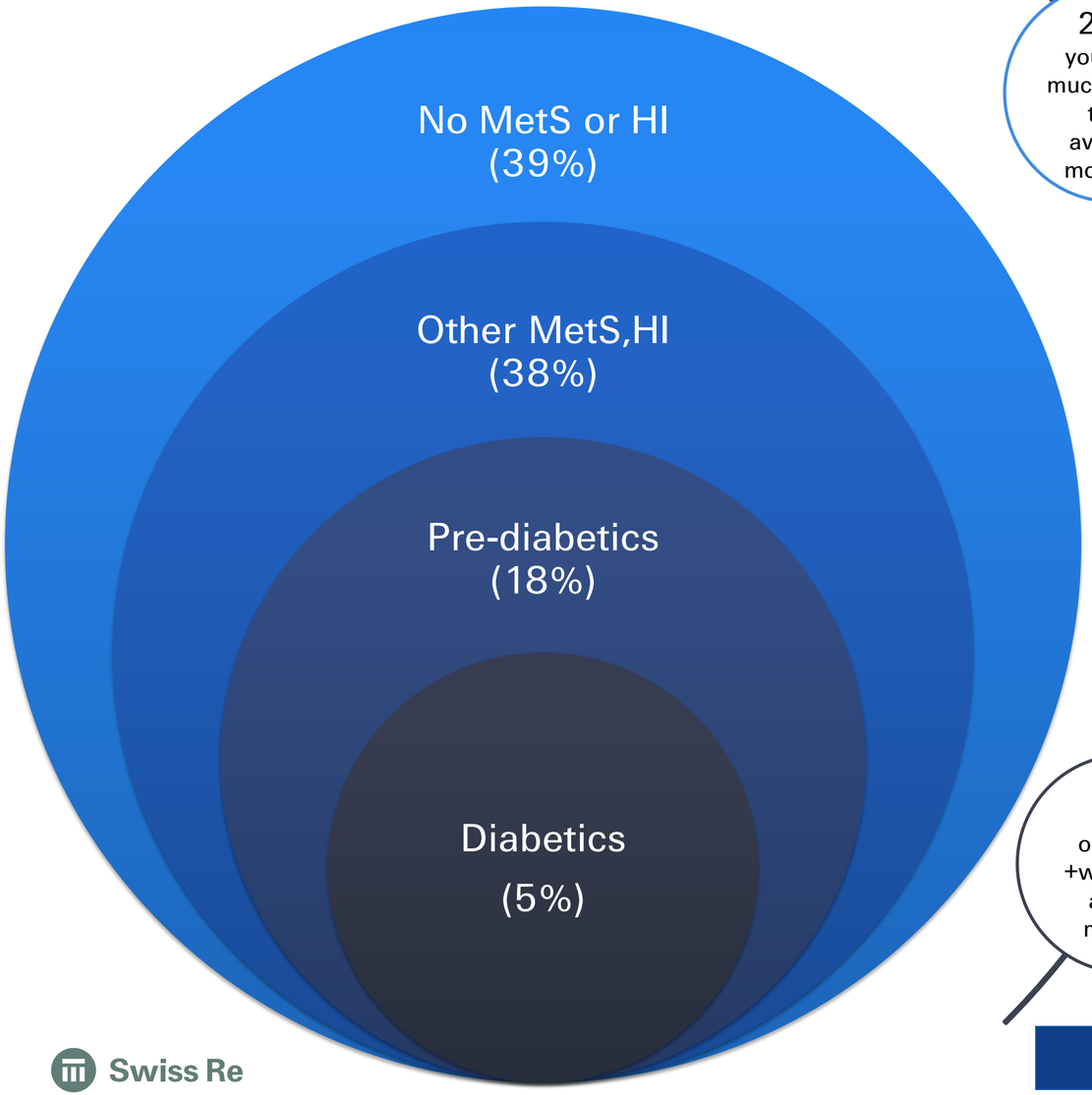
	Expected (standard rates)	Extra deaths (**no intervention**)	Extra deaths (**with intervention**)
Deaths per 1000 (***cumulative, over duration of policy***)	91.4	52.7	32.0
Difference : intervention vs. no intervention (mort saving per 1000)	20.7	Claims reduction:	14.3%
Nominal (undiscounted) cumulative saving	$20'700		

Assumptions :

1. average risk factor improvement as per program data
2. continuation of lifestyle change over duration of policy
3. no change in lapse behaviour
4. only CVD reduction modelled

Mortality claim reduction

Modelled to reduce by 13%



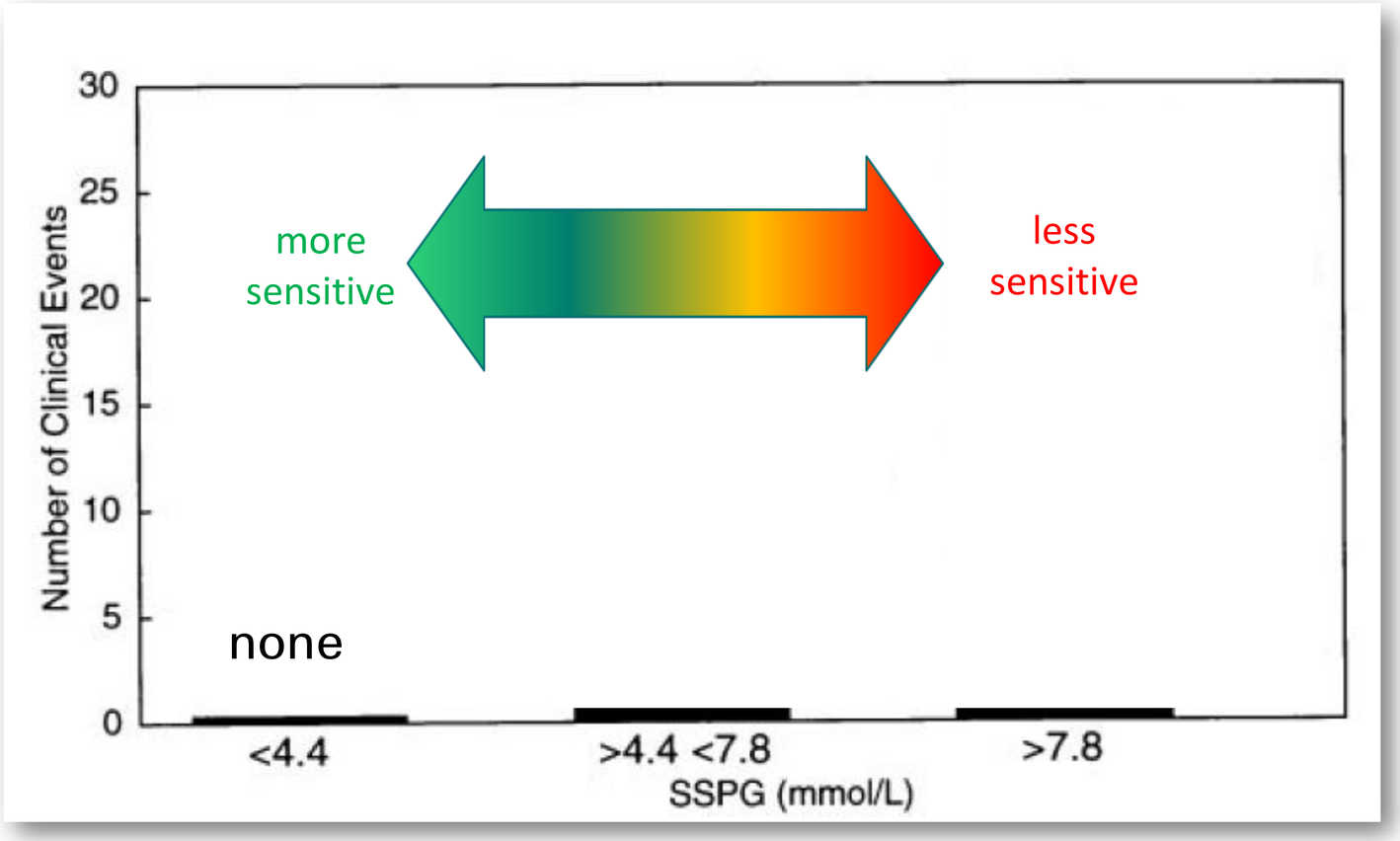
Contribution to Death Claims	Predicted Reduction to Death Claims
20% younger, much better than average mortality	No reduction
43% average age, above average mortality	13% reduction
25% above average age, worse than average mortality	19% reduction
12% older age, +worse than average mortality	26% reduction

13% overall reduction

Event/condition risk difference (by insulin sensitivity in “healthy” adults)

- ~200 **healthy adults, no DM, Hpt, CVD**
- median age 50
- f/u ~6 years
- divided into tertiles of insulin sensitivity (resistance)

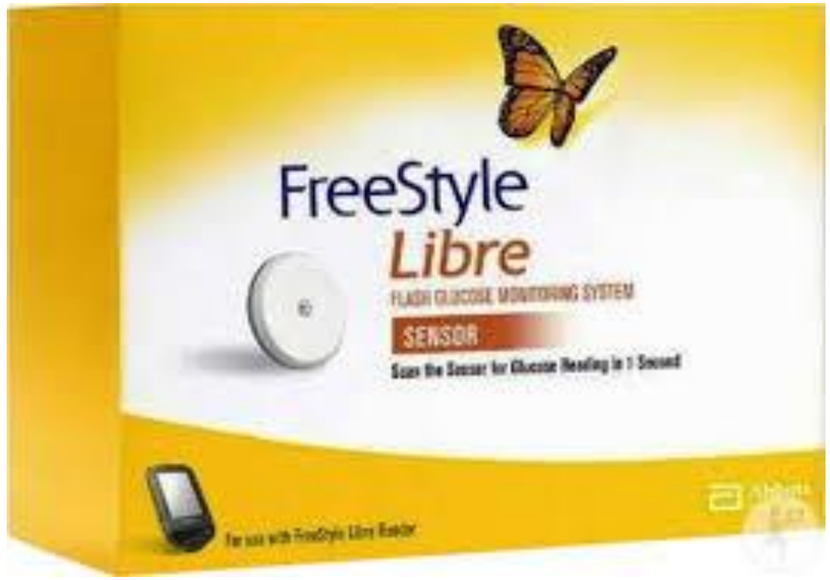
- Diagnoses :
  - hypertension
  - cancer
  - coronary heart disease
  - type 2 diabetes
  - stroke



Facchini et al. The Journal of Clinical Endocrinology & Metabolism, August 2001, 86(8):3574–3578

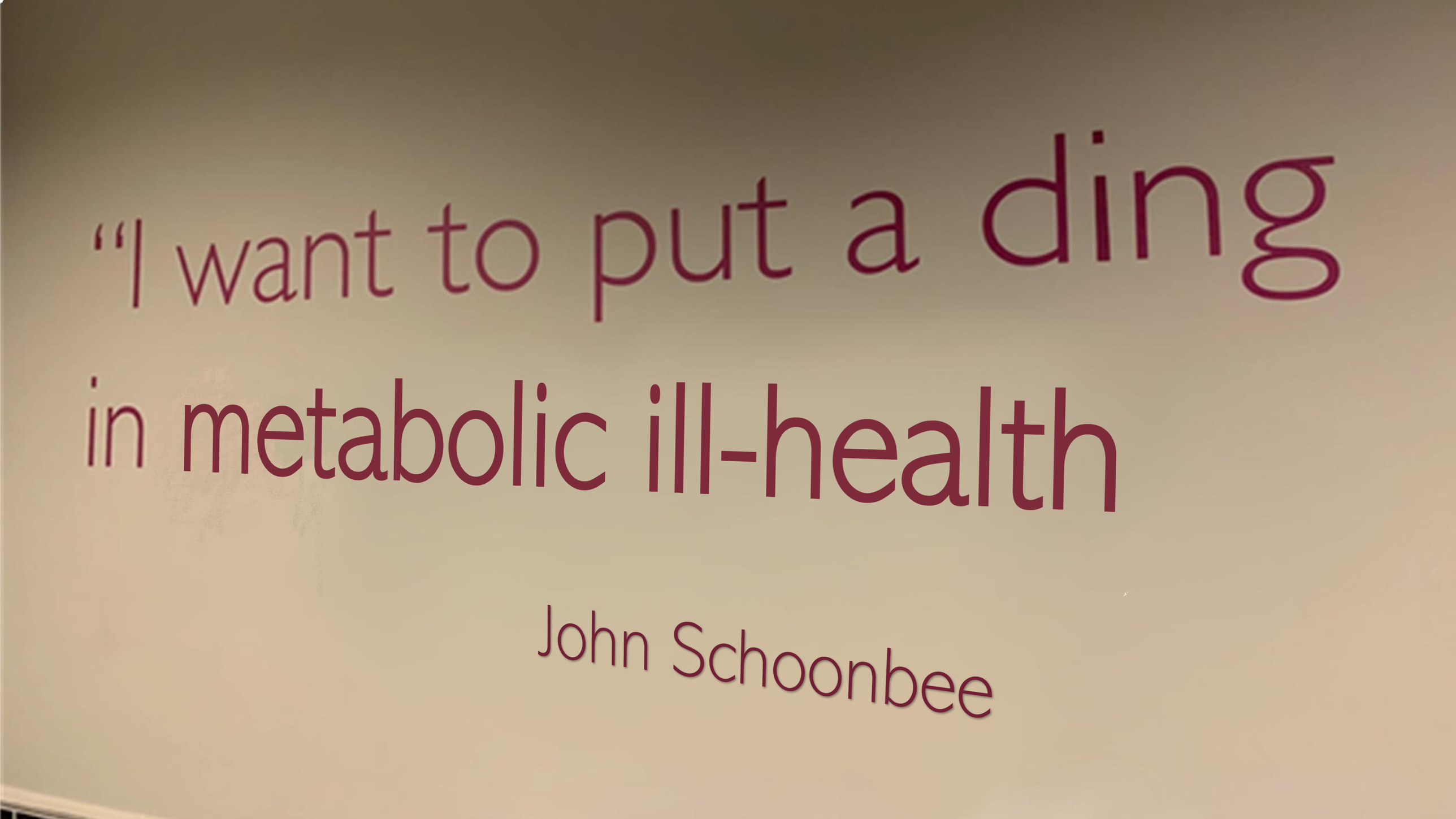
Some logistics

- Listen, learn, engage, consider your OWN bias
- Timing
- Social Media
- A note about CGDs
  - insulin resistance (IR) requires hyperinsulinemia
  - hyperinsulinemia requires (excessive) hyperglycemia
  - hyperglycemia (frequency/extent) is a consequence of food
  - **and therefore knowing what/how foods increase glucose** *seems a novel way to understand and address IR*
  - BUT :
    - we are designed to handle high glucose
    - a spike is normal and expected when eating anything with sugar or carbohydrate!



The offer of taking an Abbott FreeStyle Libre :

- entirely voluntary
- use is at your own risk
- NOT for any clinical use
- for experience and learning ONLY


"I want to put a ding
in metabolic ill-health
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