Reading 2050
The Story

We were designed to be connected to nature

Yet 54% of the world’s population live in cities

Is this disconnection the underlying cause of the epidemics of obesity and other chronic diseases?
Do we need healthy landscapes?
What are we?

Our energy is supplied by an old sea bacterium

- Our genes make up 1.5% of the Genome.
- Almost 50% of our Genome is from viruses.
- We depend on contact with ancient bacteria in the soil to regulate our immune system.

Only 10% of cells in our body belong to us. © 2015 Intelligent Health
We are a Dog’s Dinner
If we take an hour to equal 1,000 years, then four days is 100,000 years – the time from the origin of mankind to today.
Our factory setting is to be in a sociable group, supportive environment and have a purpose

People
Sociable
Connect

Place
Nature
Take Notice

Purpose
Autonomy
Be Active, Give Keep Learning

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What if there was a perfect drug called Fiterix

- Major effect on the faulty immune system reducing the pro-inflammatory markers of anti-TNF factor, C Reactive Protein and IL-6.

- Increases antioxidants and reduces the oxidative stress from Krebb’s Cycle in each mitochondria as measured by reduction in 8-hydroxydeoxyguanosine (8-OHdG)

- Prolongs the life of cells by stimulating Temelorase and lengthening the telomeres at the end of each Chromosome hence prolonging cell life.

- Reduces blood pressure, visceral fat, obesity, fibrinogen, blood pressure, and HDL/LDL ratio and can reduce the atheroma in each coronary artery

- Stimulation of Brain-Derived Neurotrophic Factor Increases repair of neurons in the brain and promotes neural generation and increases grey and white matter with enlarging the Hippocampus.
Fiterix
Fiterix
(aka going for a walk)

Triple Strength
Activity
Friendship
Nature
How does nature benefit health?

(a) Less stressed,
(b) More exercise,
(c) More positive social interactions and
(d) Better quality environment for health promotion (i.e. has lower levels of air pollution)

Fear and Chronic Stress

People
Loneliness

Place
Hostile

Purpose
Lack of control
Loneliness and Stress

- The experience of loneliness is stressful.
- Chronic stress, via its effects on the endocrine and immune systems, enhances risk of long term conditions, (similar risk as smoking 20 cigs a day for CVD)
- Lonelier people experience more sleep disturbances and engage in less physical activity than less lonely people with increased pain, depression, fatigue and poor health.

chronic stress and Inactivity

- Chronic psychosocial stress, increases the risk of physical inactivity and contributes to the epidemic of disease.

Chronic Stress Loneliness

Inactivity
Poor diet
Obesity Smoking
Chronic Stress

- Stress hormones
- Inactivity
  - Poor diet
  - Obesity
  - Smoking

Chronic Inflammation

Mitochondria as a key component of the stress response. Manoli et al. Trends in Endocrinology and Metabolism Vol 18 No 5 2007

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Inflammation: The cause of Causes

Chronic Inflammation starts in children as young as 6 years old.

- Diabetes
- Anxiety and Depression
- Obesity
- Dementia
- Cardiovascular disease
- Cancers
- Arthritis
Walking reduces inflammation

1. Reduces visceral fat
2. Reduces anti-inflammatory
3. Damages healthy cells
Inactivity: trilogy of inflammation

1. Increases visceral fat

2. Reduces anti-inflammatory

3. Damages healthy cells
Reducing inflammation – fat

Variation in visceral fat content in men with the same waist circumference

Visceral fat = 0.5 L
Visceral fat = 1.1 L
Visceral fat = 1.2 L
Visceral fat = 1.3 L
Visceral fat = 1.7 L
Visceral fat = 1.8 L
Visceral fat = 4.2 L
Visceral fat = 4.3 L

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Visceral fat reduction with exercise

Fat loss after 13 weeks of walking 60 mins a day and no weight loss

Inactivity: trilogy of inflammation

1. Increases visceral fat
2. Reduces anti-inflammatories
3. Damages healthy cells
Reducing inflammation – muscles

Contracting muscles release powerful anti-inflammatories called Myokines

These Myokines Circulate around the whole body calming every cell
Inactivity: trilogy of inflammation

1. Increases visceral fat
2. Reduces anti-inflammatories
3. Damages healthy cells
Inside a healthy cell

- Chromosomes keep dividing
- Immune system is switched off until needed
- Mitochondria, healthy and active. Providing lots of energy
Sedentary, high fat diet and stress

Mitochondria

Oxidative Phosphorylation

Reactive Oxidative Species

Anti-Oxidants

Mitochondrial DNA
Physically active, low fat and not stressed

Mitochondria

- Oxidative Phosphorylation
- Reactive Oxidative Species
- Anti-Oxidants
- Mitochondrial DNA
Telomeres get shorter


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Senescence: the end of the cell


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We have a new disease that conventional medicine cannot treat

Chronic Inflammation
Health Benefits of Physical Activity

Those patients who are inactive have:

• 38% more days in hospital
• 5.5% more GP visits
• 12% more nurse visits

REF: Department of Health 2009 Let’s Get Moving
Single Sessions of Physical Activity can enhance Attention and Memory

After 20 minutes of sitting quietly after 20 minutes of walking

Hillman et al. (2009). Neuroscience, 159, 1044-1054
Epigenetics

A potential father who becomes active will alter his genes in the sperm. This can lead to better brain function and lower risk of diabetes in future generations.

Genome-wide sperm DNA methylation changes after 3 months of exercise Denham et al Epigenomics 2015
Mitochondrial damage, telomere shortening, and chronic inflammation

Cardiovascular disease, diabetes, cancer, depression

Pathway of Ill Health

People
- Chronic stress

Place
- Poor health behaviours

Purpose

https://www.youtube.com/watch?v=kYPRV-Ynilk
When everyone stays indoors

People
- Chronic stress

Place
- Lack of walking

Purpose

- Poor concentration, tiredness, irritability, addiction, depression, weakness, chronic inflammation
- Unsafe streets, poor air quality, reduced learning and productivity, dependence on others, less volunteering, isolation,
When activity becomes central

People | Place | Purpose
---|---|---
Happiness | Being active

Increased confidence, greater concentration, less illness, greater contentment, better behaviour.

Increased productivity, safer streets, good air quality, stronger students, community cohesion, independence, more volunteering etc

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Should Happiness be the goal

- Happiness was famously analyzed by Aristotle as being the sole ultimate goal of human existence, meaning that he viewed it the only thing important in its own right, not merely as a means to an end.

- If physical activity is the sole ultimate goal then it may compromise happiness and creates anxiety and a sense of failure if not achieved.

- But if being active is a tool to achieve happiness then it remains sustainable.
The focus has moved physical activity from a venue based strategy ...
... to a community based activity where activity happens everywhere
But to get real scale we need to get lots of people becoming activity leaders themselves.
Beat the Street, Reading 2014, 2015, 2016
900,000+
Over Three Years

Beat the Street
Level of Engagement

East Sussex 44,775
Belfast 36,326
Hounslow: 29,702
Annan/Stranraer 38% of population

300,000+
In 2016 & 2017
Beat the Street inactive matched pairs 12 month data shows increase in activity

(P < 0.001)
Beat The Street Dumfries 6 month later

- There was a 10% increase in the proportion of people agreeing or strongly agreeing with the statement “Living in this neighbourhood gives me a sense of community”

- There was 11% increase in the proportion of people agreeing or strongly agreeing with the statement “I feel like I belong to this neighbourhood”
Cycling Dumfries (6 months later)

- There was a 24% increase in cycling by participants aged 50+ (N=136; P < 0.001).
- 6 months later there remained a 29% increase in the proportion of participants aged 50+ who reported cycling in the past week.
- There was a 18% increase in the proportion of players aged 50+ walking for travel on six or seven days in the past week (N = 134, P < 0.001).
Beat the Street
Changes in Mental Health in Stranraer

Those who had zero days of physical activity at the start of Beat the Street had the greatest increases in wellbeing by the end of Beat the Street.
Beat the Street Reading

Over two years in Reading there has been a 20% increase in the number of people reaching the Government recommended activity levels of 150 minutes a week.

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Green Gym Vs Aerobics

Comparison of heart-rate response during two sessions of activity

- Green Gym
- Step aerobics

V Reynolds 1999
OCHRAD
What kind of town do we want Reading to be
Stressful events

Resilience
- People
  - Caring supportive childhood
  - Strong social networks
- Place
  - Feeling safe and secure
  - Connection to neighbourhood
- Purpose
  - Sense of purpose
  - Sense of control

Weak Resilience

Chronic Stress

Alcohol, Drugs, Smoking

Inactivity

Poor Diet

Stress Hormones
- Catecholamines
- Glucocorticoids

Visceral Fat and obesity

Unhealthy gut microbiota

Diabetes, Dementia, Depression
Cardiovascular Disease
Fatigue, poor concentration, weakness

Chronic Inflammation

Telomere Shortening

Mitochondria Damage
Stressful events

Stressful events lead to:

- Stress Hormones
  - Catecholamines
  - Glucocorticoids

Stressful events also contribute to:

- Visceral fat and obesity
- Stomach Ulcers
- Diabetes
- Dementia
- Depression
- Cardiovascular Disease
- Fatigue
- Arthritis
- Inflammatory Bowel Disease

Resilience

- People
  - Caring supportive childhood
  - Strong social networks
- Place
  - Feeling safe and secure
  - Connection to Nature
- Purpose
  - Sense of purpose
  - Sense of control

Strong Resilience leads to:

- Satisfaction
- Happiness
- Active Lifestyle
- Healthy Diet

Healthy Diet contributes to:

- Telomere shortening
- Mitochondria damage
- Chronic inflammation

Satisfaction and happiness lead to:

- Purpose
- Sense of control

Purpose leads to:

- Connection to Nature
Summary

- We live in a stressful environment

- Isolation disconnection to nature and lack of purpose create chronic stress.

- Chronic stress causes poor health behaviour and leads to Chronic Inflammation (CI)

- CI is the “cause of causes” of most long term conditions

- Health, diet, activity should be means to the end which is Happiness leading to greater potential and productivity.

- Increasing SP should move to a social movement through digital platforms and Insight
Building Active Communities
William.bird@intelligenthealth.co.uk