Bone health

Acknowledgements to
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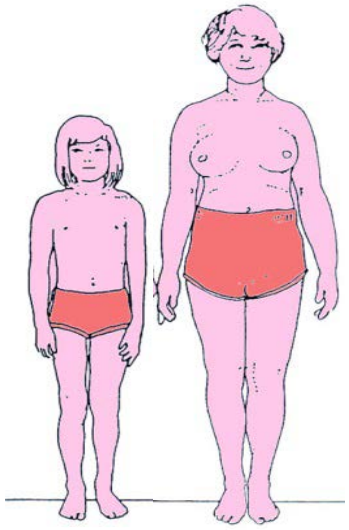
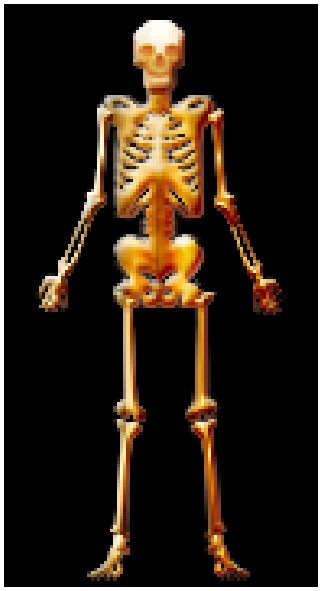
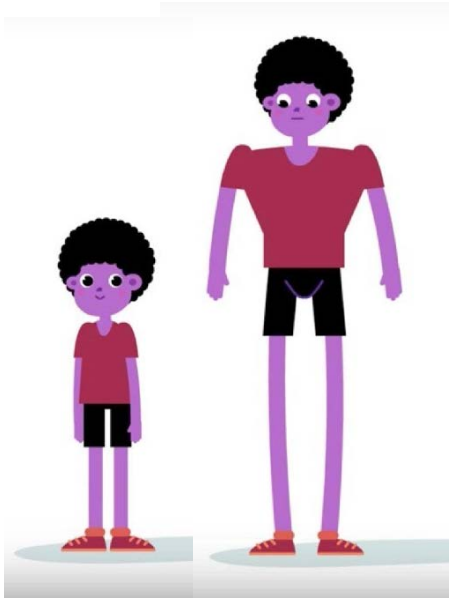
Royal Manchester Children's Hospital







Bone Health and Fanconi anaemia

- Osteopenia or osteoporosis, ie. low bone density and strength
  - 92% of the patients 18 yr or older
  - 65% had problems with puberty hormones

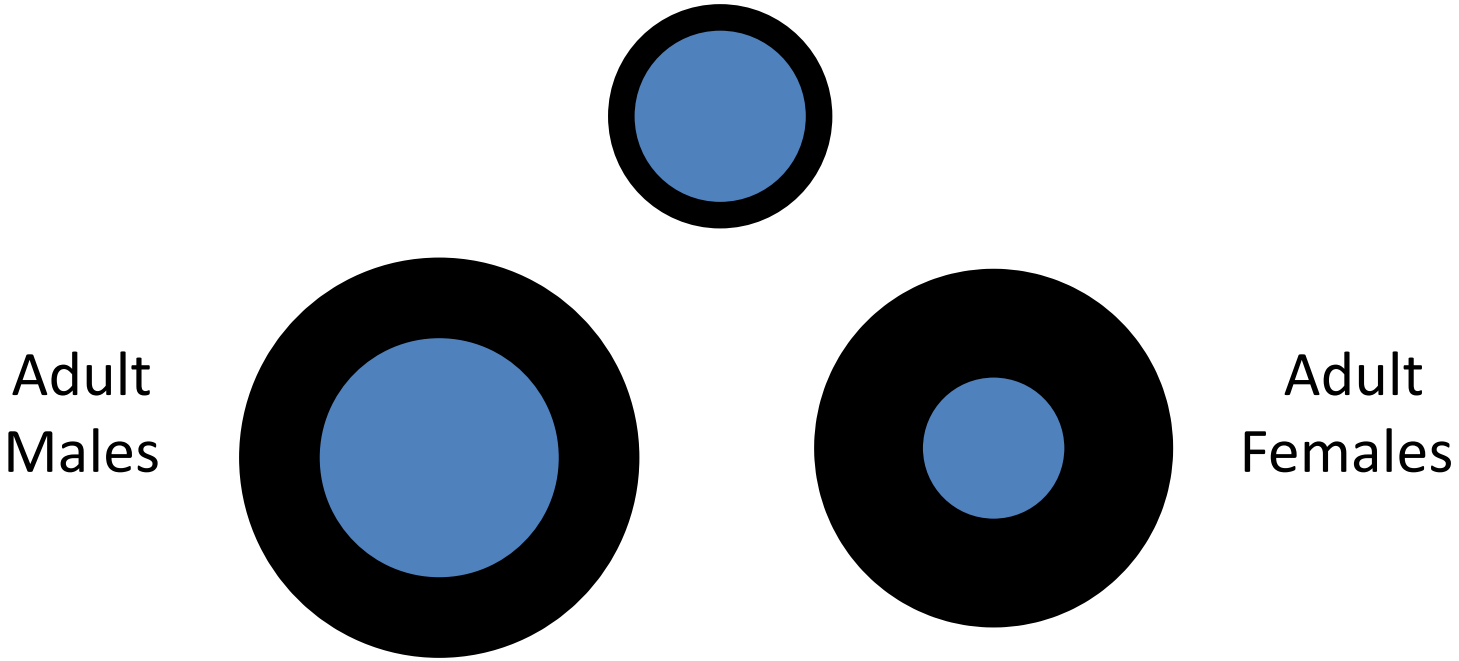
- Hematopoietic cell transplantation
  - Can reduce bone mineral density

These factors can potentially increase risk of fractures

Giri N, et al. Endocrine Abnormalities in Patients with Fanconi Anemia. *The Journal of Clinical Endocrinology & Metabolism* 2007; 92: 2624–2631.

Bone strength and geometry before & after puberty

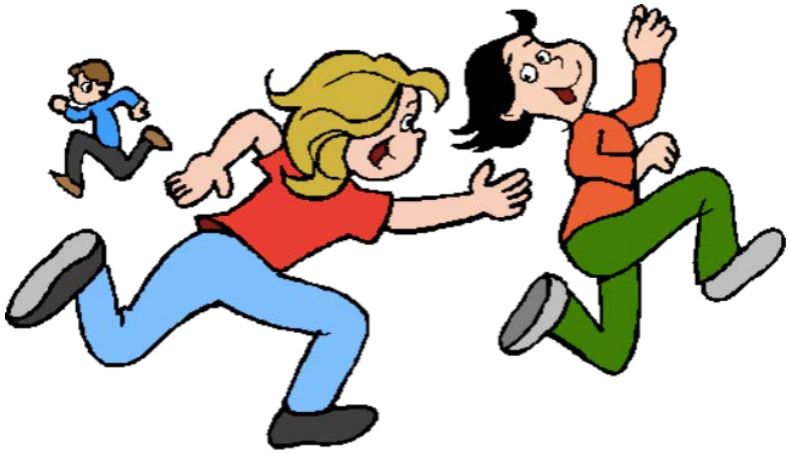
Bone shape before puberty



Adequate replacement of sex hormones
if ovaries or testes do not work optimally

How can you improve bone health?

1. Physical activity strengthens muscles and bones



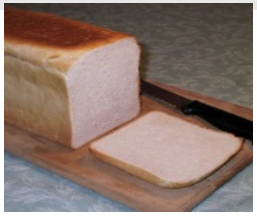
How can you improve bone health?

1. Physical activity strengthens muscles and bones
2. Vitamin D
   - April-Sept
     - ✓ O
   - Foods
     - ✓ oily fish – salmon, sardines, herring, mackerel
     - ✓ red meat, liver
     - ✓ egg yolks
     - ✓ fortified foods – some breakfast cereals
   - Vit D supplements
     - ✓ 10 mcg or 400 IU daily

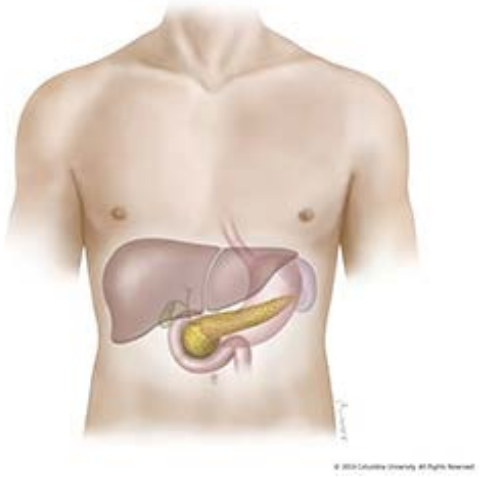
How can you improve bone health?

1. Physical activity
2. Vitamin D
3. Calcium

Recommended normal Calcium intake by age	Mg/day
Birth to 1 year	525
1 – 3 years	350
3 – 6 years	450
7 – 10 years	550
Girls 11 – 18 years	800
Boys 11 – 18 years	1000

Source	Amount	Ca
	1ml	1mg
	1oz	200mg
	1 pot	150mg
	1 slice	35mg
	1 bowl	80mg

Diabetes mellitus



Harmful effects of reactive oxygen species

Affects insulin signalling

Insulin resistance

Damage to β cells in Pancreas

Insulin deficiency

Risk factors

- Obesity
- Fat mass
- Transplant
- Steroid treatment

‘Prediabetes’ or
Impaired glucose tolerance
25 – 68%

Diabetes

8-10%

Summary

Small at birth

Stature within the range around the world

Puberty
- Too early
- Too late

Fertility

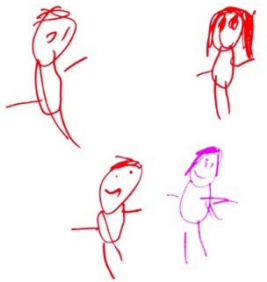
Growth

Hormones

Thyroid
Growth
hromone

Bone health

Physical activity
Vit D
Calcium



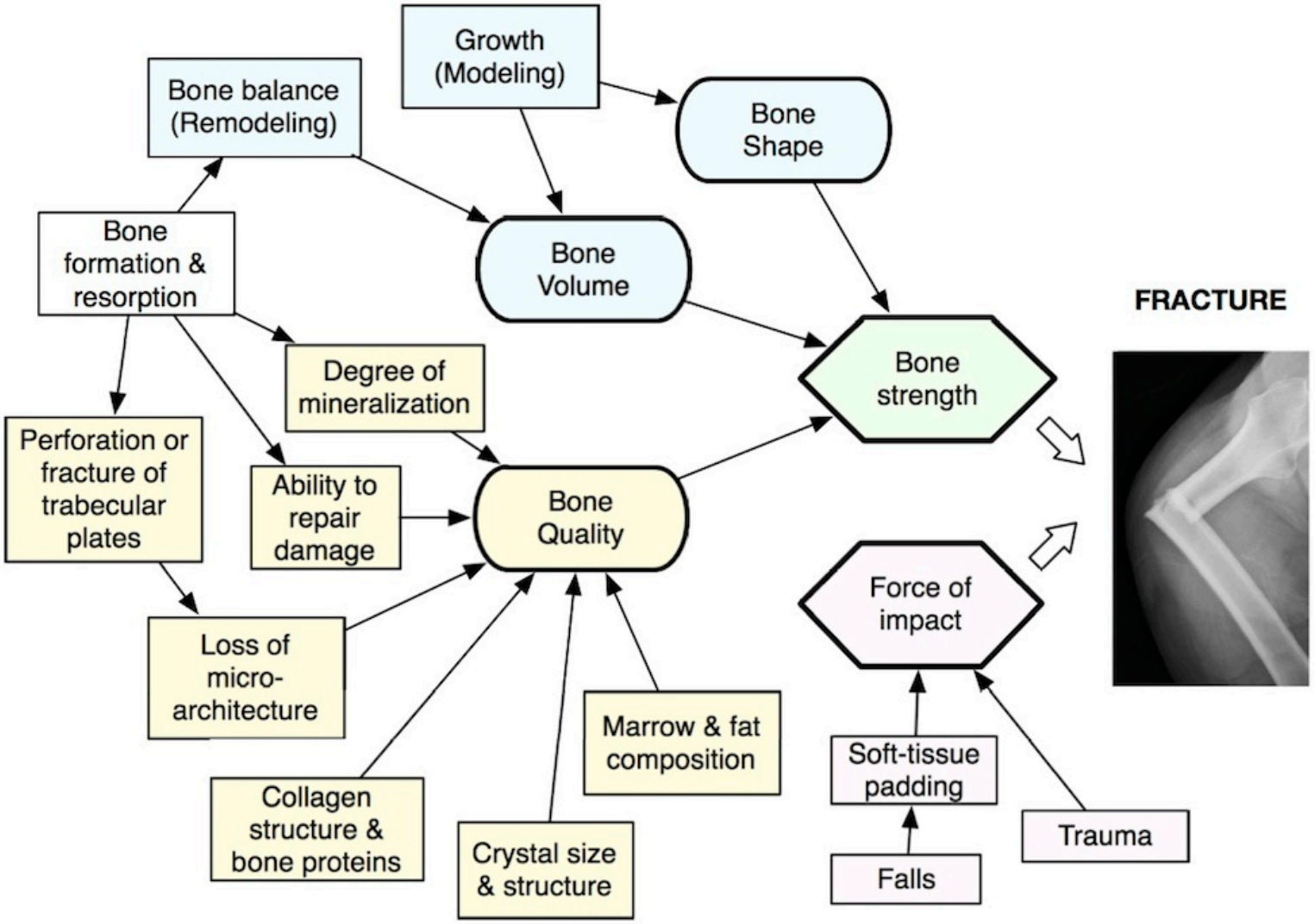
Diabetes

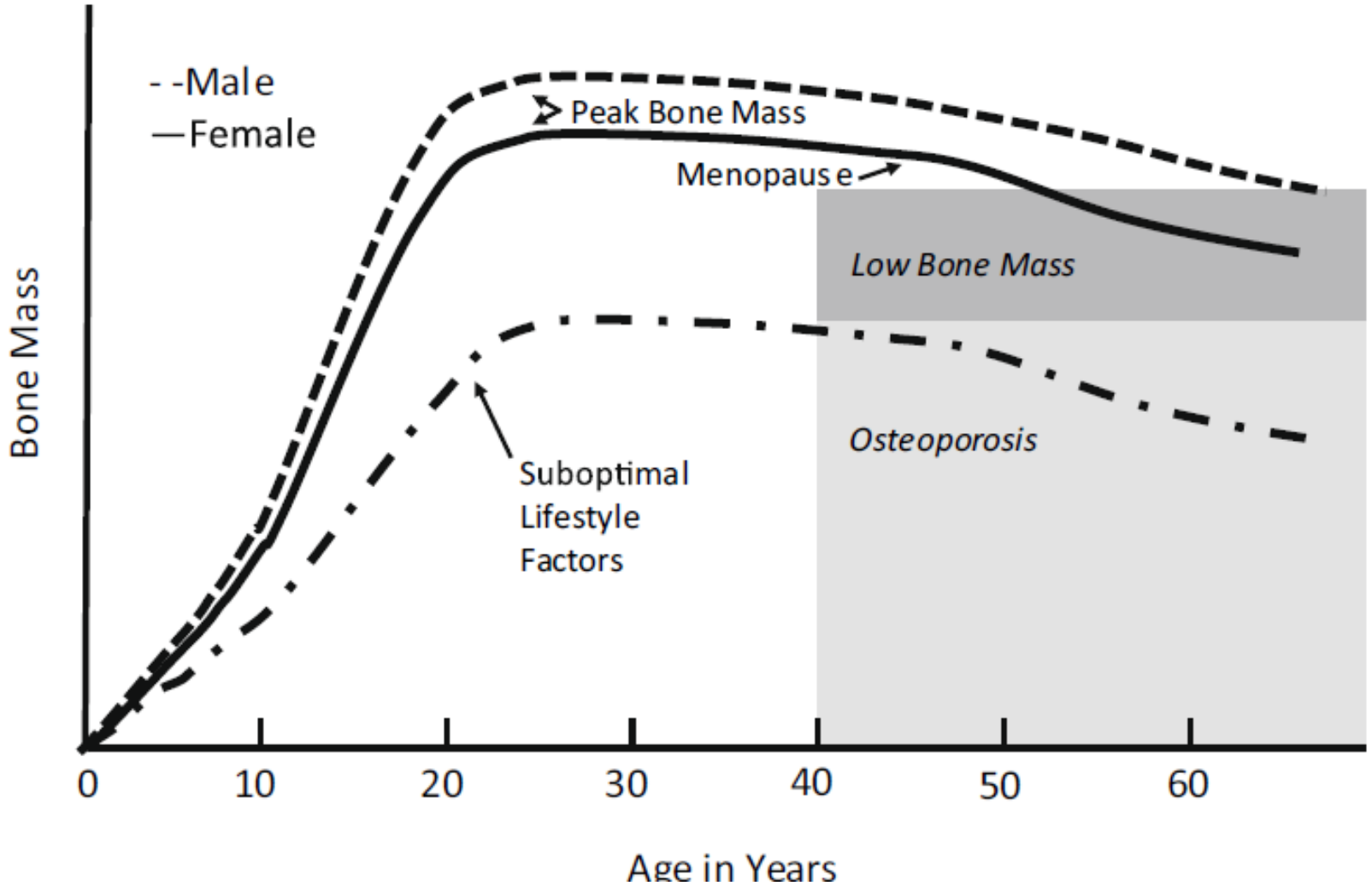
Insulin resistance /deficiency

Bone Health in Adults

- **Bone Mineral Density**
- **Bone Mineralisation**
- **Skeletal Growth and Development**
- **Fractures**

Reduced BMD is only one factor in fracture risk





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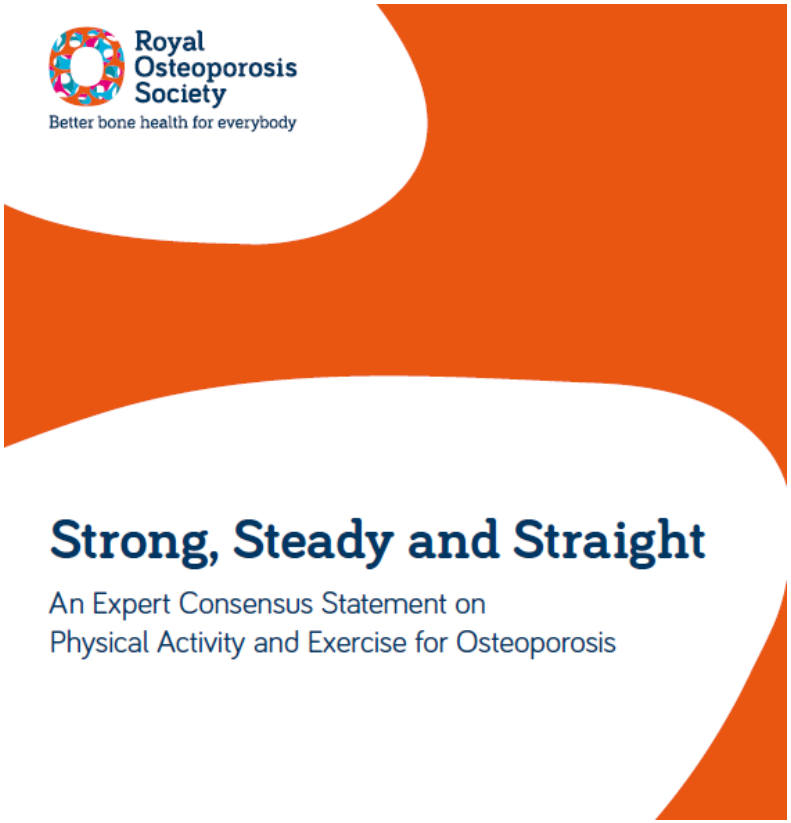
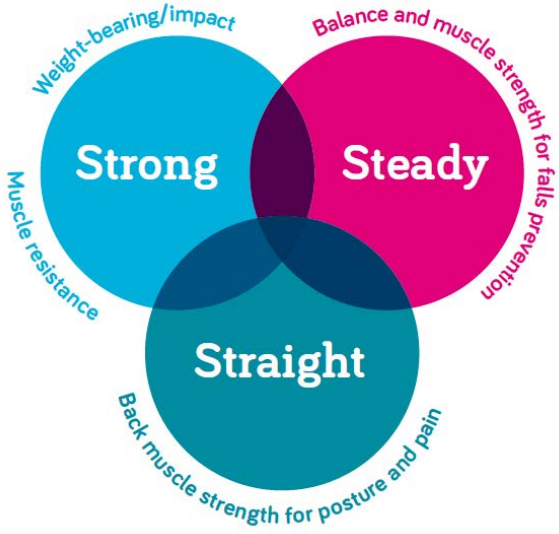
Osteoporos Int (2016) 27:1281–1386

Physical activity is important for bones





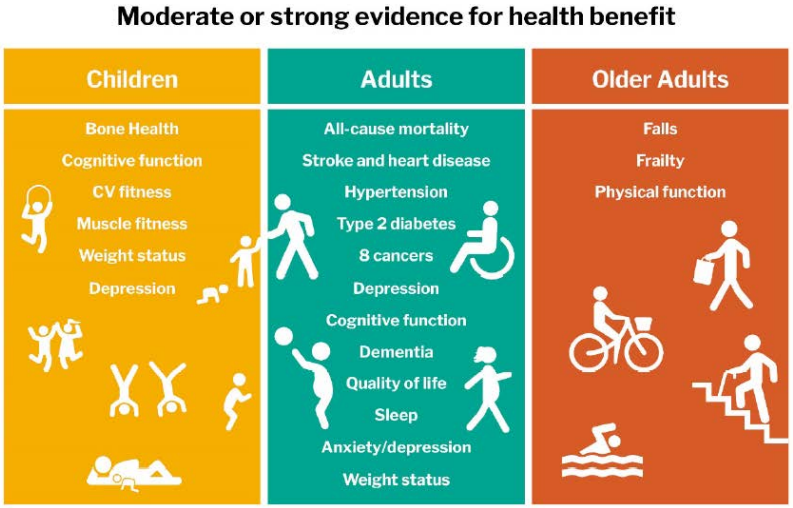
- Exercise
- Nutrition – calcium and vitamin D
- Possible need for bone strengthening medications

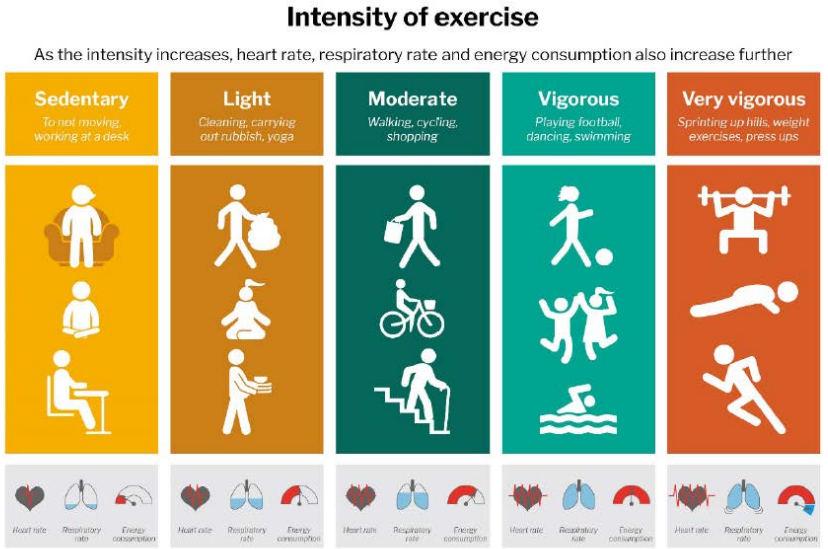
Hormone Replacement in Adults

NICE National Institute for Health and Care Excellence

- the importance of starting hormonal treatment either with HRT or a combined hormonal contraceptive and continuing treatment until at least the age of natural menopause (unless contraindicated)
- that the baseline population risk of diseases such as breast cancer and cardiovascular disease increases with age and is very low in women aged under 40
- that HRT may have a beneficial effect on blood pressure when compared with a combined oral contraceptive
- that both HRT and combined oral contraceptives offer bone protection

Keeping healthy as an adult





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Keeping healthy as an adult