

# Investing in musculoskeletal health in children



**Helen Foster**

Professor Paediatric Rheumatology

Newcastle University, UK

Great North Children's Hospital

Newcastle upon Tyne, UK

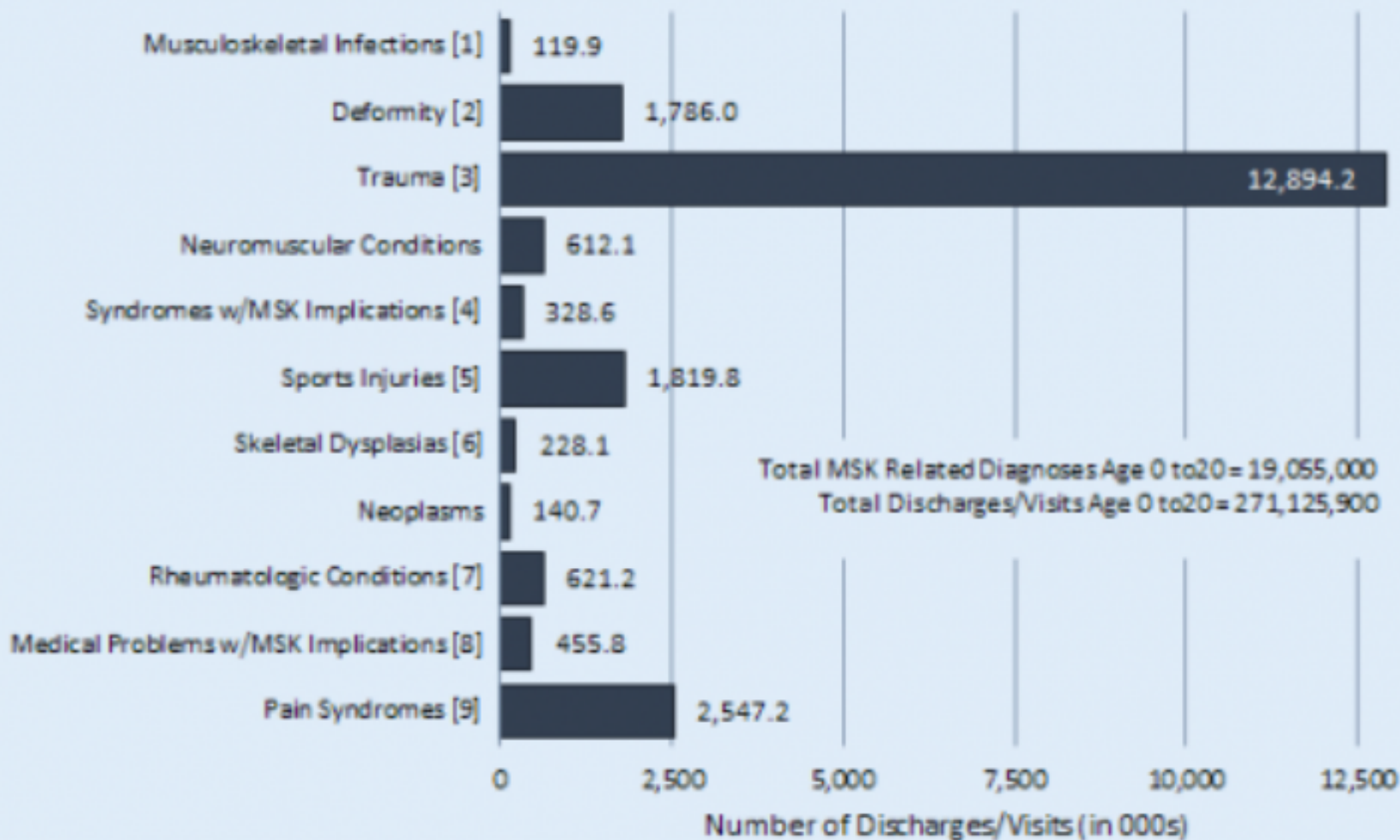
*[h.e.foster@newcastle.ac.uk](mailto:h.e.foster@newcastle.ac.uk)*

# Why this is important

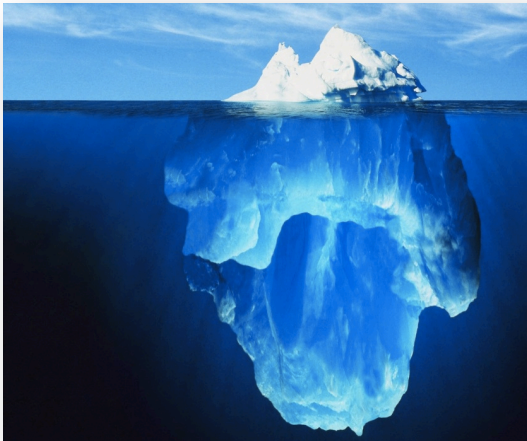
- **The future generation is our responsibility**
  - Children comprise >30% of the population
  - Economies depend on children becoming functioning adults in society
- **‘Healthy children more likely to be healthy adults’**
  - Adult morbidities often have origins in childhood
- **Early intervention to optimise musculoskeletal (MSK) health**
  - ‘Prevention’ - starting in childhood
  - ‘Better care’ - for childhood onset chronic disease



## Health Care Visits for Children and Adolescents Age 20 and Under with a Musculoskeletal (MSK) Related Diagnosis for Any Diagnoses, United States 2012



# Risk factors in childhood for poor long term musculoskeletal health



**Impact of  
Obesity  
Sedentary lifestyle  
Chronic pathology  
on bone, joint and skeletal growth and  
development**

**'Damage' occurs early but the scale and full  
impact may not be apparent for years**

**Osteoarthritis  
Osteoporosis  
Chronic pain  
Chronic back pain**

# Life course approach to musculoskeletal health

Certain risk factors of musculoskeletal conditions cannot be modified, such as old age, female sex, or your genetic susceptibility (family history of disease). However, other risk factors known as modifiable risk

factors can be managed. By managing these risk factors throughout the life course, one can reduce the risk of developing a musculoskeletal condition, but also manage disease progression and prevent further complications.

Avoidable threats to musculoskeletal health throughout the life course:<sup>50</sup>

Stage of life	Risk factors	Ankylosing spondylitis	Gout	Rheumatoid arthritis	Musculoskeletal pain (e.g. Back pain)	Osteoarthritis	Osteoporosis	Reduced muscle strength	Increased fall risk
Maternal health	Low birth weight								
	High levels of vigorous activity during pregnancy								
	Maternal nutrition								
	Maternal smoking								
Childhood and adolescence	Hip dysplasia								
	Poor early childhood growth and adolescent eating disorders								
	Obesity								
Adulthood	Physical inactivity								
	Musculoskeletal injury								
	Obesity								
	Smoking								
	Physical inactivity								
Older life	Alcohol use								
	Obesity								
	Poor nutrition								
	Alcohol use								
	Physical inactivity								

Addition of chronic disease

# Overweight and obesity in children & young people

- **Serious public health concern**

- **Multifactorial**

- **Social practice and policies**

- Sport and safe physical activity, advertising and 'fast food', community recreational areas, town and transport planning, food subsidies (corn oil, sugar), food prices

- **Family and societal attitudes to food and exercise**

- Poverty, lower levels of education, disadvantaged families

- **Strategies**

- **Prevention of obesity & promoting physical exercise paramount**

- Education and awareness
- Schools encouraging healthy diet, promoting & sustaining exercise culture
- Community interventions & physical environments

# Obesity, physical activity and ill-health

- Children and young people in many countries lead more sedentary lives<sup>1</sup>
- Children who are overweight are more sedentary and less likely to take part in exercise<sup>2</sup>
- Children with chronic rheumatic disease are more sedentary and less likely to take part in exercise than their peers<sup>3,4,5</sup>

***Promoting safe & regular exercise  
is important for all children and young people  
to prevent obesity & related comorbidities  
Likely to have a positive impact on MSK health***

1. Tremblay M et al 2014

2. NICE guidance Obesity 2015

<https://www.nice.org.uk/Guidance/CG43>

3. Limenis E et al. 2014

4. Race DL et al. 2016.

5. Norgaard M et al. 2016

# Childhood onset musculoskeletal pathology

## *A wide spectrum.. some examples*

- **Orthopaedics**
  - Trauma / sports injuries / Infection (septic / mycobacterial)
  - Congenital (e.g clubfoot) / hip pathology / back pain
- **Rheumatology**
  - Inflammatory arthritides / Multisystem diseases
  - Chronic pain syndromes
- **Metabolic diseases**
  - Osteomalacia, osteopenia
- **Genetic diseases**
  - Skeletal dysplasias
- **Oncology**
  - Bone cancers

**Pain and Functional limitation**

**Potential for chronicity**

**Potential for bone, skeletal & joint damage**

**Broad impact on growth, school & psychosocial development**



# Juvenile Idiopathic Arthritis (JIA)

- **Commonest cause of**

- Chronic inflammatory arthritis in children
- Acquired blindness in children (*cataracts, glaucoma*)

- **Various subtypes** (*different to adult RA*)

- Most common in young children (preschool age)
- >50% need ongoing care into adulthood

- **As common as epilepsy**

- Prevalence 1 in 1000, incidence 1 in 10,000

- **Early intervention improves outcomes**

- *JIA is a treatable disease*
- *However, delay in diagnosis and access to care are well described<sup>1-4</sup>*

1. Foster HE et al. 2006
2. Manners P et al 2001
3. Schiff N et al 2010
4. McErlane F et al 2014

# **Complications of JIA**

**now rarely seen with  
modern approaches  
and effective treatments being  
available**

Localised growth disturbance

Chronic uveitis and reduced visual acuity, blindness

Amyloidosis and increased mortality

Joint damage, early osteoarthritis, pain and disability

Osteopenia / fragility fractures

Lower Quality of life  
Impact on families, education  
& work

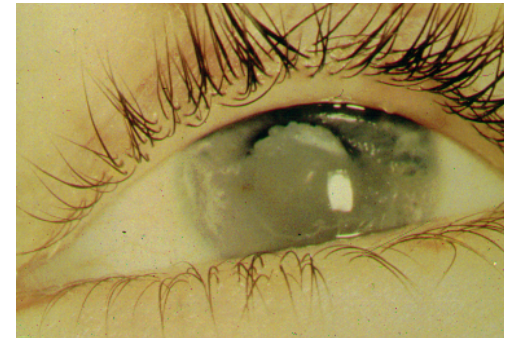
Cardiovascular morbidity and mortality

Joint replacement and high revision rates

Short stature and delayed puberty

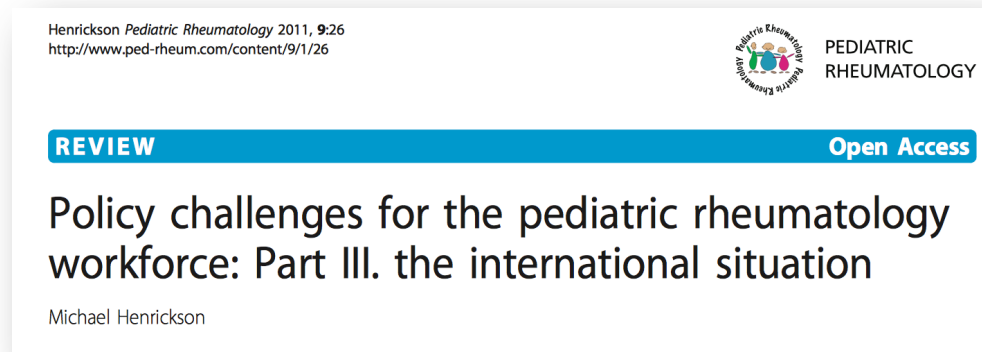
# JIA as an example of chronic MSK disease

- **Archived images reflect the natural history of JIA**
  - Major cause of acquired disability (including blindness from uveitis)
- **Serve as a reminder that ‘JIA not a benign disease’**
- **....And remain relevant today**
  - Where there is delay in access (*or very little access*) to specialist care
  - Where such treatments are not available (*or not affordable*)



# The International perspective

- **There are many children with musculoskeletal pathology (including rheumatic, orthopaedic, metabolic and trauma related) who are unrecognised, untreated or have delayed diagnosis or delayed access to appropriate care, with considerable impact on their quality of life**



- **Gross inequities in access to specialist care**
- **Needs of these children eclipsed by leading causes of mortality (infection, malnutrition)**
- **Need for different approaches emphasised (workforce, education, training)**

## Editorial

# Paediatric rheumatology in sub-Saharan Africa

*Time to narrow the gap*

Chris Scott and Kate Webb, Red Cross War Memorial Children's Hospital, Cape Town

- **300 million children in sub-Saharan Africa**
  - Burden of infection, poverty & malnutrition
  - Rheumatic disease relative low priority
- **Particular challenges for children with rheumatic disease**
  - Delays in presentation & diagnosis
  - Low availability (& cost restraints) of medications
  - Low availability of paediatric rheumatologists
- **Workforce, education & training initiatives important potential solutions**

# The big picture...lots of unknowns

- **‘True Burden’ ...**
- **Variations between ‘resource poor’ & ‘resource rich’ countries**
  - Prevalence and impact of obesity / sedentary lifestyle
  - Prevalence of chronic musculoskeletal pathology and diseases
    - Distinguish ‘true’ variation & impact of delay in diagnosis / suboptimal treatment
- **Impact and ‘cost’ (short & long term)**
  - Child, family, society
  - Growth & development, education & work, community & society



# Paediatric Task Force

## *What needs to be done ?*



- **Plan of action**
  - Scope / Purpose / Stakeholders
  - Clarify ‘Call for action’ & develop strategy
- **Describe ‘burden’ from available evidence and modelling**
  - Prevalence, impact and ‘burden’ of childhood onset musculoskeletal conditions (exemplars from rheumatology / orthopaedics), obesity & sedentary lifestyles
- **Working in partnership with stakeholders** (‘Call for action’ & strategy)
  - Focus on Workforce, education and training, models of practice, policy
    - Awareness (*targeting schools, public, policy makers, clinicians*)
    - Prevention (*focus on obesity, promoting safe exercise & healthy physical activity*)
    - Early diagnosis (*focus on chronic diseases, importance of access to ‘right care’*)
    - Treatment (*focus on affordability, accessibility to drugs & across health care contexts*)

# Why this is important – take home messages

- **The future generation is our responsibility**
  - Children constitute >30% of the population
- **‘Healthy children become healthy adults’**
  - Adult musculoskeletal morbidity has origins in childhood
- **Need for action: intervention to optimise musculoskeletal health**
  - Promotion - raise awareness about burden, impact and unmet need
  - Prevention – address obesity and sedentary lifestyles
  - Treatment - ‘Better’ (& more equitable) care for childhood onset MSK disease
- **Benefit for the lifecourse – improve quality of life and potential for children and musculoskeletal health in adults**







# A free online interactive information resource for clinicians

For further information [www.pmmonline.org](http://www.pmmonline.org) or email [pmm@ncl.ac.uk](mailto:pmm@ncl.ac.uk)