Metabolic Syndrome and Architecture

What is Metabolic Syndrome?

- Type II Diabetes
- High blood pressure
- Obesity
Metabolic syndrome affects an estimated **25%** of the population.
Metabolic Syndrome and Architecture

In people who suffer from mental illness, Metabolic Syndrome rises from 25% to (2013) 55%–60% and Rising!

Population with Mental Health Illness

without Metabolic Syndrome

with Metabolic Syndrome
And guess what?

It’s REVERSIBLE!
Collaboration with psychiatrist

**Dr Jacqueline Duncan:**
- Psychiatrist with 35 years experience in UK, Ireland, Canada
- Currently working in New Zealand (health board, Wellington)
- Developed a programme for people with Metabolic Syndrome at Waypoint Centre for Mental Healthcare, Penetanguishene in Canada
- Passionate client advocate
- Regular presenter at several conferences

**Anthony Jones:**
- Architect with 18 year’s in Healthcare architecture
- Designed facilities for Acute and Mental Health

**Linda Jordan:**
- Architect with 11 year’s architectural experience (healthcare, public sector, science & research)
- B.Sc. in Psychology
Metabolic Syndrome and Architecture

- How it affects the NHS and us as individuals?
- Costs of ignoring this?
- Why it is important for us to understand?
- What Are The Risks?
What is the RISKS of Metabolic Syndrome?

**Greater risk of:**

- Coronary heart disease,
- Stroke
- Other conditions that affect the blood vessels.
- Linked to forms of Cancer and Dementia
• Worldwide **obesity has nearly tripled** since 1974.

• **1.9 billion** members of the global population who are overweight, **650 million** of whom are clinically obese.

• Obesity accounts for **2-7%** of total **healthcare costs** in developed countries.
The Costs (NHS) on overweight and obesity

- **£6.1 billion** on overweight and obesity-related ill-health in 2014 –15

- Annual spend on obesity and diabetes **greater than the amount spent on the police, the fire service and the judicial system combined**

- Projected NHS costs - overweight and obesity issues projected to reach: **£9.7 billion by 2050**

- Wider costs to society projected to reach: **£49.9 billion** per year
Can we afford to kick the can down the road?
How can architecture help?
Design Considerations

1. Sleep - Light - Noise

2. Stress - Exercise

3. Nutrition - Dental Hygiene
Design Considerations

We will look at:

• What are the major contributing factors?
• How can design help without necessarily costing more ...........?
• Comfort

1. Sleep - Light - Noise
**Design Considerations**

**Circadian rhythm**

**WARNING!**

- Disruptions of the sleep cycle can play a role in the development of metabolic disorders
- When move outside natural circadian rhythm, more cortisol is released
- Stops the effect of insulin
- Contributes to developing Metabolic Syndrome
Design Considerations

Light

- Control, reduce blue light in bedroom
- Regulate lighting - improve biological clock:
  - Encourage lots of natural light exposure during the day
  - Red light sources during evening hours
  - Exposure to blue light at night time has a damaging effect on sleep and circadian rhythms.
- More Natural Light

1. Sleep - Light - Noise

Problems with addictions

Figure 24
Design Considerations

Noise

- King’s College London project on noise, sound and sleep (HPNoSS)
- Noise pollution in UK hospitals - exceeding international recommendations (ref)
- Effects on patients’ ability to rest, heal and recover
- Sound masking
Design Considerations

Noise

- **AVOID** beds back to back
- This arrangement **INCREASES NOISE**

1. Sleep - Light - Noise
Design Considerations

Noise

1. Sleep - Light - Noise

- INSTEAD IMPROVE sleep by offsetting doors
- REDUCE NOISE transfer
- Opportunity – modular design
Design Considerations
Noise - Light

• Take one step further
• No rooms opposite
• REDUCTION in noise transfer
• Opportunity for central atrium and access:
  o to views
  o nature
  o fresh air
  o daylight
Design Considerations

Exercise

- Obesity issues can be due to:
  - Genetic reasons
  - Prescription medications to treat mental illness often lead to increase in appetite
  - Increased appetite due to Stress
- May have had difficulties accessing fitness activities

“...Its solution is not difficult to achieve: eat less, exercise more” (Pitsavos et al, 2006)
“The more unfit you are, the more weight you put on, and the less you want to exercise... it becomes a vicious circle!” (NHS, Great Ormond Street Hospital)

Hospitals have corridors! We can use them to create interesting routes.
**Design Considerations**

**Choice**

- Give feeling of control
- Choice of seating areas
- Split day space
- Reduce stress and anxiety.
- Reduce Blood Pressure
Design Considerations

Stress reduction

- Healing gardens, Cardiology Centre Atrium, University of Michigan Hospitals
- Atrium is designed to offer a relaxing place for patients and their families to spend time away from the ward and treatment areas.

Create visual connections to nature
Metabolic Syndrome and Architecture

Design Considerations
Access to pets/animals

- Risk assessments/ Infection control
- Animals as therapy in mental health (NHS Scotland, The State Hospital – high secure hospital, South Lanarkshire)
- Therapy Animals
- Personal Pet Access / Visitation
- Benefits:
  - Empathy
  - Deal with aggressive thoughts/ feelings

2. Stress - Exercise
Design Considerations

Nutrition

1 person in every 6 will die as a result of over-eating. (Roberts, 2008)

- How design can help
- Education
- Kitchen garden
- Social aspects
- Fresh air
- Exposure to light during the day
- Healthy produce
Design Considerations

Interaction

- Major contributing factors
- Opportunity of Interactive Education

3. Nutrition/ Dental Hygiene

Figure 44

Figure 46
Design Considerations

Kitchen garden

- Eating organic produce
- Get Involved. Assisted Food Cultivation and Preparation
- Improved activity levels
- Improve Self-esteem
- Education
- Social aspects
- Interactive tables

3. Nutrition/ Dental Hygiene
Metabolic Syndrome and Architecture

Design Considerations

Dental Health

• Our dental health and general health are connected!

• Metabolic syndrome occurs when the body develops insulin resistance

• Insulin is essential to cell function so losing the ability to use it causes a huge range of systemic health issues

• Growing evidence to a link between oral inflammation and metabolic syndrome

3. Nutrition/ Dental Hygiene

Oral health is one aspect of metabolic syndrome that we can easily control
Design Considerations

Dental Room

- **Dental Room** within the facility
- Access to Dentist and Hygienist
- Cognitive decline ... Reminders to brush teeth
- Big mirror, good lighting in bathrooms

Body of evidence supports a link between oral inflammation and metabolic syndrome.
Design Considerations

- Adequate alarm buttons for staff
- Burnout prevention
- Room where you can go close your eyes for 15 minutes
- Feel refreshed
- Natural light, clean calming colours
- Tranquil background Sounds.
- Relaxing fragrances
Metabolic Syndrome and Architecture

• What is Metabolic Syndrome?
• What are the causes?
• How it affects us
• Costs
• Design: 1. Sleep - Light – Noise
  2. Exercise - Stress
  3. Nutrition - Oral Hygiene

Remember - Care for the carers

• Consideration when strategically planning and designing decisions
Take action? Or....

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