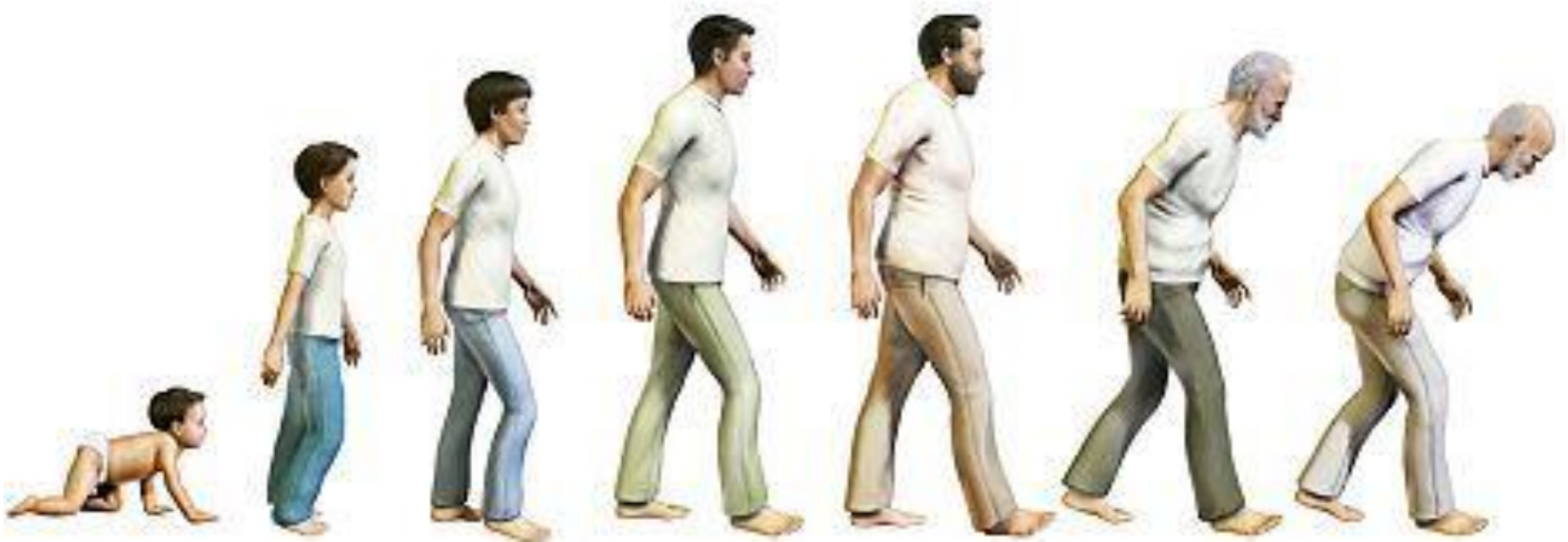


WHEN THEY SAID THE NHS IS FOR
PEOPLE 'FROM THE CRADLE TO THE
GRAVE' THEY MEANT THE **PATIENTS**
NOT THE **STAFF!**

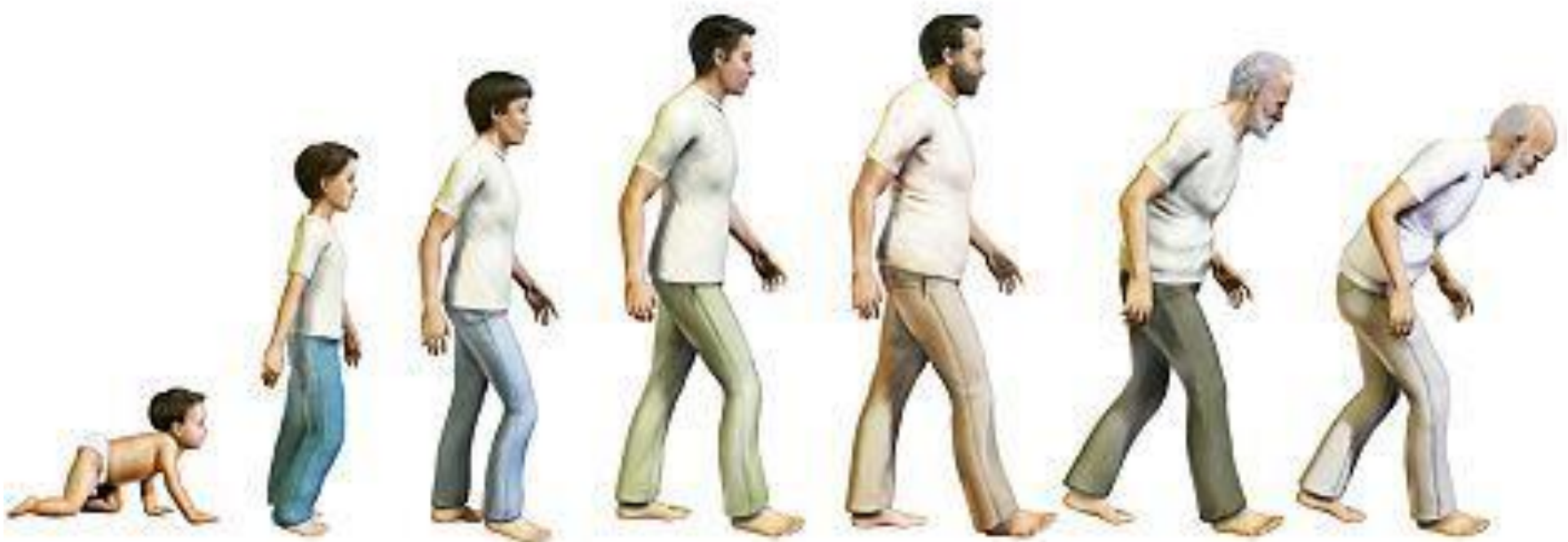


The Seven Ages of Man



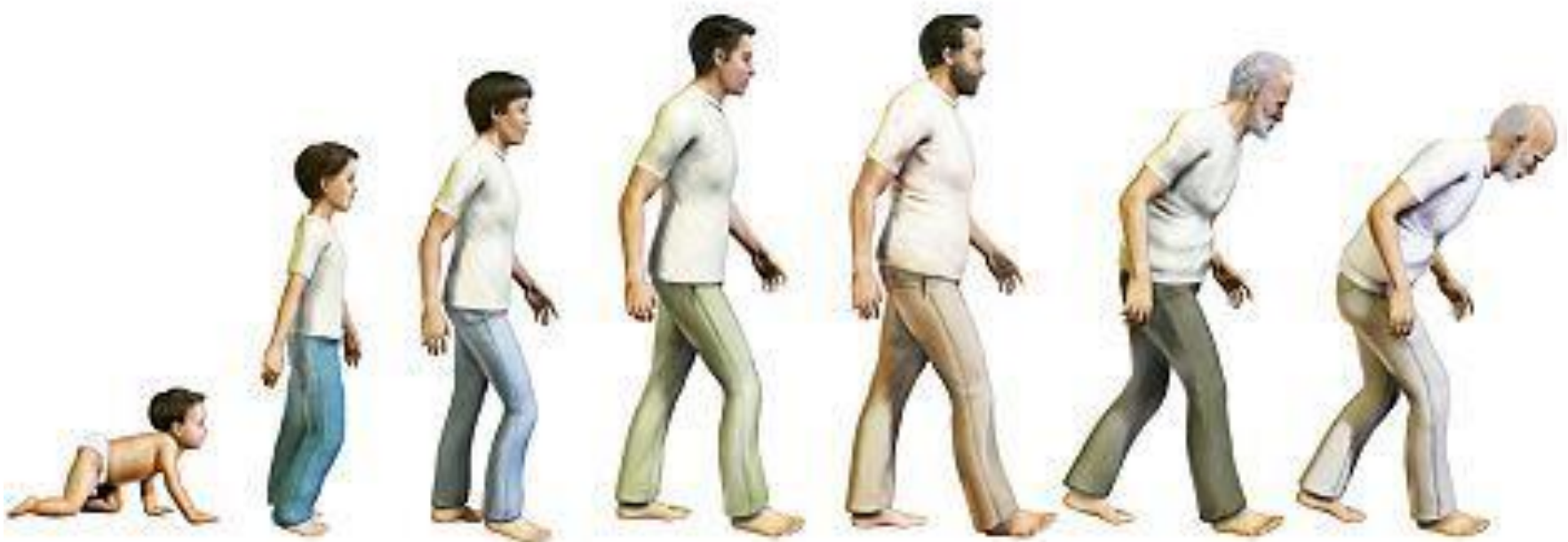
1. Infancy

The Seven Ages of Man



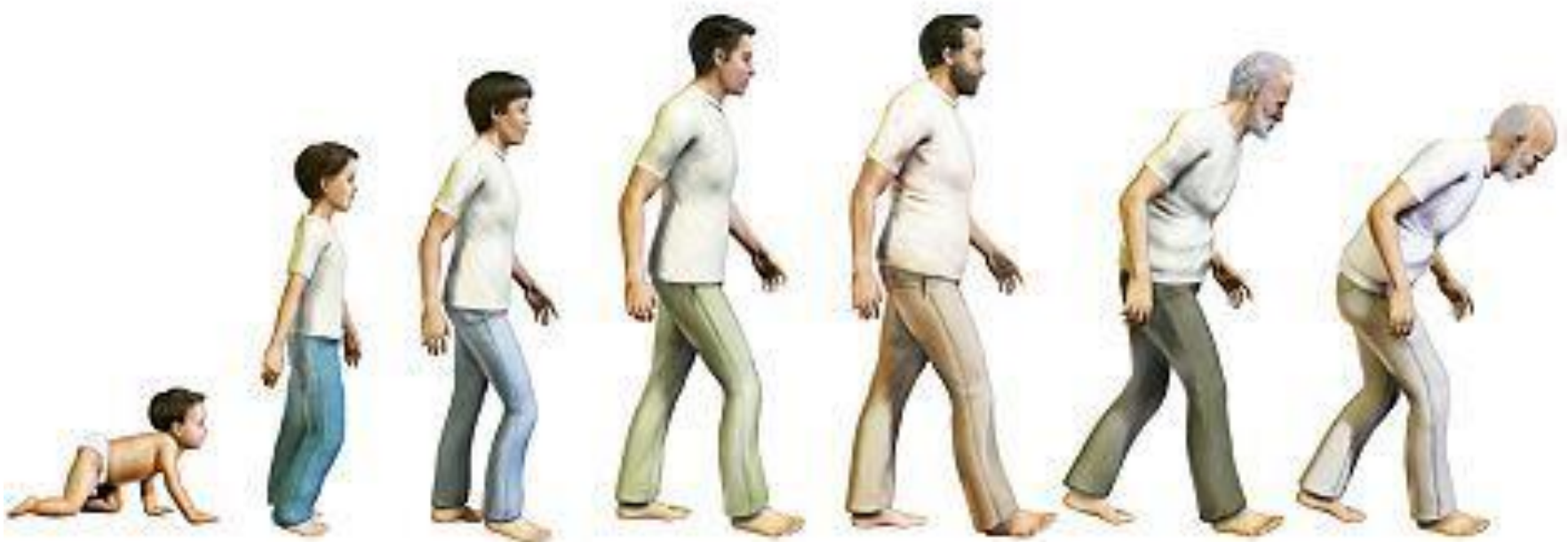
2. Childhood

The Seven Ages of Man



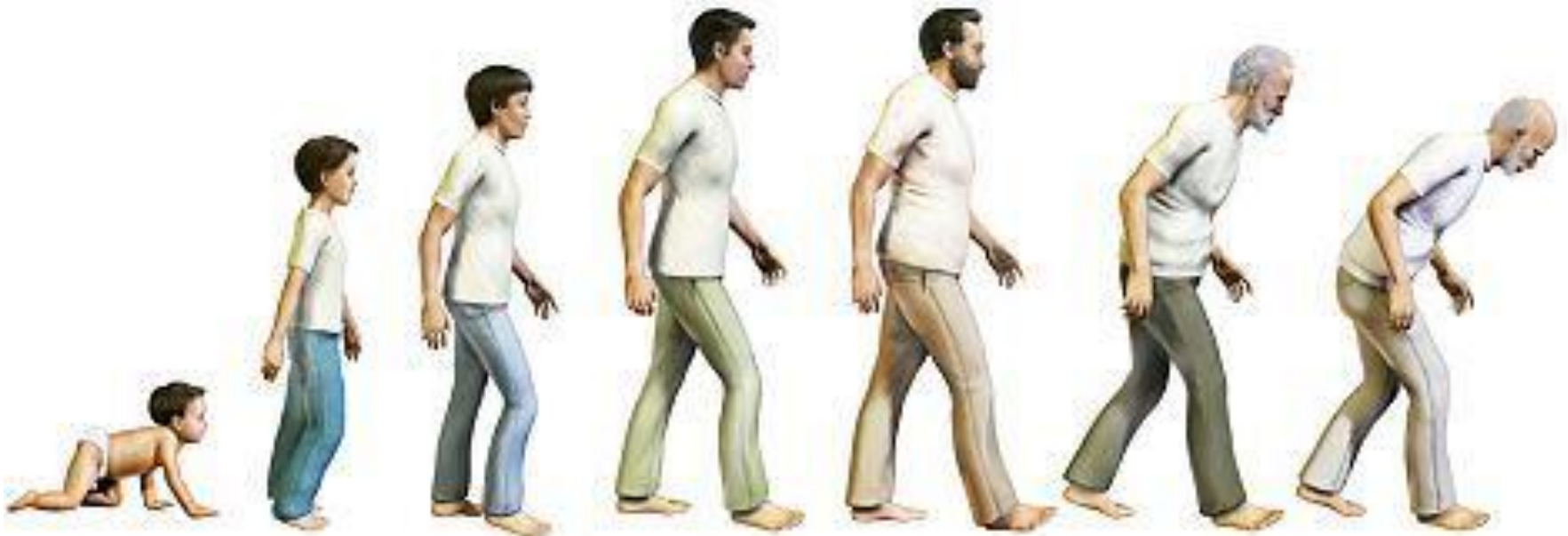
3. Adolescence

The Seven Ages of Man



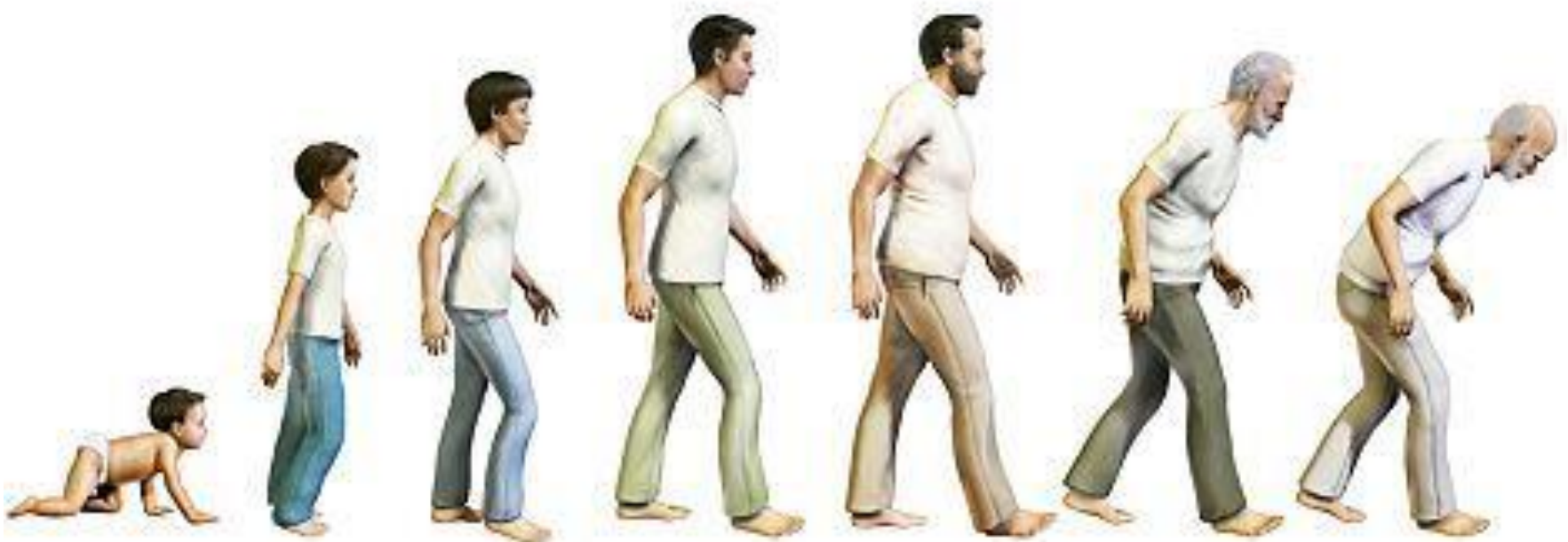
4. Young adult

The Seven Ages of Man



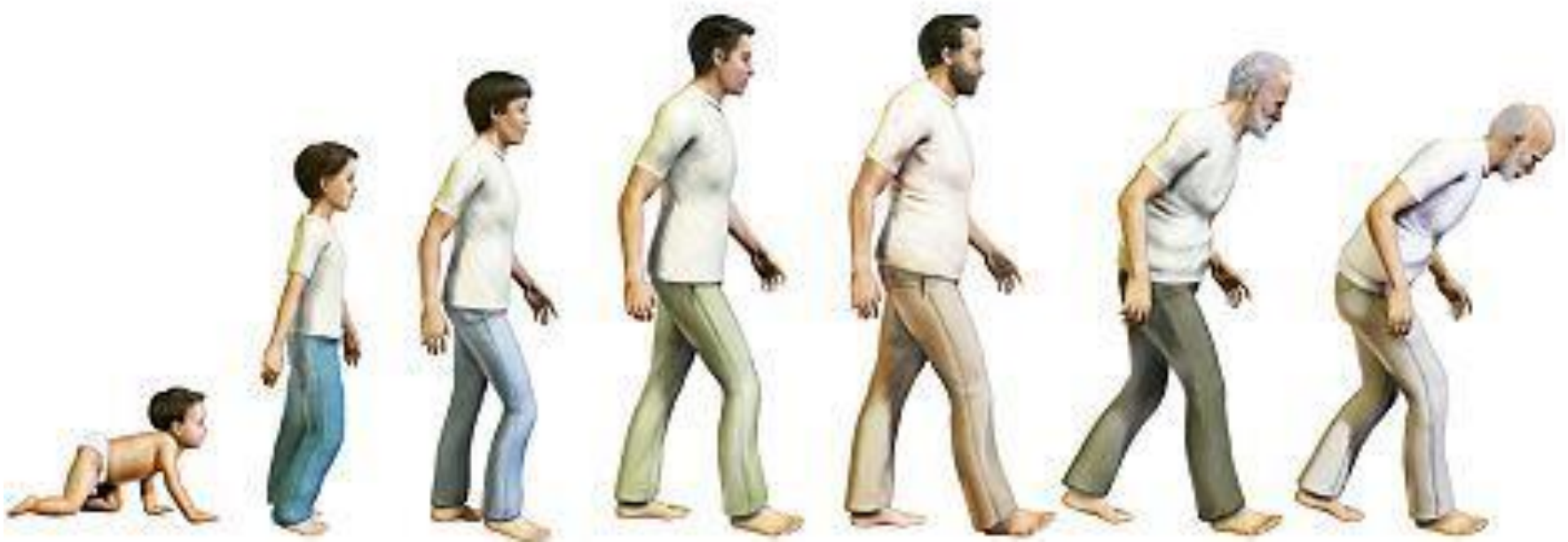
5. Adulthood

The Seven Ages of Man



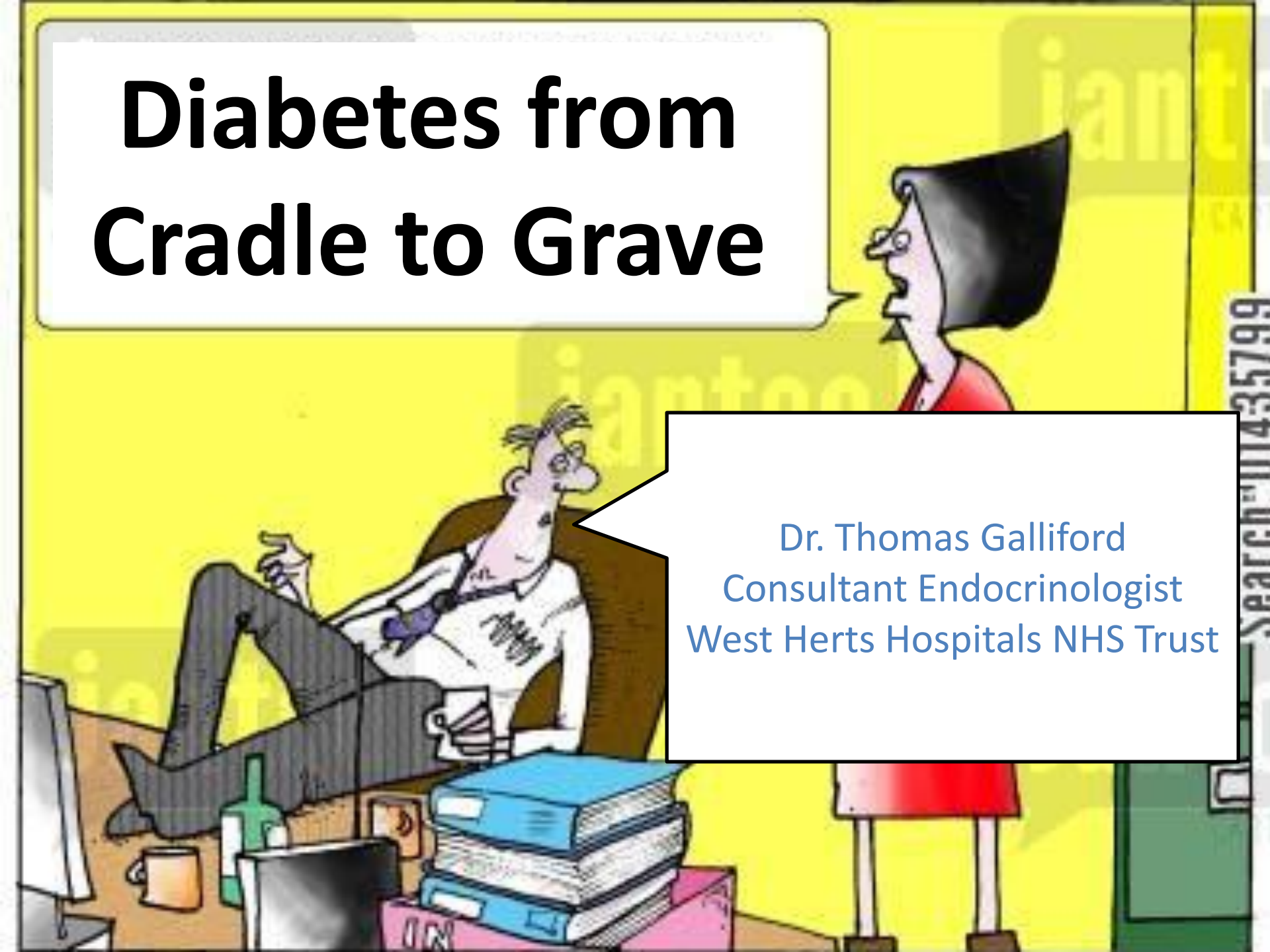
6. Early old age

The Seven Ages of Man



7. Later old age

Diabetes from Cradle to Grave

A cartoon illustration of a doctor sitting in a chair, looking towards a woman standing on the right. The doctor is wearing a white lab coat and has a stethoscope around his neck. He is holding a cup and saucer. The woman is wearing a red top and a black hat. The background is yellow with some faint text. There is a search bar on the right side of the image with the text "Search: 11435799".

Dr. Thomas Galliford
Consultant Endocrinologist
West Herts Hospitals NHS Trust

Hertfordshire Diabetes Conference

Hertfordshire Annual Diabetes Conference 1st October 2015, Fielder Centre, Hatfield 'Quality and Safety in Diabetes Care' Programme:

| | |
|-----------------|--|
| 08.30 - 08.55 | Registration and Coffee |
| 08.55 - 09.00 | Welcome and Introduction |
| 09.00 - 09.20 | Keynote Speaker: Dr Partha Kar Quality Indicators and standards for diabetes care CQC Inspection of Diabetes Service |
| 09.20 - 09.30 | Patient 1: Experience of Diabetes Care |
| 09.30 - 09.40 | Patient 2: Experience of Diabetes Care |
| 09.40 - 10.00 | Panel Q&A |
| 10.00 - 10.30 | Coffee |
| 10.30 - 11.30 | Workshop 1 (Group A), Presentations 1&2 (Group B) |
| 11.30 - 12.30 | Workshop 2 (Group A), Presentations 3&4 (Group B) |
| 12.30 - 13.30 | Lunch |
| 13.30 - 14.30 | Workshop 2 (Group B), Presentations 1&2 (Group A) |
| 14.30 - 15.30 | Workshop 1(Group B), Presentations 3&4 (Group A) |
| 15.30 - 16.00 | Tea |
| 16.00 - 16.45 | Debate: Tight Glycaemic Control - Does It Do More Harm Than Good? |
| 16.45 - 17.00 | Close |
| Workshop 1: | Prevention of Admission & Discharge Planning |
| Workshop 2: | Diagnosing Diabetes - Could It Be Type 1? |
| Presentation 1: | Overcoming Health Barriers to Deliver Quality Care |
| Presentation 2: | Hypoglycaemia Pathway & Prenatal Diabetes Care |
| Presentation 3: | Self Management Strategy & Personal Health Plans |
| Presentation 4: | Diabetes in Care Homes |

All delegates will receive an email link to an online feedback form and certificate of attendance following the conference. All presentations will be available on the websites of East & North Herts CCG, Herts Valleys CCG, East and North Herts NHS Trust, West Herts Hospital Trust & Hertfordshire Community Trust.

Hertfordshire
DIABETES
Conference
2016

A JOURNEY THROUGH DIABETES PREVENTION

| | |
|-----------------|--|
| 08.30 - 08.55 | Registration and Coffee |
| 08.55 - 09.00 | Welcome and Introduction |
| 09.00 - 09.20 | Keynote Speaker: Mr Piers Simey – Prevention: Potential and Practicalities |
| 09.20 - 09.30 | Ms Pam Bowman (Type 1 diabetes) : 'If I could turn back time' |
| 09.30 - 09.45 | Mr. Colin Bertie (Type 2 diabetes) : 'If I could turn back time' |
| 09.45 - 10.00 | A New Diabetes Service in Herts Valleys: Dr Nicola Cowap |
| 10.00 - 10.30 | Coffee |
| 10.30 - 11.30 | Workshop 1 (Group A), Presentations 1&2 (Group B) |
| 11.30 - 12.30 | Workshop 2 (Group A), Presentations 3&4 (Group B) |
| 12.30 - 13.30 | Lunch |
| 13.30 - 14.30 | Workshop 2 (Group B), Presentations 1&2 (Group A) |
| 14.30 - 15.30 | Workshop 1 (Group B), Presentations 3&4 (Group A) |
| 15.30 - 16.00 | Tea |
| 16.00 - 16.45 | Debate: 'My 2020 vision for diabetes prevention in Hertfordshire' – Public Health, Primary Care & Secondary Care . Prof. Jim Mc Manus, Dr. Alka Patel & Dr. Ana Pokarajac. |
| 16.45 - 17.00 | Close |
| Workshop 1: | Lifestyle Modification – Ms. Claire Mearing, Ms Michelle Constable etc |
| Workshop 2: | Prevention of Foot Amputation – Dr. Chantal Kong etc. |
| Presentation 1: | Prevention of Diabetic Eye Disease – Dr. Sadhana Kulkarni |
| Presentation 2: | Prevention of Hypoglycaemia – Dr. Andrew Solomon |
| Presentation 3: | Prevention of Cardiovascular disease – Dr. Peter Winocour |
| Presentation 4: | Prevention of Type 2 DM after GDM – Dr. Tom Galliford |

All presentations will be available on the websites of East & North Herts CCG, Herts Valleys CCG, East and North Herts NHS Trust, West Herts Hospital Trust & Hertfordshire Community Trust.

Supported by:

Herts Valleys CCG, East and North Herts CCG, West Herts Hospital Trust, East and North Hertfordshire Trust and Hertfordshire Community Trust

Childhood





Incidence of diabetes in children



Table 1| Top 10 countries by incidence of type 1 diabetes in children aged up to 14 years 1.

| Country | Incidence (per 100<thin>000) |
|----------------|------------------------------|
| Finland | 57.6 |
| Sweden | 43.1 |
| Saudi Arabia | 31.4 |
| Norway | 27.9 |
| United Kingdom | 24.5 |
| United States | 23.7 |
| Australia | 22.5 |
| Kuwait | 22.3 |
| Denmark | 22.2 |
| Canada | 21.7 |

¹Iacobucci. *BMJ* 2013; **346**



Incidence trends for type 1 diabetes in Europe¹



- EURODIAB registers (17 countries)
 - Oxford, Bristol, Leeds, N. Ireland

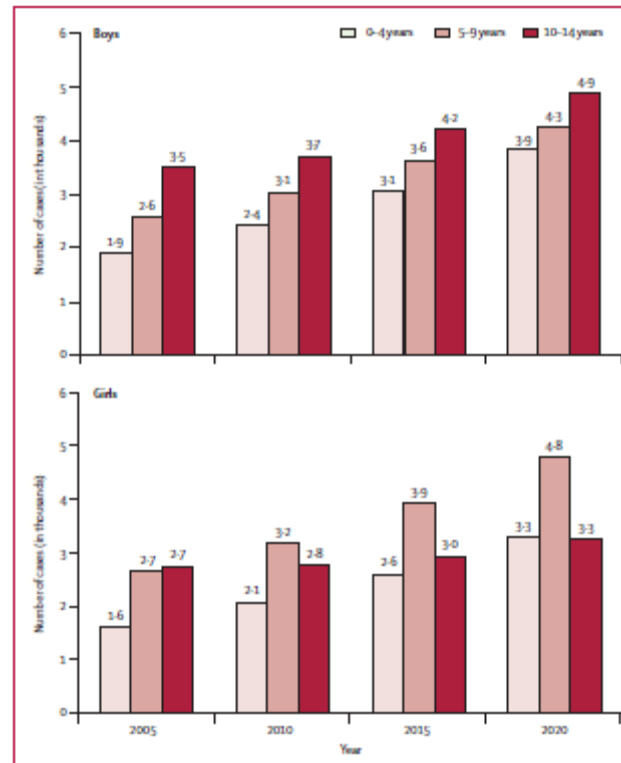


Figure 4: Estimated (2005) and predicted cases of newly diagnosed type 1 diabetes

¹Patterson et al. *Lancet* 2009; **373**:2027-33

Challenges with young children with type 1 diabetes



1. Physiological

- Increased insulin sensitivity
- Susceptibility to hypoglycaemia/failure to reliably detect
- Hyperglycaemia (glycaemic variability) leading to decreased grey matter volume

2. Nutritional

- Glycaemic index of foods
 - Food preferences and food refusal
 - Greater negative child mealtime behaviours /mealtime misbehaviour and worse diet
- } difficult to predict insulin volume and dosage

3. Physical Activity

- Unpredictable
 - Avoidance (hypoglycaemia)
- } Less activity overall

4. Psychosocial

- Considerations of management pervade nearly all ADLs (e.g. play, meals, sleep, sibling/peer relationships, school/daytime interactions)
- Adherence to treatment regime feels like punishment
- Neuropsychological effects from difficulties in achieving treatment targets
- Reduced QoL

5. Parental (more known about psychological stresses in parents)

- Fear/worry about acute and chronic complications including hypoglycaemia (e.g. seizure)
- Social isolation/negative effects on job performance or advancement
- Self-doubt
- Increased prevalence and risk of PTSD/depression/anxiety symptoms
- Sleep disturbance
- The younger the child the greater the impact
- 70-80% of burden of care on mothers (very young children)



Young children with type 1 diabetes



- Interventions
 - Limited trial data, small studies
 - e.g. parent mentors, phone-calls, coping skills training
 - Streisand et al¹:
 - 134 parents of children 1-6yrs (parent support vs. diabetes education support)
 - Parent support = phone sessions, online message board, group teleconferences
 - Interventional strategies = parental emotional functioning, support of parenting behaviours
 - Preliminary results:
 - Improvements in mealtime distress
 - Higher satisfaction
 - 0.5% reduction in HbA1c from baseline at 1 year
 - More studies needed!

¹Streisand and Monaghan. *Curr Diab Rep.* 2014, **14(9)**



ISPAD

International Society for Pediatric
and Adolescent Diabetes



**American
Diabetes
Association®**



- Target HbA1c < 58mmol/mol (7.5%)

NICE

National Institute for
Health and Care Excellence

Diabetes (type 1 and type 2) in children
and young people: diagnosis and
management

- Published Aug 2015, updated Nov 2016
- Target HbA1c < 48mmol/mol (6.5%)



NPDA

National Paediatric
Diabetes Audit

National Paediatric Diabetes Audit Report 2015-2016
Part 1: Care Processes and Outcomes



HQIP

Healthcare Quality
Improvement Partnership

RCPCH

Royal College of
Paediatrics and Child Health
Leading the way in Children's Health



- All 173 PDUs
 - 24,439 children <24yrs
- 27,115 (96%) Type 1 diabetes
 - Prevalence 195.4/100,000
 - Incidence 25.9/100,000
 - ♂ > ♀
 - Mean HbA1c 67.8mmol/mol (8.35%)
 - 3.2mmol/mol improvement from 2014-2015
 - 23.5% HbA1c < 58mmol/mol
 - Complications:
 - 9.7% microalbuminuria
 - 13.8% retinopathy
 - 26.3% hypertension
 - 30% referred to psychology or CAMHS



NPDA

National Paediatric
Diabetes Audit

National Paediatric Diabetes Audit Report 2015-2016
Part 1: Care Processes and Outcomes



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- 621 (2.2%) Type 2 diabetes

Billy has 32 candy bars. He eats 28.
What does he have now?
Diabetes.
Billy has diabetes.

The illustration shows a boy and a girl looking at a whiteboard. The whiteboard has three columns of math problems. The first column has a list of words with their first letters repeated: Aaaa, Bbbb, Cccc, Dddd, Eeee. The second column has a math problem: * Mydog is a. The third column has a subtraction problem:
$$\begin{array}{r} 1467 \\ + 396 \\ \hline 1863 \\ - 122 \\ \hline 41 \end{array}$$

someecards
user card



NPDA

National Paediatric
Diabetes Audit

National Paediatric Diabetes Audit Report 2015-2016
Part 1: Care Processes and Outcomes



HQIP

Healthcare Quality
Improvement Partnership

RCPCH

Royal College of
Paediatrics and Child Health
Leading the way in Children's Health



- 621 (2.2%) Type 2 diabetes
 - ♀:♂ = 2:1
 - 78.5% obese, 7.3% overweight
 - Black and asian backgrounds greater representation (52.3%)
 - Most children lived in deprived areas
 - Mean HbA1c 59.7mmol/mol (7.6%)
 - Complications:
 - 14.5% microalbuminuria
 - 5.4% retinopathy
 - 40% hypertension
 - 33.8% referred to psychology or CAMHS

Adolescence





Type 1 diabetes in adolescence

- Decline in metabolic control
- Rates of DKA increase
- Less likely to attend OP
- Increased drop out of medical system



The New England Journal of Medicine

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Volume 329

SEPTEMBER 30, 1993

Number 14

THE EFFECT OF INTENSIVE TREATMENT OF DIABETES ON THE DEVELOPMENT AND PROGRESSION OF LONG-TERM COMPLICATIONS IN INSULIN-DEPENDENT DIABETES MELLITUS

THE DIABETES CONTROL AND COMPLICATIONS TRIAL RESEARCH GROUP*

- 1441 patients with type 1 diabetes
 - Intensive therapy vs. conventional treatment
 - Mean follow-up 6.5 years
- Results:
 - HbA1c 7.4% vs. 9.1%
 - 76% reduction in risk for development of retinopathy
 - 54% reduction in progression of retinopathy
 - 47% reduction in proliferative or severe non-proliferative retinopathy
 - 39% reduction in occurrence of microalbuminuria
 - 54% reduction in occurrence of albuminuria
 - 60% reduction in development of clinical neuropathy
 - 41% reduction in major CV and PVD events
 - 2-3x increase in severe hypoglycaemia

NEJM 1993; **329(14)**: 977-85



The NEW ENGLAND
JOURNAL of MEDICINE

ESTABLISHED IN 1812

DECEMBER 22, 2005

VOL. 353 NO. 25

Intensive Diabetes Treatment and Cardiovascular Disease
in Patients with Type 1 Diabetes

The Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions
and Complications (DCCT/EDIC) Study Research Group*

- 93% followed for 17 years
 - Assessment of long-term incidence of CV disease (non-fatal MI, stroke, death from CV disease, angina, need for PTCA)
- Results: (intensive vs. conventional treatment)
 - HbA1c 7.9% vs. 7.8%
 - 42% reduction in risk of CV event
 - 57% reduction in non-fatal MI, stroke, death from CV disease
 - Differences between groups remained significant after adjusting for microalbuminuria and albuminuria



DCCT in adolescents

- DCCT cohort differences adolescent vs. adult¹
 - 195 young subjects (13 – 17yrs)
 - At enrollment HbA1c INT 9.6% vs. 9.0%, CON 9.5% vs. 8.9%
 - At completion HbA1c INT 8.1% vs. 7.2%, CON 9.7% vs. 8.9%
 - Risk reduction of having DR 53% ($p = 0.048$)
 - Risk reduction of progression of DR 70% ($p = 0.042$)
- DCCT/EDIC
 - 156 adolescents²
 - No difference in retinopathy progression 10yrs after the end of DCCT
 - Significantly higher risk of retinopathy progression INT adolescents vs. INT adults – adjusted hazard ratio 1.7

¹DCCT Research Group. *J Pediatr.* 1994, **125(2)**: 177-88

²White et al. *Diabetes* 2010, **59**: 1244-1253

Adulthood





NDA 2015-16: cardiovascular complications - hospital admissions



- People with diabetes comprise about 5% of the adult population yet account for 25-30% of admissions for cardiovascular complications.

| Complication ^a | Non-Emergency Admissions | | | Emergency Admissions | | |
|---------------------------|--|---|---|------------------------------------|---|---|
| | Number of all non emergency admissions | Number of non emergency admissions for NDA population | Percentage of non emergency admissions for NDA population | Number of all emergency admissions | Number of emergency admissions for NDA population | Percentage of emergency admissions for NDA population |
| Angina | 224,091 | 63,501 | 28.3 | 256,250 | 78,151 | 30.5 |
| Myocardial Infarction | 16,732 | 4,079 | 24.4 | 87,849 | 21,399 | 24.4 |
| Heart Failure | 107,820 | 32,802 | 30.4 | 356,081 | 115,695 | 32.5 |
| Stroke | 31,670 | 7,286 | 23.0 | 126,590 | 29,392 | 23.2 |

Number of hospital admissions and NDA related hospital admissions for cardiovascular complications, 2015-2016 HES/PEDW



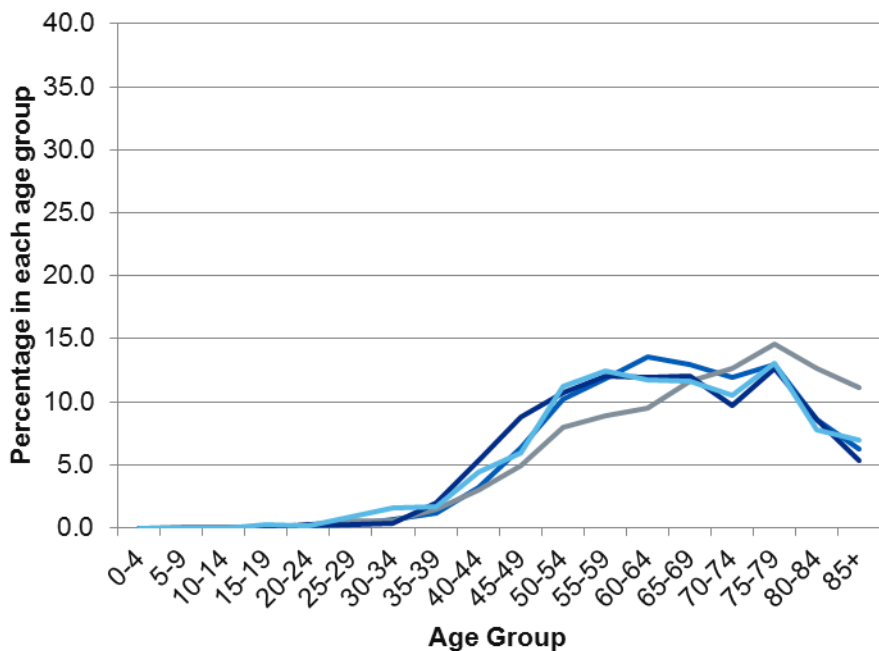
NDA 2014-15: cardiovascular complications - age at hospital admission, type 1 DM



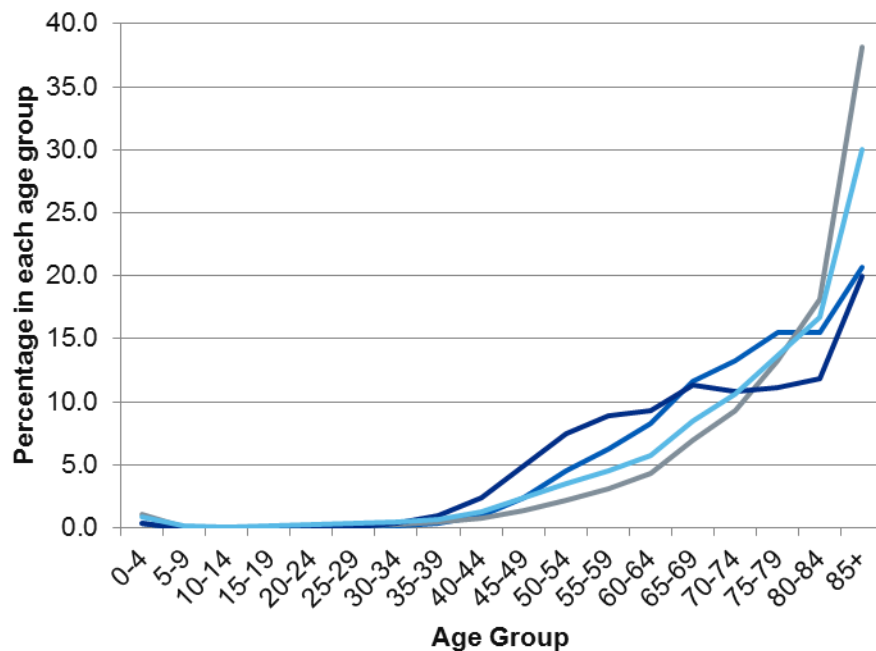
- People with type 1 diabetes admitted to hospital with cardiovascular complications are younger than those without diabetes.

Age distribution of people admitted to hospital with cardiovascular complications, by those with type 1 diabetes and those without diabetes, 2014-15 audit

Type 1



Non-Diabetic



— Angina — Heart Failure — Myocardial Infarction — Stroke

— Angina — Heart Failure — Myocardial Infarction — Stroke



NDA 2014-15: cardiovascular complications

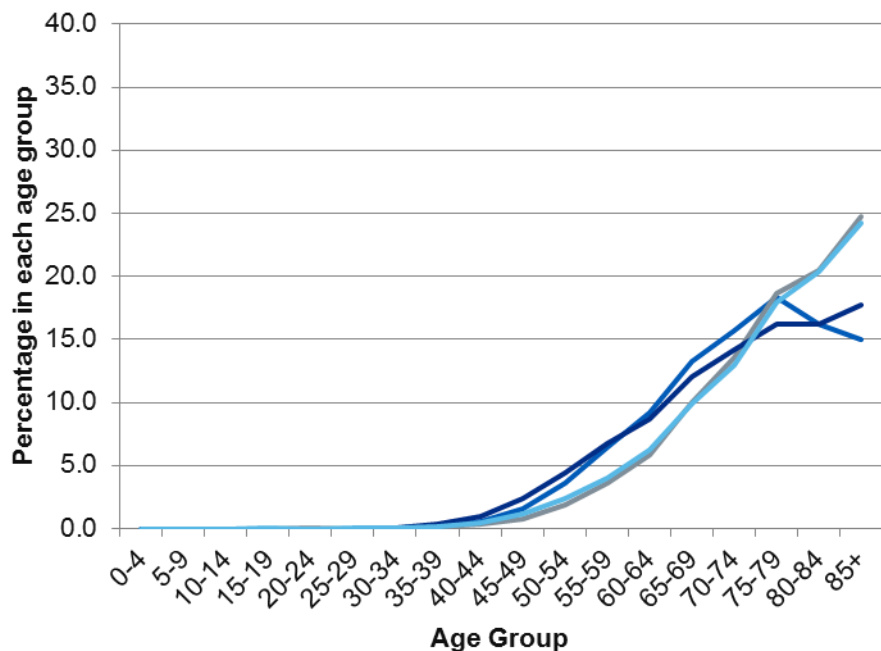
- age at hospital admission, type 2 DM



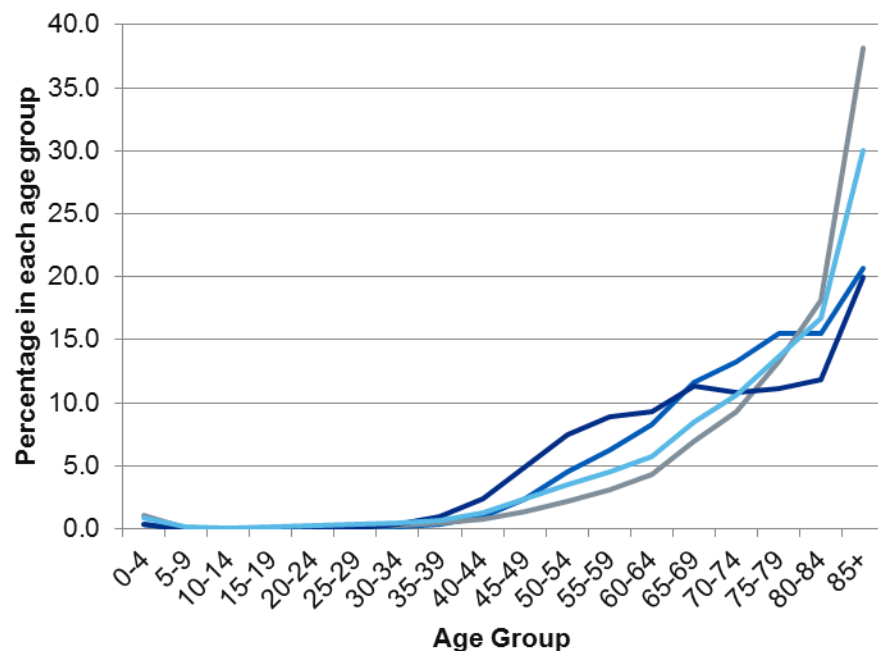
- People with type 2 diabetes admitted to hospital with cardiovascular complications are of similar age to those without diabetes.

Age distribution of people admitted to hospital with cardiovascular complications, by those with type 2 diabetes and those without diabetes, 2014-15 audit

Type 2 and other



Non-Diabetic



— Angina — Heart Failure — Myocardial Infarction — Stroke

— Angina — Heart Failure — Myocardial Infarction — Stroke



NDA 2014-15: amputation prevalence in people with all types of diabetes by age



- The absolute numbers of amputations in people with diabetes are relatively small but they represent around half of all admissions to hospital for amputation
- Duration of diabetes since diagnosis supersedes age as the dominant risk factor for major and minor amputations

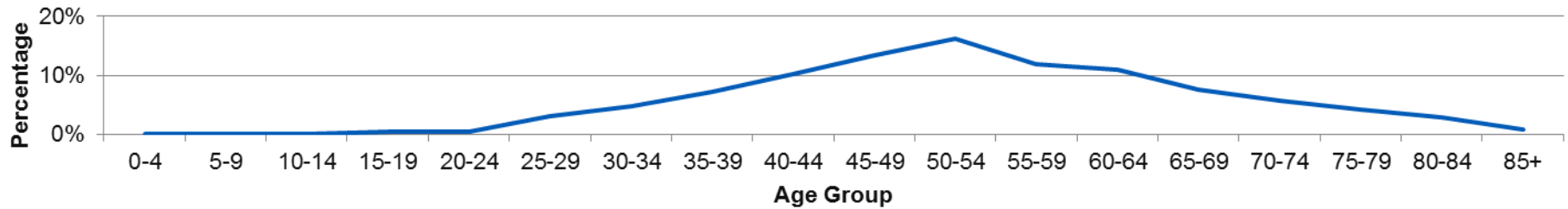
| Complication ^a | Age Range (years) | Number of People with Diabetes | Number of People with Diabetes Experiencing Amputation | Prevalence Percentage |
|---------------------------|-------------------|--------------------------------|--|-----------------------|
| Major Amputation | 0-64 | 935,957 | 623 | 0.07 |
| | 65-79 | 739,868 | 681 | 0.09 |
| | 80+ | 292,981 | 211 | 0.07 |
| Minor Amputation | 0-64 | 935,957 | 1,593 | 0.17 |
| | 65-79 | 739,868 | 1,345 | 0.18 |
| | 80+ | 292,981 | 503 | 0.17 |

One year diabetes related amputation prevalence, by age, 2014-15 audit

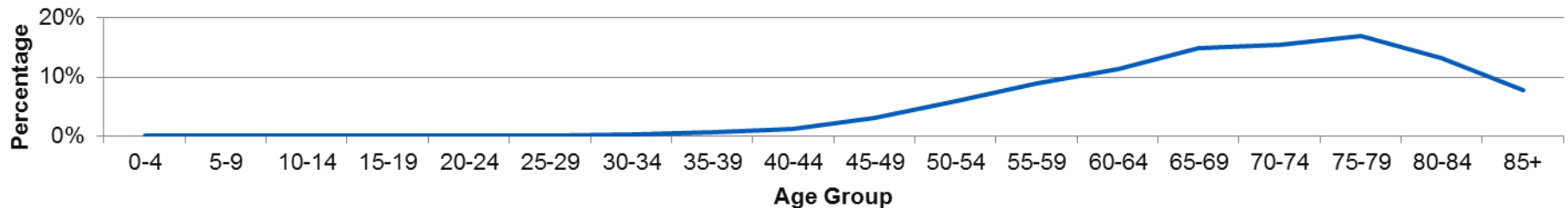
NDA 2014-15: diabetes specific hospital admission characteristics (RRT)

- People with diabetes requiring RRT are younger than those without diabetes (especially type 1)

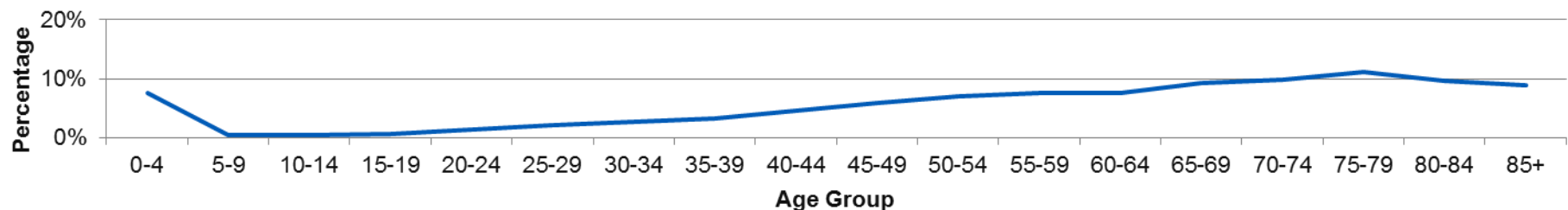
Type 1



Type 2 and Other



Non-Diabetes



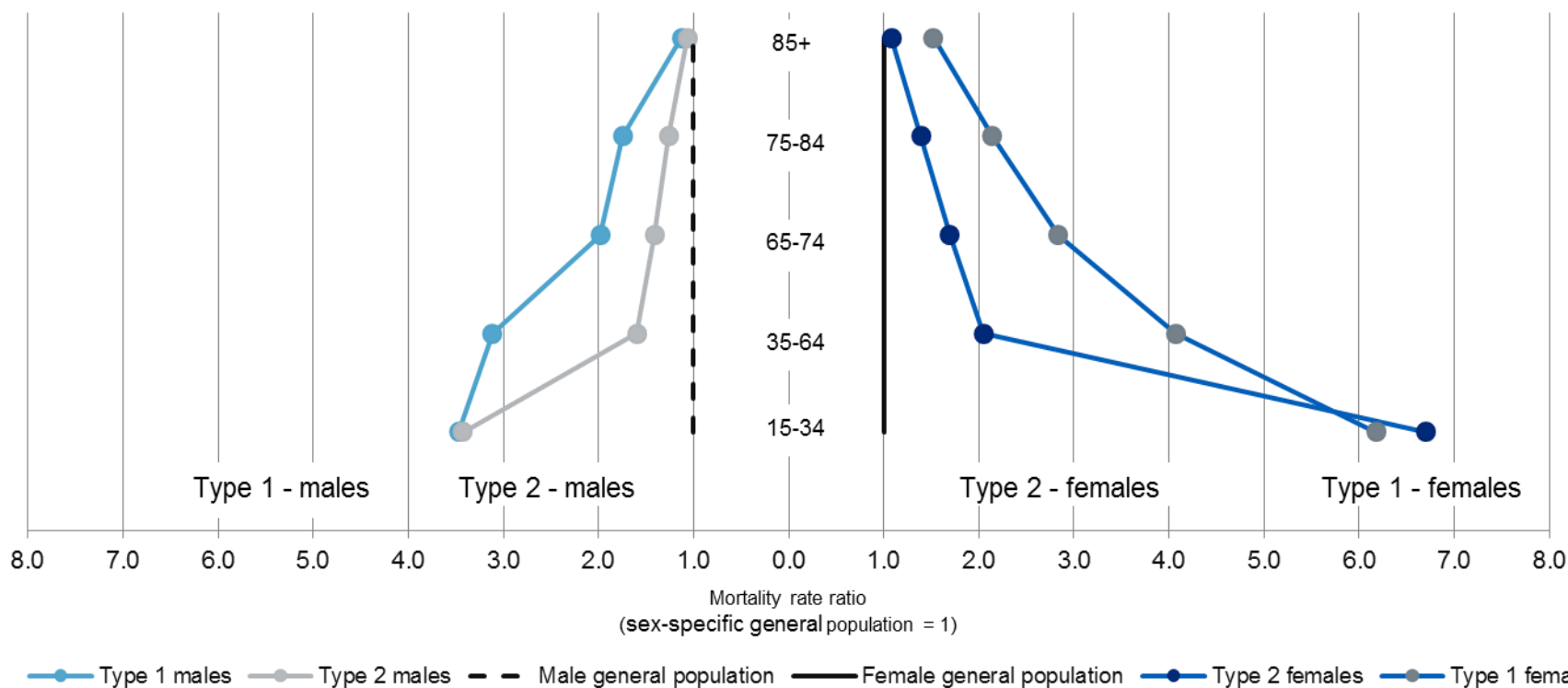
Age distribution of people with and without diabetes admitted for RRT, 2014-15 audit



NDA: age specific mortality rate ratios



- The relative risk of death is increased at all ages, in both men and women, in younger people more than older people.



Age specific mortality rate ratios by type of diabetes and sex, 2013-14 audit, deaths in 2015



NDA: mortality and care processes

– subgroup analysis



Analysis of two cohorts of people with diabetes

- aged 20 years and over and alive as at 31st March 2013
- Tracked over 7 years between 2006-7
- Looked at x3 NICE specified diabetes care processes (HbA1c, BP and cholesterol)
- follow up period was used to identify if the patient died during 2013-14 or 2014-15

1. All 21 checks, **‘Complete’**
2. 12 checks or less (significantly reduced care process completion) **‘Incomplete’**

| | Type 1 | Type 2 and Other |
|---------------------------|--------|------------------|
| Complete Care Processes | 23,928 | 242,829 |
| Incomplete Care Processes | 16,823 | 79,924 |

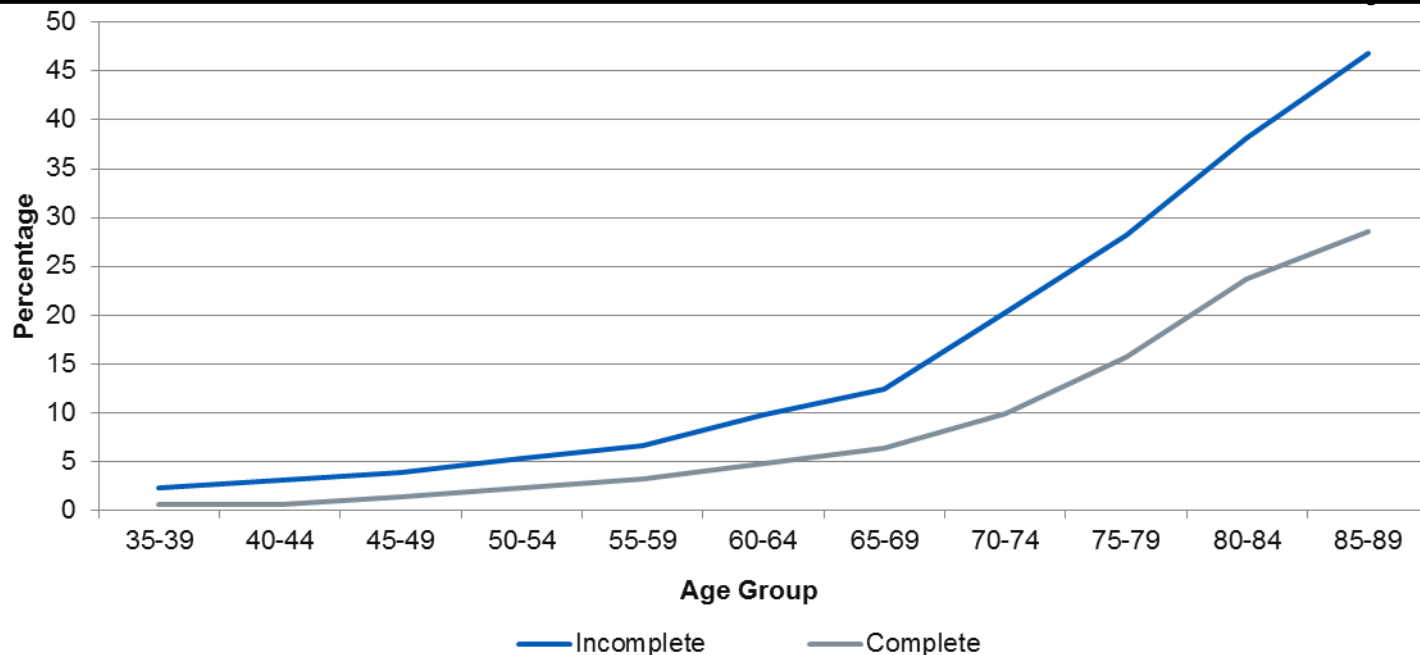
Care process completion cohort sizes for mortality



NDA: mortality and care processes - rates by age (type 1 DM)

- For all age groups, the death rate during the follow up period was higher for the group whose care process completion during the preceding seven years was incomplete – twice as high for most age groups.

This suggests that regular healthcare contacts in people with type 1 diabetes are associated with reduced additional mortality



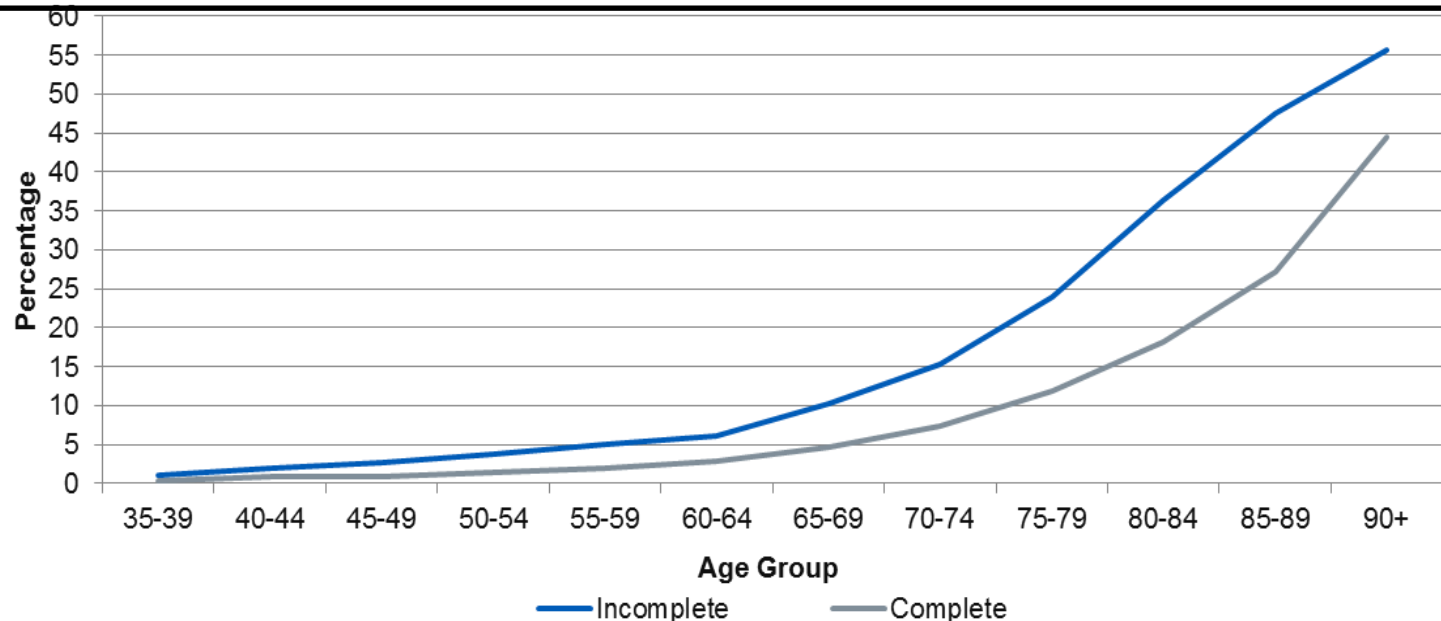
Percentage of people with Type 1 diabetes who died during the follow up period, by age



NDA: mortality and care processes - rates by age (type 2 DM)

- For all age groups, the death rate during the follow up period was higher for the group whose care process completion during the preceding seven years was incomplete – twice as high for most age groups.

This suggests that regular healthcare contacts in people with type 2 diabetes are associated with reduced additional mortality

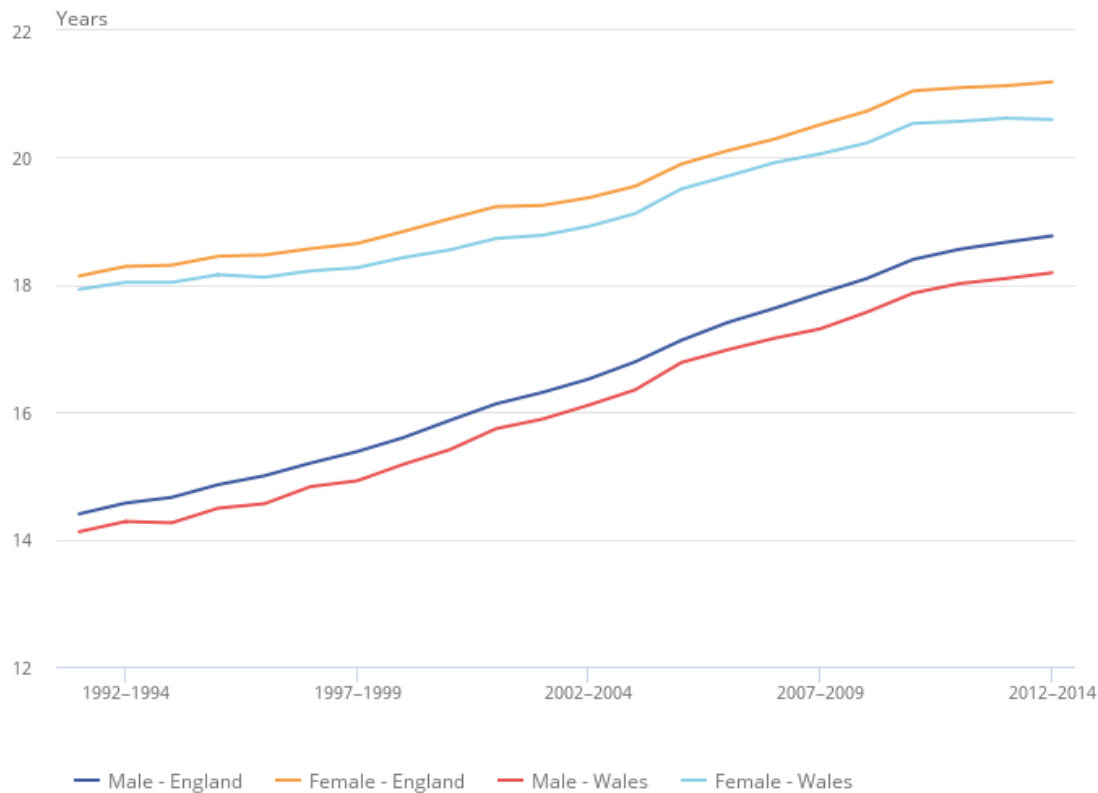


Percentage of people with Type 2 and other diabetes who died during the follow up period, by age

Old Age



Life expectancy for 65-yr olds by sex and country (England and Wales 2012-14)



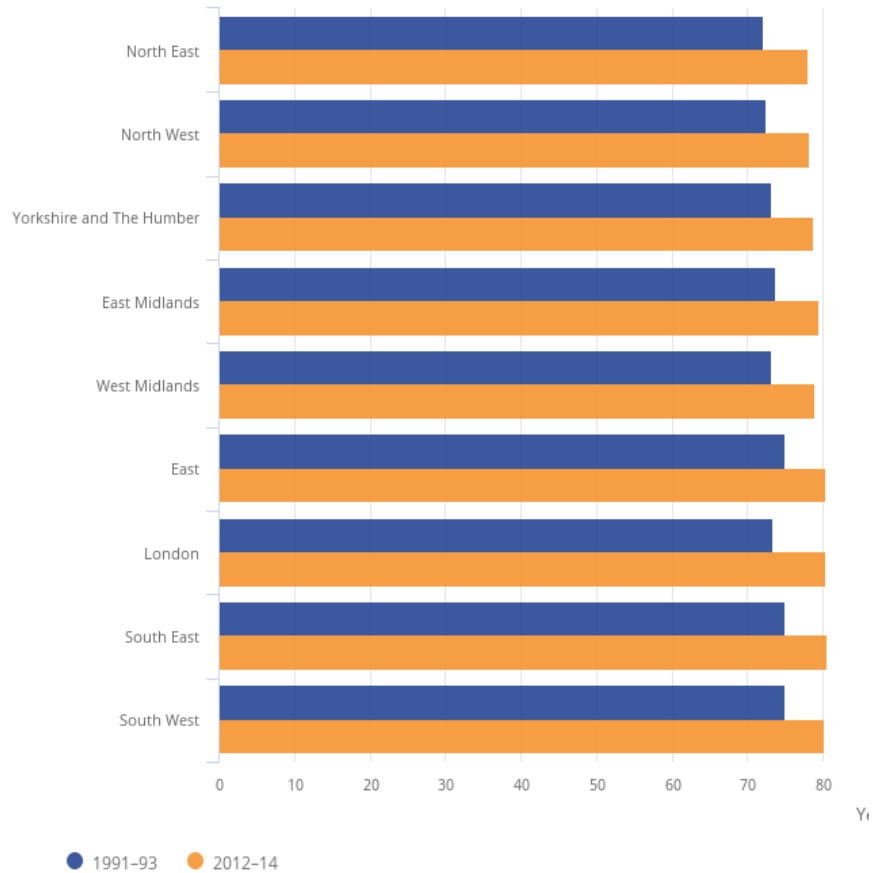
Source: Office for National Statistics



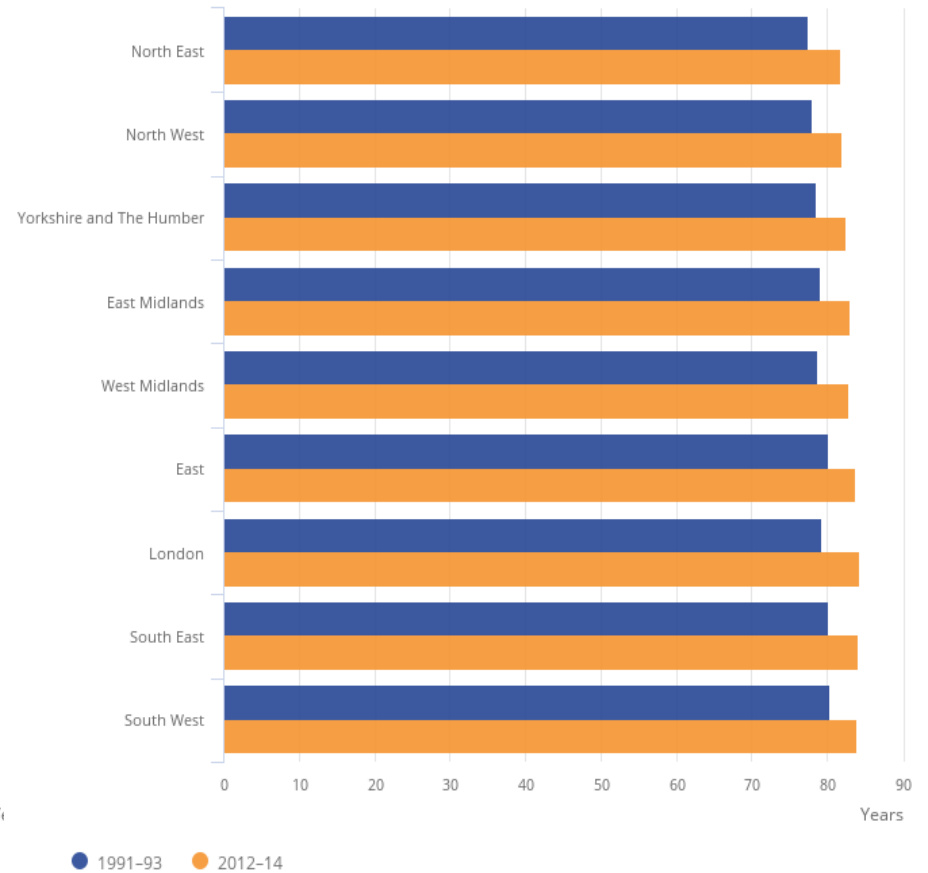
Life expectancy



*Newborn baby boys by region
1991-93 and 2012-14*



*Newborn baby girls by region
1991-93 and 2012-14*





Clinical guidelines for diabetes in older age



NICE

National Institute for
Health and Care Excellence

- Individualized care, considering the factors of age, life expectancy and co-morbidity when considering glycaemic targets
 - Little qualifying detail



- European Diabetes Working Group
 - HbA1c target 53-58mmol/mol (7-7.5%) in fit older people;
59-69mmol/mol (7.5-8.5%) for the frail
- ?69mmol/mol may be risky?

Glycaemic control in older age



- Thorpe et al *Diabetes Care* 2015; **38**: 588-95
 - 15,880 people aged > 65 yrs
 - 16% (2,541) had dementia
 - 24% (3,811) had dementia if age > 75 yrs
 - 52% (8,258) had HbA1c < 53mmol/mol / 7%
 - 75% (6,193) treated with insulin, SUs or both
- Hambling et al *Diabet. Med.* 2017; **34**: 1219-27
 - ECLIPSE data extraction in Norfolk and Suffolk for patients from Nov 2013 – May 2015
 - 24,661 patients > 70 yrs; 15.7% (3862) coded for T2 DM
 - 35.7% (1379) prescribed SUs and/or insulin therapies
 - Median HbA1c = 58mmol/mol / 7.5%
 - 719 people HbA1c < 58mmol/mol c.f. QoF
 - 400 people HbA1c < 53mmol/mol
 - 162 people HbA1c < 48mmol/mol } $\frac{1}{3}$ overtreated
 - 644 people had eGFR < 60 ml/min/1.73m²
 - 60 people coded for dementia

Vulnerabilities for hypoglycaemia



- Advanced age
 - Diabetes duration
 - Polypharmacy
 - Co-morbidities e.g. renal, cognitive impairment
 - Frailty (unintended weight loss)
- Zaccardi et al *Lancet Diabetes Endocrinol* 2016; **4**: 677-85
- Year on year increase in hospital admissions for hypoglycaemia in England 2005-2014
 - over 10yrs absolute nos. = 39% (HES data)

Sequelae of hypoglycaemia



- Emergency call outs (GP, Ambulance)
- Admission (prolonged)
- Fractures
- Head injury
- CV event
- Psychological harm
- Increased cognitive decline



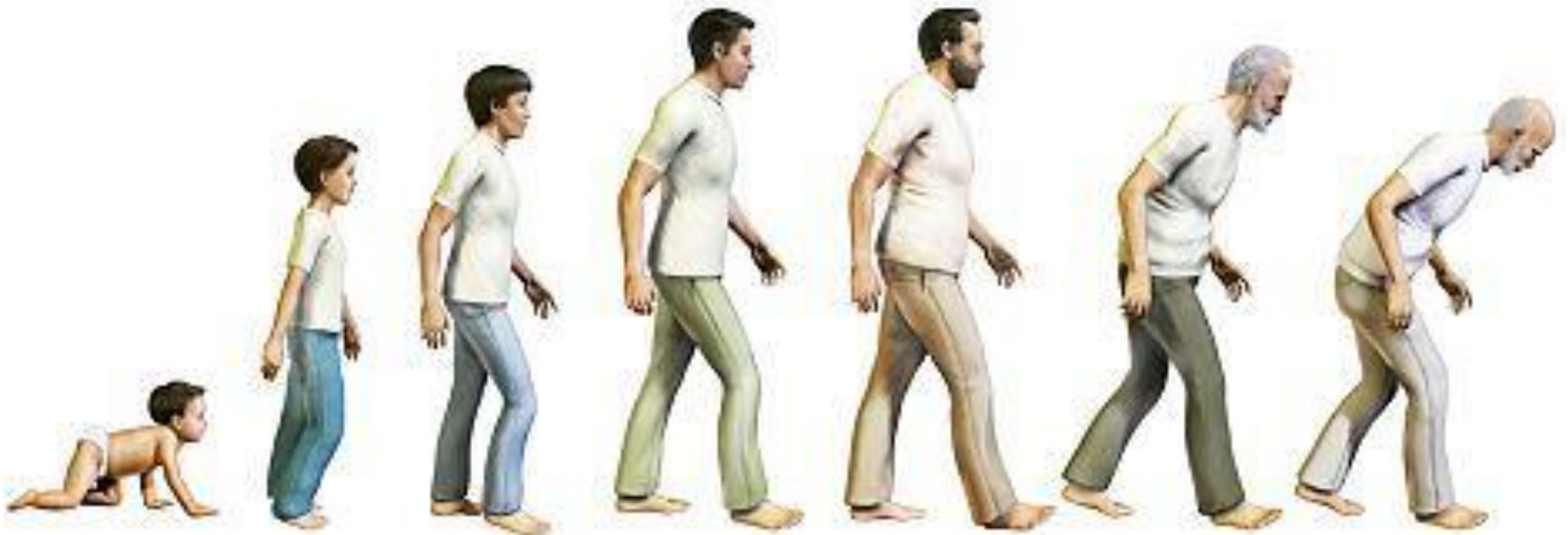
Focus on old age - summary



- Prevalence of diabetes peaks at 75-79 yrs (19.7% of men, 14.2% of women having diabetes)¹
- Insulin and oral hypoglycaemic agents are second only to warfarin and anti-platelet agents as iatrogenic causes of hospital admission
- Evidence for tight glycaemic control lacking
- Individualized care paramount
- Aim to avoid hypoglycaemia and symptomatic hyperglycaemia
- Diabetes UK. Good clinical practice guidelines for care home residents with diabetes. 2010

¹Holt. *Diabet. Med* 2017, **34**: 1183-84

The Seven Ages of Man



1. Infancy

2. Childhood

3. Adolescence

4. Young adult

5. Adulthood

6. Early old age

7. Later old age

Sir David Brailsford



"The whole principle came from the idea that if you broke down everything you could think of that goes into riding a bike, and then improved it by 1%, you will get a significant increase when you put them all together."

Marginal gains

- Newer Insulins
 - Ultrafast acting insulins
 - Better basal insulins
 - Glucose-responsive insulins
 - Buccal insulin
 - Inhaled insulin
- Newer oral agents
 - Reduced hypoglycaemia risk
- New combinations
- Technology
 - Greater use of CSII in particular groups
 - Flash glucose monitoring
 - RT-CGMS
 - Closed-loop systems
- Education and knowledge

**FOR THE MANY
NOT THE FEW**



FOR THE MANY NOT THE FEW
Labour

KEEPING
A COUNTRY
THAT WORKS
FOR EVERYONE

